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D3.2 REPORT FOR PROTOTYPING AND VALIDATION

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Abstract	This deliverable provides a report on the results from coordinated processes of prototyping and validation of the NGI vision through small-scale trials involving third-party researchers. This deliverable aims to be a practical guide for projects, organizations and institutes confronted with setting up and running Open Call programmes and engaging stakeholders.
Keywords	NGI, Open Calls, Stakeholder Engagement

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Dissemination Level		
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* R: Document, report (excluding the periodic and final reports)

DEM: Demonstrator, pilot, prototype, plan designs

DEC: Websites, patents filing, press & media actions, videos, etc.

OTHER: Software, technical diagram, etc.

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EXECUTIVE SUMMARY

This deliverable summarises the work which has been carried out in the framework of HUB4NGI on prototyping and validation of concepts and ideas originating from other work packages within the project. The work concentrates on validation of innovation pathways, engagement of stakeholders to participate in the system of Open Calls as well as the work carried out in testing new concepts of setting up and running Open Calls.

An Innovation Pathway model has been proposed in the earlier HUB4BGI D2.2 deliverable. It benefits NGI innovators in that it shows the context within the process of innovation should occur in terms of the information needed to justify, implement and exploit an innovation case. This deliverable provides validation of the pathway model via two NGI-relevant innovation case studies.

The process of Open Calls is now being frequently used in H2020-projects and will be continued in many new projects in H2020 as well as the new framework programme Horizon Europe. Some critical aspects in engaging stakeholders in this process and setting up and running Open Calls is also presented and discussed. This report provides a set of practical guidelines and serves as a hands-on manual providing templates to define, set up and run Open Calls using the cascade granting process provided by the European Commission.

The result of this deliverable is that processes have been evolved and validated. These can be used widely, to help innovators and operators of open calls using cascade funding.

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1 INTRODUCTION

This deliverable documents the validation of work conducted previously in HUB4NGI and reported in previous deliverables. It concentrates on two major elements: validation of the so-called “innovation pathways” introduced in D2.2 and management of open calls, which is now frequently featured in many H2020 projects through the Annex K “Cascade Funding” process.

The purpose of the Innovation Pathway work is to assist the creation of novel solutions to real-world problems and to support the people that do this, the innovators. A key outcome of the work to date is to make a clear distinction between the definitions of “innovation”: as a process of innovating (i.e. “innovation” is a verb), and the outcome, the innovation itself (i.e. “innovation” is a noun). The model places the innovation process in the context of its surrounding stakeholders and describes the information needed in order to make a convincing innovation case, how to develop the innovation outcome and how to sustain it.

This deliverable provides two validation cases for the Innovation Pathways model, both focused on NGI-relevant innovations addressing needs identified in the synthesis conducted in D2.1. The first case concerns privacy as a service – helping citizens understand and manage their personal data in social media, and the second concerns evidence summarisation tooling to help speed up the legislation process. These case studies are described in detail by instantiating the Innovation Pathways model, and this exercise has highlighted areas of the model that need updating or augmenting, and these are described.

The process of Cascade Granting is now frequently used in H2020-projects and is also envisaged to become, based on information provided through different channels by the European Commission on future framework programmes, in a very similar way the main workhorse to financially support research actions and initiatives in the upcoming calls as well as the new framework programme.

The system is basically a 2-step process in distributing the public EU-funding by first selecting a limited number of projects which propose a kind of framework around specific research topics in which they propose to coordinate and follow-up Open Calls in that specific research area. The funding which these projects receive is to a large amount “unallocated” at the time of granting the project but will in a 2nd step be further distributed.

The projects or initiatives are supposed to reach out to a larger community and attract stakeholders in their specific research area. How this can be done and has been tested in the HUB4NGI project is described in section 2 of this report. The proposed way is to set up a sort of database, presented on a geographical basis, but collecting information on the different players which allow to select and different sets of stakeholders depending on the needs and interests. The information presented in section 2 is a description of the work carried out within HUB4NGI but can also be used as an example of similar process to be followed in other research areas.

The “unallocated” funds need to be distributed to the so-called 3rd parties, through a process of Open Calls. The projects publish Open Calls through which 3rd parties may submit proposals for research activities in specific areas or around specific themes as defined in the Open Calls. The coordinating project organises and executes the review and selection of these proposals and provide funding to these proposals according to specific terms on duration, delivery of reports, etc.

This process of how to set up, publish and follow-up Open Calls is described in section 3 of this report and can serve as a manual for future projects. It contains templates of useful documents which can serve as starting point for projects unfamiliar with this process.

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This deliverable is structured as follows.

In a first section, the innovation pathways are briefly described and then the validation is described of this method in two case studies of innovation. The first case study concerns the “privacy as a service” concept from the H2020 Operando project, and the second is a thematic analysis toolkit from the FP7 SENSE4US project. For each case study, we populate the Innovation Pathway Model with key elements in the process for achieving the innovation outcome. Details on the validation are provided in Annex 1, but this process has highlighted adjustments and improvements needed for the model, and these are discussed.

The following section describes the method which has been actively used within the HUB4NGI-project to inventories possible stakeholders. The idea behind building this database of potential stakeholders is to create a win-win situation by gather information from interested parties while also providing them with an outlook to access valuable information to themselves as well.

Sections 4, 5, 6 and 7 describe in a systematic way the different steps to be taken to set up, run and evaluate Open Calls. These sections, together with templates provided in the annexes, have the intention to offer a hands-on manual for setting up this process describing different possibilities and formats and also providing argumentation and findings when these concepts were validated.

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2 INNOVATION PATHWAY CASE STUDIES

2.1 INTRODUCTION

This first section of this document builds on the work reported on in Deliverable D2.2 of the HUB4NGI project, which introduced the Innovation Pathway model. This will now be validated via two case studies of innovation. The first case study concerns the "privacy as a service" concept from the H2020 Operando project, and the second is a thematic analysis toolkit from the FP7 SENSE4US project. For each case study, we populate the Innovation Pathway Model with key elements in the process for achieving the innovation outcome. Details on the validation are provided in Annex 1, but this process has highlighted adjustments and improvements needed for the model, and these are discussed.

2.2 BACKGROUND: INNOVATION PATHWAYS

The Innovation Pathways methodology defines the set of steps needed to make the innovation process a success; as well as the experts which need to be involved. This is captured as a high-level domain model as shown in Figure 1. We seek to validate this model using a case study; that is, what are the case study values for the model constructs, and do they match such a model?

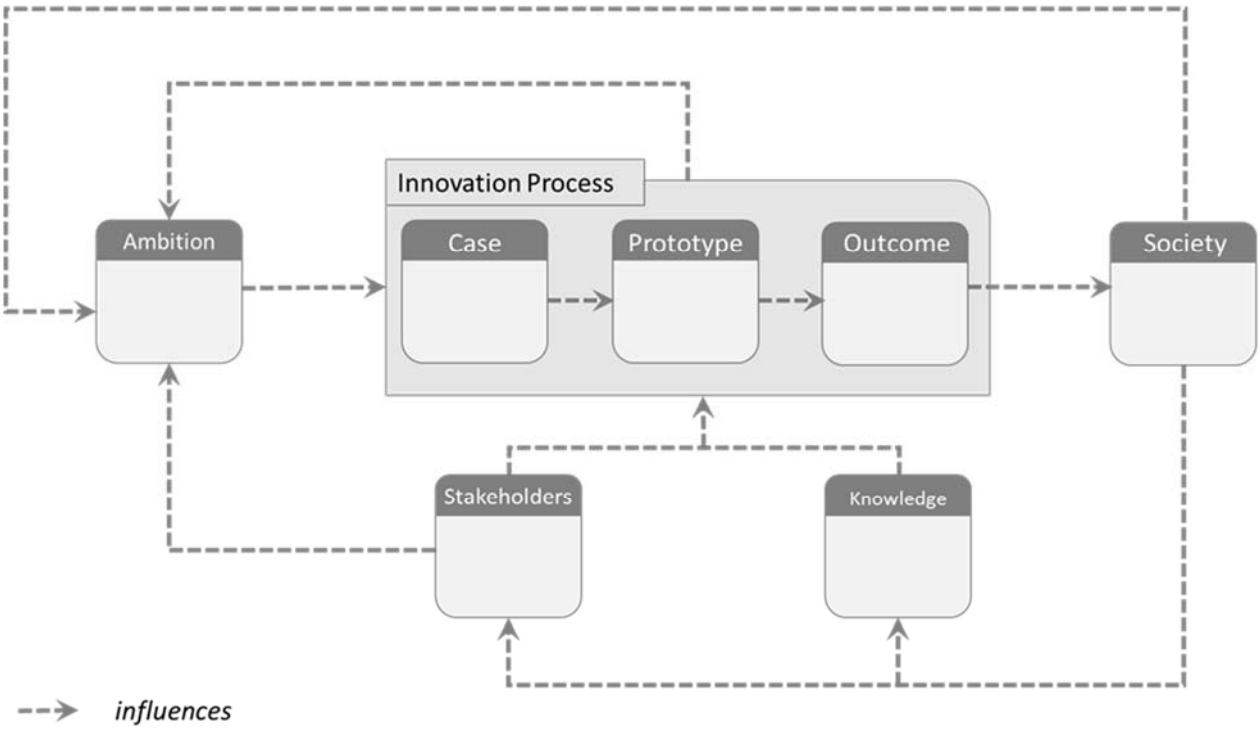

FIGURE 1: HIGH-LEVEL DOMAIN MODEL FOR INNOVATION

As identified in Deliverable D2.2[1], there are four main components to the model and these will form the inputs to the validation:

- The **Ambition** is the overall vision, what needs to be achieved; and defines the rationale and motivation behind a given innovation. The case study will look at how the ambition was generated based upon influence from both Society as a whole (what it expects and what it will not accept) and Stakeholder perceptions and expectations. This feeds into:

[1] Steve Taylor, Brian Pickering, and Michael Boniface, "NGI GUIDE V2", Hub4NGI Deliverable No. D2.2, December 2017

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- The **Innovation Process** itself where an idea is evaluated and implemented or elaborated to produce a recognisable Outcome. As well as responding to an Ambition, the Innovation Process is informed and constrained by two constructs:
  - On the one hand, there are **Stakeholders** who have an interest in whatever the Outcome of the process, but also in how it is achieved. On the other hand, **Knowledge** in broad and general terms will constrain what can be done and influence the choices on how it can be done.
  - Finally, **Society** is the main beneficiary of the Innovation Outcome, but may also constrain it (via Knowledge and Stakeholders) or seed innovation (via Ambition).

2.3 CASE STUDY: OPERANDO

The Operando project was an Innovation Action funded under the H2020 European Research Programme between 2015 and 2018.

The key objective of the Operando project was:

- To "specify, Implement, field test, validate and exploit an innovative privacy enforcement framework that will enable the Privacy as a Service (PaS) business paradigm and create a broad market for online privacy services online."

Operando created two specific innovation outcomes against this objective:

- PlusPrivacy (https://plusprivacy.com): a set of web browser tools and smartphone apps to help users manage their social media privacy, prevent tracking, and support anonymous access to online services;
- Government to Citizens (G2C) Privacy as a Service Platform: a set of privacy enforcing services and dashboard to allow online service providers to deploy the Privacy as a Service paradigm and ensure that their services comply with privacy regulations, and meet the end-users' expectations for control over their personal data.

In Annex 1a of this report, we model these innovations using the Innovation Pathways domain model in order to validate the observations determined by the Pathways Approach; that is, how it is used to understand and realise innovation outcomes.

2.4 CASE STUDY: SENSE4US

Sense4Us was a Research and Innovation Action project funded under the FP7 European Research Programme between 2013 and 2017.

A key challenge of modern-day policy making at government level is that it is too slow to keep up with the pace of technological and social change resulting from technological developments [2]. Novel approaches are required to reduce the time from policy draft to implementation, whilst maintaining accuracy. When policies are drafted, evidence is sought from key stakeholders, such as industry, NGOs and the general public. Submissions can be from a few lines to many hundreds of pages, and analysts need to understand the key themes and what was said about them, often under great time pressure. Due to the large volumes of data and intense time pressure, the human analyst approach can suffer from a lack of rigour in the analysis through human error and fatigue.

The key objective of the Sense4us project was to help policy makers better understand the impacts of draft policies in shorter time, by providing analytical tools enabling the analysis of a deluge of information from different sources. The key outcome of Sense4us was a policy evidence analysis analysis toolkit containing two tools – one to determine the key themes of the

[2] Identified in D2.1 from a survey of relevant and current literature

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corpus of evidence, and a second to determine the sentiments of the comments against each theme. These tools provide a much faster way of identifying key themes with greater rigour, than the previous method where a human analyst determined themes and sentiments by inspection.

In Annex 1B of this report, we model these innovations using the Innovation Pathways domain model in order to validate the observations determined by the Pathways Approach; that is, how it is used to understand and realise innovation outcomes.

2.5 SUMMARY OF MODEL UPDATES

The work reported here (and described in detail in Annex 1A and 1B) has evaluated the innovation pathways work reported in D2.2 of the HUB4NGI-project with two case studies that are rooted in real-life innovations. Each case study has highlighted aspects of the Innovation Pathways model that should be adjusted or improved, and these are summarised next.

- The “Outcome” element should become “Sustainable Outcome”. The model must lead to an outcome that is able to sustainably benefit society, and the sustainability of the innovation outcome needs to be considered. Therefore, the Sustainable Outcome is the innovation itself (which was the original “Outcome”), plus a plan for sustaining it (e.g. creating a business or defining a market and selling into it).
- The “Consumers” element should become “Consumers & Beneficiaries”. The original model only considered direct users as Consumers. The update considers wider Beneficiaries who may be indirectly benefited by the innovation.
- There is the addition of “Funders” as “Contributors”. Funders are crucial to the innovation process because without funding, the innovation will not happen. Convincing Funders of the viability of the innovation is a critical part of the case for innovation. If the funders see genuine benefit from the innovation, they will support it, and thus enable it to happen.

A key observation of the innovation process is that it must always lead to a Sustainable Outcome. The Innovation Pathways Model can have many entry points and the model’s processes can be iterated until a Sustainable Outcome is achieved. The model shows the information needed, and the model can be populated iteratively until a viable Sustainable Outcome is achieved.

D2.2 highlighted the distinction between two definitions of “innovation”: the *artefact* and the *process* to arrive at the artefact. The artefact can be thought of as the novel application of technology to solve a real-world problem; and the evaluation described here describes the process and the information needed at each stage of the process to create the artefact.

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3 IDENTIFYING POTENTIAL STAKEHOLDERS

3.1 INTRODUCTION

The process of Open Calls is set up to provide funding, research, innovation, experimentation and collaboration opportunities to a wide community. The process can only be successful if enough parties in this community are engaged to participate in the process. Therefore, the very first step in the process of engaging possible stakeholders in any of the process and in the process of Open Calls in particular, is the identification of these stakeholders and collecting contact information and interests. In many cases such contacts will already exist but are very limited and mostly based on personal contacts as well as existing mailing lists.

The major challenge lies in reaching out to a wider community and engaging this larger community into the target audience of the projects and actions. In this section a method will be presented which has been actively used within the HUB4NGI-project to inventories these possible stakeholders.

The idea behind building this database of potential stakeholders is to gather information from interested parties while also providing them with an outlook to access valuable information to themselves as well. Creating this win-win situation and relationship is key to successful building the database. Within HUB4NGI, future work will now look at providing support for running different types of analysis (like discussed in Annex 2) as a service attached to the online map, in order to provide this directly to registered actors.

3.2 STAKEHOLDERS WITHIN THE NGI COMMUNITY

Success in creating the next generation Internet relies on the contribution of subject experts and experience across the core NGI topic areas and other related, relevant topics. Collaboration with key actors and access to required resources are therefore important in shaping the initiative and its corresponding R&D agenda, in identifying and setting up informative events and activities, building tools and deriving instruments that will work toward its goals.

The NGI Community Map (www.ngi.eu) serves as a resource for bringing together actors in the NGI community, predominantly within, but also beyond, the EU.

Actors, on the Map, in exchange sharing information about their organisation openly, derive benefit from the NGI community. This includes the offer of a free marketing channel and a collaboration space, and, importantly, publicly identifies actors as stakeholders in an important EU initiative. Each actor receives directly information on relevant open and specific EU calls, more indirect information on other projects and initiatives relevant to their area of expertise. for those actors not signed up to the NGI mailing lists other means exist for discovering these resources via the NGI website or by contacting other actors on the map.

By default, the map presentation, as shown in

Figure 2, allows geographical location to be used to determine physical access to potential collaborators and shared resources, both accessible remotely and not. The map recorded its 179th actor on the 4th of Oct 2018. The entries span 25 countries, 4 of which non-EU - Norway (5), Serbia (1), Switzerland (6) and Turkey (4) - see also Figure 3.

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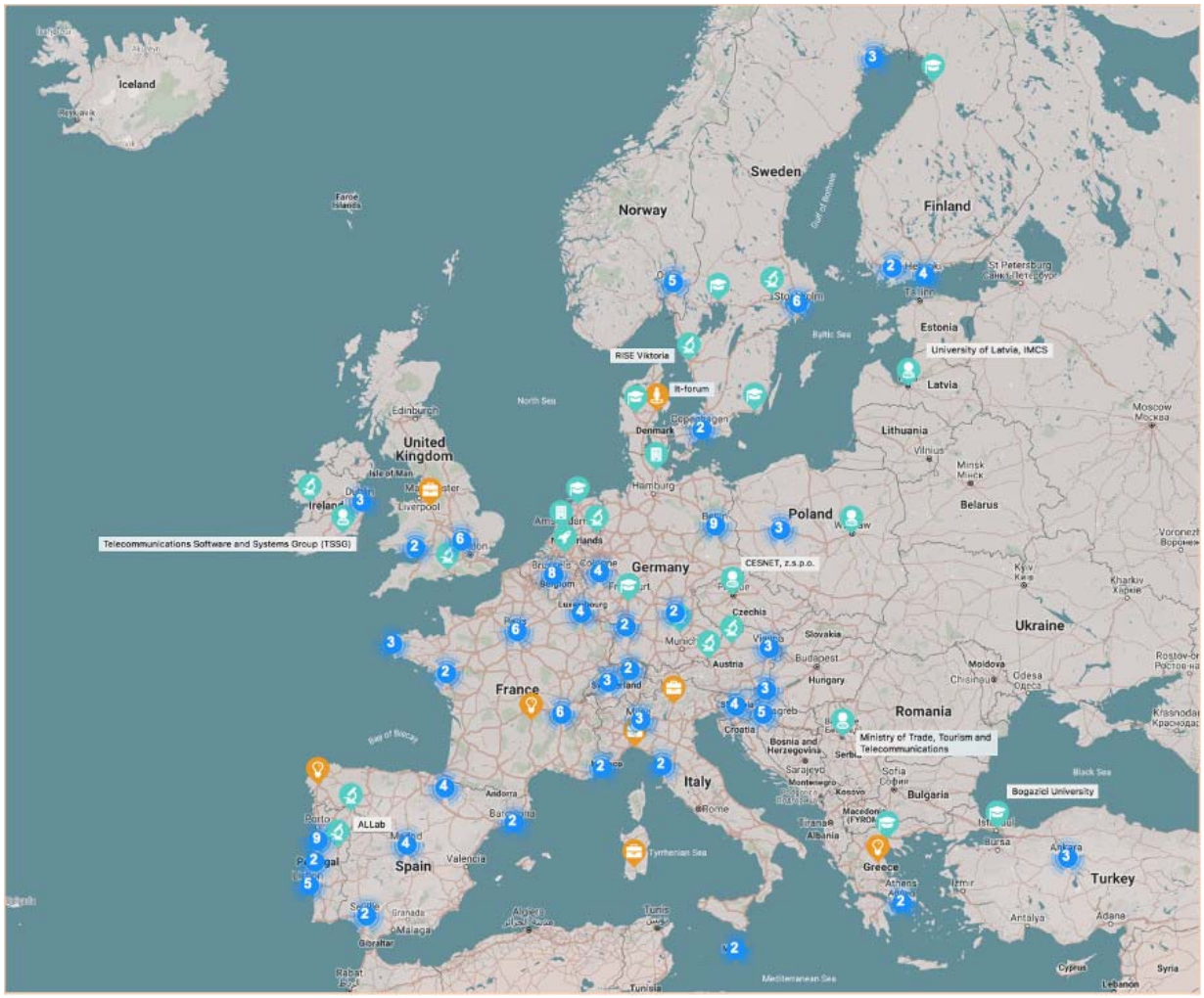

FIGURE 2: THE NGI COMMUNITY MAP AS AT THE START OF OCT 2018, WITH 179 REGISTERED ACTORS ACROSS 25 COUNTRIES. ORGANISATION LABELS ARE SUPERIMPOSED ON THE MAP TO ILLUSTRATE THE DIVERSITY IN THE COMMUNITY, BOTH WITH RESPECT TO ORGANISATION TYPE AND SPECIFIC AIMS

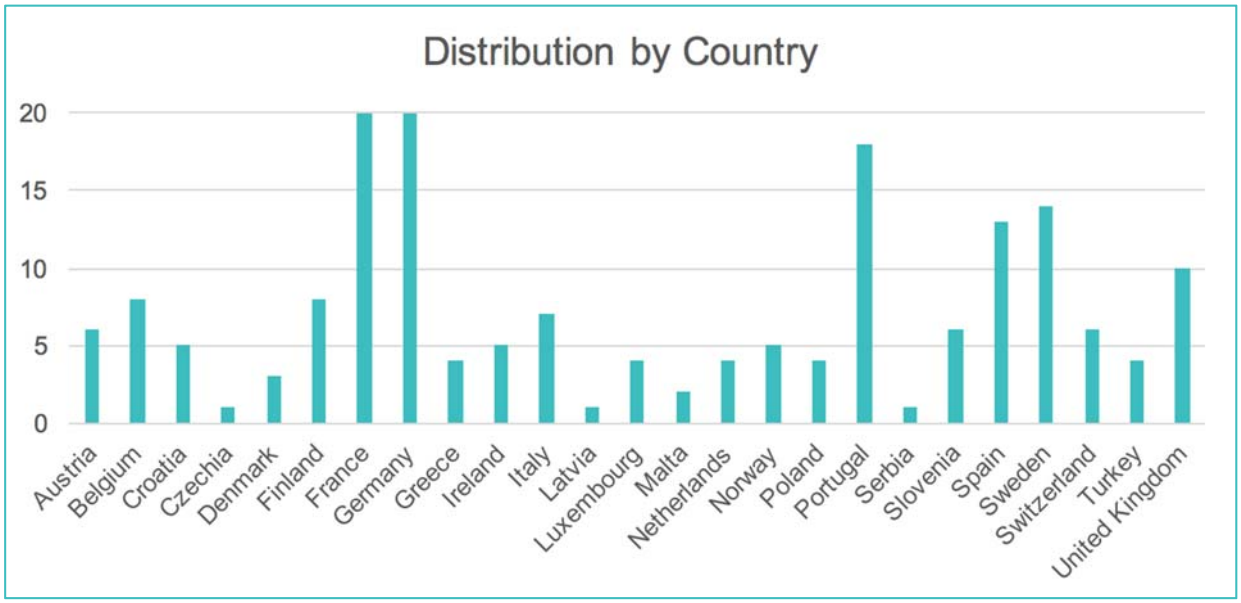

FIGURE 3: DISTRIBUTION BY COUNTRY

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As the community grows, the pool of resources, information and knowledge it contains increases. To tap into this effectively, the HUB4NGI project has started preliminary, offline analysis of the public organisation data. Among others, this is to support submission to new and ongoing calls by helping to identify expertise and interest, and therefore potential collaborators.

One can first select on organisation type which can be of direct interest to select a subset of the stakeholders identified to target specific Open Calls. This may also include geographical information to identify potential patrons for supporting experiments, or thematic information for potential collaborations.

It should be noted that while not required to register, organisations are encouraged to provide a description that includes interests, expertise, current projects and initiatives. Each actor description therefore indicates how best it is aligned along the aims of the NGI.

The data thus made available supports topic mining and, therefore, similarity analysis based on shared interests.

More information on how such analysis is carried out in HUB4NGI can be found in Annex 2 where an example is provided.

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4 SETTING UP OPEN CALLS

4.1 INTRODUCTION

Potential stakeholders defined and information gathered on possible interested parties, paves the way to getting those parties involved in the research work through the system of Open Calls. This part of the document provides some information on issues to be decided upon and formalities to be completed before one can start publishing an Open Call:

- Decision on the format of the Open Call
- Preparation of the Open Call information document
- Preparation of the Proposal template
- Preparation of the Legal documents
- Preparation of the Report template

This section comprises information on different formats which have been tested and comments received. It also provides information on the timeline which is normally to be considered and templates which can be used to prepare the information on the call, the legal documents and the budgetary aspects.

The templates presented have been worked out in the framework of HUB4NGI, tested within the Fed4FIRE+ project and some ideas have now already been used in several other H2020-projects which also run Open Calls.

4.2 THE FORMAT OF THE OPEN CALLS

The “Cascade Granting” system implies that part of the funding, received by the project is re-distributed amongst 3rd parties which respond to Open Calls. These Open Calls are not precised in more detail and it is up to the project to work out the details of these Open Calls. In this deliverable we will present different formats of Open Calls which have been tested and for which we can summarize some characteristics and issues to be considered.

4.2.1 Standard Open Calls

Most of the current research projects use what one can call “Standard” Open Calls to attract 3rd parties. They mainly consist of publishing the scope of the call, the budget of the sub-projects to be submitted and the details on how these should be prepared. There is no further distinction made with respect to the type of 3rd parties which can participate nor with respect to geographical spread or focussed research topics.

4.2.2 Targeted Open Calls

With this type of Open Call, we can specifically target certain types of proposers or 3rd parties. By specifying the type of proposing party, one can limit the submissions to such calls to e.g. proposals only originating from SME’s. This clearly has the advantage and purpose to favour this type of proposing party and can be included in the eligibility specifications.

4.2.3 Themed Open Calls

Open Calls are evidently targeting specific research domains, covered by the project issuing the Open Calls. However, in case of projects which cover a wide range of technologies, application areas or research themes, one can favour specific themes within this research area by again specifying this in the eligibility criteria or the focus of the call. In the Fed4FIRE+ project which

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has been used for testing this format, a wide range of technologies is covered which are all in the area of NGI. At some occasions, themed calls were published to attract new players or a set of parties in specific domains. His can be considered when a shortage is noticed in specific domains or when specific areas are considered as Hot Topics e.g. at the occasion of events, conferences, …

4.2.4 Staged Open Calls

This format of Open Calls works with 2 stages for submission. In a 1st stage a very limited proposal is submitted. Based on this limited information, a first selection is carried out by the review panel. The selected parties in the 1st stage are invited to submit a full or more extensive proposal in a 2nd stage.

The main advantage of this staged approach is the minimal effort which is required in the 1st stage to prepare and submit a proposal and limits of course the workload on getting a first feedback. In the test which was carried out, the format went even further in the sense that acceptance in the 1st stage allowed the proposing parties to obtain some financial support to carry out a first set of tests to check feasibility and compliance before even preparing a full proposal for the 2nd stage.

In the test this staged Open call was limited to SMEs and allowed SMEs to limit the effort in preparing a 1st stage proposal, if accepted to carry out a first test and get acquainted with the format and test environment and prepare, in collaboration with a Patron, the 2nd stage proposal.

4.2.5 Continuous Open Calls:

Out of all the tests which were carried out, the main feedback which was obtained was to suggestion and request to limit the administrative effort and the time to obtain a feedback on possible selection to an absolute minimum. At the time of writing this deliverable, a test was carried out by which a continuous Open Call is published to which SMEs and only SME's' can submit. At a 2-weekly interval, all received proposals are collected and prepared for review. This review is carried out on a remote basis with very specific criteria and scoring thresholds.

Based on this quick review, which has to be finished within 2 weeks, a selection on "Go – no Go" is made.

This implies that a proposing party receives a decision on acceptance or rejection within 2 weeks after the cut-off dates.

When issuing such continuous Open Calls, one has to carefully consider the process which is required to accept / restrict re-submissions and submission of different proposal by the same party.

In the case of the test carried out, the restrictions implemented were:

- ➔ 1 re-submission is allowed every 6 months only
- ➔ Only 1 proposal from a submitting party can be accepted every 6 months

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4.3 OPEN CALL INFORMATION

Once a decision is made on the format of the Open Call, one can start preparing the document which describes all the necessary information. This document may include sections on:

- Information Summary
- Background information on the project issuing the call
- Focus and scope of the call
- Eligibility criteria
- Budget information
- Reporting information
- IP – related information
- Attendance at meetings
- Selection criteria

For the tests carried out in this work, the template attached in Annex 3 of this deliverable served as a basis of this information document.

4.4 PROPOSAL TEMPLATE

All proposals should be prepared using a fixed template. This ensures that all of the required information is presented and structured in a way to ease the review process. When listing the selection criteria, one can easily refer to specific sections in the proposal template to facilitate the review process as well as to clarify what information should be provided in each section.

During the tests carried out in this work, the template in Annex 4 was used.

The template in Annex 4 is the template for proposals used in most of the tests, however in case of the staged Open Call and in case of the continuous Open Call, a more concise template was used with page limits to restrict the administrative time required to prepare the proposal.

4.5 LEGAL DOCUMENTS

As the Cascade Granting process involves a re-distribution of public funding as well as the commitment b the proposing party to carry out work, a legal agreement is required between the proposing party and the party issuing the Open Call.

Consortia running the Open Calls are not legal entities and as the process to establish a legal agreement between the proposing party and all of the parties in the project publishing the Open Call is not feasible in view of time to pass the signature process, it is advisable to prepare, in the consortium agreement of the project running the Open Calls, a statement that the project coordinator or another specific partner, is able to sign the agreement with the 3rd party representing the whole consortium

- It also helps to work out a standard agreement which is agreed upon by all project partners and which is made available in advance, as part of the Open Call information package to the 3rd party. In this way, all partners in the project can agree upon this agreement document prior to publishing any Open Call, and the proposing 3rd party can check if the agreement is acceptable.

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- In all tests carried out in this work, the template in Annex 5 was used as an agreement between the project and the proposing party. This agreement was already used by other projects running open calls and can be considered as a valuable starting point to work out more specific documents if required.

4.6 REPORT TEMPLATE

As part of the information package, a template should also be presented of the report which will be required at the end of the project which has been proposed. This provides information to the proposing party on what amount of work and what kind of information is required at the end of the project.

Besides a more technical description of the project results it is also advisable to include questions and sections calling upon the 3rd party to provide information on why they participated and what impact the project has on their own work and business plan. This helps to evaluate the impact and success of the Open Calls and also provides valuable information on whether the Open Calls need to be re-formatted or changed in scope or format.

A template as was used in these tests is provided in Annex 6.

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5 RUNNING OPEN CALLS

5.1 SPREADING THE NEWS

Once the Open Call has been published, the main task lies in the dissemination of the news. Social Media can be very attractive here, as well as traditional channels such as websites and newsletters. However, it turns out form the tests and from information gathered from several projects, that it is very difficult to spread the message outside the traditional community in which the project partners are involved in.

Webinars, presentations at events and presence at exhibitions can also be very helpful and, depending on the choice of the event, may indeed trigger interests form other communities than “the usual suspects”.

5.2 RECEPTION OF PROPOSALS

During the final days before the set deadline for the submission of the proposals, most of the proposals come in. In some of the projects in which framework some tests were carried out, the Open Calls targeted the use of technical experimental facilities and a system was set up by which one of the project partners served as a “Patron” for the submitting 3rd party.

This role as Patron, helped the submitting 3rd party in preparing their proposal and also to check compatibility of the proposed work with the experimental facilities available. To enforce this, a 2nd deadline was set, about 1 week prior to the final deadline by which this compatibility-check needed to be performed and completed.

This 1st compatibility deadline helped in maintaining the normal submission deadline but involved some extra work for the project partners issuing the Open Call.

5.3 REVIEW OF THE SUBMITTED PROPOSALS

Once all proposals are in, these have to be reviewed.

It is strongly advised to use a pool of external experts to review the proposals to avoid any conflict of interest as well as to increase the neutrality of the review process.

The submitted proposals need to be distributed amongst the reviewers depending on their field of expertise.

The review process can also have different formats amongst we just list 3:

- ➔ Review and scoring of the proposals, followed by a pure mathematical ranking & selection based on the scores
- ➔ Review and scoring of the proposals, followed by a consensus meeting to agree on common scores. This consensus meeting can be physical or via telephone conference
- ➔ Review and scoring of the proposals followed by a partially consensus meeting only covering those proposals on which scores more than set criteria.

Depending on the complexity of the review and the process, the number of the proposals and the number of reviewers available, the number of reviewers per proposal can vary, but is strongly advised to have at least 2 reviewers per proposal.

In most of the tests used for this work, the last option was chosen by which only the consensus meetings were carried out via telephone conference on those proposals for which the scores by the 2 reviewers differ too much.

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Depending on the test, the number of criteria used to score the proposals during review varied between 6 and 9. Some of the criteria were weighted higher than others and a typical list used is given below:

- Criteria I 0 to 5 points (threshold 3 points) weight = 2
- Criteria II 0 to 5 points (threshold 3 points) weight = 2
- Criteria III 0 to 5 points (threshold 3 points) weight = 1
- Criteria IV 0 to 5 points (threshold 3 points) weight = 1
- Criteria V 0 to 5 points (threshold 3 points) weight = 2
- Criteria VI 0 to 5 points (threshold 3 points) weight = 1
- Criteria VII 0 to 5 points (threshold 3 points) weight = 1
- Criteria VIII 0 to 5 points (threshold 3 points) weight = 1
- Criteria IX 0 or 5 points (no threshold) weight = 1
- Total score: 0 to 60 points (threshold 40 points)

To ease the review process, the following rules can be implemented (and were tested in this work):

- If all reviewers score a proposal on the same criteria below threshold, the proposal is not brought to the consensus meeting and is immediately rejected.
- If the difference in (non-weighted) scores by the reviewers on a single criterion is 2 points or higher, the proposal needs to undergo a consensus meeting to discuss this specific criterion and to bring the scores closer to each other.
- If the difference in total score by the reviewers is 15% or higher, the proposal needs to undergo a consensus meeting to discuss this proposal and to bring the scores closer to each other.

A template which can be used for the reviewers to complete their review is provided in Annex 7.

5.4 FAST REVIEW PROCESS

The scheme above worked well during the tests, but in case a fast turn-around time is required to provide feedback to the proposing 3rd party, another simplified scheme can be used. This is the case in e.g. a continuous Open Call aimed at SMEs as here a very fast response is required to the SME to provide feedback. As in this case also a very short proposal with limited information is required by the proposing 3rd party, a simplified review process was tested.

In this process each proposal was reviewed by 3 reviewers with a reduced set of criteria and also a pure mathematical ranking was used to determine selection of the proposal.

5.5 FEEDBACK TO THE PROPOSING 3RD PARTY

Providing feedback to the proposing 3rd party is essential in the whole process, It provides useful information to the proposing party on how to improve their proposal for future re-submission in new Open Calls.

Care needs to be taken in providing the feedback and comments from the reviewers in an anonymous way as to avoid conflicts.

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5.6 FOLLOW-UP OF THE PROPOSALS DURING EXCECUTION.

During execution of the projects, follow calls or meetings are required to check on the status and progress of the projects. This is interesting to identify possible problems at an early stage during the process and to improve the quality of the work, as well as the experience of the submitting 3rd party.

Requesting written reports is in most cases considered as a too large burden, but setting up follow-up telephone conferences already provides useful information.

5.7 COLLECTION OF RESULTS

At the end of the projects, results must be collected. This information is necessary to:

- ➔ Evaluate the work carried out
- ➔ Collect feedback
- ➔ Assessment of the impact

5.7.1 1st evaluation of the work

Evaluation of the work carried out needs to be done to provide a basis for the payment to the 3rd party. This reporting is done through the templates provided for the reports. These templates are known to the proposing 3rd party by including them in the information package of the Open call.

In these reports the project issuing the Open Call can request information on the technical results, the motivation for the work, the way the work is placed in the business of the proposing 3rd party, etc…

It can also contain sections in which the 3rd party provides information and feedback to the project on the format of the Open call, the process of running the Open call, the review process, the administrative load, the quality of the support, the quality of the services offered,.. This part of the report can be very interesting to improve the process of Open calls, to fine-tune the process, etc…

This report serves a first basis for the payment of the 3rd party.

5.7.2 Formal review of the work

In most cases, a formal review might be required. This has been the case in most of the H2020-projects through which these tests were carried out and also from others from which information was collected.

This formal review serves as a basis for the 2nd and final payment of the 3rd party. In most cases this evaluation requires a formal presentation / demonstration in front of an external review panel. In the case of the EU-funded projects, this was carried out co-located and co-organized with reviews of the project issuing the Open Call.

5.7.3 Quick surveys

On-line surveys are, in addition to the report, also very valuable to collect information on a more systematic way on various aspects of the Open call process as well as on the quality of the work.

The system of a very limited number of questions with a limited number of standardised answers which one has to pick, allows in an easy way to provide statistical information on the impact, the usefulness and the quality of the work and the whole process.

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5.8 PUBLICATION OF RESULTS

Publication of results can be interesting for the proposing 3rd party, unless confidentiality is required, but the publication of at least a short overview of the results and experiences by the proposing 3rd parties is very important for the proposing project. This publication of summaries, success stories and user-testimonials is useful in spreading the news on the system of Open calls and increases the chances in reaching out to a wider community.

In view of the possible confidentiality of the results and the products involved, clear arrangements need to be made between the 3rd party and the project on which results and which information will be published. Again, this needs to be provided in the information document of the Open call and sections in the report can also be labelled as “publishable” or “confidential”.

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6 PAYMENT SCHEME

6.1 STANDARD PAYMENT SCHEME

3rd parties responding to Open calls can be best compared to subcontractors: payment is carried out on the basis of proof of results. This implies that payment of the 3rd party is only done after reception and evaluation of the report containing all the results and other required information.

In practice, the tests have proven that some flexibility needs to be provided and therefore, based on the work carried out here, the following scheme is advised:

- No prepayments are done
- 75% of the required financial support is paid at the end of the project after reception and evaluation of the report
- The remaining 25% of the requested funding is paid after the formal review has taken place with a positive result.

6.2 ALTERNATIVE PAYMENT SCHEME

In some cases, special arrangements need to be applied. This can be the case for projects of long duration submitted by 3rd parties such as e.g. SMEs. In case the project has a long duration, the SME has to provide pre-financing of the work for a long period before funding is received. In some cases, this might be troublesome for the SME and proposing 3rd party and may withheld them from participating.

Therefore, one can provide a flexibility in required intermediate reports (e.g. at each quarter of the proposed project) and pay a corresponding amount of the requested funding at reception and evaluation of these intermediate reports.

6.3 ACTUAL PAYMENT

The way the actual payments are carried out, is strongly dependent on restrictions or guidelines which may have been described in detail in the actual grant agreement and contract of the overall project with the funding agency. In the case of the Fed4FIRE+ project which served as a test-vehicle for these Open Call schemes, the payment was carried out through an invoice of the party carrying out the project to the coordinator of Fed4FIRE+.

It is strongly advised to seek guidance and confirmation on the way these payments have to be carried out in a formal and correct way, and there can, unfortunately, no general rule be presented.

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7 SCHEMATIC SUMMARY

The information described in the sections above are summarized in a schematic way in the list below:

- Setting up Open Calls
  - The format of the Open Calls
  - Open Call information
  - Proposal template
  - Legal documents
  - Report template
- Running Open Calls
  - Spreading the news
  - Reception of proposals
  - Review of the submitted proposals
  - Feedback to the proposing 3rd party
  - Follow-up of the proposals during execution.
  - Collection of results
- Publication of results
- Payments

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8 CONCLUSIONS

This deliverable has described the work on prototyping and validation of concepts and ideas originating from other work packages within the project. The work described here concentrates on validation of two main aspects:

- an information model and process aimed at helping NGI innovators make successful and sustainable innovations; and
- engagement of stakeholders to participate in the system of Open Calls as well as the work carried out in testing new concepts of setting up and running Open Calls.

An Innovation Pathway model has been proposed in the earlier HUB4BGI D2.2 deliverable. It benefits NGI innovators in that it shows the context within the process of innovation should occur in terms of the information needed to justify, implement and exploit an innovation case. This deliverable has provided two validation cases for the Innovation Pathways model, both focused on NGI-relevant innovations addressing needs identified in the synthesis conducted in D2.1. The first case concerns privacy as a service – helping citizens understand and manage their personal data in social media, and the second concerns evidence summarisation tooling to help speed up the legislation process. These case studies have been described in detail by instantiating the Innovation Pathways model, and this exercise has highlighted areas of the model that need updating or augmenting, and these are described.

A key observation of the innovation process is that it must always lead to a Sustainable Outcome. The Innovation Pathways Model can have many entry points and the model's processes can be iterated until a Sustainable Outcome is achieved. The model shows the information needed, and the model can be populated iteratively until a viable Sustainable Outcome is achieved.

The second part of this deliverable is devoted to the identification of potential stakeholders and the required steps to be taken in implementing Open Calls using the Cascade Granting procedure. The process described for identification of potential stakeholders is a process which was successfully used within the HUB4NGI project where a win-win situation is created by gathering information from possible interested parties and at the same time providing them access to valuable information.

The remainder of the document described in detail the individual steps to be taken to set up, run and evaluate Open Calls. Different formats of Open Calls are presented and have also bene tested and validated in the framework of H2020-projects, and more specifically in the framework of the Fed4FIRE+ project. These steps are presented in a systematic way so that the document can serve as a manual which can be used in the framework of other projects.

The material is presented grouped for the different phases of the process:

- setting up the Open Calls, which includes the decisions on the format of the Open Calls. Different formats are propose: standard formats, thematic calls, continuous calls, calls targeting specific classes of proposers,… and also the preparation of the information document, proposal template, legal documents and the report template
- Running Open Calls, which includes the process of reception of the proposals, the subsequent review process and the follow-up and collection of results of the submitted projects
- Payment process

The overall result is that two processes, addressing issues of concern to H2020 and the Next Generation Internet have been developed in this project and validated in this deliverable. This deliverable has shown how the processes can be used and can benefit other parties in H2020 and the NGI, and a wider community.

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9 ANNEXES

Annex 1A: Innovation Pathway Case Study Operando

Annex 1B: Innovation Pathway Case Study Sense4Us

Annex 2: Detailed information on building the NGI map and using the information provided to identify potential stakeholders

Annex 3: Template for Open Call Information

Annex 4: Template for Open Call Proposal

Annex 5: Template for Open Call Legal agreement

Annex 6: Template for Open Call Report

Annex 7: Template for Open Call Review sheet

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10 ANNEX 1A: INNOVATION PATHWAY CASE STUDY: OPERANDO

10.1 INTRODUCTION

Operando was an Innovation Action project funded under the H2020 European Research Programme between 2015 and 2018.

The key objective of the Operando project was:

- "Specify, Implement, field test, validate and exploit an innovative privacy enforcement framework that will enable the Privacy as a Service (PaS) business paradigm and create a broad market for online privacy services online."

Operando created two specific innovation outcomes against this objective:

- PlusPrivacy (https://plusprivacy.com): a set of web browser tools and smartphone apps to help users manage their social media privacy, prevent tracking, and support anonymous access to online services.
- Government to Citizens (G2C) Privacy as a Service Platform: a set of privacy enforcing services and dashboard to allow online service providers to deploy the Privacy as a Service paradigm and ensure that their services comply with privacy regulations, and meet the end-users' expectations for control over their personal data.

In this report, we model these innovations using the Innovation Pathways domain model in order to validate the observations determined by the Pathways Approach; that is, how it is used to understand and realise innovation outcomes.

10.2 GENERATING AMBITION

The Operando ambition was initiated in response to stakeholder input: where there was a perceived need in relation to Requirements, Vision and/or Agenda. We show this in terms of using the Ambition construct shown in Figure 4.

Vision

The overall vision for society in terms of Internet and Privacy is identified as:

- An Internet where personal privacy is respected. In particular by the online content and service providers with access to the growing amounts of personal data utilised online; there will be an estimated 35 zettabytes of digital records worldwide by the year 2020[3].
- A safer and trusted Internet driven by end-users in control of their own privacy.
- A privacy preserving society, whereby individual privacy is considered beyond economic gains.
- Reduce privacy breaches and abuse of usage of personal data. Privacy breaches (particularly those reported in the media, c.f. the Cambridge Analytica scandal) impact on the service provider's capacity to attract users and increase usage. Hence, there is a strong need to comply with regulations.

[3] P. Anthonysamy and A. Rashid. 2015. Software Engineering for Privacy in-the-Large. In 2015 IEEE/ACM 37th IEEE International Conference on Software Engineering, Vol. 2. 947–948. https://doi.org/10.1109/ICSE.2015.300

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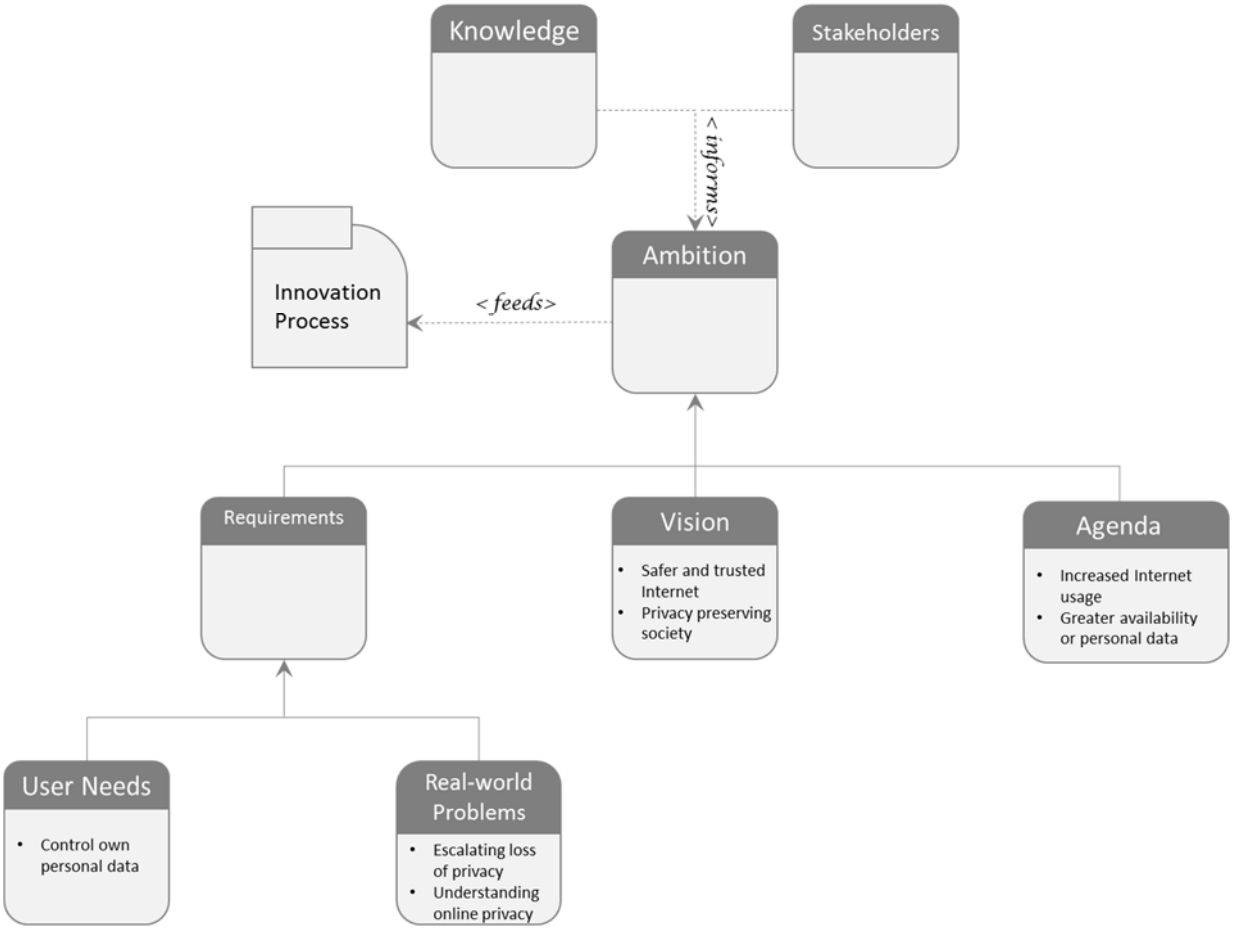

FIGURE 4: THE AMBITION CONSTRUCT

Agenda

The overall vision for a better society is constrained by vested interest and other factors:

- Encourage increased Internet usage. On the one hand to increase revenue for service providers, but on the other hand provide greater access to information and services to improve quality of life.
- Increase availability of consumer data; with the growth of data analytics, data mining and recommender systems that rely on significant amounts of data to increase their value—then it is often in the best interests of service providers to ensure consumer data is available to them, even where this conflicts with user privacy.

Requirements

The requirements are driven by user needs and real-world problems to be solved. There are two user groups in the Operando case study: individuals and service providers. We split these two and look at the requirements of both.

For the **individual** (or citizen), who is simply a user of online services:

- *User needs*. An individual or citizen wants to be able to maintain their privacy; and by this we mean that they can make informed decisions about the usage and disclosure of their personal data. Fundamentally, it is the individual who is in control of their personal information.
- *Real world problems*:

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- *Escalating loss of Privacy*: Consumer services are stripping users of their privacy for their own gain. Privacy regulations do not keep up with technology change.
- *Increasing complexity*: The growing use of personal data driven by IoT and Big Data systems accentuates the complexity of understanding online privacy by individuals. Technology is often deliberately obtuse (e.g. privacy policies), so not as to fully explain how a service uses personal data.
- *Inconsistent user behaviour*. The privacy paradox[4] is a phenomenon whereby users state they are concerned about online privacy and then behave online as though they do not care about privacy. Possible explanations for the paradox is that users lack awareness of the risks of disclosing information online.

For a **service provider**, who develops and operates online services that leverage personal data:

➔ *User needs*. To be able to demonstrate compliance with current privacy regulations. To design systems that maintain the trust of the user.

➔ *Real world problems*:

- Inadvertent disclosures to other agencies; where services are integrations of multi-stakeholder systems they may become increasingly difficult to manage—particularly the integration of legacy systems. Here there is increased risk that unwanted personal data disclosures may be possible.
- Hacking attacks; the increased value of personal data mean that it is an asset that may be directly attacked.
- Stringent privacy laws and compliance requirements. Privacy regulations are difficult to understand for system developers, and hence there is a strong need to provide technologies to help achieve compliance.

10.3 IDENTIFYING STAKEHOLDERS

Stakeholders represent the human actors associated with the Society. They may be both recipients of innovation Outcomes, and also monitor and add controls to the Innovation process itself. We examine the constructs as seen in Figure 5 and identify the stakeholder relevant to the Operando Case study. If we take each class from left to right:

➔ *Commentators*. Individuals or groups who monitor innovation; where it is going and what the consequences might be; these *Stakeholders* are responsible for keeping *Society* aware of what is going on, and what may happen

- Privacy Groups, e.g. EFF (The Electronic Frontier Foundation https://www.eff.org/)
- Social Media e.g. Operando technologies have been discussed and analysed by the sub-Reddit privacy group[5].
- The media. Articles about the Operando technology[6]; and also more general media articles that cover privacy breaches (e.g. the coverage of the Cambridge Analytica scandal).

➔ *Regulators*. Information privacy laws are created and applied by regulators relevant to Operando technologies.

[4] Kokolakis, S., 2017. Privacy attitudes and privacy behaviour: a review of current research on the privacy paradox phenomenon. Comput. Secur. 64, 122–134.
[5] https://www.reddit.com/r/privacy/
[6] https://thenextweb.com/security/2017/08/17/eu-funded-online-privacy-tool-will-protect-your-data-and-help-you-sell-it/

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- The European Union and National Governments: create privacy legislation that Operando software must comply with. Also, Operando technologies should help service providers comply with legislation
- Information Privacy Officers and Data Protection Agencies. Their role is to ensure compliance with regulations. The information provided by Operando technologies can help them understand such compliance by online services.

➔ *Contributors*. These are the Stakeholders who have the ideas and identify needs, as well as understand the technologies, in order to be able to help feed the Ambition and provide consultancy and expertise during the Innovation process. **The case study highlighted the need to extend the contributor class with sub classes:**

- *Developers*. The Operando consortium, who proposed the initial innovations to address the ambition, and also developed the technologies and expertise during the innovation process
- *Funders*. The European Commission identified the ambition requirements (covering society, user needs and real-world problems) in the call for proposal within the H2020 work programme. The commission then provided the initial funding based upon the innovation proposal created by the Operando consortium.

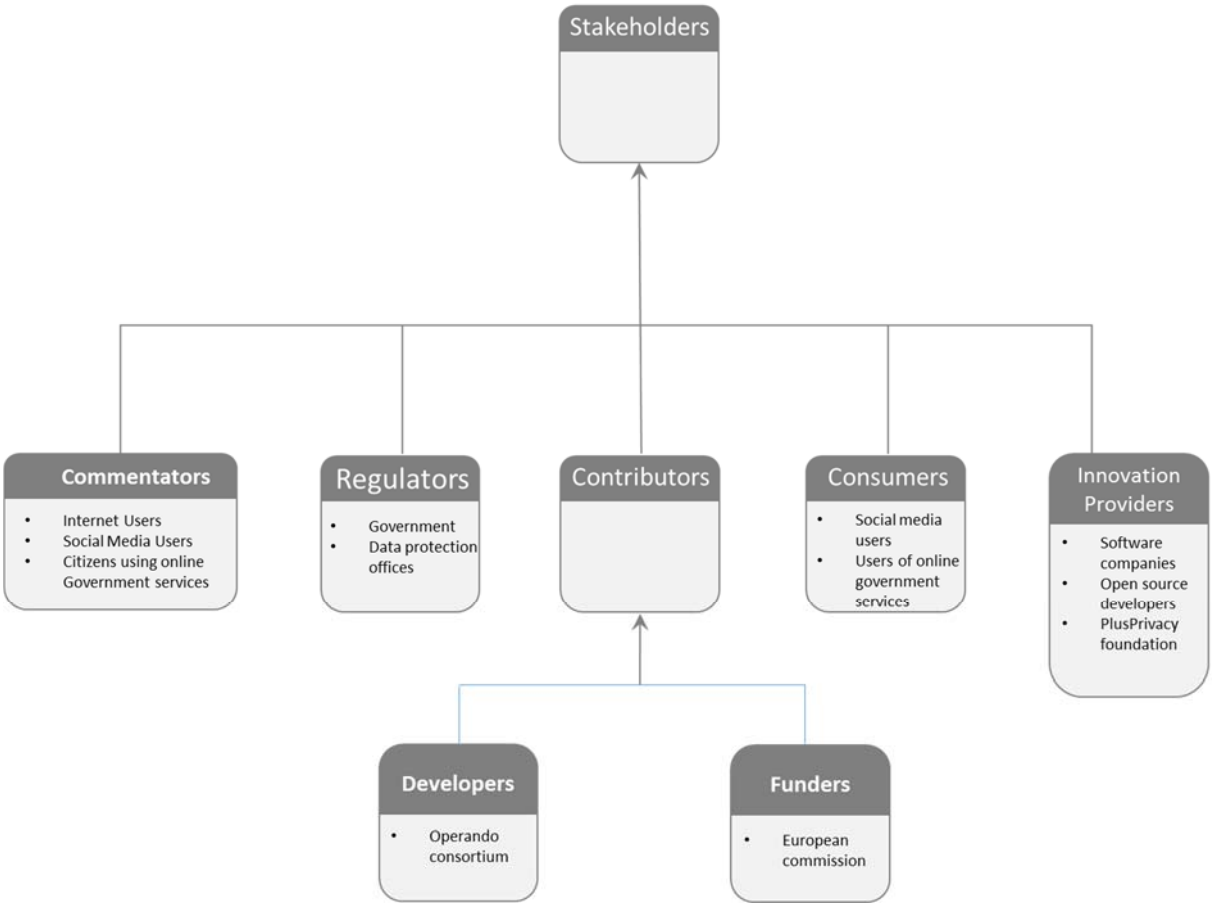

FIGURE 5: STAKEHOLDERS

➔ *Consumers*. Across a wide range of online technologies there are consumers driving the user need for technologies to preserve their privacy and put them in control of their personal data.

- Internet Users
- Citizens using online Government services

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- Social media users (Facebook, Twitter, LinkedIn, etc.) who use the PlusPrivacy tools.
- Online Service Providers who link their services to the Operando Privacy as a Service Platform.
- Individual users of online services (government, healthcare, etc.)

➔ *Innovation Providers*: those Stakeholders who run the innovation outcome such that others may access and exploit it:

- Software Companies that develop online services for government and healthcare service providers. For example, Oxford Computer Consultants are developing Operando-based products for SME health service developers.
- The Open Source Developer community with a strong interest in privacy can contribute to the Open Source PlusPrivacy technologies.
- The PlusPrivacy foundation is a non-profit organisation formed from a subset of the Operando partners that continues to operate and develop the PlusPrivacy technologies for end-users to control their online privacy.

10.4 GENERATING KNOWLEDGE

Knowledge may be considered the union of all enablers and constraints, other than individual (human) agents. The construct is summarised in Figure 6. *Knowledge* acts as the basic enabler of all innovation: it is on this basis that an innovator is able to move forward and develop a fresh innovation. It sits within the context of all that we do and possibly could know.

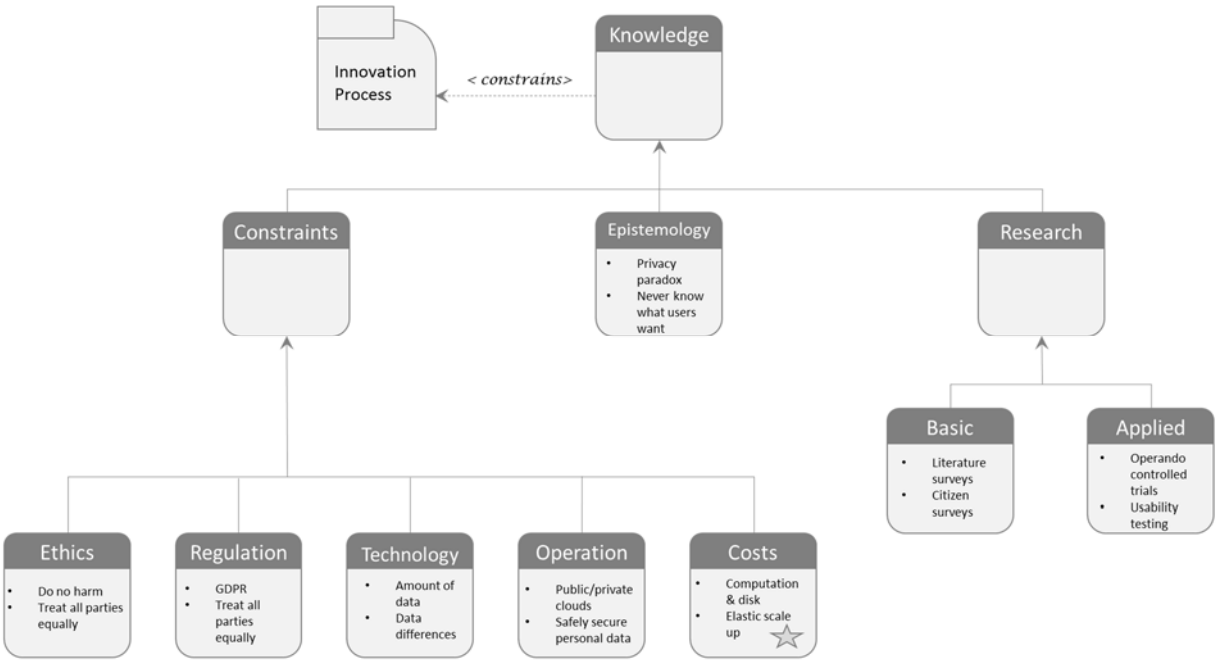

FIGURE 6: KNOWLEDGE AS AN ENABLER AND CONSTRAINT ON INNOVATION

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As enablement, therefore, *Knowledge* in terms of *Research* is applied to address what is articulated as part of the *Ambition*. But at the same time, *Knowledge* may reflect a range of different constraints, such as physical resource, but also the controls which *Society* imposes. Sub-classes associated with *Knowledge* therefore include:

- *Constraints:* anything which might constrain the *Innovation Process*, which may be the result of one or more of:
  - *Ethics:* in terms of Operando this covers the Principle of "Do No harm" and Treating all parties equally;
  - *Regulation:* the legal framework within which something would operate; for Operando under EU jurisdictions the General Data Privacy Regulation is the framework; however, there are wider global privacy regulations that must be considered (privacy shield) as usage of technology broadens.
  - *Technology:* there are numerous technical challenges to address. The scale and heterogeneity of the data. That is, too much personal data for a technical solution to reason about. Furthermore, the challenges of data heterogeneity e.g. language differences, understanding what is and isn't personal or sensitive data etc. make controlling privacy difficult to apply automatically.
  - *Operation:* the ability of a service provider to safely and securely host Operando services and data. This may be on local servers (e.g. a private cloud), or within a public cloud infrastructure.
  - *Costs:* the expense of computation and disks. Hosting costs that may scale rapidly as more and more data is collected; and depending on the usage of the service the computation services may need to scale up. If the service is critical there may be costs to introduce increased redundancy and backups beyond a traditional setup.
- *Epistemology:* What can we actually know and implement when it comes to user behaviours regarding personal behaviour? (i.e., surveys and ethnographic study may not be enough…. we may never really understand what people make of technology). The privacy paradox is a good example, where studies have shown that online behaviour often does not match with what people say about online privacy when questioned.
- *Research:* During various phases of the Operando project research was carried out in order to increase knowledge about privacy, privacy preferences and the extent to which Operando met its core requirement to put users in control of their own data:
  - Basic: Literature surveys to uncover the novelty of potential innovations; surveys of citizens to understand their privacy requirements and preferences; and observational work with potential users to understand their needs better.
  - Applied: Operando carried out a series of trials that tested the usability of the products and consideration by users whether the Operando services were valuable to them.

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10.5 COSTS

The final consideration of the innovation pathway model is to consider the costs of creating, operating and sustaining the innovation outcome (as highlighted in the model in Figure 7) as well as the costs to society if the innovation is successful.

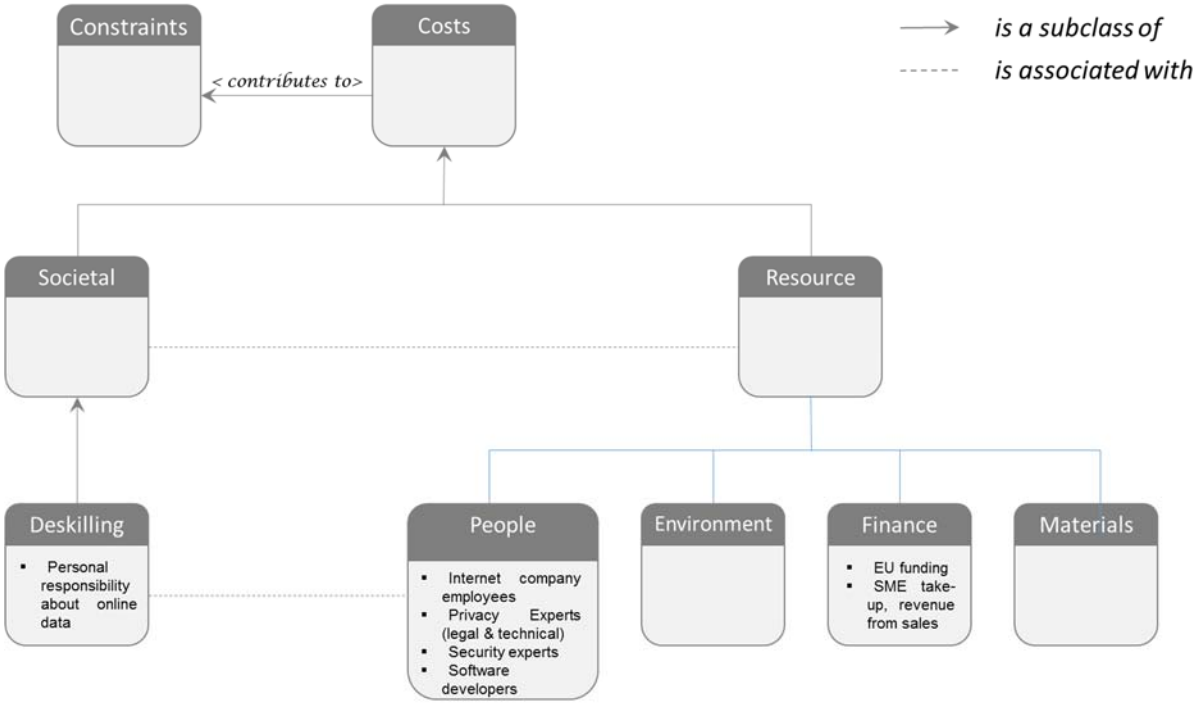

FIGURE 7: COSTS

Using the model to consider the potential costs of the Operando outcomes:

- Societal Costs
  - Deskilling: data subjects would not learn to take responsibility about their personal data
- Resources
  - People
    - Internet company employees
    - Privacy Experts (legal & technical)
    - Security experts
    - Software developers
- Finance
  - EU funding of initial innovation process
  - SME take-up (via revenue income)
    - Selling G2C to government agencies
    - PlusPrivacy (% from Internet Services pay to access user data)

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10.6 MARKET

The innovation must deliver benefits to society (as shown in Figure 8) in terms of *stakeholders*, who as previously identified are the users of online services and commercial or government providers of these services. However, the society is also shaped by the market place, i.e. to what extent is there a *market* for these services:

- Facebook has over 2 billion users, Twitter over 250 million users. There are similarly large user bases for other social media applications. Hence, there is a significant market and potential impact for the PlusPrivacy tools.
- In terms of software that supports the development of privacy-aware online services:
  - "IDC predicts that the opportunity for security software from GDPR-related concerns will be $811 million in 2016, rising to $1.8 billion by 2019. GDPR-related storage software will grow from $258 million in 2016 to $1.7 billion in 2019."
  - "The value extracted from European consumers' personal data were worth €315bn in 2011 and has the potential to grow to nearly €1tn annually in 2020, according to new research conducted by Boston Consulting Group"

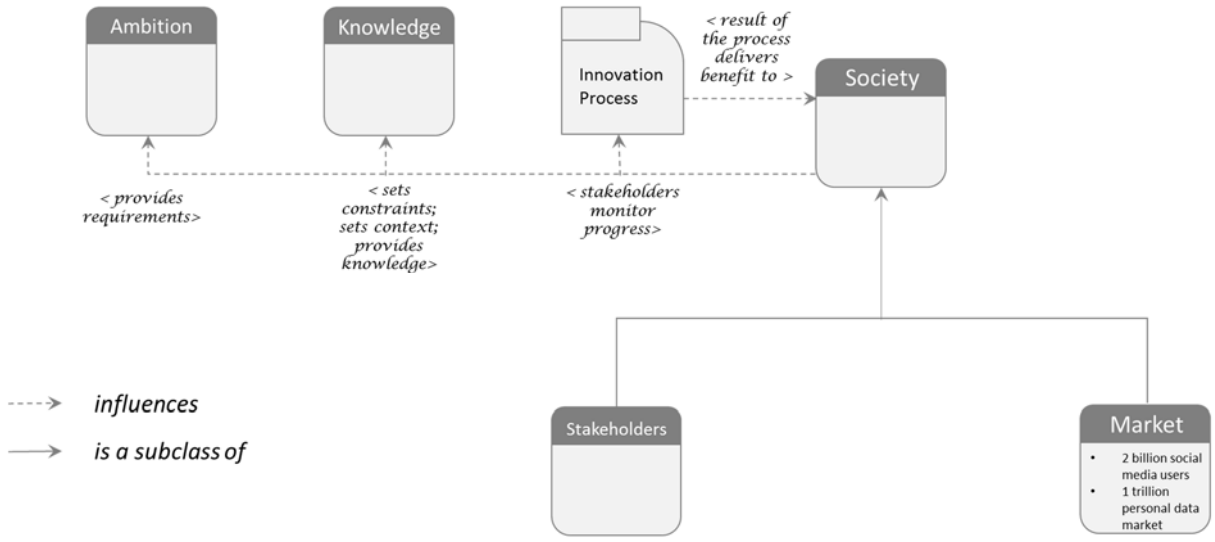

FIGURE 8: SOCIETY

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10.7 INNOVATION PROCESS

The iteration through the previous sections leads into the initial innovation process; as highlighted by the diagram (from the innovation pathway model) in Figure 9. The insights gained from considering the knowledge, ambition and stakeholders drives the individual innovation cases.

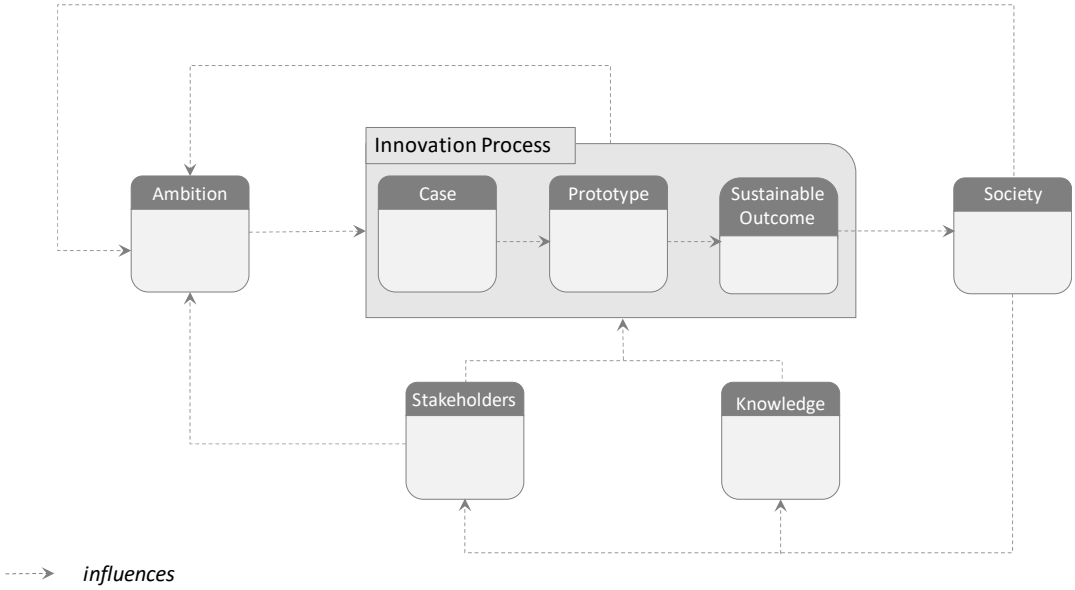

FIGURE 9: THE INNOVATION PROCESS

As defined earlier – this led to two separate outcomes within the Operando project that had direct but distinct impacts on society:

- **PlusPrivacy**. *Case*. The need for online users of social media and consumer driven online services to better understand implications of their personal data uses. The ability to restrict identifying information about themselves. This generated the case for a suite of technologies to shut down privacy settings automatically for well-known services, and providing anonymous access via pseudo-identities. *Prototype*. During the project funding period: i) browser extensions and the online PlusPrivacy portal were created, ii) the tools were advertised to initial users, and iii) a qualitative analysis of user's usage of the tool was used to make targeted changes to increase impact e.g. the development of additional browser extensions, and the inclusion of more social media sites. *Sustainable Outcome.* After the completion of the funding period, the exploitation of the innovation case was considered – and the creation of a non-profit foundation (formed by two SMEs in the consortium) to support the sustained development and distribution of the PlusPrivacy tools was begun.

Operando G2C dashboard and Services. *Case*. The need for government (and in particular healthcare) service providers to build legally compliant services that users can trust. This generated the case for the Privacy as a Service platform that services could integrate with online services to automatically allow users to control their data, and also comply with current GDPR regulations. *Prototype.* The privacy as a service platform was developed as a set of microservices (policy reasoning, policy enforcement, personal data datastores, anonymization services etc.) that could be deployed and operated such that an online service could integrate with it. A dashboard for both users and operators then allowed configuration, monitoring and management of personal data access. Three prototype services were then developed to trial the innovation case; including a healthcare service and a local government service. These were evaluated by trials with real users who were questioned about their usage of the services. The results of the trial highlighted the Operando outcomes of privacy control and awareness were highly beneficial. *Sustainable Outcome*. The maturation of the Operando platform by software companies within the consortium—their plan is to sell implemented healthcare and government services built on the Operando platform, i.e. the outcome is a commercial product that can be tailored to multiple customers.

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11 ANNEX 1B INNOVATION PATHWAY CASE STUDY: SENSE4US

11.1 INTRODUCTION

Sense4Us was a Research and Innovation Action project funded under the FP7 European Research Programme between 2013 and 2017.

A key challenge of modern-day policy making at government level is that it is too slow to keep up with the pace of technological and social change resulting from technological developments [7]. Novel approaches are required to reduce the time from policy draft to implementation, whilst maintaining accuracy. When policies are drafted, evidence is sought from key stakeholders, such as industry, NGOs and the general public. Submissions can be from a few lines to many hundreds of pages, and analysts need to understand the key themes and what was said about them, often under great time pressure. Due to the large volumes of data and intense time pressure, the human analyst approach can suffer from a lack of rigour in the analysis through human error and fatigue.

The key objective of the Sense4us project was to help policy makers better understand the impacts of draft policies in shorter time, by providing analytical tools enabling the analysis of a deluge of information from different sources. The key outcome of Sense4us was a policy evidence analysis analysis toolkit containing two tools – one to determine the key themes of the corpus of evidence, and a second to determine the sentiments of the comments against each theme. These tools provide a much faster way of identifying key themes with greater rigour, than the previous method where a human analyst determined themes and sentiments by inspection.

In this report, we model these innovations using the Innovation Pathways domain model in order to validate the observations determined by the Pathways Approach; that is, how it is used to understand and realise innovation outcomes.

11.2 GENERATING AMBITION

The Sense4Us ambition was initiated in response to stakeholder input: where there was a perceived need in relation to Requirements, Vision and/or Agenda. We show this in terms of using the Ambition construct shown in Figure 10.

Vision

The overall vision for society in terms of policy making is identified as:

- Policy making better reflects the needs of society.
- Citizens feel engaged in the policy-making process: voices from diverse cross sections of the population are equally heard.
- The policy making cycle is sped up, so that legislation can keep up with accelerating social change due in part to technological revolutions.

[7] Identified in D2.1 from a survey of relevant and current literature

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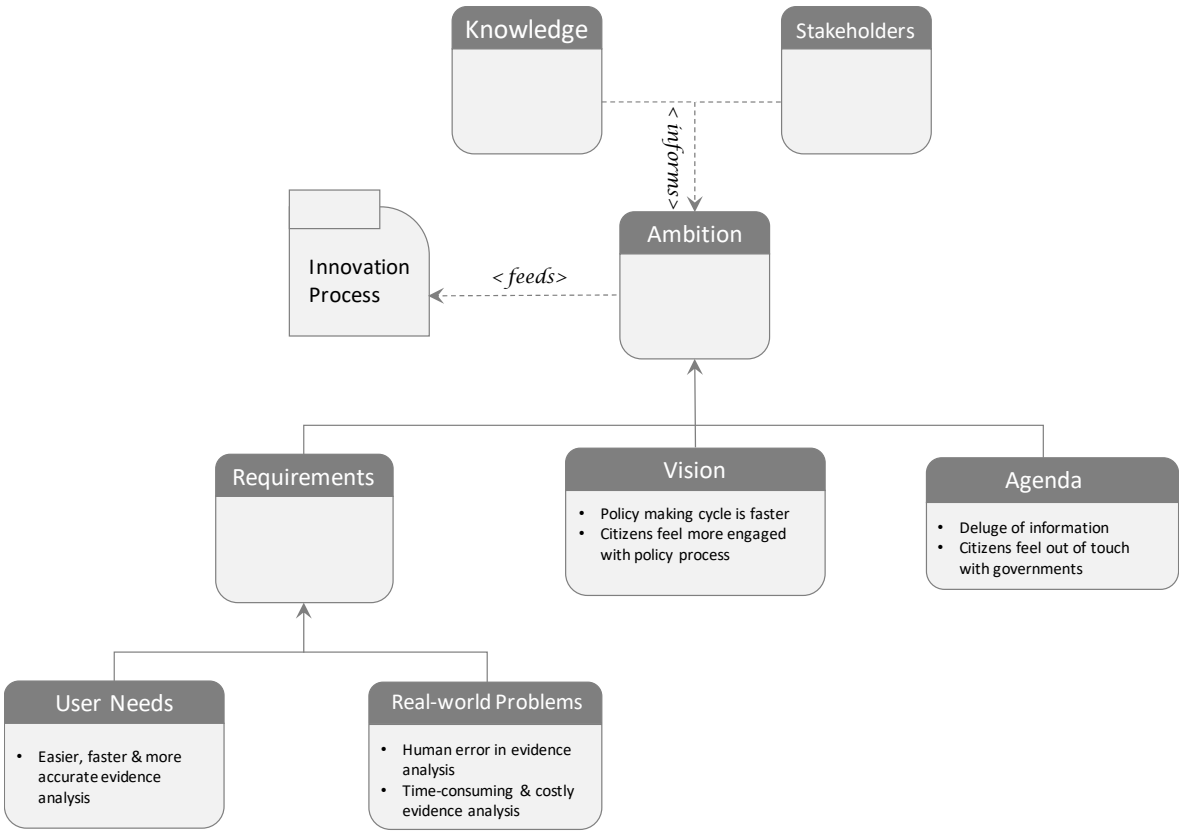

FIGURE 10: SENSE4US AMBITION

Agenda

The overall vision for a better society is constrained by vested interest and other factors:

- Citizens feel out of touch with government and their voice is not heard when policies are made. Citizens feel that governments are elitist and self-serving, promoting an "us and them" sentiment, which needs to be seen to be addressed.
- Policy makers are deluged with information relevant to a draft policy, both directly in response to calls for evidence; and indirectly in wider discussions. They suffer resourcing problems in generating a representative analysis in a time- and cost-effective way. As a result, often corners need to be cut in the analysis.

Requirements

The requirements are driven by user needs and real-world problems to be solved. As discussed, the primary target user is a policy researcher, who is tasked with summarising evidence bases, but the beneficiaries are wider.

- *User needs*. The key requirement is easier, faster and more rigorous analysis of themes from a large corpus of evidence.
- *Real world problems*. The real-world problems leading to the user need corresponds to the time & effort cost plus human error, in thematic & sentiment analysis of large evidence bases. As a case in point, a recent bill passing through the UK parliament generated 3500 pages of evidence in response to a request for comments on the draft bill. A single policy researcher was given one week to produce a summary of the key themes of this corpus and what was said about each. It is easy to comprehend that this is a huge challenge in terms of workload, and it is also easy to see that a fully rigorous analysis is impossible given the time and resources allocated to the task.

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11.3 IDENTIFYING STAKEHOLDERS

Stakeholders represent the human actors associated with the Society that has determined the real-world problems and should benefit from the solutions proposed by the innovation. They may be both recipients of innovation Outcomes, and also monitor and add controls to the Innovation process itself.

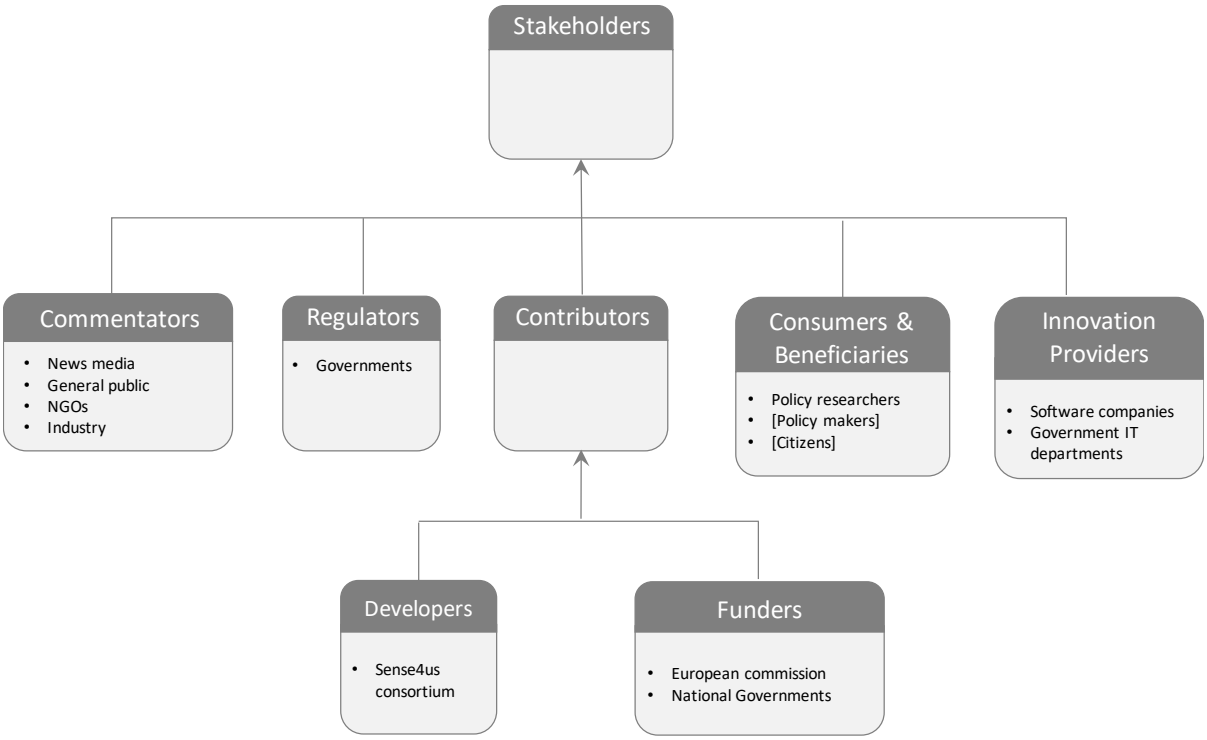

FIGURE 11: KEY SENSE4US STAKEHOLDERS

We examine the constructs as seen in Figure 11 and identify the stakeholders relevant to the Sense4Us Case study as follows.

- *Commentators*. Individuals or group who monitor innovation, where it is going and what the consequences might be; these *Stakeholders* are responsible for keeping *Society* aware of what is going on, and what may happen. Here, the commentators are classified as the observers and monitors of public policy, and the actual commentators will depend on the individual case of the policy being drafted and evaluated.
  - News media are key disseminators of information around different types of policy, especially if a draft bill is controversial, as the controversy will be reported.
  - Different actors may contribute to consultations on draft public policy and are invited to provide evidence when the bill is in draft. These may include the general public, NGOs, pressure groups, businesses and industry.
- *Regulators*. The regulators are the government and parliament of the country in question. Here, we are influencing the legislative process through the offering of tools to automate its labour-intensive and error-prone parts.
- *Contributors*. These are the Stakeholders who have the ideas and identify needs, as well as understand the technologies, in order to be able to help feed the Ambition and provide consultancy and expertise during the Innovation process.
  - *Developers*. The Sense4Us consortium, who proposed the initial innovations to address the ambition, and also developed the technologies and expertise during the innovation process.

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- *Funders*. The European Commission identified the ambition requirements (covering society, user needs and real-world problems) in the call for proposal within the FP7 work programme. The commission then provided the initial funding based upon the innovation proposal created by the Sense4Us consortium.

➔ *Consumers & beneficiaries*. We have made a distinction here between direct and indirect beneficiaries (indirect beneficiaries are indicated by square brackets in the figure).

- A direct beneficiary is the actual user of the tools, which is most likely a policy researcher. This is a government employee who has general journalistic-style research skills, and who is tasked with summarising the key themes and opinions from evidence bases. The toolkit does not replace their interpretive skills, but it provides them with a structured index of the key themes of the evidence corpus and pointers to the actual text of the source documents, taking the monotonous and time-consuming part of the work and leaving the intelligent interpretation and high-level grouping of themes up to the human.
- An indirect beneficiary is the recipient or beneficiary of the information created by the policy researcher. This can be a policy maker – the person or body in authority who actually decides on policy (e.g. a member of parliament who pushes a bill through parliament, or the parliamentary vote on a bill). The ultimate indirect beneficiary is the society of citizens, who benefit from more representative policy.

➔ *Innovation Providers*: those Stakeholders who can take up and run the innovation outcome such that others may access and exploit it:

- Software Companies that develop online services for government and healthcare service providers.
- Government IT Departments, who can deploy the toolkit within their IT systems, for use by policy researchers.

11.4 GENERATING KNOWLEDGE

The knowledge constructs for the Sense4Us case study are summarised in Figure 12 (costs are considered separately).

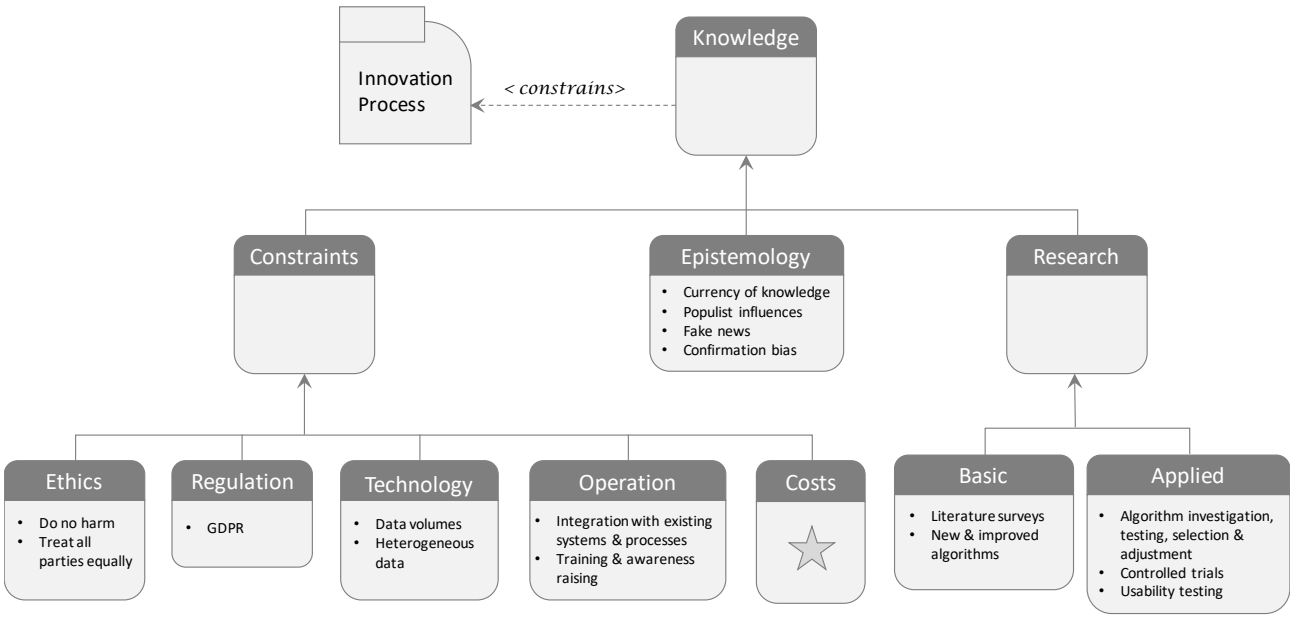

FIGURE 12: KNOWLEDGE CONSTRUCTS FOR SENSE4US CASE STUDY

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- *Constraints:* anything which might constrain the *Innovation Process*. The relevant constraints to Sense4us are listed as follows.
  - *Ethics:* in the public consultations concerning draft bills, we clearly need to observe at the very least the Kantian principle of "Do No harm". All society should have a say in policy creation, should they wish to, so the principle of "Treat all parties equally" applies also.
  - *Regulation:* contributors to consultations for daft policy do so under their own name (whether they are an individual or an organization), so the data collection of the consultation responses is personal data and therefore subject to the GDPR.
  - *Technology:* Data volumes are challenging, and scalability investigations are likely to be needed. As a reference point in tests, 3500 pages of evidence take in the order of 3 minutes to analyse on basic hardware, but once memory limits are reached and swapping occurs, performance degrades quickly. The heterogeneity of data needs addressing also – all input is in textual form but unstructured formats such as PDF need special consideration.
  - *Operation:* Integration with government departments' existing systems is likely to be needed – e.g. if they have a document repository or sharing intranet. In the UK, contributions are made available on public websites (assuming consent is given), so at the basic level, the documents can be downloaded and input into the system, but increases and efficiency will be achieved if the tools and their results are integrated into the data management systems of the user. There is also the question of awareness raising of the benefits of the tools and training in their use – users must be confident in the tools' operation and of their benefits.
  - *Costs:* Costs are dealt with separately later, but include the resourcing costs to enable the innovation to achieve societal benefit, plus any societal costs that the innovation may cause.
- *Epistemology:* Here, we are concerned with truth and credibility, and making sure that the opinions recorded accurately reflect the populace in question. This is challenging, and often the respondents to consultations on draft bills are self-selecting and in the case of e.g. lobby groups may have an agenda to push that does not reflect the overall population. In many cases, experts are invited to contribute their opinion, but again this may not represent the general public. Other considerations are influencers on opinions, for example populist leaders and messages, confirmation bias and the rise of "fake news".
- *Research:* During various phases of the Sense4us project, research was carried out in two forms:
  - Basic: Literature surveys to uncover the novelty of potential innovations; surveys of policy researchers and government departments to understand their analytics requirements and preferences; and observational work with potential users to understand their needs better. Sense4Us also created an improved algorithm for sentiment analysis.
  - Applied: Sense4us investigated different algorithms for thematic analysis, which were evaluated and deployed in the toolkit. Sense4us also carried out a series of trials with policy researchers that tested the usability of the products and consideration by users whether the tools were valuable to them. It is from these results that the innovation opportunity was confirmed, in that the tools were seen to be very useful by the target users.

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11.5 COSTS

The major costs for the innovation are shown in Figure 13.

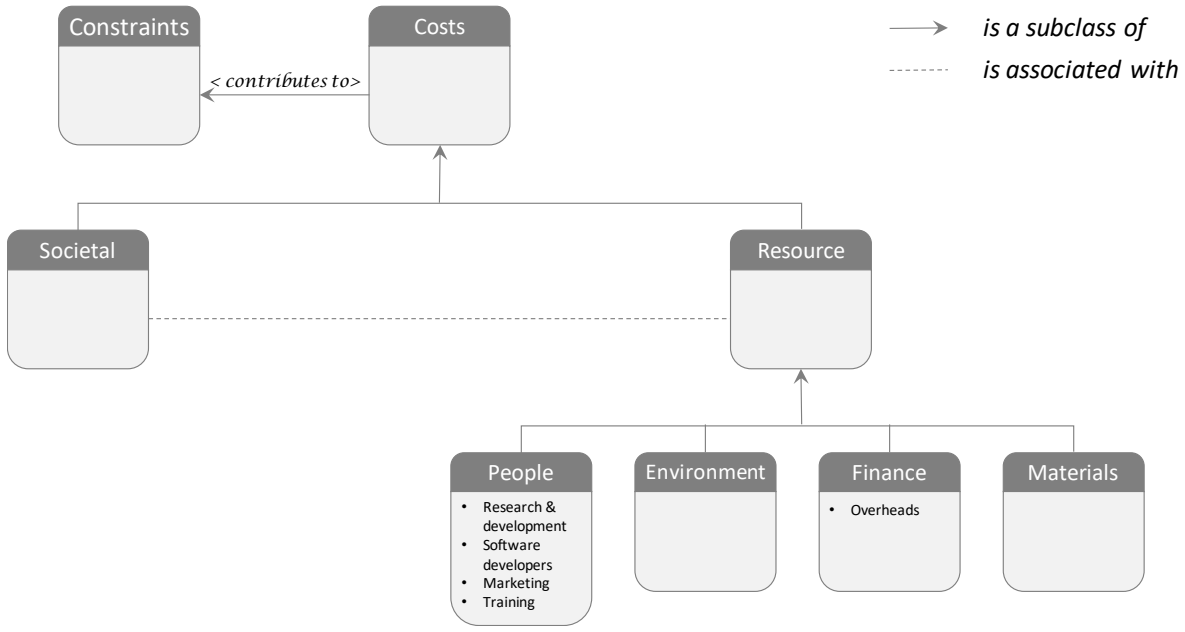

FIGURE 13: SENSE4US COSTS

The main costs are people's salaries, to fund normal business activities such as research & development, software engineering, marketing and training. Other costs involve the overheads of running a normal business.

There are no significant societal costs to the use or deployment of the toolkit. There are expected to be no employment consequences, because the toolkit enables policy researchers to better understand the evidence bases they are confronted with and their skills are still needed, rather than their being replaced by the tools.

There are no environmental costs, additional to those of running a normal small business, and material costs are likely to be negligible, apart from the capital purchase of computing hardware.

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11.6 MARKET

The potential market for the toolkit is considered within the society construct, shown in Figure 14.

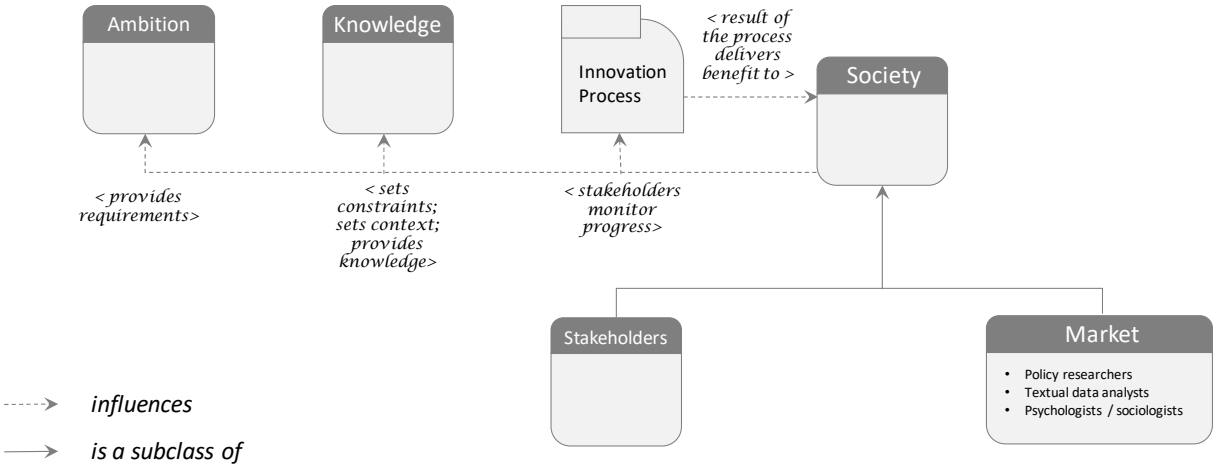

FIGURE 14: SENSE4US MARKET

Most of the components within the society construct have been discussed previously, for example, the vision, agenda real-world needs and requirements of the users, and these are all inter-related with the potential market. These elements determine the key value proposition and positioning of the toolkit in the application of policy making. The actual market audience for this application is policy researchers, who are government employees, but it is most likely the budget holders above them who will be the customers (i.e. those who pay for the benefits of the toolkit). Typical user bases within e.g. the UK are estimated to be in the low thousands – government employees who need to analyse evidence bases.

The toolkit is applicable to other application domains, because it can be used as a general-purpose thematic analysis tool, so it can be applied to any situation where this is required. Other users include psychologists or sociologists, who often need to conduct surveys or market research and need to summarise textual responses in addition to closed-form questions such as Likert scales. This means the potential market is significantly greater than the policy researchers for whom the toolkit was originally created.

11.7 INNOVATION PROCESS

The constructs described in the previous sections all contribute to providing the necessary information to support the innovation process; as highlighted by the diagram (from the innovation pathway model) in Figure 15. The insights gained from considering the knowledge, ambition and stakeholders drives the innovation case that serves as justification to undertake the innovation process – i.e. there is a clear societal need, defined users with requirements that reflect the societal need, and knowledge underpinning an idea to address the need and requirements.

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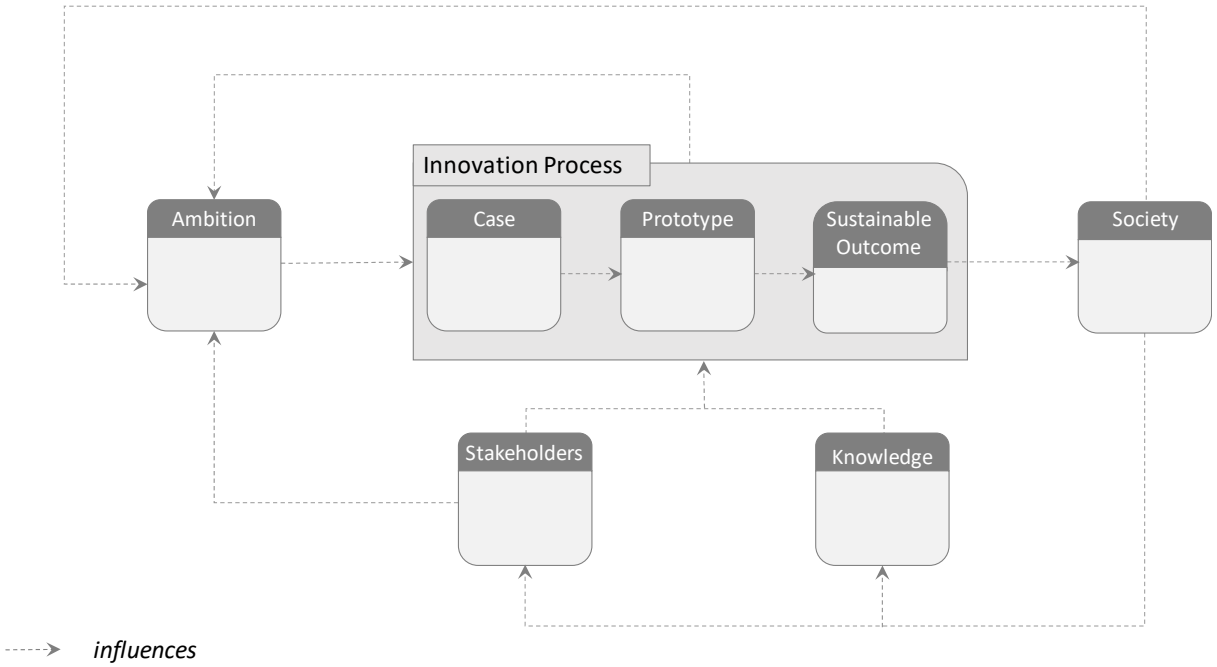

FIGURE 15: INNOVATION PROCESS

The innovation process is broken into three components:

- *Case*. The need for better understanding of society's opinions regarding public policy is the driving motivation behind the case, coupled with problems experienced by practitioners to achieve this due to inefficiency and resource & time costs.
- *Prototype*. During the project funding period: i) research was undertaken into understanding how to better determine sentiment from textual data, with subsequent implementation of a sentiment analysis tool, ii) investigation into thematic analysis approaches was conducted and a thematic analysis component created, iii) a toolkit was created with a database backend and a web front end to host the tools, and iv) the toolkit was demonstrated to the target end users (policy researchers), where its reception was gauged and feedback into improvements sought. The reception and the feedback confirmed the need for the toolkit.
- *Sustainable Outcome.* The sustainability of the innovation case, the knowledge gained from the innovation process, and the toolkit itself was considered and plans made to seek continuation funding with a view to rolling out the toolkit to the target user community so that the societal needs are addressed, as well as further investigation of alternative markets. During the project's funding period, this process was begun and is ongoing. To date, it has involved further development of the prototype toolkit into a minimum viable product (MVP) for demonstration purposes, discussions and demonstrations with the end user community, and assessment of different sources of continuation funding (e.g. venture capital and innovation accelerator funding).

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12 ANNEX 2: ANALYSIS ON THE NGI MAP

WE LOOK FIRST AT ORGANISATION TYPE, DENOTED ON THE MAP BY DIFFERENT ICONS -

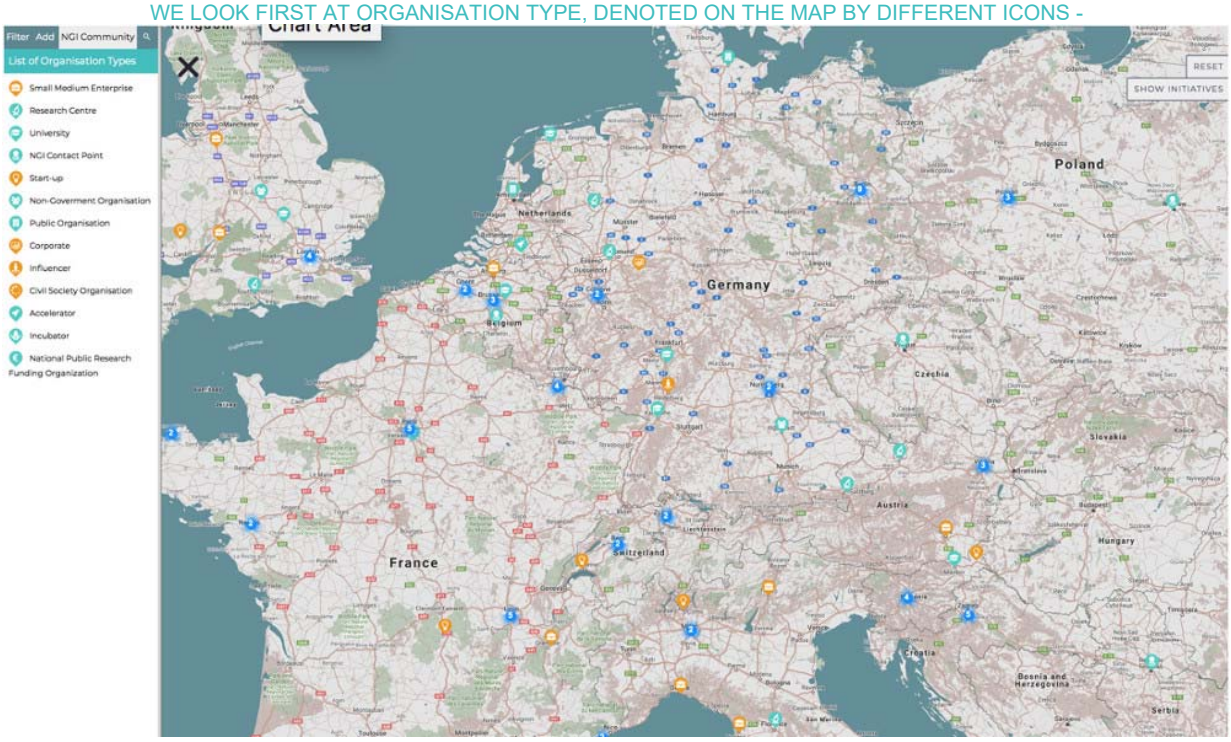

Figure 16 zooms in to show the clusters separating to show a subset of the organisations in detail. At a glance the viewer can identify organisations that qualify for a specific call, say, targeted at SMEs only. Alternatively, SMEs in a specific location may identify which research institutions may serve as ideal patrons in finalising a bid to join an initiative or participate in a call, or large corporations to target in evaluating and potentially selling services and products to.

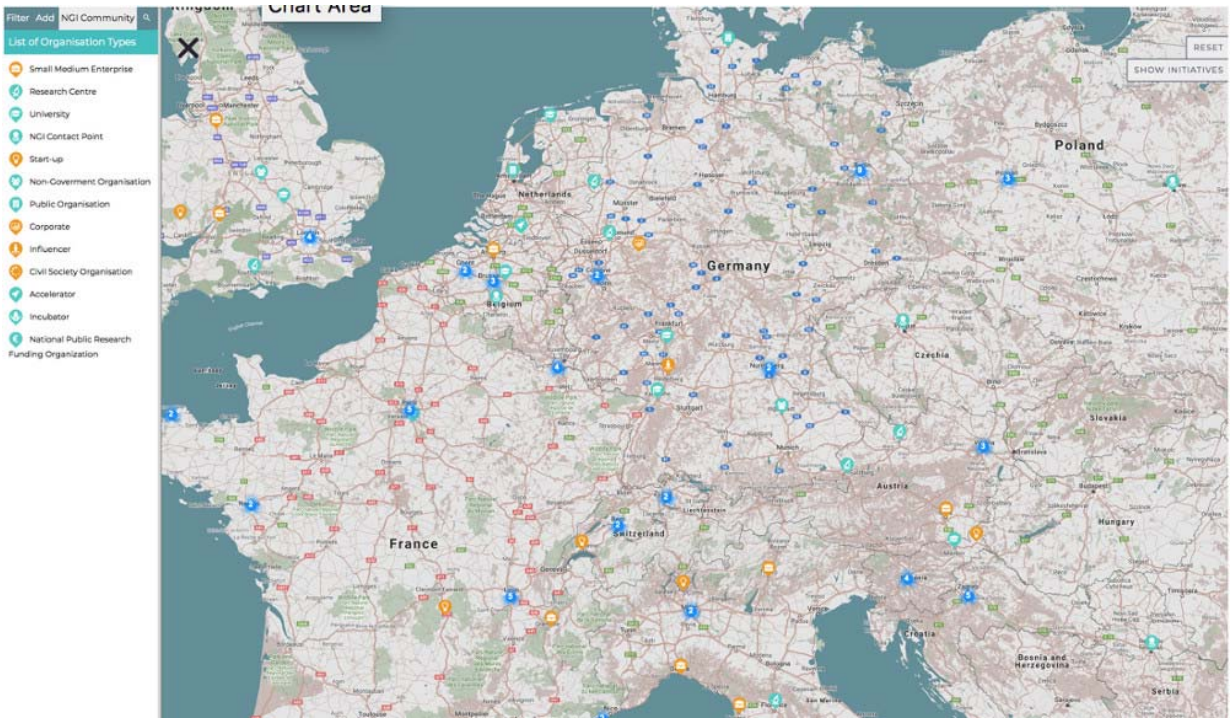

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FIGURE 16: ZOOMING IN SHOWS MORE DETAIL, WITH RESPECT TO ORGANISATION TYPE AND GEOGRAPHICAL PROXIMITY; THE LEGEND ON THE LEFT ILLUSTRATES THE ORGANISATION TYPES TARGETED

Distribution across organisation types is shown in Table 1 and Figure 17. The most active type is the SME, followed by research centres and universities, then startups. To date no coworking spaces nor investors have registered.

TABLE 1: DISTRIBUTION OF ACTORS BY ORGANISATION TYPE

Accelerator	3
Corporate	4
Coworking Space	0
Civil Society Organisation	3
Incubator	2
Investor	0
Influencer	3
NGI Contact Point	24
Non-governmental Organisation	10
National Public Research Funding Organization	1
Public Organisation	6
Research Centre	31
Small-Medium Enterprise	39
Start-up	24
University	29

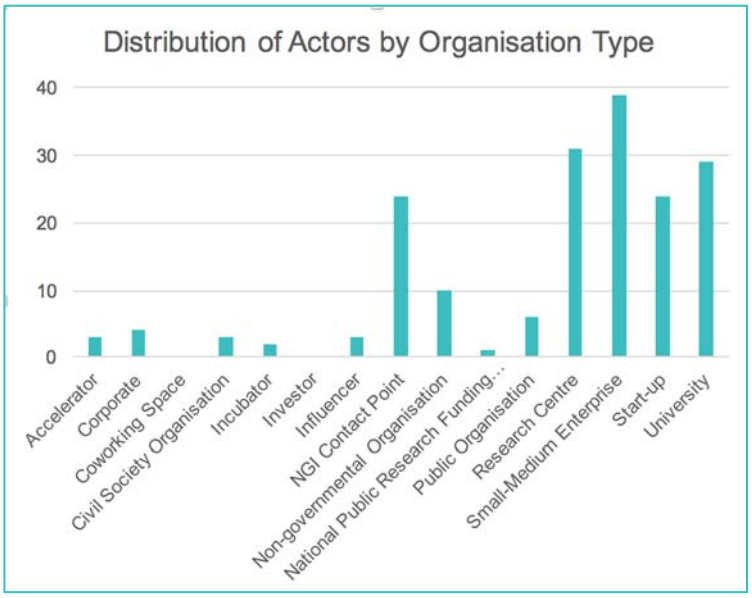

FIGURE 17: DISTRIBUTION BY ORGANISATION TYPE

Interests and topic expertise relevant to the subject of a call are two useful means to guide the identification of potential collaborators and stakeholders. It should be noted that while not required to register, organisations are encouraged to provide a description that includes

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interests, expertise, current projects and initiatives. Each actor description therefore indicates how best it is aligned along the aims of the NGI.

The data thus made available supports topic mining and, therefore, similarity analysis based on shared interests. Of the 179 actors on the map two do not provide descriptions. Further, initial similarity analysis revealed the same institution registered twice, with near identical descriptions. The second instance is therefore omitted, as this skews the results.

The interest and stakeholder analysis in sections 12.1 and 12.2 is carried out on the remaining 176 actors.

12.1 IDENTIFYING INTERESTS & EXPERTISE

Four attributes of each entry, all publicly displayed on the map: organisation description and type, projects and initiatives, contribute to the determination of interest and expertise, and along with location, similarity between actors. The (initial) analysis presented here is based mainly on the organisation descriptions, using simple text mining to identify key terms used across the map and those most likely to be used by each actor.

A number of algorithms exist for text mining, including clustering and topic modelling. We illustrate first the use of the latter to identify sets of keywords commonly employed by actors, as a way of identifying (shared) interests and, therefore, similarity. Figure 18 shows 20 sets of frequently occurring terms (showing the top 5 in each set), and the probability that an organisation type will describe itself using them.

Focusing on SMEs, we see some degree of distribution across four main sets. As with corporate organisations, SMEs are more likely to describe themselves using the terms[8] "*solution*, *develop*, *manage*, *software companies*", and to a lower degree, "*digital*, *innovate*, *service*, *consult*, *ICT*". This indicates a focus on the development and management of digital/software services and solutions.

[8] Note that "terms" here also includes variants of the term shown, e.g., digital/digitise would match "digitais". The most prevalent version of the stem over the dataset is that shown in the snapshots. Multi-linguality means that *this is occasionally a non-English variant of a term.*

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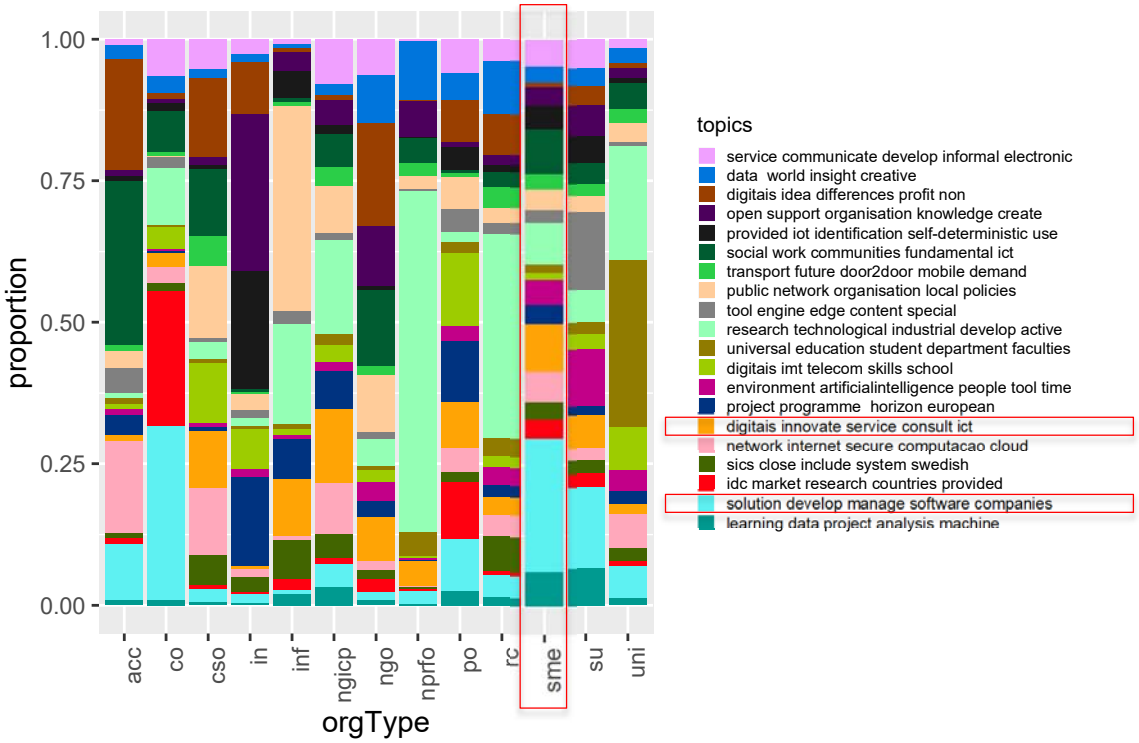

FIGURE 18: DISTRIBUTION OF TOPIC SETS BY ORGANISATION TYPE; WE SEE THAT SMES ARE MORE LIKELY TO DESCRIBE THEMSELVES USING THE TERMS "SOLUTION, DEVELOP, MANAGE, SOFTWARE", AND TO A LOWER DEGREE, "DIGITAL, INNOVATE, SERVICE, CONSULT, ICT"

Looking more closely at each of the 37 SMEs, we confirm this, with higher probability of use of terms within the set highlighted above across more organisations than for any other (rows highlighted with red borders in Figure 19). This allows an organisation seeking additional interest or expertise to hone in to those others that show relatively higher probability of term usage within any other set.

For example, the set " *transport*, *future*, *door2door*, *mobile*, *demand*" is dominated by a single entity, *door2door* (see column at top highlighted with orange border). We see also that this is their key area of expertise. Much lower probability of term usage is seen for the most commonly used set for SMEs in general, with slightly higher probability for other set: "*public*, *network*, *organisation*, *local*, *policies*". This indicates that the SME *door2door* may carry out work with public organisations, or may be involved in guiding or advisory on adhering to local policy-making in their field.

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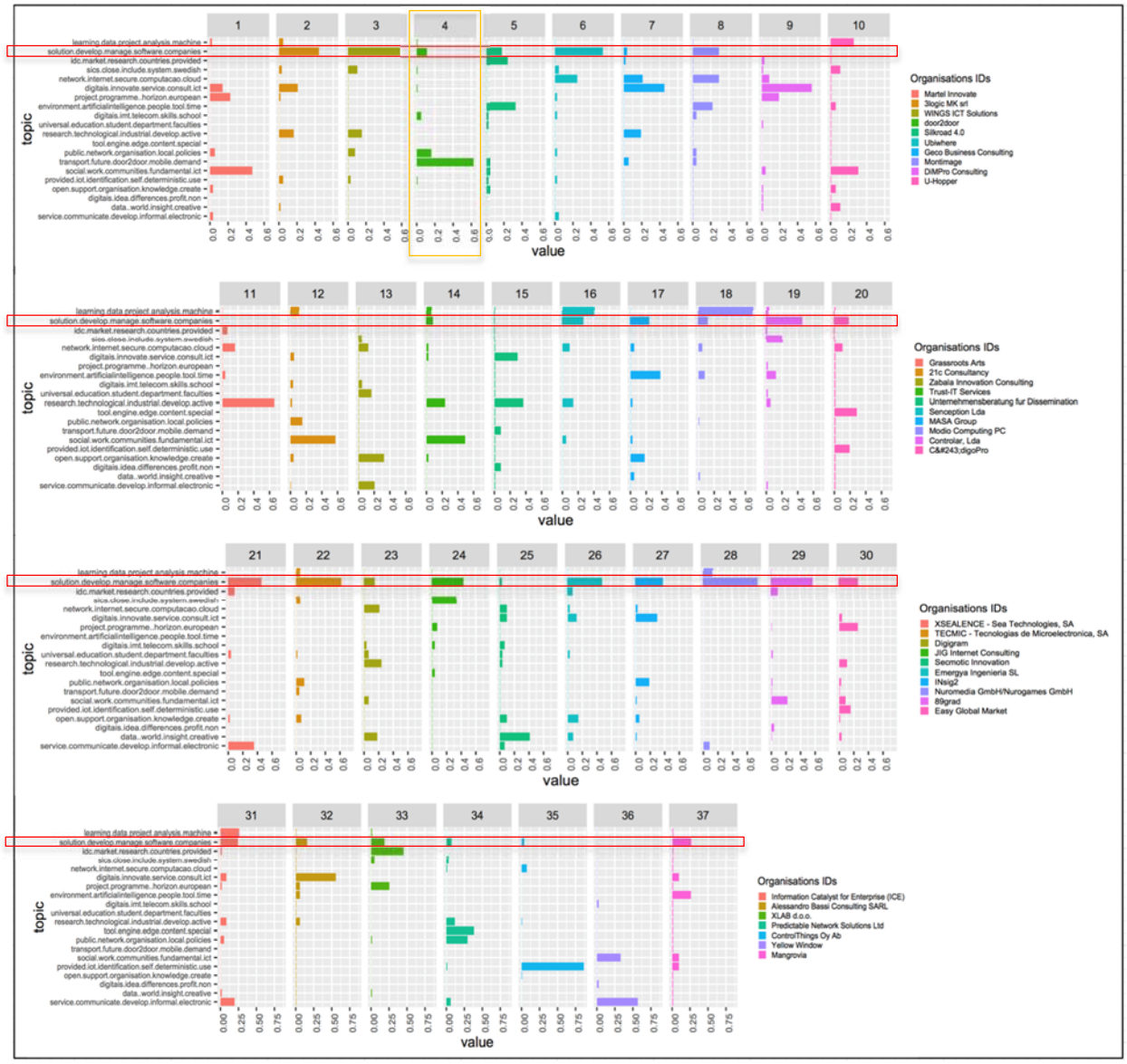

FIGURE 19: PROBABILITY OF TERM USAGE WITHIN SMES' DESCRIPTIONS, FOR 20 SETS OF FREQUENTLY USED TERMS ACROSS THE MAP

It should be noted that the unsupervised machine learning method aggregates data; therefore an organisation may not make use of all the terms within a topic set to which it is assigned. The analysis results serve as a guide and filter, to narrow down to the most likely candidates to choose from. Figure 20 contains a snapshot of the entry for *door2door* on the NGI map; taking a look at its description we see that the topic assignment provides a good match. This indicates also good reliability of the topic assignment overall.

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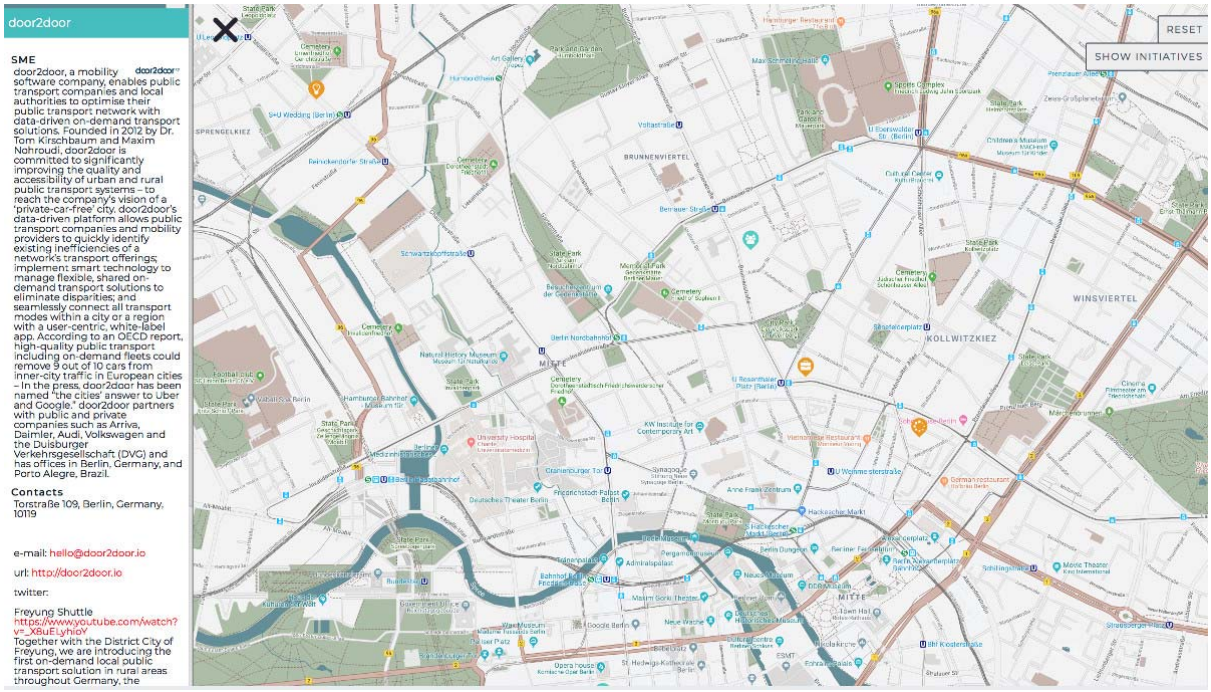

FIGURE 20: THE SME DOOR2DOOR ON THE NGI COMMUNITY MAP

12.2 IDENTIFYING POTENTIAL STAKEHOLDERS

Different criteria feed into the identification of stakeholders (including collaborators or target consumers of research or products). For the purpose of supporting submissions to calls we may consider organisation type, e.g., calls targeting SMEs carrying out research in a specific field. A call may also be restricted to a particular location or region, or an organisation may seek others nearby to collaborate with.

Actors on the community map will have different degrees of nearness or similarity to others, based on shared interests and expertise, institution type and location, among others.

We use in this case cosine similarity, among the recommended similarity measures for text data, to calculate mutual similarity across all actors, based on terms extracted from their descriptions. Figure 21 plots the results in a pair-wise matrix[9], colour-coding and then sorting by organisation type. By mapping relative degree of similarity between each pair of actors to saturation of each cell colour we see, from top-bottom and left-right, decreasing similarity for each group. The paler a cell, therefore, the lower the similarity between organisation pairs. The diagonal is therefore darkest, as the pairs here are the same organisation, identical to itself.

[9] Note that the matrix is mirrored along the diagonal, where each cell refers to a single organisation. The mirror line, showing the highest similarity possible - identical, as an organisation is identical to itself, appears as a darker line from top, left to bottom, right.

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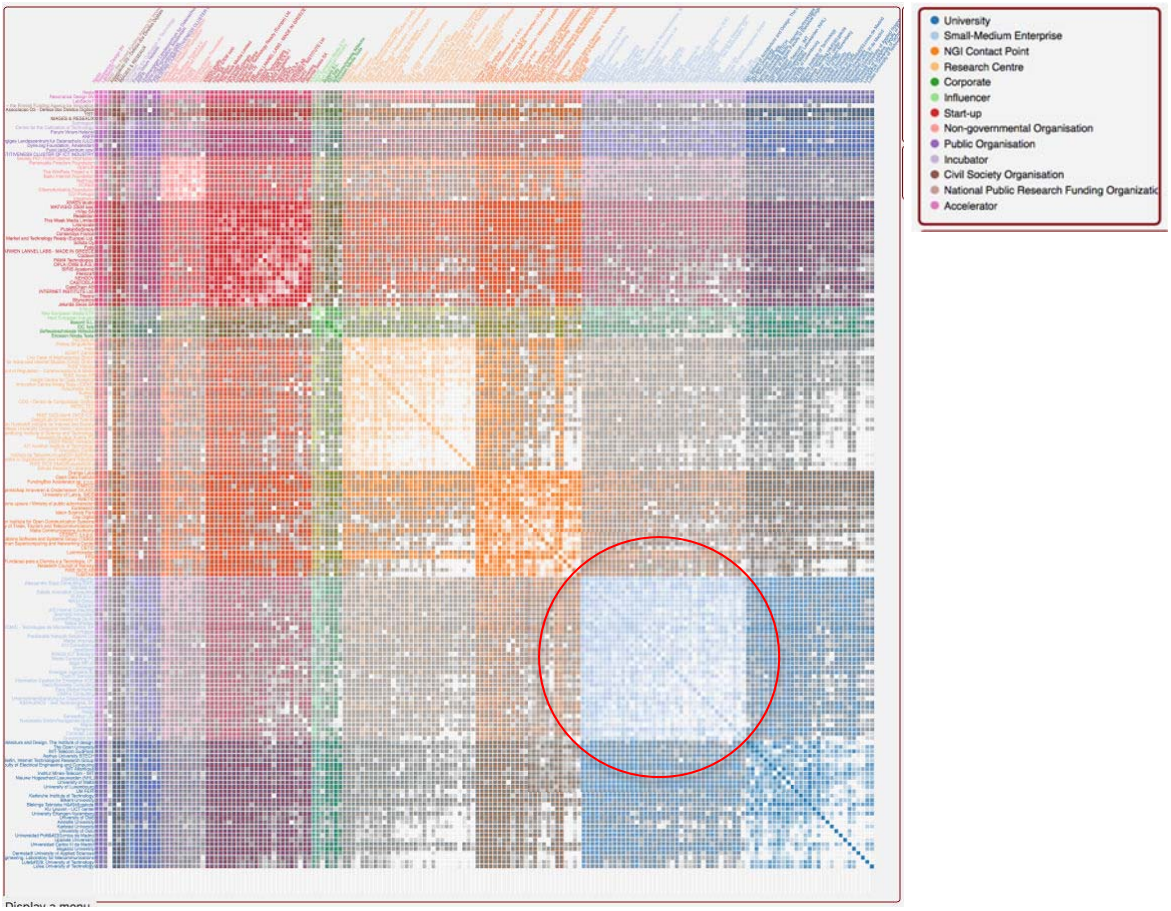

FIGURE 21: ACTORS GROUPED BY ORGANISATION TYPE, THEN ORDERED BY SIMILARITY; SMES ARE ENCIRCLED

Consider again the SME door2door. As this is in Germany we filter to look at all other registered actors in Germany - see Figure 22. This may be useful for identifying other (local) organisations with which it may gather requirements for and evaluate products and services that would support its submission to a call. By highlighting the row (or corresponding column) for this actor we see varying similarity. Roughly 1/3 of those in the same country show very low to none, and another 1/3 a good degree of similarity. This third is a good point from which to start to study in more detail which other actors to target in seeking partners to collaborate with, to strengthen a bid.

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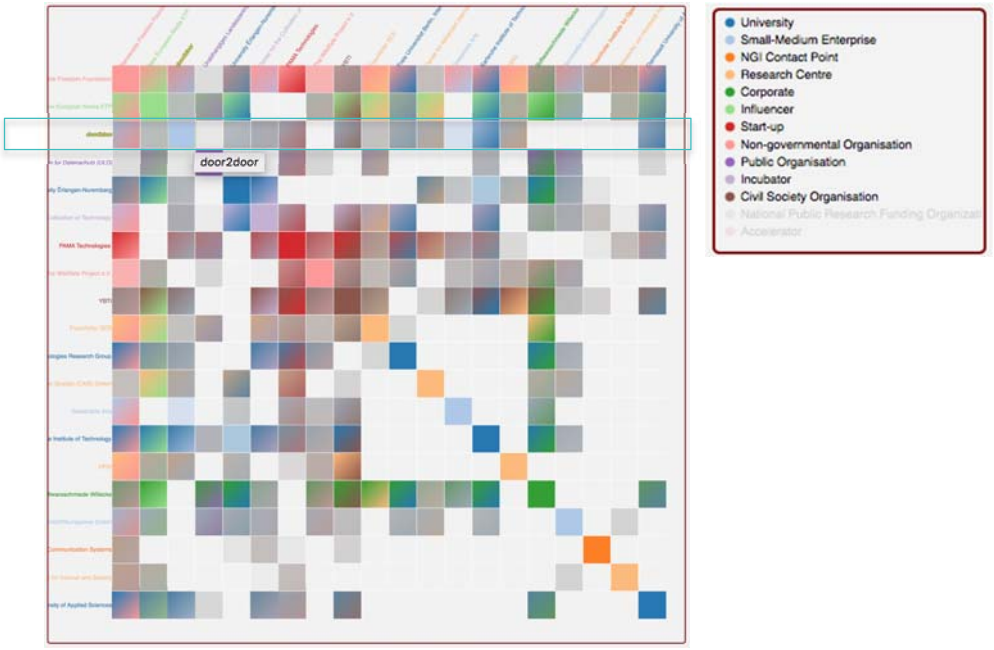

FIGURE 22: FILTERING TO SHOW ONLY ACTORS IN GERMANY, ORDERED BY RELATIVE SIMILARITY. DOOR2DOOR HAS THE MOUSE FOCUS, LYING NEAR THE TOP IT HAS RELATIVELY HIGHER SIMILARITY TO OTHER ACTORS.

Alternatively, the SME may wish to target other organisations with parallel but different expertise, in which case analysis using a visualisation as that shown in Figure 19, for all or a specified subset of the map, will help to identify organisations that align along selected aims, and also have the alternative expertise desired.

One approach that helps to identify alignment with an actor's interests is to look at other terms commonly discussed along with those that match their expertise. Out of the list of most frequently used terms across the map the term "*transport*" is that most frequently associated with *door2door*. Figure 23 shows the top 15 most frequently co-occurring terms with "*transport*" - larger yellow nodes, and those terms that co-occur with each of these 15 at least 3 times. Among these we identify terms aligned with the 9 NGI initiative topics of interest - *smart/IoT*, *network*. Other terms of interest, including verticals, include *cybersecurity*, *cloud*, *mobile*, *health* and *safety* – showing additionally potential application areas. Figure 24 looks at another key term used by *door2door*: "*public*". This reveals additional terms of interest to the NGI initiative, including *societal* and *linked data*.

These two networks provide a simple means of identifying term co-occurrence, linking these back to actors who frequently use them aids the identification of relevant expertise, and therefore, potential collaborators.

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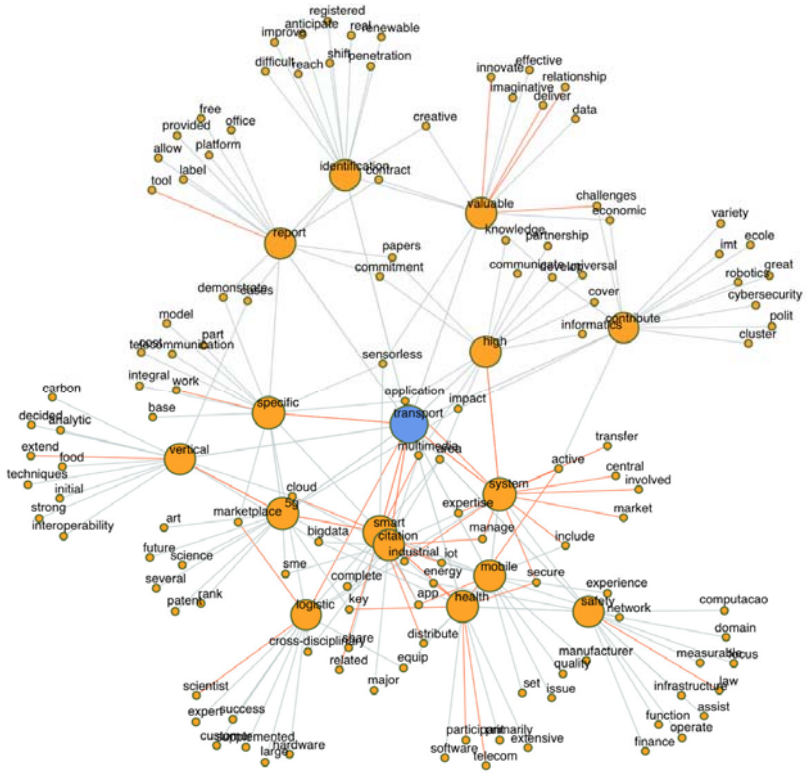

FIGURE 23: TERMS CO-OCCURRING WITH "TRANSPORT"; THIS INDICATES WHAT OTHER INTEREST AND EXPERTISE ARE TYPICALLY DISCUSSED WITH "TRANSPORT"

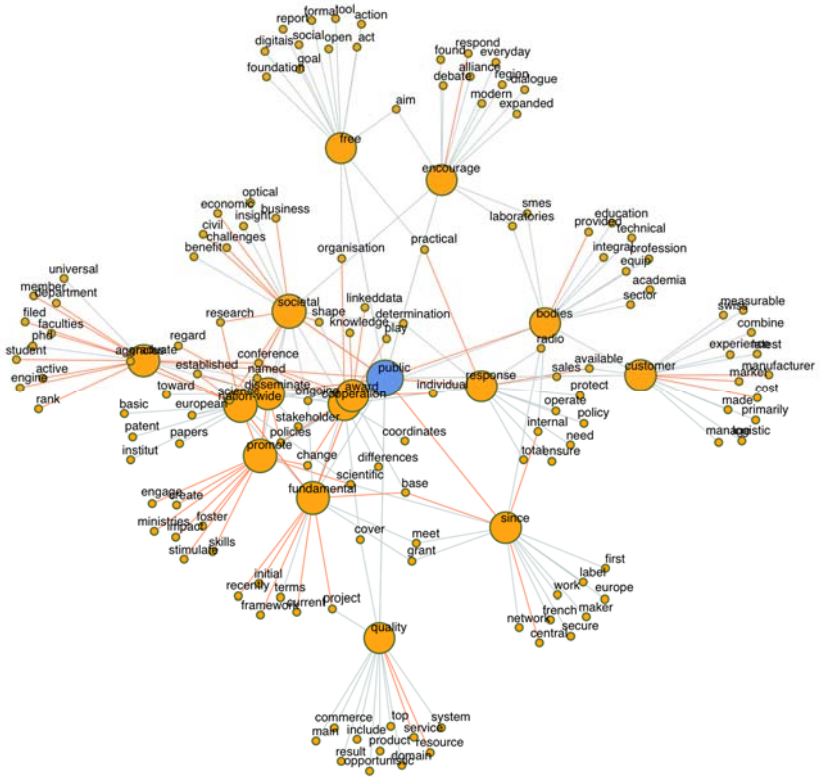

FIGURE 24: TERMS CO-OCCURING WITH "PUBLIC"

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13 ANNEX 3: TEMPLATE FOR OPEN CALL INFORMATION

Open Call - Experiments

Call information:

- Project full name: **Fed4FIRE+: Federation for FIRE**
- Project grant agreement number: **732638**
- Call identifier: **F4Fp-04-M**
- Call title: **4th Fed4FIRE+ Competitive Call - Innovative Experiments Category "Medium Experiments" with focus on IoT & 5G**

Submission deadline 18 September 2018, at 17:00 Brussels local time

Call Objectives:
The major objective of this Call is to make Fed4FIRE's federated infrastructure directly available for execution of innovative experiments by experimenters at both industrial (including SMEs) and research organisations. Examples of such experiments may include but are not limited to testing of new protocols or algorithms, performance measurements or scalability testing. These Calls envisage experiments by which existing products or services are tested, implemented or optimized on the Fed4FIRE+ testbeds rather than proposing or developing new ideas from scratch.

This call focusses on proposals of experiments in the area of IoT (Internet of Things) and 5G. More information on the specific objectives can be found further in the call document.

Funding for Experimenters:
Funding is available to support experimenters, as described in the following table.

Experiment Type	Max Experimenter Funding Per Experiment	Testbed Patron Funding per experiment	Max number of experiments funded in this call	Max duration of experiment
Medium	€ 55 000	€ 5000	5	5 months

Eligibility:

- Proposals will only be accepted from a single party eligible for participation in EC H2020-projects.
- Proposers must from parties or organisations that are not already part of the Fed4FIRE+ project consortium.
- Proposers can submit multiple experiment proposals, but only one experiment per proposer will be selected for funding in this Call.
- Proposers who have submitted proposals in previous calls of the Fed4FIRE+ - project are allowed to re-submit.

Detailed information about the open call and its aspects can be retrieved online (**www.fed4fire.eu)**

Language in which the proposal must be submitted: English

Contact: contact@Fed4FIRE+.eu

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13.1 INTRODUCTION TO FED4FIRE+

Fed4FIRE+ is a Research and Innovation Action under the European Horizon 2020 Programme addressing the work programme topic Future Internet Research and Experimentation. The project started on 01 January 2017 and runs for 60 months, until the end of 2021.

The Fed4FIRE+ project has the objective to run and further improve Fed4FIRE+'s "best-in-town" federation of experimentation facilities for the Future Internet Research and Experimentation initiative. Federating a heterogeneous set of facilities covering technologies ranging from wireless, wired, cloud services and open flow, and making them accessible through common frameworks and tools suddenly opens new possibilities, supporting a broad range of experimenter communities covering a wide variety of Internet infrastructures, services and applications.

Fed4FIRE+ continuously upgrades and improves the facilities and include technical innovations, focused towards increased user satisfaction (user-friendly tools, privacy-oriented data management, testbed SLA and reputation, experiment reproducibility, service-level experiment orchestration, federation ontologies, etc.). It will open this federation to the whole community and beyond, for experimentation by industry and research organisations, through the organization of Open Calls and Open Access mechanisms

The project also offers a flexible, demand-driven framework which allows test facilities to join during the course of its lifetime by defining a set of entry requirements for new facilities to join and to comply with the federation.

Fed4FIRE+ also continues to build on the existing community of experimenters, testbeds and tool developers and bring them together regularly (two times a year) in engineering conferences to have maximal interaction between the different stakeholders involved.

An overview of the available FIRE facilities offered through Fed4FIRE+ can be retrieved at the facility overview page on the Fed4FIRE+ website[10]. Additional background information about both the offered facilities, the tools adopted by the federation, and the implementation steps needed from a facility when joining the federation can also be found in the Fed4FIRE+ training material[11].

13.2 OBJECTIVES OF THE CALL

The major objective of this Open Call is to make the federated infrastructure directly available for execution of innovative experiments by experimenters at both industrial (including SMEs) and research organisations. These experiments should be of a duration as defined by the type of the call (Extra Small, Small, Medium or Large) and use one or more Fed4FIRE+ testbeds. Examples of such experiments may include but are not limited to testing of new protocols or algorithms, performance measurements, service experiments. It is required that these experimenters will come from parties or organisations that are not part of the Fed4FIRE+ project consortium.

In view of the targeted timeline and duration of the experiment, it should be clear that these Calls envisage experiments by which existing products or services are tested, implemented or optimized on the Fed4FIRE+ testbeds rather than proposing or developing new ideas from scratch. Examples of such experiments may include but are not limited to testing of new protocols or algorithms, performance measurements, service experiments.

The Fed4FIRE+ project is issuing this series of open and competitive calls for experiments with a degree of industrial and/or scientific innovation, relevance for the Fed4FIRE+ federation and an appropriate scale of complexity. Independent evaluations of the submitted proposals will be

[10] https://www.fed4fire.eu/testbeds/
[11] http://doc.fed4fire.eu/

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performed, in order to select experiments which will be executed within the project. It is required that the experiments are performed by a single organization.

This 4th Open Call targets one specific category for experiments:

- "Medium Experiments" with a maximum budget (including the financial support to the Fed4FIRE+ partner(s) acting as a Patron) of € 60 000 and a maximum duration of 5 months.

This 4th Open Call focusses on experiments in the area of IoT (Internet of Things) and 5G. Experiments targeting other areas, applications and/or technologies can also be submitted, however the focus of this call implies that experiments in the area of IoT and 5G will be favourised during evaluation.

- The focus on IoT covers topics such as (non exhaustive list): smart devices, smart buildings, smart cities, smart interfaces, sensors and monitoring devices and (wireless) IoT networks and protocols, IoT architectures, security, power consumption, battery life,..
- The focus on 5G covers topics such as (non exhaustive list): networks, MIMO, Multi-Radio Access technologies, end-to-end performance, contextual awareness, intelligent data mining, (distributed) cloud, software-defined networking and network function virtualization. new applications and requirements

Benefits for an experimenter to propose experiments on the Fed4FIRE+ federation of testbeds:

- Possibility to perform experiments that break the boundaries of different testbeds or domains (wireless, 5G, wired, OpenFlow, cloud computing, smart cities, services, etc.)
- Easily access all the required resources with a single account.
- Focus on your core task of experimentation, instead of on practical aspects such as learning to work with different tools for each testbed, requesting accounts on each testbed separately, etc.
- An extra benefit which is offered in this call is the dedicated support from specific Fed4FIRE members. Each proposer, preparing a proposal is required to seek a supporting Fed4FIRE consortium partner or partners (the "Patron") that will be in charge of dedicated (advanced) support of the experiment.

13.3 ELIGIBILITY

- Proposals will only be accepted from parties eligible for participation in EC H2020-projects.
- Proposals will only be accepted from single parties (no consortia are allowed).
- Proposers must from parties or organisations that are not already part of the Fed4FIRE+ project consortium.
- Proposers can submit multiple experiment proposals, but only one experiment per proposer will be selected for funding in this Call. In case multiple proposals are submitted by the same party, reference should be made to each submitted proposal and clear indication should be given on the complementarity of the proposals.
- Proposers who have submitted proposals in previous calls of the Fed4FIRE+ - project are allowed to re-submit. Details on how this information needs to be included in the proposal are given below and should be included in a specific section in the proposal (cfr. Proposal template)
- Parties who have submitted proposals in previous calls which were NOT selected for funding should indicate the exact dates and details of the previous submissions.

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- Parties who have submitted proposals in previous calls which were selected for funding should indicate the difference between the current proposal and the previously submitted proposal.
- Parties belonging to a legal entity of which other groups have submitted proposals in previous calls also need to indicate the difference between the current proposal and the previously submitted proposals.

13.4 INCLUSION INTO THE CONSORTIUM

Once a party is selected to perform the proposed experiment, it will be contracted by the project coordinator (imec) as a 3rd Party receiving financial support. This will require the signature of the Agreement of which can be found as download on the Fed4FIRE+ website together with this Call information.

13.5 PARTICIPATION IN MEETINGS AND SUBMISSION OF REPORTS

13.5.1 Submission of reports

(templates can be found as download on the Fed4FIRE+ website together with this Call information)
The proposer will need, if its experiment is selected for funding:

- To submit a report at the end of the experiment using the template in Annex 2 to this document.
- To prepare a Poster (A1-format) describing the objective and results of the experiment as well as the impact of the experiment on the proposers' business. This poster can be used by the Fed4FIRE+ consortium at public events and will be used at the occasion of the review meetings.
- To prepare a flyer (2 A4-pages) describing the objective and results of the experiment as well as the impact of the experiment on the proposers' business. This flyer can be used by the Fed4FIRE+ consortium at public events.
- To prepare a presentation and demo explaining and illustrating:
  - the objective and results of the experiment
  - the impact of the experiment on the proposers' business.
  - The feedback towards the Fed4FIRE+ consortium on the use of the facilities
- The production of a short video about the experiment is recommended. This video will be used by the Fed4FIRE+ project at public events.

13.5.2 Attendance at meetings

Attendance at the meetings listed below is required. It is therefore recommended to budget these in the proposal.

…. To be completed according to required schedule

13.6 TARGETED TIMING:

…. To be completed according to required schedule

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13.7 OPEN RESEARCH DATA

13.7.1 Motivation & Principles

In order to support open and repeatable scientific experiments, the EC is advocating that experimenters publish their experiment data[12,13]. This is not mandatory: the EC recognises that there are legitimate reasons why experimenters may want to keep their data confidential. To support this in Fed4FIRE+, experimenters are encouraged (but not mandated) to create a data package containing their experiment results with all data that supports them, and upload it to the Fed4FIRE+ approved repository so that it may be found and reused by other interested parties.

The EC's guiding principle regarding open research data is *"AS OPEN AS POSSIBLE, AS CLOSED AS NECESSARY"*. This means the default situation is that all experiment data should be open but if there are genuine reasons why experiment data is not to be opened, experimenters can opt out and their experiment data can be kept confidential. Fed4FIRE+ experimenters can opt out of opening data at any time up to the point of publication after the experiment has completed, even if they have previously declared that they want to open data. Experiment proposers need to state the reasons why they will not open data, and these can include:

- Commercial confidentiality & IPR
- Personal data
- Conflict with the experiment's main objective

In general, most academic experimenters are anticipated to want to open data in order to support their academic work, and most commercial experimenters will want to keep their data confidential, but the final decision is the experimenter's, provided they give valid reasons for opting out of opening data.

13.7.2 Data Archive

The repository chosen for Fed4FIRE+ is **Zenodo**[14]. The reasons for this choice are given in detail in Fed4FIRE+ D2.1, Initial Guidelines on Data Management, but they are summarised here:

- Zenodo is hosted by CERN, so it is unlikely to disappear any time soon, and has a stated long-term data preservation policy.
- Zenodo exports descriptive metadata to ORD search engines, enabling the data to be easily found.
- Zenodo is an issuer of Digital Object Identifiers (DOIs)[15], enabling the data to be uniquely identified.
- Zenodo is flexible on licensing of data.
- Zenodo provides automated reporting to the EC for open data stored within it, so evidence of the commitment from Fed4FIRE+ and experimenters to provide open experiment data can be easily verified.

[12] https://ec.europa.eu/research/press/2016/pdf/opendata-infographic_072016.pdf
[13] http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf
[14] https://zenodo.org/
[15] https://www.doi.org/

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13.7.3 Funding Available

Funding to cover the experimenter's costs in preparing the ORD data package is available from the Fed4FIRE+ Federator. This is additional to the support funding for experiments, and will be paid to an experimenter upon confirmation that their experiment data package is complete and uploaded into the Fed4FIRE+ approved data repository, Zenodo.

The funding available is capped to an upper limit of €500.

13.7.4 Process

The process for ORD in Fed4FIRE+ is shown in Figure 25. The left-hand column shows activities by the experimenter, and the right hand column shows activities by the Federator.

At experiment proposal time, the experimenter decides whether they want to open data. If they want to keep data confidential, they need to provide satisfactory reasons why not in their proposal. Valid reasons will not prejudice against funding for experiment proposals. If experimenters want to open data, they must complete a basic data management plan and include this with the proposal submission. If the proposal (including the basic DMP) is accepted, in addition to providing the experiment funding, the Federator puts aside funding to cover the experimenter's extra costs in preparing the ORD package.

After the experiment is complete, the experimenter has another opportunity to decide whether they want to open their research data. If they wish to keep their data closed, they need to provide reasons in their experiment report. If they wish to open data, they must complete a more detailed DMP, prepare a data package including metadata describing the experiment data and upload the data package to Fed4FIRE+'s approved data repository, Zenodo. Zenodo will issue a Digital Object Identifier, and this must be submitted to the Federator. The Federator will check the existence and completeness of the data package, and if all is well, will authorise a cost claim for the experimenter covering their costs for opening data (up to a limit of €500).

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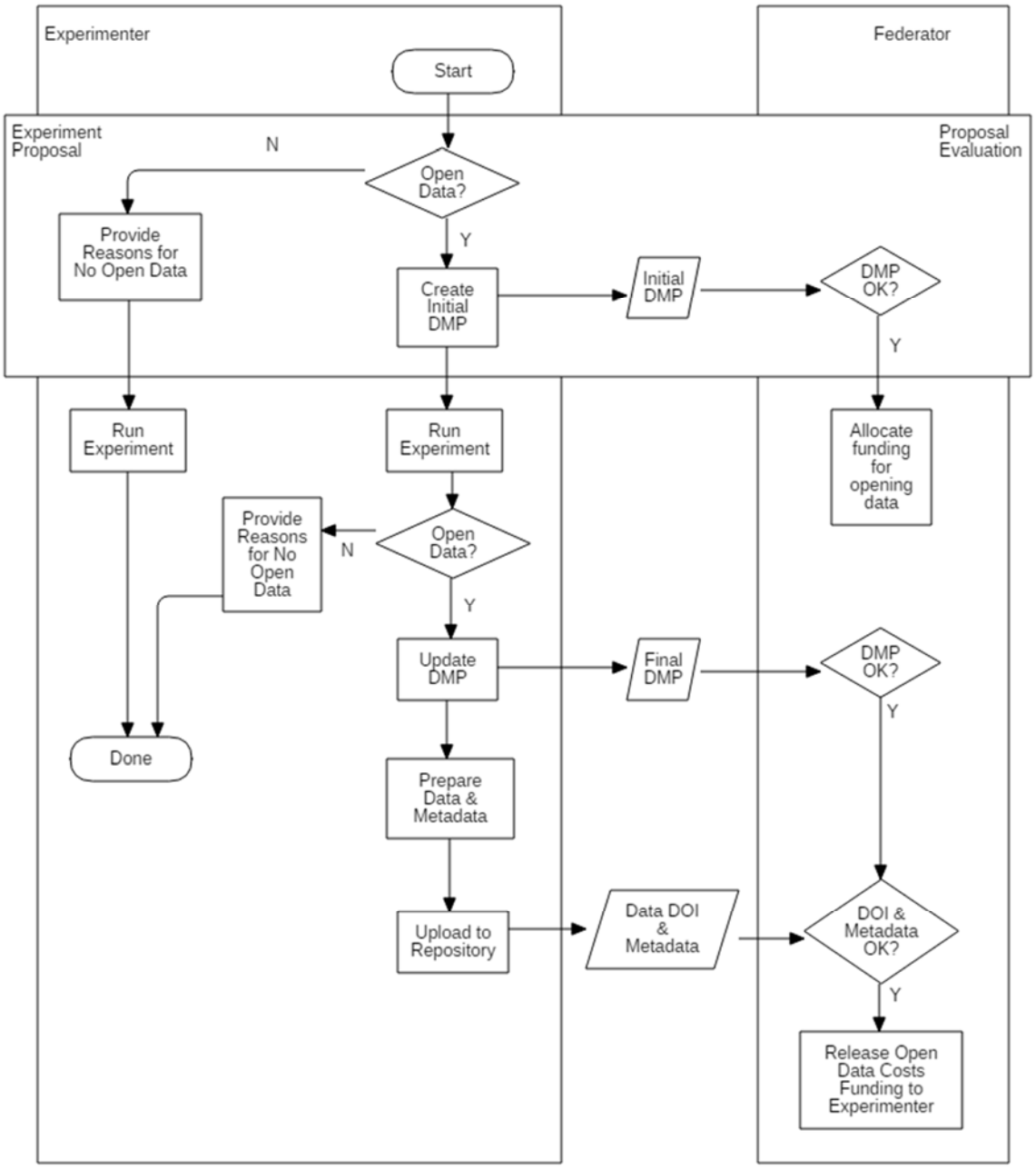

FIGURE 25: FED4FIRE+ OPEN RESEARCH DATA PROCESS

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13.8 PROPOSAL TEMPLATE

The use of a specific proposal format as described in this section is mandatory. The template (can be found as download on the Fed4FIRE+ website together with this Call information) is limited in size and is focusing on “what experimenters want to do” and “what the expected result is”.

Section A Information page and Summary (300 word summary)
The information in this section may be used in public documents and reports by the Fed4FIRE+ consortium.

Section B Description and Expected Results (target length 6 pages)
describing the details on the planned experiment (what do you hope to obtain, how, why is it relevant,…). This section should also include all information with respect to the State-of-the-Art to show the innovative character of the experiment and the expected business impact

Section C Requested Fed4FIRE+ tools, testbeds and facilities (1 page, standard form)
The information in this section needs to be collected in collaboration with the Fed4FIRE partner acting as patron on this experiment. For this section a specific format needs to be used, which is attached to this document and available for download.

Section D Compliance check (max. 1 page, standard form to be provided by the Fed4FIRE+ Patron)
This section contains the formal statement of the Fed4FIRE+ partner(s) acting as patron on this experiment that he/she has been informed about your proposed experiment and that he agrees that it can be carried out on the required testbed(s). To be able to complete this form, the Patron needs to be informed about the proposal itself. Therefore, a “feasibility-check” deadline is set, by which the Patron needs to have received the draft proposal to be able to complete this form.

Section E Background and qualifications (target length 1-2 pages)
This section describes the proposing experimenters and includes an overview of the activities, your qualifications, technical expertise and other information to allow the reviewers to judge your ability to carry out the experiment.

Section F Expected feedback to the Fed4FIRE+ Consortium (target length 1-2 pages)
This section contains valuable information for the Fed4FIRE consortium and should indicate the expected feedback the Fed4FIRE consortium can expect form the use of its federated facilities after carrying out your experiment. This information is essential in view of the sustainability of the facilities and use of tools and procedures. Note that the production of this feedback is one of the key motivations for the existence of the Fed4FIRE open calls.

Section G Future plans (target length 1 page)
This section contains information regarding expected possible follow-up experiments, new initiatives, new projects which may follow out of the experiment as proposed in this Open Call.

Section H Requested funding (1 page. standard form).
This section provides an overview of the budgeted costs and the requested funding. A split is made in personnel costs, other direct costs (travel, consumables,..) and indirect costs. This section also includes the split between the budget allocated to the experimenter and the budget allocated to the Patron(s), clearly argumenting this split (max. €5 000 in total for the patron(s)). It is thus possible to have e.g. one patron providing specific testbed resources and setup for €3 500 and another patron offering consulting help for €1 500 for the same experiment.

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Section I Participation in previous Open Calls of the Fed4FIRE+ project.
This section provides information on previous participation in Open Calls of the Fed4FIRE+ project:

- Parties who have submitted proposals in previous calls which were NOT selected for funding should indicate the exact dates and details of the previous submissions.
- Parties who have submitted proposals in previous calls which were selected for funding should indicate the difference between the current proposal and the previously submitted proposal.
- Parties belonging to a legal entity of which other groups have submitted proposals in previous calls also need to indicate the difference between the current proposal and the previously submitted proposals.

Section J Data Management
This section begins with the question: “Will you provide a complete, publicly-accessible dataset of your experiment results and supporting data, uploaded in Fed4FIRE+’s chosen repository?”
For the Answer “NO”: The experimenter needs to provide reasons why they will not make their experiment data open as part of the proposal. Guidance on opt out reasons can be found in Section 13.7.1.
For the Answer “YES”: The experimenter needs to fill in the table provided in the template, and this becomes the initial Data Management Plan, to be submitted with the experiment proposal. Guidance notes are provided in the table.

Section K Survey.
This survey contains a list of specific requirements which you expect your experiment has for our federated testbeds. This survey will be done through a specific template which will become available on-line. This survey is an integral part of your proposal. Proposing parties who do not complete this survey by the set deadline are not eligible for evaluation.
The survey responses will remain within the Fed4FIRE consortium and will be used for reports and evaluation of the Fed4FIRE tools, testbeds and concept. The results will not be forwarded to the reviewers and will consequently not influence the scoring of your proposal during the evaluation process.

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13.9 SUPPORT DURING EXPERIMENT AND THE ROLE OF THE PATRON

Experimenters in this open call category have access to basic and advanced support:

A. Basic support

- Guaranteeing that the facility is up and running (e.g. answering/solving "could it be that server X is down?")
- Providing pointers to documentation on how the facility can be used (e.g. "how to use the virtual wall testbed" => answer: check out our tutorial online at page x")
- Providing pointers to technical questions as far as relevant (e.g. answering "do you know how I could change the WiFi channel" => answer: yes, it is described on following page: y"; irrelevant questions are for example "how to copy a directory under Linux")
- This support will be handled through the support forum detailed at http://doc.fed4fire.eu/support.html

B. Dedicated (advanced) support includes all of the following supporting activities by the patron:

- Deeper study of the problem of the experimenter: invest effort to fully understand what their goals are, suggest (alternative) ways to reach their goals. To put it more concretely (again using the example of the Virtual Wall testbed), these experimenters do not need to know the details on the Virtual Wall or how it should be used, they will be told what is relevant to them and can focus on their problem, not on how to solve it.
- Help with setting up the experiments (e.g. "how to use the virtual wall" => answer: the tutorial is there, but let me show you how what is relevant for you, let me sit together with you while going through this example and let us then also make (together) an experiment description that matches what you are trying to do.
- (Joint) solving of practical technical problems (e.g. "do you know how I could change the WiFi channel" => yes, it is described on page y, in your case you could implement this as following: ..., perhaps we should quickly make a script that helps you to do it more easily, ...)
- Custom modifications if needed: e.g. adding third-party hardware and preparing an API for this.
- Technical consultancy during/after the experiments (e.g. "I do get result x but would have expected y, what could be the problem?")

It is essential that you get in contact with the Fed4FIRE+ partner in charge of the testbed(s) you will use for your experiment to discuss your experiment and the specific requirements. Each proposing party must therefore contact the Fed4FIRE+ consortium regarding its submission to identify a possible Patron. The proposing party must submit its draft proposal to this Patron. The feedback by the Patron is provided in section D of the proposal.

The role and support by the Patron will be reflected in the budget (see section G of the proposal). At least one Patron is needed per experiment, but more are possible.

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13.10 BUDGET & PAYMENT SCHEME

As the experimenter will be linked to the Fed4FIRE+ consortium as 3rd Party receiving financial support, specific arrangements exist with respect to financial costs and payment schemes:

13.10.1 Compliance rules

As a 3rd Party, the proposing party needs to include an overview of the estimated costs in its proposal at the time of submission. Costs consist of personnel costs, direct costs (such as travel, consumables, etc.) and indirect costs. The costs of a 3rd Party have to comply with the rules and the principles mentioned in Section I, Article 6 (Eligible and ineligible costs) of the H2020 AGA — Annotated Model Grant Agreement

(http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/amga/h2020-amga_en.pdf),

in the same way as the beneficiaries, and must be recorded in the accounts of the 3rd Party. In other words, the rules relating to eligibility of costs, identification of direct and indirect costs and upper funding limits apply. Equally those concerning controls and audits of Section I, Article 22 of the H2020 AGA.

13.10.2 Budget

- ➔ The maximum requested funding for each experiment in this Call is set at:
  - 60k euro for Medium Experiments
- ➔ The budget covers the costs for:
  - the experimenter including the costs for:
    - getting acquainted with the testbed
    - executing the experiment
    - reporting feedback about the federation framework
    - submitting the required documents
    - attending the required meetings (travel)
  - the Fed4FIRE+ partner(s) acting as Patron(s) including the costs for:
    - supporting the proposer during the preparation and execution of the experiment
    - specific adaptation of the testbed to run the experiment
    - providing feedback and quality-check on the submitted reports and materials by the experimenter.
- ➔ The budget can be split in a flexible way between the experimenter and the Patron but the split needs to be provided and argumented in the proposal (with a max. total of €5 000 for the patron(s)).

13.10.3 Submission of invoices

- ➔ The proposer will need, if its experiment is selected for funding:
- ➔ To submit an invoice for 75% of the budget allocated to the 3rd Party which will be paid by imec as coordinator upon an approval of the report by the Fed4FIRE+ consortium.
- ➔ To submit an invoice for 25% of the budget allocated to the 3rd Party which will be paid by imec as coordinator upon receiving a positive evaluation report by the EU appointed reviewers following a formal review by the EU representatives.

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➔ Payments to the Fed4FIRE+ partner acting as Patron will be made internally within the consortium.

13.11 ACCESS TO FOREGROUND INFORMATION FROM THE PROJECT

As indicated by the EC Guidelines, a 3rd Party is paid in full for its contribution made to a project by the coordinator. As a consequence, 3rd Parties do not have any IPR rights on the foreground of the project.

13.12 REPORTING

As the experimenter will be linked to the Fed4FIRE+ consortium as 3rd Party receiving financial support, no input will be required for any of the regular project reports which the Fed4FIRE+ consortium needs to submit to the EU.

A final report needs to be submitted after conclusion of the experiment. A specific template needs to be used (can be found as download on the Fed4FIRE+ website together with this Call information) and will include:

Part A. Summary

Part B. Detailed description
This section describes the details on the experiment and provides information as you have been collecting this from your point of view and from your business. It includes:
- B.1 Concept, Objectives, Set-up and Background
- B.2 Technical Results & Lessons learned
- B.3 Business impact

Part C. Open Research Data
This section provides feedback on the actions taken by the proposer in the framework of the Open Research Data initiative. If you have opted out of this initiative, please provide the reasons. If you have opted in, please provide the Final Data Management Plan and all necessary information to show that a complete, publicly-accessible dataset of your experiment results and supporting data, has been uploaded in Fed4FIRE+'s chosen repository.

Part D. Feedback to Fed4FIRE+
This section contains valuable information for the Fed4FIRE consortium and describes your experiences by running your experiment on the available testbeds. Note that the production of this feedback is one of the key motivations for the existence of the Fed4FIRE+ open calls. It includes:
- C.1 Resources & tools used
- C.2 Feedback based on design/set-up/running your experiment on Fed4FIRE+
- C.3 Why Fed4FIRE+ was useful to you

This report will not only serve as an evaluation tool to judge payment of the experimenter, but will mainly serve as input to the Fed4FIRE sustainability plans, evaluation of the user-friendliness of the Fed4FIRE tools and identification of missing gaps in both testbeds and tools.

Part of this report may be used by the Fed4FIRE+ consortium for inclusion in their reporting documents to the EU and in public presentations. Inclusion of confidential information should therefore be indicated and discussed with the Fed4FIRE+ consortium.

This report will also be used for the formal review by the European Commission.

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13.13 CRITERIA FOR EVALUATION AND RANKING OF EXPERIMENTS

Proposals can only be submitted by eligible parties (cfr section 3):

Evaluation and ranking will be carried out by an external review panel. Selection will mainly be based upon:

Criteria I. A degree of industrial and/or scientific innovation including a motivation for the experiment. (Section B of the Proposal Template)
The score given here should reflect the degree of innovation: if an experiment is pushing the boundaries of its domain, then it should get a higher score here then experiments testing trivial things. In order to demonstrate these criteria, the proposer may opt to indicate the State of the Art in the appropriate field.

Criteria II. A degree of industrial and/or scientific relevance (Sections B of the Proposal Template)
This score should reflect the industrial relevance including the expected and projected impact on the experimenter through product development or the scientific relevance and the projected impact on the organisation

Criteria III. Clarity and methodology (0Section B of the Proposal Template)
The experiment should be scientifically and/or technically sound. There should be a clear problem statement, a solid experiment design, a good methodology, etc.

Criteria IV. Use of Fed4FIRE+ facilities and tools (Sections B & C of the Proposal Template)
The use of the proposed testbeds and tools will be evaluated on the basis of the relevance and the required complexity. Proposals will not be penalized for using only single testbeds or single tools, but use of multiple testbeds is stimulated, as Fed4FIRE+ is a federation of testbeds. No distinction is made between achieving this by running the same experiment in sequence on multiple testbeds (e.g. to evaluate different wireless environments), or by running a single experiment that relies on resources from different testbeds at the same time. If however proposals have made their design artificially more complex than needed just in order to use multiple testbeds, then the score will be lower. Similarly, if proposals have made their designs too trivial while you can easily identify opportunities for involving other testbeds that would have made the experiment stronger, then the score will also be lower. In order to optimise the design of the experiment, the proposer should seek information on the available testbeds.

Criteria V. Relevance for Fed4FIRE+ framework in terms of potential feedback to the project on the planned facility and tools utilization (Section F of the Proposal Template)
The Fed4FIRE consortium is seeking feedback regarding the available tools, procedures and testbeds. Proposals which can indicate that more information and feedback on the use of these tools and procedures will be provided will get a higher score. So the more of the Fed4FIRE tools and APIs that an experiment can provide feedback on, the better. If they need to use additional non-Fed4FIRE tools, that is not a problem as long as they clearly indicate the added value of these additional tools.

Criteria VI. Indication on possible future follow-up experiments and how this can support the sustainability of the federated testbed facilities. (Section G of the Proposal Template).
The proposer may indicate possible follow-up projects and experiments which can contribute to the sustainability of the Fed4FIRE facilities. The quality, the size and the expected feasibility to carry out these future experiments will be reflected by the score in this criterion.
These future plans can be new experiment with Fed4FIRE, a new research project, internal projects, product commercialization…. As the objective of Fed4FIRE+ is to provide an incentive, seed budget or initial assistance in your

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business or research, any new initiative triggered by this experiment is acceptable to be listed. The future plans do not have to exclusively impact the future of Fed4FIRE!

Criteria VII. The proposer should exhibit technological expertise and quality. This information must be included in Section E of the Proposal Template.

Criteria VIII. Preference is given to proposals originating from new players in the field. Therefore the following restrictions will be implemented:

- parties who have submitted a proposal in previous calls of Fed4FIRE+ and which were selected for funding are allowed to submit a new proposal only when clear distinction can be made with previous submitted proposals.
- Parties who have not submitted or been participating in previous calls of the Fed4FIRE+ project but are belonging to same legal entity as proposers which have submitted proposals in previous calls, are eligible in case they can clearly identify the difference with previous submitted proposals by the other groups.
- This information must be included in Section I of the Proposal Template.

Criteria IX. Preference is given to proposals with in the area of IoT (Internet of Things) and 5G. Therefore, proposals which, based on the description in Section B of the proposal can be situated in these areas, will be given an extra 5 points on their total score.

Amongst all above listed criteria, Criteria I, II and V will be weighted higher:

- Criteria I 0 to 5 points (threshold 3 points) weight = 2
- Criteria II 0 to 5 points (threshold 3 points) weight = 2
- Criteria III 0 to 5 points (threshold 3 points) weight = 1
- Criteria IV 0 to 5 points (threshold 3 points) weight = 1
- Criteria V 0 to 5 points (threshold 3 points) weight = 2
- Criteria VI 0 to 5 points (threshold 3 points) weight = 1
- Criteria VII 0 to 5 points (threshold 3 points) weight = 1
- Criteria VIII 0 to 5 points (threshold 3 points) weight = 1
- Criteria IX 0 or 5 points (no threshold) weight = 1
- **Total score: 0 to 60 points (threshold 40 points)**

The proposed experiment must be executed on the available Fed4FIRE+ testbeds. This competitive call allows for both experiments using multiple testbeds (in parallel and/or in sequence) and experiments using a single testbed. Information about the current Fed4FIRE+ testbeds is available at the dedicated pages[10]. The proposed experiment must use the experimentation tools provided by Fed4FIRE+ in order to provide feedback to the project about their usefulness and maturity in a final report. In justified cases additional external tools may be used.

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14 ANNEX 4: TEMPLATE FOR OPEN CALL PROPOSAL

Green highlighted areas to be filled

Open Call – Experiments

Full title of the existing project you wish to join:
Acronym of the existing project:
Grant agreement number of existing project:
Type of instrument (Integrated project/Network of excellence):

Full title of your project
Acronym of your proposal (optional)

Date of preparation of your proposal: xx/yy/201x
Version number *(optional):*

Your organisation name: Your organisation name
Your organisation address: Your organisation address
Name of the coordinating person: Name of the coordinating person
Coordinator telephone number: Coordinator telephone number
Coordinator email: Coordinator email
(this will be the email address to which the Acknowledgement of Receipt will be sent)

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SECTION A PROJECT Summary

(Maximum 300 words – summary of your proposed work)

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Remark: The information in this section may be used in public documents and reports by the Fed4FIRE+ consortium.

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Section B Detailed Description and Expected Results (target length 6 pages)

This section describes the details on the planned experiment (what do you hope to obtain, how, why is it relevant). This section should also include all information with respect to the State-of-the-Art to show the innovative character of the experiment and the expected business impact. Suggested sections include:

B.1 Concept and objectives

Describe in detail the objectives of your proposed experiment. These objectives should be those achievable within your proposed action, not through subsequent development. Preferably they should be stated in a measurable and verifiable form.

B.2 Business impact

Describe how this experiment may impact your business and product development by indicating the way how this experiment fits in your activities.

Having close contacts with possible end-users during this experimental phase might be used to illustrate the business impact of your experiment.

B.3 Description of State-of-the-Art

Describe in detail how this experiment compares to the State-of-the-Art in the field covered by the experiment. Are there similar experiments, products, services,.. on the market? Is this experiment incremental to existing work?

B.4 Methodology and associated work plan

Provide a workplan which eventually can be broken down into work packages[16] (WPs). Provide clear goals and verifiable results and also a clear timing.

[16] A work package is a major sub-division of the proposed work with a verifiable end-point - normally a deliverable or a milestone in the overall action.

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Section C Requested Fed4FIRE+ tools, testbeds and facilities (target length 1 page)

Please check the Fed4FIRE+ testbed or multiple testbeds which will be required for your experiment

Please use www.fedfire.eu to get details on the specific testbeds or contact@fed4fire.eu.

Wired networking testbeds		
	Virtual Wall (imec)	
	PlanetLab Europe (UPMC)	
	PL-LAB (PSNC)	
	Geant Testbed as a Service (GTS) (Nordunet)	

Wireless/5G/IoT testbeds		
	w-iLab.t (imec)	
	Portable wireless testbed (imec)	
	City of Things Antwerp testbed (imec)	
	NITOS (UTH)	
	Netmode (NTUA)	
	SmartSantander (UC)	
	FuSeCo (FOKUS)	
	PerformLTE (UMA)	
	IRIS (TCD)	
	LOG-a-TEC (JSI)	
	R2lab (Inria)	

OpenFlow testbeds		
	i2CAT OFELIA island	
	NITOS (UTH)	
	Virtual Wall (imec)	

Cloud computing testbed		
	Virtual Wall (including GPUlab) (imec)	
	Exogeni (UvA)	
	Grid5000 (Inria)	

Other		
	Tengu – big data (imec)	

Please provide here more information on why specific testbeds will be required for your experiment (max. ½ page)

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Section D Compliance check (max. 1 page)

Each proposing party must contact the Fed4FIRE+ consortium regarding its submission to identify a possible Patron. This Patron will in most cases be the Fed4FIRE+ partner responsible for the Testbed the proposing experimenter will use during its experiment. The proposing party must submit its draft proposal to this Patron by the set deadline for the Feasibility Check. The Patron completes the form below and this signed form is copied by the proposer into this section of the proposal.
It is advised you get as soon as possible in contact with the Fed4FIRE++ in charge of the testbeds you intend to use and discuss with him/her your proposal.

I, ... (name),

representing ..... (Fed4FIRE+ Partner)

hereby confirms to have been informed about the

proposal ..... (proposal name)

being prepared by ..... (experimenter organisation)

and to be submitted to the Fed4FIRE+ Open Call -3.

I, acting as Patron for the above mentioned experiment, hereby confirms that the proposed experiment can be carried out on the testbeds as indicated in Section C of this proposal.

Signature

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Section E Background and qualifications (target length 1-2 pages)

This section describes the proposing SME and includes an overview of the activities, your qualifications, technical expertise and other information to allow the reviewers to judge your ability to carry out the experiment.

Section F Expected feedback to the Fed4FIRE+ Consortium (target length 1-2 pages)

This section contains valuable information for the Fed4FIRE+ consortium and should indicate the expected feedback the Fed4FIRE+ consortium can expect form the use of its federated facilities after carrying out your experiment. This information is essential in view of the sustainability of the facilities and use of tools and procedures. Note that the production of this feedback is one of the key motivations for the existence of the Fed4FIRE+ open calls.

Section G Future plans (target length 1 page)

This section contains information regarding expected possible follow-up experiments, new initiatives, new projects which may follow out of the experiment as proposed in this Open Call.

The proposer may indicate possible follow-up projects and experiments which can contribute to the sustainability of the Fed4FIRE facilities. The quality, the size and the expected feasibility to carry out these future experiments will be reflected by the score in this criterion.

These future plans can be new experiment with Fed4FIRE, a new research project, internal projects, product commercialization…. As the objective of Fed4FIRE+ is to provide an incentive, seed budget or initial assistance in your business or research, any new initiative triggered by this experiment is acceptable to be listed. The future plans do not have to exclusively impact the future of Fed4FIRE+.

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Section H Requested funding (form to be completed)

This section provides an overview of the budgeted costs and the requested funding. A split is made in personnel costs, other direct costs (travel, consumables,..) and indirect costs. This section also includes the split between the budget allocated to the experimenter and the budget allocated to the Patron(s), clearly argumenting this split (max. €5 000 in total for the patron(s)). It is thus possible to have e.g. one patron providing specific testbed resources and setup for €3 500 and another patron offering consulting help for €1 500 for the same experiment.

For the travel budget, see the needed travels in the call document.

Besides the table below, extra information can be provided to support the requested funding and which may help to judge the cost to the Fed4FIRE+ project.

Please show your figures in euros (not thousands of euros)

H.1 Budget Experimenter:

	Total PM	Cost
1. Personnel costs (incl. indirect costs)		
2. Other costs (incl. indirect costs)		
3. Total costs (Sum of row 1 and 2)		

H.2 Budget Patron:

	Total PM	Cost
1. Personnel costs (incl. 25% indirect costs)		
2. Other costs (incl. 25%. Indirect costs)		
3. Total costs (Sum of row 1 and 2)		

In row 1, insert your personnel costs for the work involved.

In row 2, insert any other costs, for example equipment or travel costs.

For the Experimenter all numbers must include indirect costs, for the Patron, indirect costs follow the H2020 guidelines and are defined as 25%.

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Section I Participation in previous Open Calls of the Fed4FIRE+ project. (1-2 pages)

Parties who have submitted proposals in the previous Open Calls of the Fed4FIRE+ project are allowed to re-submit.

Information only to be provided if one of the following conditions apply:

- Parties who have submitted proposals in previous calls which were NOT selected for funding should indicate the exact dates and details of the previous submissions.
- Parties who have submitted proposals in previous calls which were selected for funding should indicate the difference between the current proposal and the previously submitted proposal.
- Parties belonging to a legal entity of which other groups have submitted proposals in previous calls also need to indicate the difference between the current proposal and the previously submitted proposals.

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Section JOpen Research Data

Will you provide a complete, publicly-accessible dataset of your experiment results and supporting data, uploaded in Fed4FIRE+'s chosen repository?	YES or NO
For the Answer "NO":	The experimenter needs to provide reasons why they will not make their experiment data open as part of the proposal. Guidance on opt out reasons can be found in Section 8.1.
For the Answer "YES":	The experimenter needs to fill in the following table, and this becomes the Initial Data Management Plan, to be submitted with the experiment proposal. Guidance notes are provided in the table.

Initial Data Management Plan (DMP)

Sec t-ion	DMP Category and Question	Initial DMP	Fed4FIRE+ Guidance Notes
			Y = mandatory to answer question, O = optional to answer, N/A = not applicable
0	**Experiment Information**		
	Name of Experiment	Y	
	Names of Experimenters	Y	
	Experimenters' Organisations	Y	
	Fed4FIRE+ Call ID	Y	
	Experiment Start Date	Y	
	Experiment End Date	Y	
	Fed4FIRE+ Testbeds	Y	
	Fed4FIRE+ Sponsor	Y	
1	**Data Summary**		
	What is the purpose of the data collection/generation and its relation to the objectives of the project?	Y	This should be the abstract of experiment from proposal including objectives of collecting the experiment data.
	What types and formats of data will the project generate/collect?	Y	Initially this can be an estimate. In the final DMP this should be a statement of the formats, so it can go into the metadata.
	Will you re-use any existing data and how?	O	If any external data is anticipated before the experiment starts, state it here. If any external data has been used during an experiment, it must be stated, along with any license terms or stipulations.

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Sect-ion	DMP Category and Question	Initial DMP	Fed4FIRE+ Guidance Notes
			Y = mandatory to answer question, O = optional to answer, N/A = not applicable
	What is the origin of the data?	Y	This is the expected source of the data before the experiment runs, and the actual source of data once the experiment is complete.
	What is the expected size of the data?	O	Initially this can be an estimate. In the final DMP this should be the actual size of the data.
2	**FAIR[17] data**		
2.1	*Making data findable, including provisions for metadata*		
	Are the data produced and/or used in the project discoverable with metadata, identifiable and locatable by means of a standard identification mechanism (e.g. persistent and unique identifiers such as Digital Object Identifiers)?	Y	Initially, this should be a statement committing that the experiment data will be discoverable. When the experiment is complete, the experiment data's Digital Object Identifier (DOI) and metadata should be cited. Fed4FIRE+'s repository of choice, Zenodo, allocates a DOI at upload time, and allows keywords to be entered into a form. These keywords will form part of the metadata that allow the data to be discoverable.
	What naming conventions do you follow?	O	Initially this can be optional, although it is recommended to think of the naming conventions before the data is collected. After the experiment, this should cite the naming conventions used.
	Will search keywords be provided that optimize possibilities for re-use?	Y	This should always be YES - there will be or are keywords for search terms. The keywords should be stated here.
2.2	*Making data openly accessible*		
	What methods or software tools are needed to access the data?	O	If there are any special tools or methods needed to access the data (e.g. commercial software tools that can open the data's format), state them here.
	Is documentation about the software needed to access the data included?	O	If software tools are needed, cite the documentation.

[17] FAIR is an acronym for “findable, accessible, interoperable and reusable”. See: Wilkinson, Mark D., Michel Dumontier, IJsbrand Jan Aalbersberg, Gabrielle Appleton, Myles Axton, Arie Baak, Niklas Blomberg et al. "The FAIR Guiding Principles for scientific data management and stewardship." Scientific data 3 (2016). http://dx.doi.org/10.1038/sdata.2016.18

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Sect-ion	DMP Category and Question	Initial DMP	Fed4FIRE+ Guidance Notes
			Y = mandatory to answer question, O = optional to answer, N/A = not applicable
	Is it possible to include the relevant software (e.g. in open source code)?	O	If possible, include or cite the software tools (e.g. sourceforge location)
2.3	*Making data interoperable*		
	Are the data produced in the project interoperable, that is allowing data exchange and re-use between researchers, institutions, organisations, countries, etc. (i.e. adhering to standards for formats, as much as possible compliant with available (open) software applications, and in particular facilitating re-combinations with different datasets from different origins)?	Y	The default position for Fed4FIRE+ is "yes - the data will be (or is) interoperable". This section should be a statement of commitment by the experimenter that the data will be (or is) interoperable.
	What data and metadata vocabularies, standards or methodologies will you follow to make your data interoperable?	O	Initially, this should be a statement of the formats intended for the data, together with citations of their definitions if applicable (e.g. RFCs etc.). For metadata, the experimenter should cite the anticipated metadata schemas by URL. After the experiment is complete, it should be a statement of the actual formats used, as well as citations to metadata schemas.
2.4	*Increase data re-use (through clarifying licences)*		
	How will the data be licensed to permit the widest re-use possible?	Y	Initially, this should be a statement of the intended license, which at least must permit open access. Once the experiment is complete, the data must be licensed under terms that permit open access, and the license must be named here. The default license is Creative Commons CC-BY 4.0, an open license that provides attribution of the creator.
	Are data quality assurance processes described?	O	If any QA procedures are observed, they should be stated - it is in the interest of the experimenter to describe these, as they will help the reusability of the data.
3	**Allocation of resources**		

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Sect-ion	DMP Category and Question	Initial DMP	Fed4FIRE+ Guidance Notes
			Y = mandatory to answer question, O = optional to answer, N/A = not applicable
	Who will be responsible for data management in your project?	Y	The person responsible for the data management should be named in both the initial and final DMP. This should be the principal experimenter.
4	**Data security**	N/A	**Responsibility of Repository**
5	**Ethical aspects**		
	Are there any ethical or legal issues that can have an impact on data sharing? These can also be discussed in the context of the ethics review. If relevant, include references to ethics deliverables and ethics chapter in the Description of the Action (DoA).	Y	Legal, ethical and data protection issues must to be described in the initial DMP that forms part of the experimenter's proposal before the experiment runs, together with procedures for correct compliance with the applicable laws including the implications of storing the data for the long term in an open repository.
	Is informed consent for data sharing and long term preservation included in questionnaires dealing with personal data?	Y	The experimenter must specify methods for acquiring informed consent in their initial DMP.
6	**Other issues**		
	Do you make use of other national/funder/sectorial/departmental procedures for data management? If yes, which ones?	O	If other DMP procedures are used, the experimenter should state them.

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Section K Survey & Use of proposal information

Proposals are treated in a confidential way, meaning that only successful proposals may be disclosed to the Fed4FIRE+ consortium. Open calls previously organized by other FIRE projects were very successful and have revealed that many submitted non-granted proposals also contain very interesting and valuable information that could be used for setting up collaborations or to extract ideas for further improving the federated test infrastructures. Therefore the project would like to have the opportunity to collect more detailed information and further use this information, also if the proposal is not selected for funding. In any case, the Fed4FIRE+ consortium will treat all information of this proposal confidentially. Three types of information usage are envisaged:

- *Information which is part of the Sections A, C, D and F will be used within the Fed4FIRE+ project as input for tasks related to architectural optimizations, sustainability studies, etc. The same information can also be used in an anonymous way to create statistics and reports about this first open call. All proposals submitted to this competitive open call are obliged to allow this form of information access and usage.*
- *Other information belonging to this proposal might also be accessed by the Fed4FIRE+ consortium if allowed by the corresponding consortium. Any use of such information will be discussed and agreed upon with the proposers. Proposals have the freedom to select if they wish to support this kind of information usage.*
- *As part of the submission of your proposal, and in support of the Fed4FIRE+ project itself, a survey needs to be completed (Section I). This survey consists of a list of specific requirements which you expect your experiment has for our federated testbeds. Please be informed that the survey has been set up in general terms and some of the questions may not apply to your experiment. This survey and its responses are intended for internal use within the Fed4FIRE+ project and for the collection of information in view of the Fed4FIRE+ deliverables and reports. The survey and its responses will NOT be forwarded to the reviewing panel and will therefore have NO impact on the evaluation process.*
  This survey is an integral part of your proposal and proposals submitted without completing the on-line survey will not be eligible.
  The survey consists of a template available in Section I that needs to be completed.

The proposers are therefore asked to include the following statements below in their proposal and tick the corresponding boxes.

I allow that the material provided in Sections A, C, D and F of this proposal may be accessed by the Fed4FIRE+ consortium, also if the proposal is not selected for funding. In any case, the Fed4FIRE+ consortium will treat all this information confidentially. It will be used within the Fed4FIRE+ project as input for tasks related to architectural optimizations, sustainability studies, etc. The same information can also be used in an anonymous way to create statistics and reports about this first open call.	YES	
Furthermore, I allow that the other parts of this proposal may be accessed by the Fed4FIRE+ consortium, also if the proposal is not selected for funding. In any case, the Fed4FIRE+ consortium will treat all information of this proposal confidentially. Any use of this information will be discussed and agreed upon with the proposers.	YES	NO

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15 ANNEX 5: TEMPLATE FOR OPEN CALL LEGAL AGREEMENT

Agreement for the Use of the Fed4FIRE+ Testbed for Experimentation

This Agreement for the Use of the Fed4FIRE+ Testbed for Experimentation (hereinafter referred to as the "Agreement") is executed by and between:

1. Experimenter:
[FULL NAME + LEGAL FORM], with its registered office situated at [ADRESS] and hereby duly represented by [NAME+TITLE]

2. Coordinator:
[FULL NAME + LEGAL FORM], with its registered office situated at [ADRESS] and hereby duly represented by [NAME+TITLE]

relating to the research project under the Horizon 2020 – the Framework Programme for Research and Innovation (2014-2020), Call: H2020-ICT-2016-2017, Topic: ICT-13-2016 for the implementation of the project entitled "Federation for FIRE Plus" (hereinafter referred to as "Fed4FIRE+" or "the Project)

Hereinafter individually referred to as the "Party" and jointly as the "Parties"

- WHEREAS as from January 1st, 2017, the Coordinator participates in the Project together with [list of project partners] (hereinafter collectively referred to as the "Fed4Fire+ Partners" or "Beneficiaries";
- WHEREAS the Fed4FIRE+ Partners have amongst themselves entered into a written agreement detailing their respective rights and obligations under the Project;
- WHEREAS the purpose of Fed4Fire+ is to provide, run and further improve Fed4FIRE+'s "best-in-town" federation of experimentation facilities covering technologies ranging from wireless, wired, cloud services and open flow for the Future Internet Research and Experimentation initiative;
- WHEREAS the Fed4FIRE+ platform consists of individual testbeds and tools put at the disposal by different resource providers;
- WHEREAS the Experimenter through the execution of the submitted proposal (hereinafter referred to as the "Proposal") under an open call (in accordance with the rules detailed in the open call documents) has applied to use the Testbed to be provided by the Fed4FIRE+ Partner(s) identified in the Proposal;
- WHEREAS on the basis hereof the Experimenter will be entitled to use the Testbed subject to the terms and conditions described hereunder;

NOW, THEREFORE, the Parties agree as follows:

Article 1 - Definitions

When used herein, unless the context requires otherwise, the following words and expressions shall have the meaning as stated hereunder:

1.1. "Experiment(s)" means the experimentation activity(ies) undertaken by the Experimenter, alone or (if applicable) with the patron, for testing new ideas and technologies in the area of computer networking. Details of the Experiment can be found in the Proposal submitted by the Experimenter.
1.2. "Experiment Results" means any tangible and intangible outputs of the Experiments that are generated by or on behalf of the Experimenter (e.g. involvement of patron) as well as any rights attached to them.
1.3. "Maximum Budget" means the maximum amount of funding to be made available by the Coordinator to

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the Experimenter by way of financial support as further detailed in Appendix 1 hereto.

1.4. "Platform" means the Fed4FIRE+ testbed resources and tools in the Fed4FIRE+ federation. The Platform has been constructed for experiment-driven research activities, where experiment-driven research is defined as any activity that furthers the Experimenters' knowledge and/or understanding of concepts, algorithms, protocols of wireless solutions, provided that this activity is legal.

1.5. "Testbed" means the specific Platform components that are to be made available to the Experimenter for the performance of Experiment(s) in accordance with the terms and conditions of the Agreement.

Article 2 – Scope of the Agreement - Responsibilities

2.1. Subject to the terms and conditions set forth in the Agreement, the Experimenter is hereby granted the non-exclusive, non-sub licensable, non-transferable right to use the Testbed for the performance of Experiments. Any other use of the Testbed by the Experimenter than the use expressly described in the Experiments is not permitted.

2.2. Responsibilities of the Experimenter

2.2.1. The Experimenter shall perform its tasks in accordance with the conditions of the Agreement and the Proposal towards the implementation of the Experiment to the best of its ability and in accordance with any guidelines issued by the Coordinator.

2.2.2. The Experimenter shall not, directly or indirectly:

- rent, lease, transfer or sub-license the Testbed, nor permit any third party to do so;
- use the Testbed to host commercial activities or in a way that limits the rights of others to use the Testbed;
- remove, alter, cover or obscure any copyright notices or other proprietary rights notices placed or embedded on or in Testbed;
- reverse engineer, decompile, disassemble, re-engineer, translate, integrate, adapt, create derivate works or updates of the Testbed or any part thereof nor permit, allow, or assist any third party to do so.

2.2.3. The Experimenter acknowledges and agrees that besides the terms and conditions detailed in the Agreement, specific regulations of the party providing the Testbed (the "Provider") may apply. It is the Experimenter's responsibility to remain aware of all applicable regulations and of any changes made to them.

If there is evidence that the actions of the Experimenter are adversely impacting the quality offered by the Platform, the Coordinator is empowered to take reasonable measures to terminate or reprioritize usage in order to protect the overall operation of the Platform.

2.2.4. Should the Experimenter's usage imply giving access to the Testbed to third parties, the Experimenter understands it will need to gather explicit consent from the Coordinator and agrees to enforce any restrictions imposed by the Coordinator and accepts to fulfill its legal obligations as a service provider regarding data protection and retention laws.

2.2.5. The Experimenter is responsible and liable for any and all actions performed by using the Testbed. The Experimenter undertake that it shall:

- comply with all instructions and regulations relating to the use of the Testbed;
- not use the Testbed in a manner which is or is likely to adversely affect the Testbed or which may disturb the working of, interfere or damage the Testbed or any other system. In case of misuse, the Experimenter is responsible for restoring all damages to the Testbed and is responsible for any loss and damages incurred;
- not interfere with others' work or attempt to invade their privacy;
- not use the Testbed in a manner that may damage the Fed4Fire+ Partner'(s) t's good name and reputation or may infringe the intellectual or industrial property rights of a Party or any other third

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party. Copyright, other intellectual property right and data protection legislation must be observed by the Experimenter.

2.2.6. The Experimenter shall, in a timely manner, provide all information reasonably required by the Coordinator such as but not limited to the information required for the Coordinator to comply with its obligations under the Agreement, the Grant Agreement with the European Commission and the Consortium Agreement.

2.2.7. The Experimenter shall ensure that neither the Experimenter nor anyone of its behalf or with its consent causes any damage to the Testbed.

2.2.8. The use of the Testbed is at Experimenter's own risk and responsibility. The Coordinator does not assume any liability in regards to interruption, corruption, loss or disclosure of services, processes and data hosted on the Platform. The Experimenter acknowledges and agrees that the uninterrupted availability and use of the Testbed cannot be ensured ("reasonable efforts").

The Experimenter shall take appropriate measures to protect its credentials and prevent their use by third parties. The information the Experimenter provides when requesting an account should be correct. The Experimenter is responsible for all and any loss or damages incurred by the Coordinator, the Provider and/or the Beneficiaries as a result of any unauthorized transfer by them of their password.

2.3. The Testbed will be put at the disposal of the Experimenter free of charge for the Experiments detailed in the Proposal and on a reasonable effort basis.

2.4. The Coordinator shall give the Financial Support for the Experiment in accordance with the conditions detailed in article 3 of the Agreement.

Article 3 – Financial support

3.1. For the performance of the Experiment in accordance with the terms and conditions of the Agreement, the Coordinator agrees to provide within the Maximum Budget financial support to the Experimenter. Details can be found in Appendix 1.

3.2. Invoicing of the financial support will effectuated by the Coordinator for the Experimenter as detailed in the Open Call document. Payment is subject to receipt of the funding from the European Commission, acceptance by the Beneficiaries of the reports and the attendance of the meetings as detailed in the Open Call documents.

3.3. The Experimenter hereby agrees to be bound by the obligations as set forth in the articles 22, 23, 35, 36, 38 and 46 of the Grant Agreement. These articles can be found http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/amga/h2020-amga_en.pdf

Article 4 – Intellectual property – Consent to use data

The Results achieved by the Experimenter using the Testbed will be owned by the Experimenter.

The Experimenter will deliver a final report describing the Results of the Experiment and the experience gained in using the Testbed. This final report can be made public to the European Commission and all Beneficiaries including their Affiliated Entities.

Publications and demonstrations made based on the Results of the Experiment should clearly mention the usage of the Testbed and the provider and refer to the Project even if the publication or demonstration takes place after the end of the Experiment.

The Experimenter agrees the Coordinator and the other relevant Fed4Fire+ Partner(s) may monitor the Testbed and traffic for vulnerabilities and conformance to authorized use and may collect and use data and information, including but not limited to the information about Experimenter's use of the Testbed. This information, provided it is anonymized, can be used by to improve the Testbed.

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Article 5 - Liability – Warranty

5.1. The Experimenter shall fully and exclusively bear the risks in connection with the Experiment, including without limitation to any risk arising from the use of the Testbed. The Experimenter shall hold harmless and indemnify the Coordinator and/or the Fed4Fire+ Partners harmless against all losses, repayments, liabilities, claims or damages which the Fed4Fire+ Partners and/or the Coordinator as a result thereof would incur or suffer or have to pay to the European Commission or any third parties. In addition, should the European Commission have a right of recovery against the Coordinator or any other Beneficiary regarding any or all of the Financial Support granted under the Agreement, the Experimenter shall repay the sums in question in the terms and on the dates stipulated by the Coordinator.

5.2. No warranty whatsoever is given with respect to the Testbed, support and all information provided hereunder including, but not limited to, any express or implied warranty for use, availability, reliability, quality, fitness for a particular purpose or non-infringement of third party intellectual property rights. They are provided “AS IS”.

5.3. To the extent authorized under mandatory law, in no event shall the Coordinator or any of the other Beneficiaries be liable to the Experimenter or any person or entity connection with any of them for costs of procurement of substitute goods, property damage, personal injury, profit loss, business interruption, or for any other special, indirect, consequential or incidental damages, however caused, whether for breach of warranty, contract, tort or negligence, strict liability or otherwise.

The Coordinator’s liability in aggregate, arising out of or in connection with the Experiment and/or the Agreement, however caused, whether for breach of warranty, contract, tort or negligence, strict liability or otherwise, shall not exceed the Maximum Grant.

5.4. The Coordinator is not liable for any failure due to the direct or indirect use, loss of use, or delay in delivery of the Testbed or the services provided herein, unless the Experimenter can show willful misconduct, fraud or deceit by the Coordinator.

Article 6 – Term and termination of the Agreement

The Agreement enters into force on the date detailed in Appendix 1 for the period provided in Appendix 1, unless sooner terminated in accordance with article 6. The Experimenter acknowledges and agrees that its authorized use of the Testbed is only effective during the term of the Agreement.

The Experimenter’s right to use the Testbed and the Agreement are automatically and without notice from the Coordinator terminated if the Experimenter fails to comply with any of the obligations detailed in the Agreement.

Upon termination of the Agreement, the Experimenter shall immediately discontinue all use of the Testbed.

Article 7 - Applicable law

The Agreement is governed by the laws of Belgium without reference to its conflict of law principles. Any dispute arising out of the Agreement shall be settled by the competent courts located in Brussels (Belgium).

Article 8 - Miscellaneous

8.1. The Experimenter represent and warrant that the Testbed shall not be evaluated or employed for the purpose of use in the design, development, production, stockpiling or use of weapons of mass destruction, such as nuclear, chemical or biological weapons or in any manner for a military end use or with a military end-user. The Experimenter shall comply with applicable laws and regulations controlling the export of technical data, computer software and all other export controlled commodities and ensures that it will

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not include the participation of persons on any restricted party listing in accordance with applicable national and international regulations. The Experimenter agree to indemnify, defend and hold harmless the Coordinator and the other Fed4Fire+ Partners from any and all claims, damages and other liabilities resulting from the Experimenter's violation of any applicable export regulations.

8.2. The Parties may sign and deliver this Agreement by electronic transmission. Each Party agrees that the delivery of this Agreement by electronic transmission shall have the same force and effect as delivery of original signatures and that each Party may use such electronic or facsimile signatures as evidence of the execution and delivery of this Agreement by the Parties to the same extent that an original signature could be used.

AS WITNESS, the Parties have caused the Agreement to be duly signed by the undersigned authorised representatives in separate signature pages.

For Experimenter,

Name:

Title:

Date:

For Project Coordinator,

Name:

Title:

Date:

Appendix 1:

Experiment – financial information

Duration of the Experiment:

Start date: xxx

End date: xxx

Maximum Budget: xxx k€

Payment conditions (subject to payment conditions detailed in article 3.3): (timing of the payment, unless this is included in the open call document)

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16 ANNEX 6: TEMPLATE FOR OPEN CALL REPORT

Experiment Report

Full title of your project

Acronym of your proposal (optional)

Date of preparation of your proposal:	xx/yy/201x
Version number *(optional):*	
Your organisation name:	Your organisation name
Your organisation address:	Your organisation address
Name of the coordinating person:	Name of the coordinating person
Coordinator telephone number:	Coordinator telephone number
Coordinator email:	Coordinator email

(this will be the email address to which the Acknowledgement of Receipt will be sent)

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SECTION A PROJECT Summary

This section provides an executive summary of the experiment objectives, implementation and main results. Remark: The information in this section will be used in public documents and reports by the Fed4FIRE+ consortium. The length of this section is restricted to 1 page.

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Section B Detailed Description

This section describes the details on the experiment and provides information as you have been collecting this from your point of view and from your business.

B.1 Concept, Objectives, Set-up and Background

There is no page limit for this section as you are invited to describe the concept, objectives and setup in as much detail as you wish to do. Please also include graphs and figures were needed.

B.1.1 Concept & objectives

Describe in detail the concept and objectives of your experiment.

B.1.2 Set-up of the experiment

Describe in detail the set-up of your experiment. What was the technical design of the experiment? Please include a general overview figure to explain the set-up.

B.1.3 Background / Motivation

Situate this experiment in your business or research activity. Why did you want to execute this experiment? How did this experiment fit within the strategy of your company / institution?

B.2 Technical Results & Lessons learned

Describe in detail the technical results of your experiment and the lessons learned.

There is no page limit for this section as you are invited to describe the concept, objectives and setup in as much detail as you wish to do. Please also include graphs and figures were needed.

B.3 Business impact

Describe in detail how this experiment may impact your business and product development.

B.3.1 Value perceived

What is the value you have perceived from this experiment (return on investment)? E.g. gained knowledge; acquired new competences; practical implementation solutions such as scalability, reliability, interoperability; new ideas for experiments/products; etc.

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What was the direct or indirect value for your company / institution? What is the time frame this value could be incorporated within your current product(s) range or technical solution? Could you apply your results also to other scenarios, products, industries?

If no federation of testbed infrastructure would be available, how would this have affected your product / solution? What would have been the value of your product / solution if the experiment was not executed within Fed4FIRE+? What problems could have occurred?

Are there any follow-up activities planned by your company/institution? New projects or funding thanks to this experiment? Do you intend to use Fed4FIRE+ facilities again in the future?

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B.3.2 Funding

Was the allocated budget related to the experiment to be conducted high enough (to execute the experiment, in relation to the value perceived, etc.)?

Did you receive other funding for executing this experiment besides the money from the Fed4FIRE+ Open Call (e.g. internal, national, etc.)?

Would you (have) execute(d) the experiment without receiving any external funding?

Would you even consider to pay for running such an experiment? If so, what do you see as most valuable component(s) to pay for (resources, support, etc.)?

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Section C Open Research Data

This section provides feedback on the actions taken by the proposer in the framework of the Open Research Data initiative. If you have opted out of this initiative, please provide the reasons. If you have opted in, please provide the Final Data Management Plan and all necessary information to show that a complete, publicly-accessible dataset of your experiment results and supporting data, has been uploaded in Fed4FIRE+'s chosen repository.

Section D Feedback to Fed4FIRE+

This section contains valuable information for the Fed4FIRE+ consortium and describes your experiences by running your experiment on the available testbeds. Note that the production of this feedback is one of the key motivations for the existence of the Fed4FIRE+ Open Calls.

D.1 Resources & tools used

D.1.1 Resources

Describe the testbeds you have been using and specify the resources used.

Did you make use of all requested testbed infrastructure resources, as specified in your Open Call proposal? If not, please explain.

What was the ratio between time reserved vs time actually used for each resource? Why does it differ that much (e.g. for interference reasons, other)?

D.1.2 Tools

Describe in detail the tools you have been using, resources used, how many nodes, etc.

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D.2 Feedback based on design/set-up/running your experiment on Fed4FIRE+

Describe in detail your experiences concerning the procedure and administration, set-up, Fed4FIRE+ portfolio, documentation and support, experimentation environment, and experimentation execution and results. This feedback will help us for future improvement.

D.2.1 Procedure / Administration

How do you rate the level of work for administration / feedback / writing documents / attending conference calls or meetings compared to the timeframe of the experiment?

D.2.2 Setup of the experiment

How much effort was required to set up and run the experiment for the first time? Did you need to install additional components before you were able to execute the experiment (e.g. install hardware / software components)?

How do your rate the experience as user that you only had to deal with a single service provider (i.e. single point of contact and service) instead of dealing with each testbed itself?

D.2.3 Fed4FIRE+ portfolio

Was the current portfolio of testbeds provided by the federation, with access to a large set of different technologies (sensors, computing, network, etc.) provided by a large amount of testbeds, sufficient to run your experiment?

Was the technical offering in line with the expectations? What were the positive and negative aspects? Which requirements could not be fulfilled?

Could you easily access the requested testbed infrastructures?

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Could you make use of all requested resources at the different testbeds as was proposed in the description of the experiment? If not, how many times did this fail? What were the main reasons it failed (e.g. timing constraints, technical failures, etc.)?

Did you use a lot the combination of resources over different testbeds? Did it all work out nicely? Were they interoperable?

D.2.4 Documentation and support

Was the documentation provided helpful for setting up and running the experiment? Was it complete? What was missing? What could be updated/extended?

Did you make use of the first level support dashboard?

Did you contact the individual testbeds for dedicated technical questions?

D.2.5 Experiment environment

Was the environment trustworthy enough for your experiments (in terms of data protection, privacy guarantees of yourself and your experiment)?

Did you have enough control of the environment to repeat the experiment in an easy manner?

Did you experience that the Fed4FIRE+ environment is unique for experimentation and goes beyond the lab environment and enables real world implementation?

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Did you share your experiment and/or results with a wider community of experimenters (e.g. for greater impact of results, shared dissemination, possibility to share experience and knowledge with other experimenters)? If not, would you consider this in the future?

D.2.6 Experiment execution and results

Did you have enough time to conduct the experiment?

Were the results below / in line with / exceeding your initial goals and expectations?

What were the hurdles / bottlenecks? What could not be executed? Was this due to technical limits? Would the federation or the individual testbeds be able to help you solving this problem in the future?

D.2.7 Other feedback

If you have other feedback or comments not discussed before related to the design, set-up and execution of your experiment, please note them below.

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D.3 Why Fed4FIRE+ was useful to you

Describe why you chose Fed4FIRE+ for your experiment, which components were perceived as most valuable for the federation, and your opinion what you would like to have had, what should be changed or was missing.

D.3.1 Execution of the experiment

Why did you choose Fed4FIRE+ for your experiment? Was it the availability of budget, easy procedure, possibility to combine different (geographically spread) facilities, access to resources that otherwise would not be affordable, availability of tools, etc.? Please specify in detail.

Could you have conducted the experiment at a commercially available testbed infrastructure?

D.3.2 Added value of Fed4FIRE+

Which components did you see as highly valuable for the federation (e.g. combining infrastructures, diversity of available resources, tools offered, support and documentation, easy setup of experiments, etc.)? Please rank them in order of importance.

Which of these tools and components should the federation at least offer to allow experimentation without funding?

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D.3.3 What is missing from your perspective?

What would you have liked to have had within Fed4FIRE+ (tools, APIs, scripts, etc.)? Which tools and procedures should be adapted? What functionality did you really miss?

Which (types of) testbed infrastructures (and resources) would have been very valuable for you as an experimenter within the Fed4FIRE+ consortium?

Is there any other kind of support that you would expect from the federation, which is not available today e.g. some kind of consultancy service that can guide you through every step of the process of transforming your idea into an actual successful experiment and eventually helping you to understand the obtained results?

D.3.4 Other feedback

If you have further feedback or comments not discussed before how Fed4FIRE+ was useful to you, please note them below.

D.3.5 Quote

We would also like to have a quote we could use for further dissemination activities. Please complete the following sentence.

Thanks to the experiment I conducted within Fed4FIRE+ ...

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17 ANNEX 7: TEMPLATE FOR OPEN CALL REVIEW SHEET

Open Call

Call identifier: xxxx

INDIVIDUAL EVALUATION FORM

Proposal Acronym: xxxxx

1. A degree of industrial and/or scientific innovation including a motivation for the experiment. (Section B o f the Proposal Template). *The score given here should reflect the degree of innovation: if an experiment is pushing the boundaries of its domain, then it should get a higher score here then experiments testing trivial things. In order to demonstrate these criteria, the proposer may opt to indicate the State of the Art in the appropriate field.*	**Score:** *(Threshold 3/5; Weight 2)*
2. A degree of industrial and/or scientific relevance (Section B of the Proposal **Template)** *This score should reflect the industrial relevance including the expected and projected impact on the experimenter through product development or the scientific relevance and the projected impact on the organisation.*	**Score:** *(Threshold 3/5; Weight 2)*
3. Clarity and methodology (Section B of the Proposal Template) *The experiment should be scientifically and/or technically sound. There should be a clear problem statement, a solid experiment design, a good methodology, etc.*	**Score:** *(Threshold 3/5; Weight 1)*
4. Use of Fed4FIRE+ facilities and tools (Sections B & C of the Proposal Template) *The use of the proposed testbeds and tools will be evaluated on the basis of the relevance and the required complexity. Proposals will not be penalized for using only single testbeds or single tools, but use of multiple testbeds is stimulated, as Fed4FIRE+ is a federation of testbeds. No distinction is made between achieving this by running the same experiment in sequence on multiple testbeds (e.g. to evaluate different wireless environments), or by running a single experiment that relies on resources from different testbeds at the same time. If however proposals have made their design artificially more complex than needed just in order to use multiple testbeds, then the score will be lower. Similarly, if proposals have made their designs too trivial while you can easily identify opportunities for*	**Score:** *(Threshold 3/5; Weight 1)*

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involving other testbeds that would have made the experiment stronger, then the score will also be lower. In order to optimise the design of the experiment, the proposer should seek information on the available testbeds.	
5. Relevance for Fed4FIRE+ framework in terms of potential feedback to the project on the planned facility and tools utilization (Section F of the Proposal Template) *The Fed4FIRE consortium is seeking feedback regarding the available tools, procedures and testbeds. Proposals which can indicate that more information and feedback on the use of these tools and procedures will be provided will get a higher score. So the more of the Fed4FIRE tools and APIs that an experiment can provide feedback on, the better. If they need to use additional non-Fed4FIRE tools, that is not a problem as long as they clearly indicate the added value of these additional tools.*	**Score:** *(Threshold 3/5; Weight 2)*
6. Indication on possible future follow-up experiments and how this can support the sustainability of the federated testbed facilities. (Section G of the Proposal Template) *The proposer may indicate possible follow-up projects and experiments which can contribute to the sustainability of the Fed4FIRE facilities. The quality, the size and the expected feasibility to carry out these future experiments will be reflected by the score in this criterion.* *These future plans can be new experiment with Fed4FIRE, a new research project, internal projects, product commercialization....* *As the objective of Fed4FIRE+ is to provide an incentive, seed budget or initial assistance in your business or research, any new initiative triggered by this experiment is acceptable to be listed. The future plans do not have to exclusively impact the future of Fed4FIRE!*	**Score:** *(Threshold 3/5; Weight 1)*
7. Technological expertise and quality *The proposer should exhibit technological expertise and quality. This information must be included in Section E of the Proposal Template.*	**Score:** *(Threshold 3/5; Weight 1)*
8. Preference is given to proposals originating from new players in the field *Therefore the following restrictions will be implemented:* *– Parties who have submitted a proposal in previous calls of Fed4FIRE+and which were selected for funding are allowed to submit a new proposal only when clear distinction can be made with previous submitted proposals.* *– Parties who have not submitted or been participating in previous calls of the* *Fed4FIRE+ project but are belonging to same legal entity as proposers which have submitted proposals in previous calls, are eligible in case they*	**Score:** *(Threshold 3/5; Weight 1)*

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can clearly identify the difference with previous submitted proposals by the other groups. *– This information must be included in Section Iof the Proposal Template.*	
9. Preference is given to proposals with in the area of IoT (Internet of Things) and 5G *Therefore, proposals which, based on the description in Section B of the proposal can be situated in these areas, will be given an extra 5 points on their total score.*	**Score:** *(No threshold; Weight 1)*
Remarks *Note: General remarks can be made here, including remarks regarding the proposed budget. The budget will NOT be scored in this evaluation, however any comments can be made.*	**Overall score:** *(Threshold 40/60)*
Does this proposal contain ethical issues that may need further attention?	

I declare that, to the best of my knowledge, I have no direct or indirect conflict of interest in the valuation of this proposal.

Name	
Signature	
Date	

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