



Grant Agreement No.: 825147
Call: H2020-ICT-2018-2020

Topic: ICT-24-2018-2019
Type of action: CSA



D5.3 SECOND MONITORING AND IMPACT ASSESSMENT REPORT

Revision: v.1.0

Work package	WP5
Task	Task 5.2
Due date	30/06/2022
Submission date	30/06/2022
Deliverable lead	LOBA
Version	0.1
Authors	Pietro Rigonat
Reviewers	Joao Gaspar, Alexandre Almeida, Robert Miskuf, Grete Gutmann



Document Revision History

Version	Date	Description of change	List of contributor(s)
V0.1	27/06/2022	General review	Joao Gaspar
V0.2	29/06/2022	General review	Alexandre Almeida

DISCLAIMER

The free-of-charge, first-line support provided by the TETRA project aims to help beneficiaries of the “R&I Actions” (co-)funded under the topic H2020-ICT-24-2018-2019 and their third parties to turn their research results into marketable products and services. This support -including support on intellectual property- should not be considered neither as of a legal or professional nature nor substitute to private advisory services.

The tools (website, publications, training or promotional materials, etc.) and the activities of the project shall not be considered as the official position of the European Commission. Neither the TETRA Consortium partners, nor the European Commission, nor any person acting on behalf of the European Commission or the TETRA Consortium is responsible for the use, which might be made of these project tools and services.

COPYRIGHT NOTICE

© 2019 - 2022 TETRA Consortium

Project co-funded by the European Commission in the H2020 Programme		
Nature of the deliverable:		R
Dissemination Level		
PU	Public, fully open, e.g. web	✓
CL	Classified, information as referred to in Commission Decision 2001/844/EC	
CO	Confidential to TETRA project and Commission Services	

* 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.



EXECUTIVE SUMMARY

This deliverable – D5.3 Second monitoring and impact assessment report – aims at providing a quantitative overview of NGI RIAs open calls issued as of June 2021 and on possible measures to foster NGI Community sustainability.

The deliverable first provides a quantitative perspective of the NGI RIAs open calls by providing metrics on each of the NGI RIA project.

More specifically, per each NGI project the following information is provided:

- Total number of proposals
- Total number of third party (TP) applicants
- Total number of selected projects
- Total number of third parties
- Types of organisations which awarded the NGI grant
- Country of origin of winners

Second, a quantitative overview of the whole NGI initiative is provided in the light of open calls' metrics of each RIA project.

Finally, taking open-source as common factor across the different NGI third parties' projects, and individual and SMEs as main actors of the NGI community, paths towards NGI sustainability are explored based on both literature review, and bilateral qualitative interviews conducted with NGI Projects' teams.

In the light of the insights stemming from literature review on sustainability of open-source communities and from the qualitative interviews conducted, conclusions on elements fostering and hindering sustainability of NGI Initiative and Community are provided.



TABLE OF CONTENTS

1	QUANTITATIVE OVERVIEW PER NGI PROJECT	7
2	QUANTITATIVE OVERALL OVERVIEW	21
3	PATHS TOWARDS NGI SUSTAINABILITY.....	27
4	QUALITATIVE INTERVIEWS WITH NGI PROJECTS.....	38
5	CONCLUSIONS	63
6	REFERENCES	66



LIST OF TABLES

TABLE 1 - NGI PET OVERVIEW	7
TABLE 2 - NGI PET'S TYPES OF ORGANISATIONS	7
TABLE 3 - NGI DISCOVERY OVERVIEW	8
TABLE 4 - NGI DISCOVERY TYPE OF ORGANISATIONS.....	9
TABLE 5 - NGI TRUST OVERVIEW	10
TABLE 6 - NGI TRUST TYPE OF ORGANISATIONS	10
TABLE 7 - LEDGER OVERVIEW	11
TABLE 8 - LEDGER TYPE OF ORGANISATIONS	11
TABLE 9 – DAPSI'S OVERVIEW.....	12
TABLE 10 – DAPSI'S TYPE OF ORGANISATIONS.....	13
TABLE 11 – NGI ATLANTIC'S OVERVIEW	14
TABLE 12 – NGI ATLANTIC'S TYPE OF ORGANISATIONS	14
TABLE 13 – eSSIF-LAB'S OVERVIEW	15
TABLE 14 – eSSIF-LAB'S TYPE OF ORGANISATIONS.....	15
TABLE 15 – NGI POINTER'S OVERVIEW.....	16
TABLE 16 – NGI POINTER'S TYPE OF ORGANISATIONS.....	17
TABLE 17 – NGI ASSURE'S OVERVIEW	18
TABLE 18 – NGI ASSURE'S TYPE OF ORGANISATIONS.....	18
TABLE 19 – TRUBLO'S OVERVIEW	19
TABLE 20 – TRUBLO'S TYPE OF ORGANISATIONS.....	19
TABLE 21 - TOTAL APPLICANTS; WINNERS OPEN CALL.....	21
TABLE 22 - KEY OS ACTORS	32
TABLE 23 – ELEMENTS FOSTERING AND HINDERING SUSTAINABILITY	65



LIST OF FIGURES

FIGURE 1 - NGI PET'S WINNERS' COUNTRY OF ORIGIN.....	8
FIGURE 2 - NGI DISCOVERY'S WINNERS' COUNTRY OF ORIGIN.....	9
FIGURE 3 - NGI TRUST'S WINNERS' COUNTRY OF ORIGIN	11
FIGURE 4 – LEDGER'S WINNERS' COUNTRY OF ORIGIN	12
FIGURE 5 – DAPSI'S WINNERS' COUNTRY OF ORIGIN	13
FIGURE 6 – NGI ATLANTIC'S WINNERS' COUNTRY OF ORIGIN	15
FIGURE 7 – ESSIF-LAB'S WINNERS' COUNTRY OF ORIGIN.....	16
FIGURE 8 – NGI POINTER'S WINNERS' COUNTRY OF ORIGIN	17
FIGURE 9 – NGI ASSURE'S WINNERS' COUNTRY OF ORIGIN	19
FIGURE 10 – TRUBLO'S WINNERS' COUNTRY OF ORIGIN.....	20
FIGURE 11 - EU-27 WINNERS' COUNTRY OF ORIGIN	22
FIGURE 12 - NON-EU-27 WINNERS' COUNTRY OF ORIGIN.....	22
FIGURE 13 - EU-27 COUNTRY SUCCESS RATE	23
FIGURE 14 - NON-EU-27 COUNTRY SUCCESS RATE IN %	24
FIGURE 15 - WINNERS' TYPES OF ORGANISATIONS.....	25



1 QUANTITATIVE OVERVIEW PER NGI PROJECT

This section aims at providing a quantitative overview of NGI open calls' metrics per each NGI project.

Per each project, the following information is provided:

- Total number of proposals
- Total number of third party (TP) applicants
- Total number of selected projects
- Total number of third parties
- Types of organisations which awarded the NGI grant
- Country of origin of winners

1.1 NGI PET

Proposals	TP Applicants	Selected projects	Number of third parties
707	1205	151	259

TABLE 1 - NGI PET OVERVIEW

Types of organisations

Type of organisation	No.
Natural Person	202
SMEs	36
Research organisation	3
Higher Education (e.g. university)	5
Other Public Sector (municipalities, regions...)	0
Other non-for-profit (NGO, foundation, association...)	13
Other private organisation (large company...)	0
Total	259

TABLE 2 - NGI PET'S TYPES OF ORGANISATIONS

Winners' country of origin

The majority of NGI PET third parties come from the EU-27, with also a high percentage of UK third parties, namely:

1. Germany: 68 third parties
2. The Netherlands: 30 third parties
3. UK: 24 third parties
4. France: 19 third parties

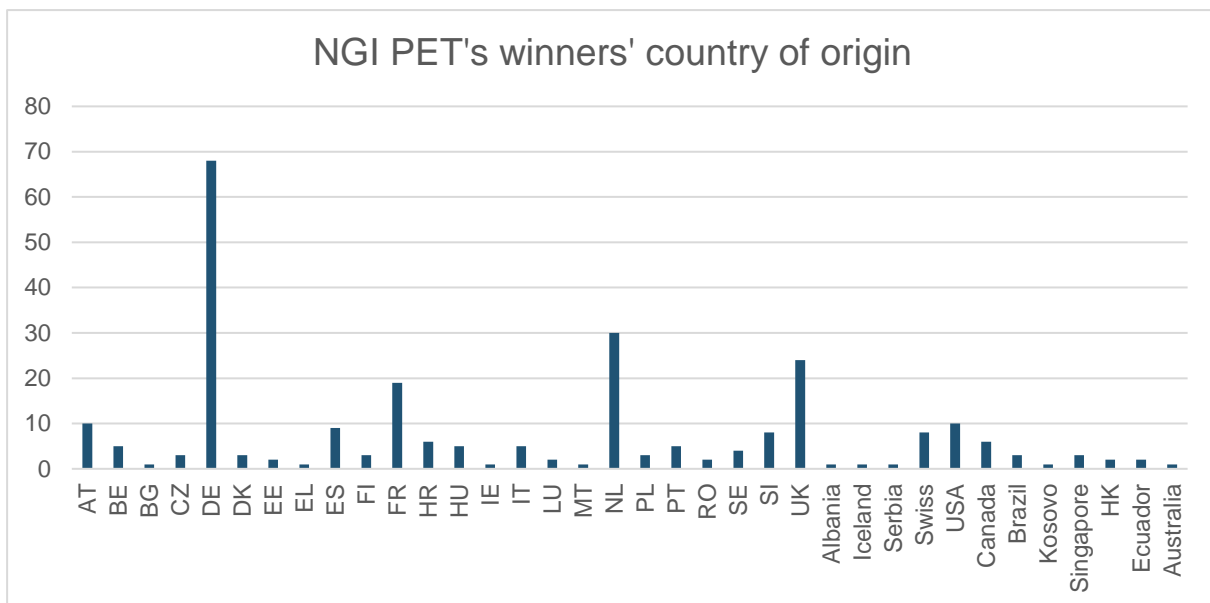


FIGURE 1 - NGI PET'S WINNERS' COUNTRY OF ORIGIN

1.2 NGI DISCOVERY

Proposals	TP Applicants	Selected projects	Number of third parties
772	1305	143	230

TABLE 3 - NGI DISCOVERY OVERVIEW

Types of organisations

Type of organisation	No.
Natural Person	162
SMEs	40



Research organisation	1
Higher Education (e.g. university)	5
Other Public Sector (municipalities, regions...)	0
Other non-for-profit (NGO, foundation, association...)	22
Other private organisation (large company...)	0
Total	230

TABLE 4 - NGI DISCOVERY TYPE OF ORGANISATIONS

Winners' country of origin

The majority of NGI DISCOVERY third parties come from the EU-27, with UK and Swiss as forth and fifth non-EU-27 countries with highest number of third parties, namely:

1. France: 47 third parties
2. Germany: 43 third parties
3. The Netherlands: 24 third parties
4. UK: 17 third parties
5. Swiss: 12 third parties

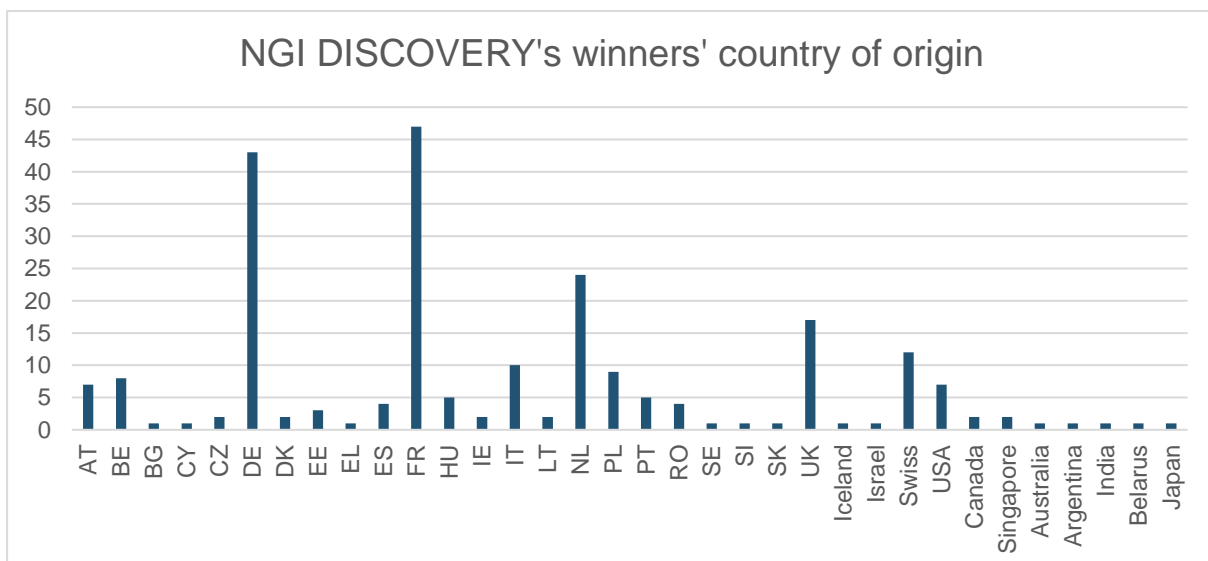


FIGURE 2 - NGI DISCOVERY'S WINNERS' COUNTRY OF ORIGIN



1.3 NGI TRUST

Proposals	TP Applicants	Selected projects	Number of third parties
300	448	57	86

TABLE 5 - NGI TRUST OVERVIEW

Types of organisations

Type of organisation	No.
Natural Person	4
SMEs	44
Research organisation	4
Higher Education (e.g. university)	22
Other Public Sector (municipalities, regions...)	1
Other non-for-profit (NGO, foundation, association...)	11
Other private organisation (large company...)	0
Total	86

TABLE 6 - NGI TRUST TYPE OF ORGANISATIONS

Winners' country of origin

The majority of NGI TRUST third parties come from the EU-27, with UK as non-EU-27 country with highest number of third parties, namely:

1. France: 11 third parties
2. Italy: 10 third parties
3. UK: 10 third parties
4. The Netherlands: 7 third parties
5. Greece: 7 third parties



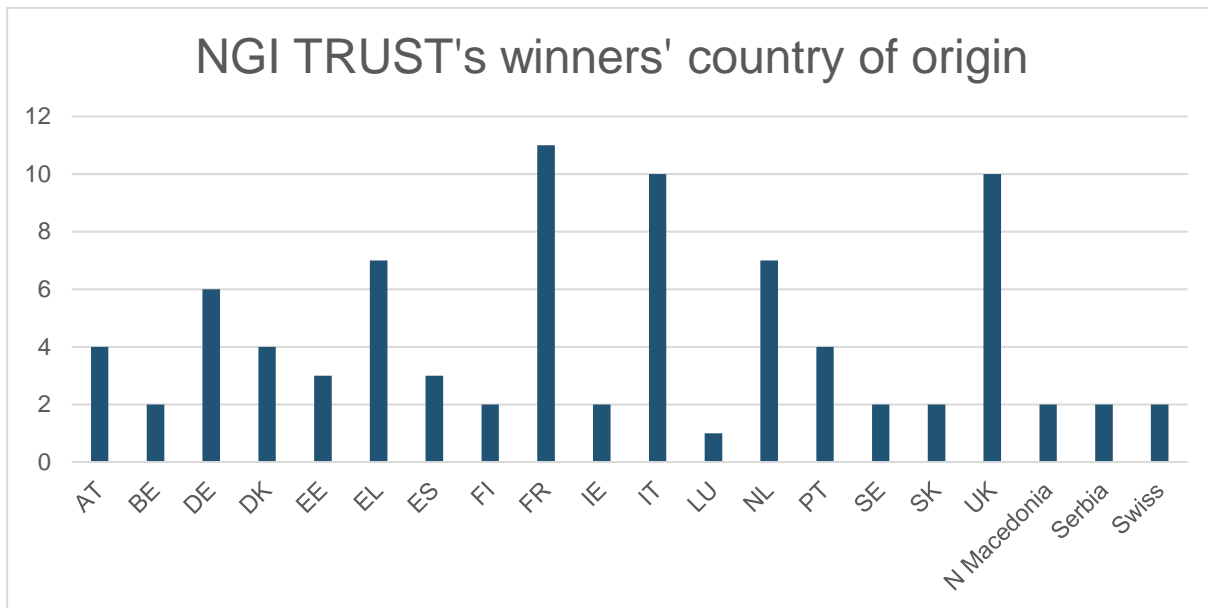


FIGURE 3 - NGI TRUST'S WINNERS' COUNTRY OF ORIGIN

1.4 LEDGER

Proposals	TP Applicants	Selected projects	Number of third parties
728	889	34	51

TABLE 7 - LEDGER OVERVIEW

Types of organisations

Type of organisation	No.
Natural Person	14
SMEs	26
Research organisation	1
Higher Education (e.g. university)	2
Other Public Sector (municipalities, regions...)	1
Other non-for-profit (NGO, foundation, association...)	7
Other private organisation (large company...)	0
Total	51

TABLE 8 - LEDGER TYPE OF ORGANISATIONS

Winners' country of origin

The majority of LEDGER third parties come from the EU-27, with UK as non-EU-27 country with highest number of third parties, namely:

1. Spain: 17 third parties
2. The Netherlands: 7 third parties
3. Germany: 5 third parties
4. France: 4 third parties
5. UK: 4 third parties

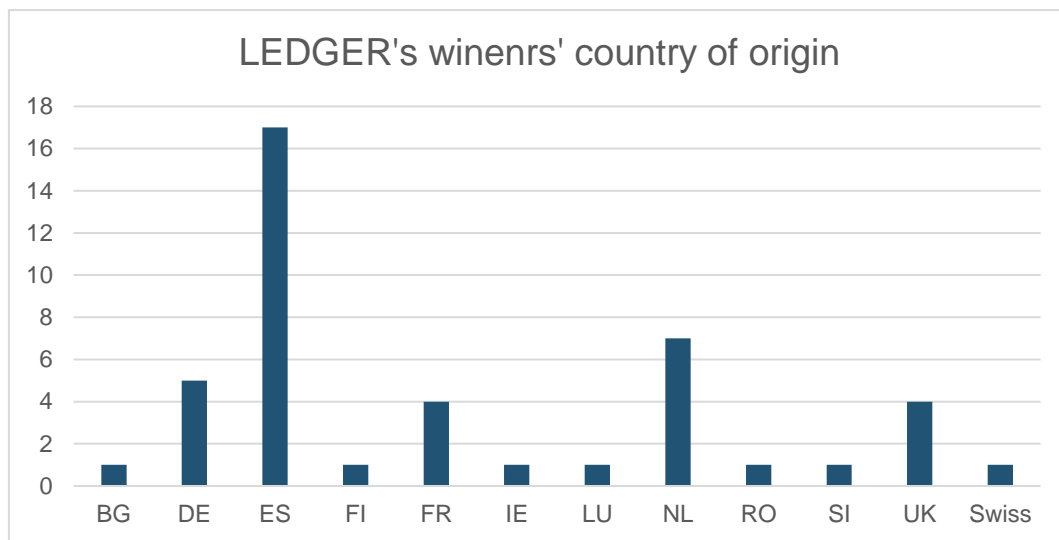


FIGURE 4 – LEDGER'S WINNERS' COUNTRY OF ORIGIN

1.5 DAPSI

Proposals	TP Applicants	Selected projects	Number of third parties
358	496	26	40

TABLE 9 – DAPSI'S OVERVIEW

Types of organisations

Type of organisation	No.
Natural Person	9
SMEs	25
Research organisation	1



Higher Education (e.g. university)	1
Other Public Sector (municipalities, regions...)	0
Other non-for-profit (NGO, foundation, association...)	4
Other private organisation (large company...)	0
Total	40

TABLE 10 – DAPSI’S TYPE OF ORGANISATIONS

Winners’ country of origin

The majority of DAPSI third parties come from the EU-27, with UK as non-EU-27 country with highest number of third parties, namely:

1. France: 9 third parties
2. Germany: 5 third parties
3. The Netherlands: 3 third parties
4. Italy: 3 third parties
5. UK: 2 third parties

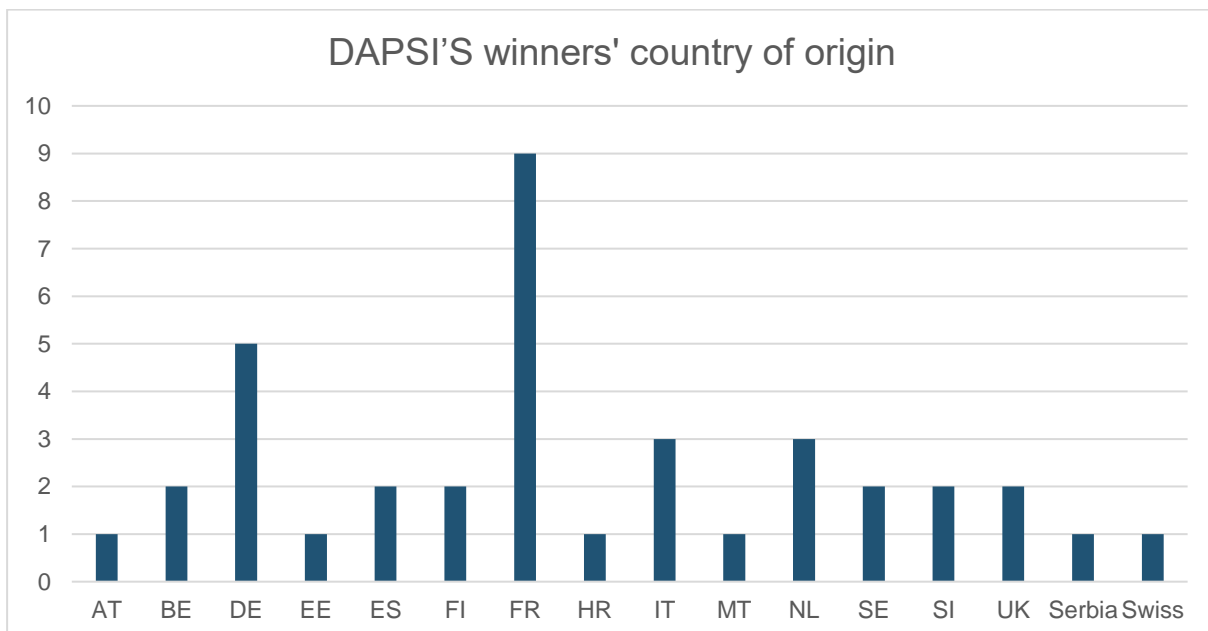


FIGURE 5 – DAPSI’S WINNERS’ COUNTRY OF ORIGIN



1.6 NGI ATLANTIC

Proposals	TP Applicants	Selected projects	Number of third parties
77	101	20	25

TABLE 11 – NGI ATLANTIC'S OVERVIEW

Types of organisations

Type of organisation	No.
Natural Person	0
SMEs	5
Research organisation	3
Higher Education (e.g. university)	14
Other Public Sector (municipalities, regions...)	0
Other non-for-profit (NGO, foundation, association...)	2
Other private organisation (large company...)	1
Total	25

TABLE 12 – NGI ATLANTIC'S TYPE OF ORGANISATIONS

Winners' country of origin

The majority of NGI ATLANTIC'S third parties come just from the EU-27, namely:

1. Spain: 7 third parties
2. Germany: 3 third parties
3. France: 3 third parties
4. Ireland: 3 third parties
5. Greece, Austria, Italy: 2 third parties

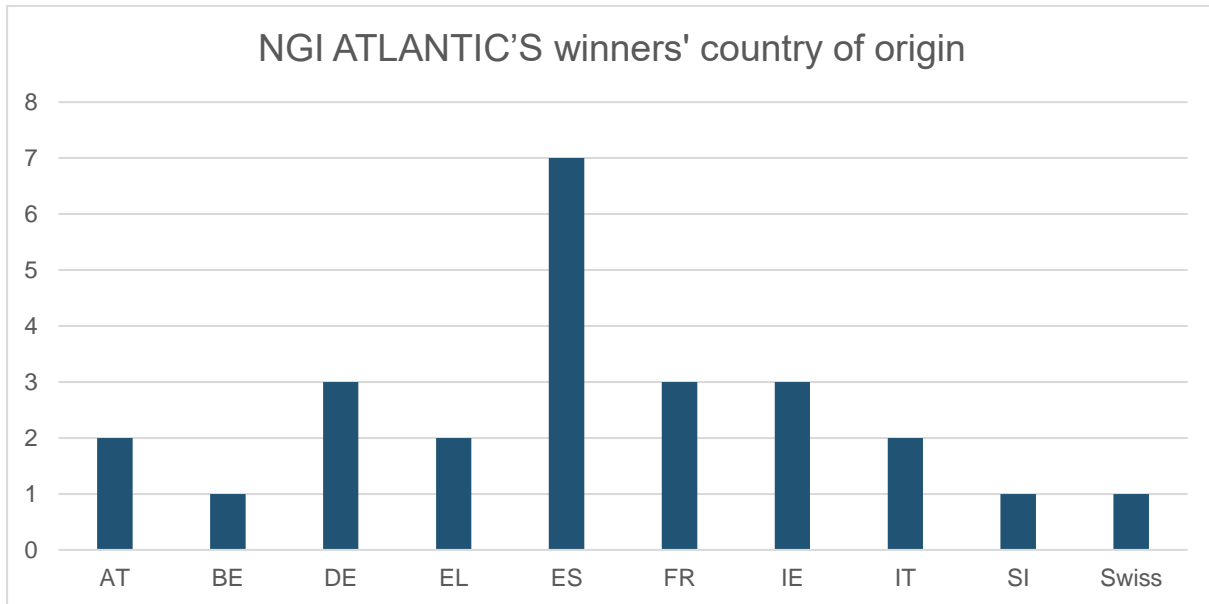


FIGURE 6 – NGI ATLANTIC'S WINNERS' COUNTRY OF ORIGIN

1.7 eSSIF-LAB

Proposals	TP Applicants	Selected projects	Number of third parties
161	167	50	52

TABLE 13 – eSSIF-LAB'S OVERVIEW

Types of organisations

Type of organisation	No.
Natural Person	0
SMEs	48
Research organisation	2
Higher Education (e.g. university)	0
Other Public Sector (municipalities, regions...)	0
Other non-for-profit (NGO, foundation, association...)	2
Other private organisation (large company...)	0
Total	52

TABLE 14 – eSSIF-LAB'S TYPE OF ORGANISATIONS

Winners' country of origin

The majority of eSSIF-LAB’s third parties come from the EU-27, with UK and Swiss as non-EU-27 countries with highest number of third parties, namely:

1. Germany and Italy: 7 third parties
2. The Netherlands: 6 third parties
3. UK: 6 third parties
4. Spain: 5 third parties
5. Swiss: 4 third parties

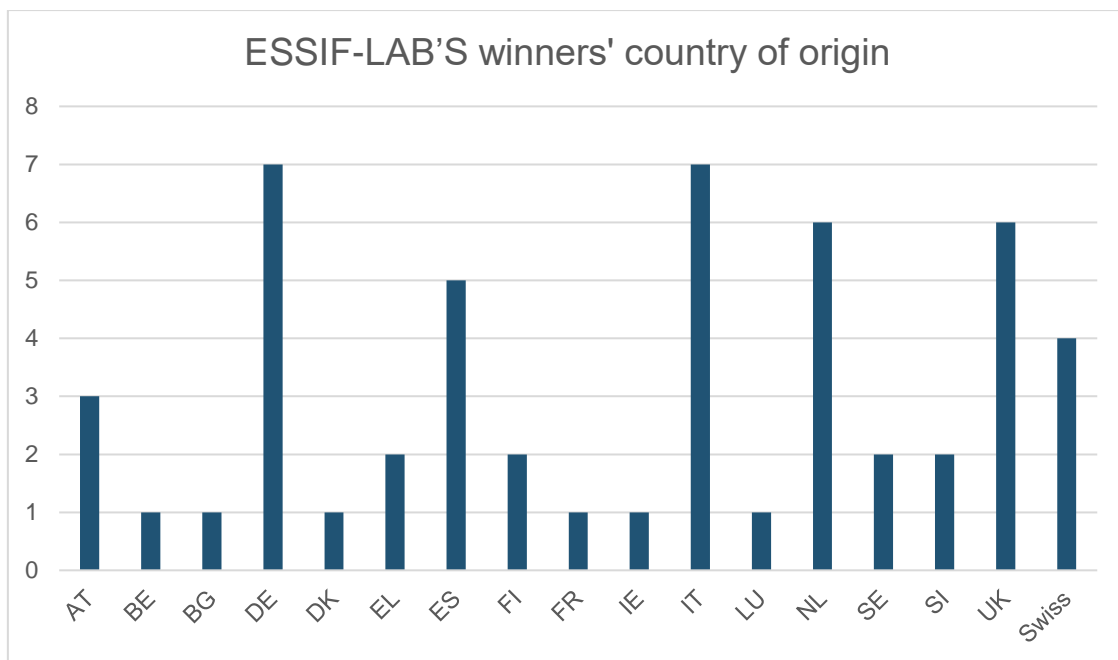


FIGURE 7 – eSSIF-LAB'S WINNERS' COUNTRY OF ORIGIN

1.8 NGI POINTER

Proposals	TP Applicants	Selected projects	Number of third parties
239	261	36	50

TABLE 15 – NGI POINTER'S OVERVIEW

Types of organisations

Type of organisation	No.
Natural Person	21



SMEs	15
Research organisation	5
Higher Education (e.g. university)	8
Other Public Sector (municipalities, regions...)	0
Other non-for-profit (NGO, foundation, association...)	1
Other private organisation (large company...)	0
Total	50

TABLE 16 – NGI POINTER’S TYPE OF ORGANISATIONS

Winners’ country of origin

The majority of eSSIF-LAB’s third parties come from the EU-27, with UK and Swiss as non-EU-27 countries with highest number of third parties, namely:

1. Germany: 14 third parties
2. France: 6 third parties
3. Swiss: 5 third parties
4. UK and Belgium: 4 third parties
5. Spain and the Netherlands: 3 third parties

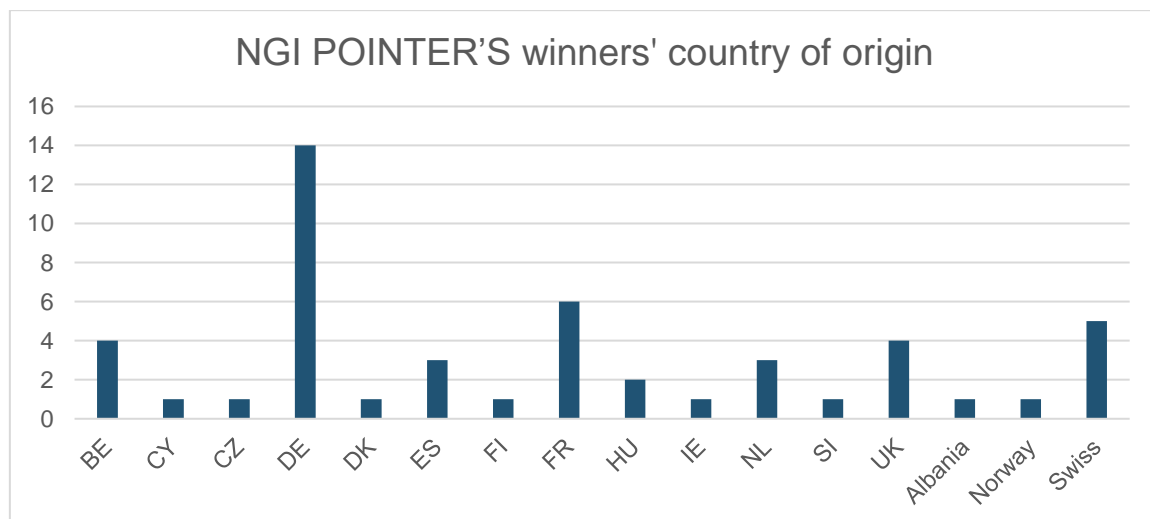


FIGURE 8 – NGI POINTER’S WINNERS' COUNTRY OF ORIGIN



1.9 NGI ASSURE

Proposals	TP Applicants	Selected projects	Number of third parties
217	325	49	71

TABLE 17 – NGI ASSURE'S OVERVIEW

Types of organisations

Type of organisation	No.
Natural Person	54
SMEs	9
Research organisation	1
Higher Education (e.g. university)	5
Other Public Sector (municipalities, regions...)	0
Other non-for-profit (NGO, foundation, association...)	2
Other private organisation (large company...)	0
Total	71

TABLE 18 – NGI ASSURE'S TYPE OF ORGANISATIONS

Winners' country of origin

The majority of NGI ASSURE'S third parties come from the EU-27, with UK and Swiss as non-EU-27 countries with highest number of third parties, namely:

1. Germany: 21 third parties
2. The Netherlands: 11 third parties
3. UK: 10 third parties
4. France: 7 third parties
5. Poland: 4 third parties

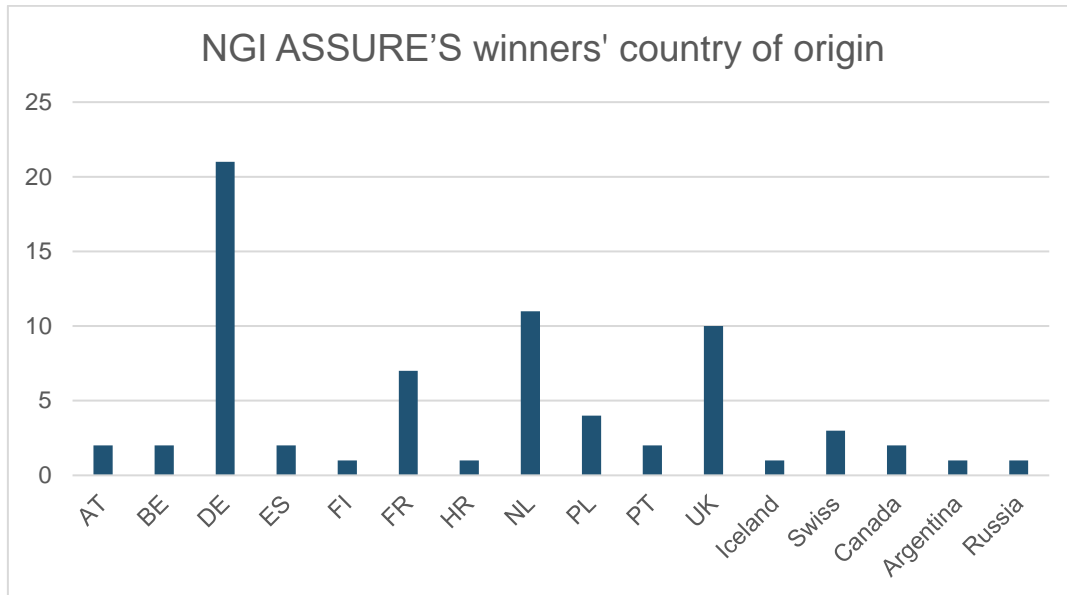


FIGURE 9 – NGI ASSURE'S WINNERS' COUNTRY OF ORIGIN

1.10 TRUBLO

Proposals	TP Applicants	Selected projects	Number of third parties
143	242	10	11

TABLE 19 – TRUBLO'S OVERVIEW

Types of organisations

Type of organisation	No.
Natural Person	0
SMEs	8
Research organisation	0
Higher Education (e.g. university)	3
Other Public Sector (municipalities, regions...)	0
Other non-for-profit (NGO, foundation, association...)	0
Other private organisation (large company...)	0
Total	11

TABLE 20 – TRUBLO'S TYPE OF ORGANISATIONS

Winners' country of origin

TRUBLO'S third parties are homogeneously distributed across the EU-27 with the exception of Italy with 2 third parties, namely:

1. Italy: 2 third parties
2. Belgium, Germany, Estonia, Greece, Spain, Hungary, Ireland: 1 third party
3. UK and Serbia: 1 third party

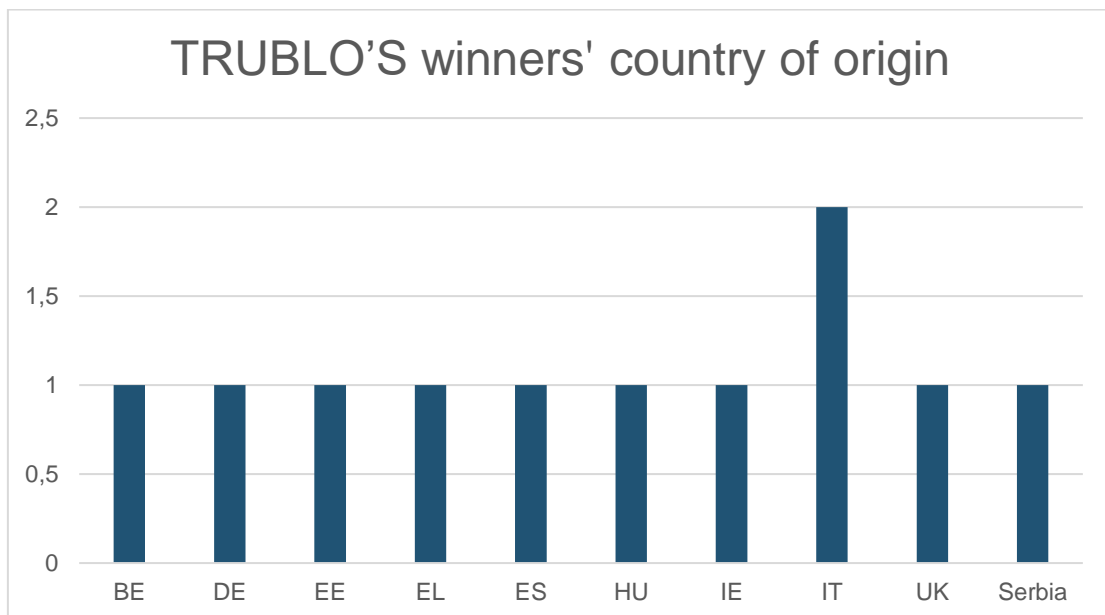


FIGURE 10 – TRUBLO'S WINNERS' COUNTRY OF ORIGIN

2 QUANTITATIVE OVERALL OVERVIEW

This section aims at providing a quantitative overview of NGI open calls' metrics in the light of information provided in section 1.

The section first presents the total number of proposals, applicants, funded projects, winners, grants and open calls issued, followed by winners' respective country of origin, overall country success rate, type of organisations and technology domains.

As per gender balance, the majority of NGI CSAs and RIAs do not monitor such aspect and therefore it was not possible to provide a general overview of this aspect.

Total proposals	Total applicants	Total funded projects	Total winners (third parties)	Total grants	Total open calls
3702	5439	576	875	40.643.095€	51

TABLE 21 - TOTAL APPLICANTS; WINNERS OPEN CALL

2.1 OVERALL WINNERS' COUNTRIES OF ORIGIN

Out of the EU-27, the countries that awarded more NGI grants are:

1. Germany: 173 third parties (19,7%)
2. France: 107 third parties (12%)
3. Netherlands: 91 third parties (10,4%)
4. Spain: 53 third parties (6%)
5. Italy: 44 third parties (5%)
6. Austria: 29 third parties (3,3%)
7. Belgium: 26 third parties (3%)

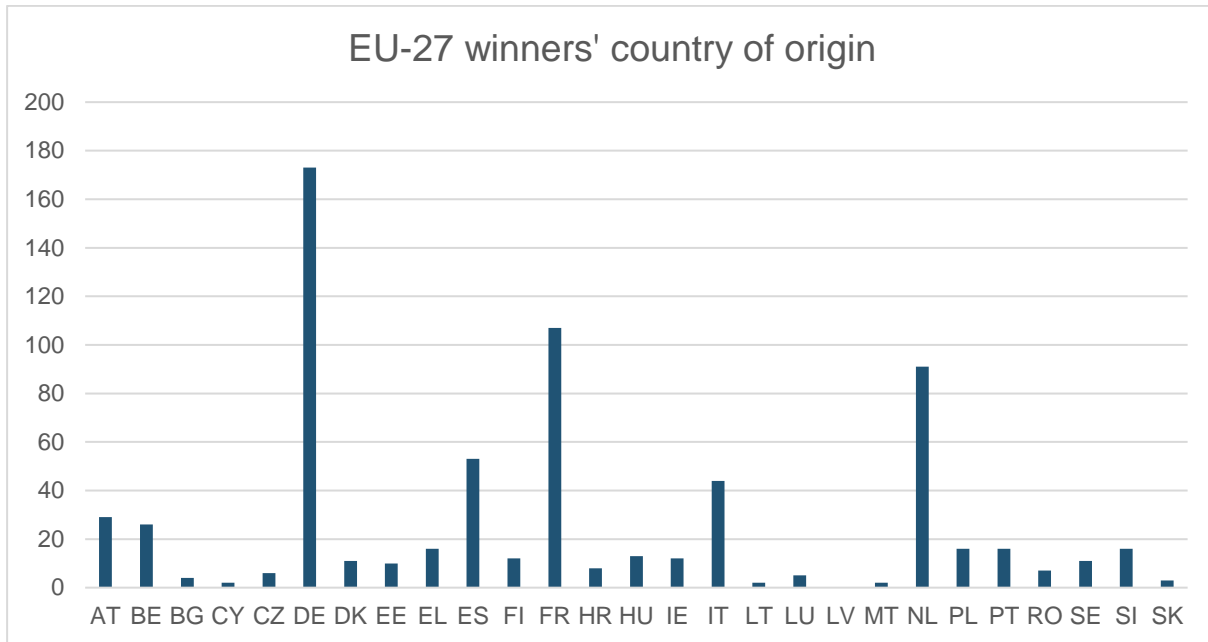


FIGURE 11 - EU-27 WINNERS' COUNTRY OF ORIGIN

Outside the EU-27, the countries that awarded more NCI grants are:

1. UK: 78 third parties
2. Swiss: 37 third parties
3. USA: 17 third parties
4. Canada: 10 third parties
5. Serbia: 5 third parties
6. Others: 30 third parties

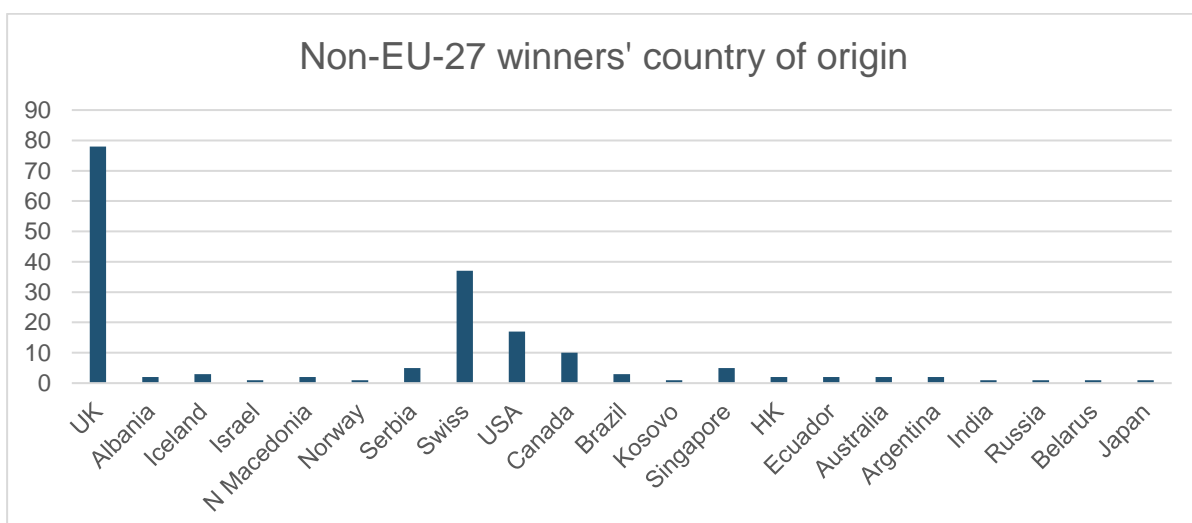


FIGURE 12 - NON-EU-27 WINNERS' COUNTRY OF ORIGIN



2.2 OVERALL COUNTRY SUCCESS RATE

In the EU-27, the countries with the highest success rate in awarding NGI grants from NGI open calls are:

1. Austria with approx. 35%
2. Germany with approx. 34%
3. Luxembourg with approx. 33%
4. Czech Republic with approx. 33%
5. Slovenia with approx. 32%
6. France with approx. 30%
7. Germany with approx. 30%

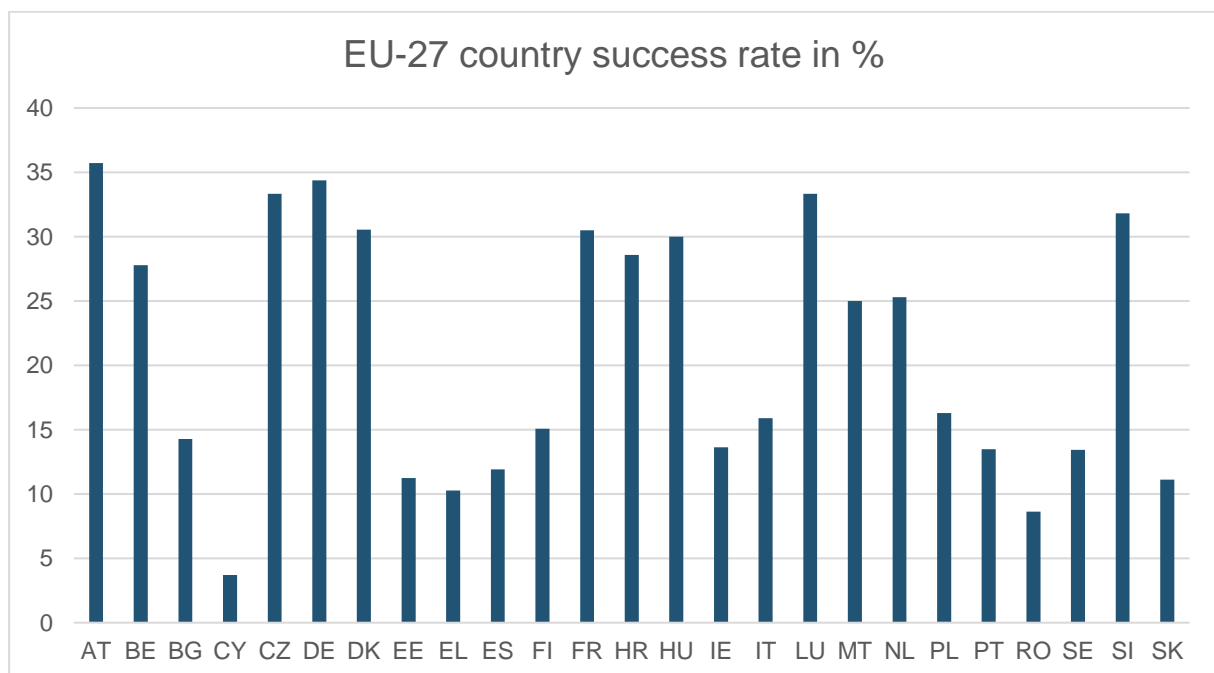


FIGURE 13 - EU-27 COUNTRY SUCCESS RATE

Outside the EU-27 the countries, without considering those with just one project whose success rate is 100% (e.g., Kosovo) or 2/3 projects (e.g., Argentina and Brazil), the countries with the highest success rate in awarding NGI grants from NGI open calls are:

1. Ecuador with approx. 66%

2. Canada with approx. 47%
3. UK with approx. 27%
4. USA with approx. 15%

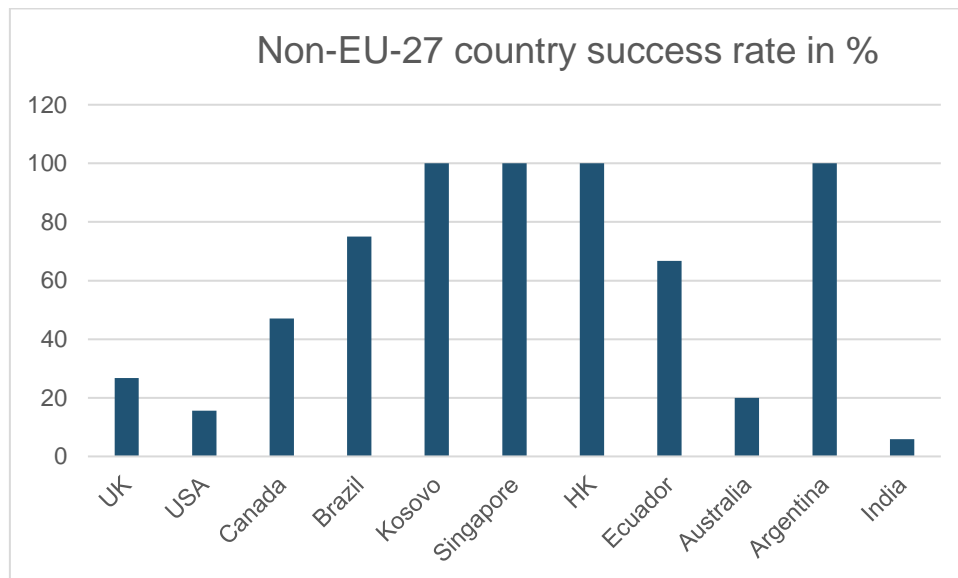


FIGURE 14 - NON-EU-27 COUNTRY SUCCESS RATE IN %

2.3 OVERALL WINNERS' TYPES OF ORGANISATIONS

The winners' types of organisations see a predominance of individuals, SMEs and start-ups, followed by academic institutions and non-profit organisations, namely:

1. Individuals: 53% (466 Individuals)
2. SMEs and start-ups: 29% (256 organisations)
3. Higher Education (e.g. university): 8% (65 organisations)
4. Other non-for-profit (NGO, foundations, associations, etc.): 7% (64 organisations)
5. Research organisations: 3% (21 organisations)
6. Other Public Sector (municipalities, regions, etc): 0% (2 organisations)
7. Other private organisation (large company, etc.): 0% (1 organisation)

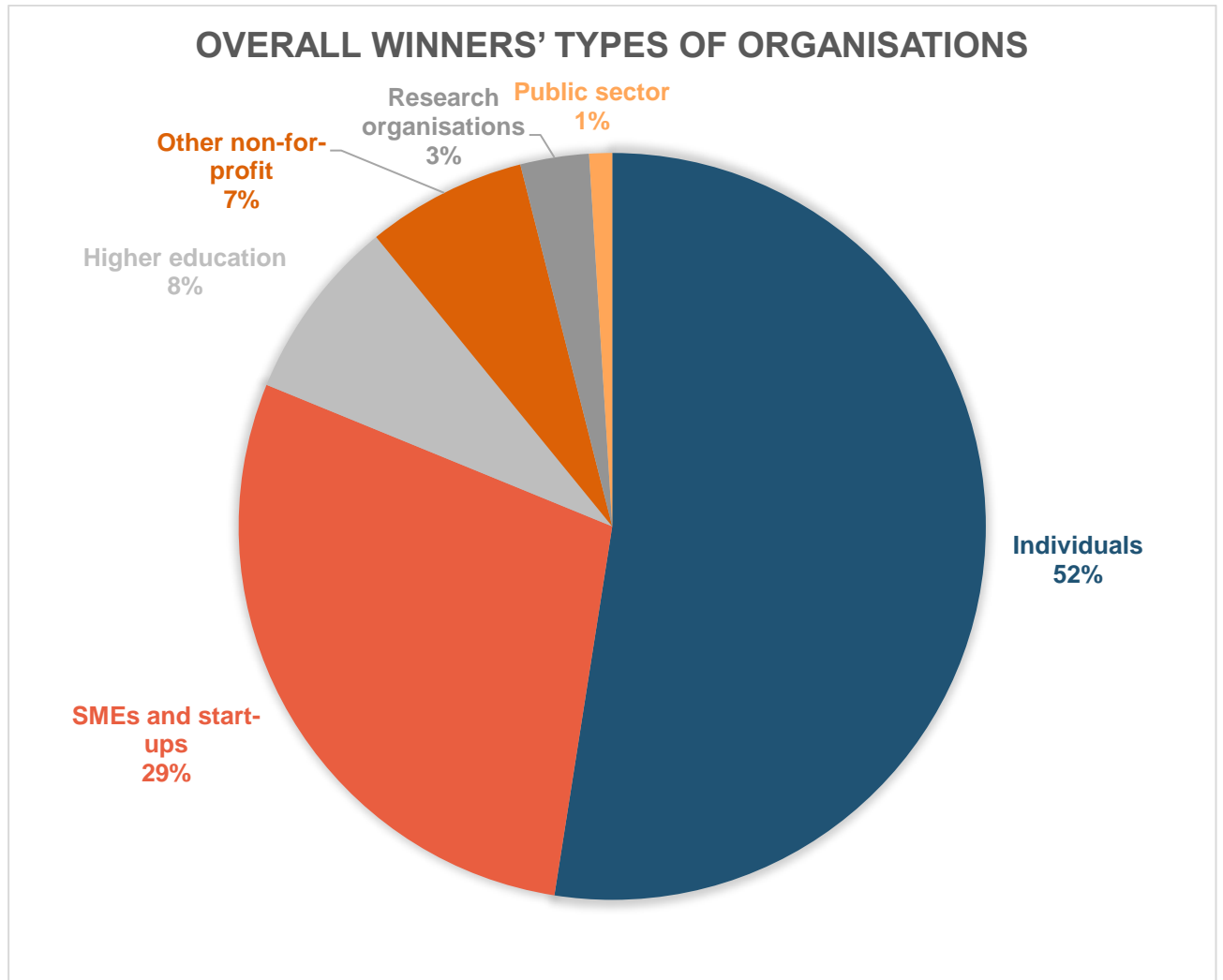


FIGURE 15 - WINNERS' TYPES OF ORGANISATIONS



2.4 OVERALL TECHNOLOGY DOMAINS

The NGI RIAs and CSAs foster the usage and development of protocols, software, hardware, etc. embracing or making use of a broad and diversified spectrum of technology domains, however, the main ones are:

- Distributed ledger and decentralised solutions (general)
- Blockchain (general)
- Routing (i.e. comprised in applications for network and transport infrastructures, more specifically, onion routing)
- Communication services and applications (e.g., for instant messaging, live chats, videoconferencing, etc.)
- Cryptography (e.g., algorithms for software engineering), including but not limited to:
 - VPN protocols
 - DNS protocols
 - Blockchain protocols
- AI
- 5G
- IoT



3 PATHS TOWARDS NGI SUSTAINABILITY

This section aims to answer the questions “*How can the NGI Initiative have long-lasting impact in the EU?*”; “*How to ensure legacy?*”, in the light of the quantitative overview provided in the previous sections, literature review on sustainability of open-source communities, and also considering interactions occurred with NGI beneficiaries during TETRA activities, as well feedback stemming from NGI Research and Innovation Actions (RIAs) during TETRA third Advisory Board meeting.

To answer the above-mentioned questions from the whole NGI initiative perspective, we are considering **open-source** as common factor across NGI projects, individuals and SMEs as main actors (since majority of NGI third parties belong to the two categories) and the following elements:

- Why open-source – Possible value propositions for NGI
- Animating open-source communities
- NGI governance
- Intellectual property
- Technological maturity
- Funding

3.1 WHY OPEN-SOURCE – POSSIBLE VALUE PROPOSITIONS FOR NGI

What’s the advantage of open-source for an individual or a company?

As an individual, one gets valuable work experience which can enhance his/her coding skills and become a successful coder. Additionally, open-source projects give an exposure to work with coders or peers who can significantly improve or guide a beginner’s career.



By nature, open-source projects are very inclusive and for this reason, they offer a chance to learn from and interact with people from different work backgrounds. Last but not least, an open-source participant gets global recognition as his/her work is easily accessible and used by people worldwide.

In few points, individuals may opt for open-source and join the NGI community in order to:

1. Improve their coding skills
2. Interact with peers from different work backgrounds
3. Get worldwide recognition of their work
4. Get to know a community sharing common values
5. Contribute to technologic commons and ensure sustainability of the project

As a company, employees or staff can get the chance of learning new concepts, ideas, or unique techniques to meet work needs or expectations, it can serve as a means to reduce the burden on their programming or software engineering team to build everything from scratch.

Using an open-source software in place of expensive proprietary alternatives can be a good option for saving resources, not just in budgetary terms but also time wise.

With regard to hiring, open-source can allow or support also finding potential employees while marketing wise, open-source communities can provide an effective distribution and message multiplier channel. One major reason could be that open-source is often aligned with more mission-driven goals such NGI's, rather than purely economic goals, and attracts a diverse set of personalities.

For this very reason, the next section concerns open-source communities as it is a key factor for ensuring success and sustainability of open-source projects.

To sum up, a company may opt for open-source in order to:

1. Benefit from open-source communities' promotion
2. Save resources



3. Find new employees or clients
4. Allow employees' growth

3.2 ANIMATING OPEN-SOURCE COMMUNITIES

An healthy open-source community is supportive, diversified and independent (Gamalielsson and Lundell, 2014).

Assuming that open-source communities normally include volunteer participants, maintaining **motivation** of its members is a crucial factor for the sustainability of the community. Meaning that developers and members must perceive value from being part of the community or of the specific open-source project.

In this regard, the NGI Initiative certainly has a strength factor given its ambitious and human-centred mission of shaping next generation internet around values such as trust, security, and inclusion, while also reflecting EU values and norms.

Given that a vast majority of NGI third parties (80%) come from the EU-27, that third parties' organisation types are diversified (29% is SME; 53% is individual; 8% is higher education and 7% non-for-profit organisations), it may be correct to presume the NGI Initiative laid the foundations of a diversified EU-based community driven by shared values and a common mission.

When it comes to TETRA experience developed during interactions with NGI third parties during four bootcamps and more than 40 webinars, it appears that, among the three core values of NGI (trust, security, inclusion), **Trust** and more specifically *“providing solutions guaranteeing citizens' privacy”* is a value considered of extremely high importance by NGI third parties.

Open and public discussions on software-related developments enabling privacy could be organised to motivate developers to contribute their ideas and facilitate interaction across NGI third parties.



Indeed, **community vibrancy** is a factor that could be effectively supported by live meetings and dedicated events.

As literature confirms (Crowston et al, 2004), coordination between developer teams is a key component of an open-source community. The implementation of coordination practices, which could take the form of periodic onsite/online meetings, and establishing project teams, which in the NGI case may correspond to the different NGI projects, can contribute to the community's overall health. More specifically, face-to-face meetings were found to help foster a sense of belonging to a physical community, thus securing its long-term membership¹.

Reputational benefits experienced by participants appear to be another factor fostering a vibrant open-source community in the literature (Von Hippel, 2003; Baldwin et al, 2006; Naparat et al, 2015).

The more visible the outputs of the community and the more acknowledged the contributions of individual members are, the higher the reputational benefits experienced by community contributors.

In this regard, the NGI initiative could have different value propositions to offer to its third parties when it comes to visibility. NGI could be intended as an EU-wide visibility platform or launch pad for talented developers pursuing the same mission of making the internet more human. Indeed, the development of an online repository with all the more than 600 third parties' projects clustered by NGI project, country, status and technology domain, can be an important asset to maximise the visibility of the projects and an attractive asset for developers to increase their visibility.

However, as NGI Initiative, ensuring EU-wide visibility and acknowledgment of contributions to each third party's project may be a challenging exercise to be implemented at central level.

¹ Naparat, D., Finnegan, P., & Cahalane, M. (2015). Healthy Community and Healthy Commons: 'Opensourcing' as a Sustainable Model of Software Production. *Australasian Journal of Information Systems*, 19. <https://doi.org/10.3127/ajis.v19i0.1221>



3.3 NGI GOVERNANCE

Literature² underlines how a clear governance structure plays a crucial role for open-source communities' sustainability. To function efficiently, an open-source community needs clear **leadership**, **rules**, and **guidelines** to organise itself as well as measures assuring efficient coordination between the developers and teams.

When it comes to leadership, the NGI initiative by its nature has a decentralised governance structure composed of European Commission, NGI outreach office, NGI projects (RIAs, CSAs) and respective third parties' projects, who are at the core of the NGI open-source community.

Within such structure, NGI projects play a crucial role as point of reference for their third parties and intermediary between other NGI projects and NGI outreach office.

However, it is not possible to associate the concept of "leadership" as intended in literature with the current NGI scenario as each NGI project coordinates and manages multiple open-source projects, which in turn have their own organisational structure in case of an SME or belong already to a community in case of individuals.

Governance at central NGI level could be fostered with the support of key open-source organisations from the countries with the highest number of third parties, which may have direct interest in collaborating and providing new members to the community. As an example, taking Germany, France and the Netherlands as reference (as countries with higher number of NGI beneficiaries):

Country	Key OS actors
Germany	<ul style="list-style-type: none"> <li data-bbox="539 1794 1326 1827">• Open-source Business Alliance e.V. (OSB Alliance)

² Gamalielsson, J., Lundell, B., Sustainability of Open Source software communities beyond a fork: How and why has the LibreOffice project evolved?, *The Journal of Systems and Software* (2013), <http://dx.doi.org/10.1016/j.jss.2013.11.1077>

France	<ul style="list-style-type: none"> • Adullact • The Union of Free Software and Open Digital Enterprises (CNLL)
The Netherlands	<ul style="list-style-type: none"> • Code for NL • Delta10 • SURF • The Standardisation Forum • The Forus Foundation • The Foundation for Public Code • Waag technology & society

TABLE 22 - KEY OS ACTORS

Open-source Business Alliance e.V. (OSB Alliance) is a not-for-profit community of public administrations, SMEs, and private companies that focuses on open-source matters in Germany and Europe. The OSB Alliance regularly organises and promotes events such as conferences, webinars, and meetings. It also sends out a newsletter with the latest updates on the topic of OSS and technological news. There are nine working groups in the Alliance who initiate activities and act as a forum for further discussion. In 2017, it started the project ‘Open-source as Drivers for Digitisation, Sovereignty and Innovation in the Public Sector,’ running until 2020.³

Adullact is an association that aims to promote the use, reuse, and development of OSS by French regions and municipalities. Among many initiatives, the association created an OSS repository for public administrations.

³ Federico Chiarelli; Vivien Devenyi; Debora Di Giacomo; Alessandro Zamboni; Eleonora Zoboli (2020), Open Source Software Country Intelligence Report - Germany



The Union of Free Software and Open Digital Enterprises (CNLL) is a representative organisation of more than 300 French companies working in the free software industry.⁴

Code for NL is a network of developers and designers supporting OSS, open government initiatives, and government digitalisation. Code for NL is the Dutch branch of the Code for All network.

Delta10 is a team of developers, designers, and jurists with public sector experience. Their aim is to improve ICT in the Dutch public administration using OSS solutions.

SURF is a cooperative of over 100 education and research centres advocating in favour of the use of ICT in education and research throughout the country.

The Standardisation Forum supports the Dutch government in the development, use and establishment of open standards for electronic information exchange. The second goal of the Standardisation Forum is to prevent vendor lock-in and reduce costs in government spending on ICT.

The Forus Foundation is an independent network of organisations and individuals contributing to the development of OSS for public administrations and municipalities.

The Foundation for Public Code was established to help open-source projects for public organisations to become successful, build sustainable

⁴ Federico Chiarelli; Vivien Devenyi; Debora Di Giacomo; Chloé Dussutour; Alessandro Zamboni; Eleonora Zoboli (2020), Open Source Software Country Intelligence Report - France



communities around them and create a thriving public open-source ecosystem.

Waag technology & society is a middle-ground organisation composed of research groups that work with both grassroots initiatives and institutional partners across Europe. The mission of the Waag is 'making technology & society more open, fair and inclusive.'⁵

3.4 INTELLECTUAL PROPERTY

Raising awareness on Intellectual Property related to ICT and open-source applications could play an important role to either attract new members to join the NGI initiative, or keep highly motivated current NGI third parties belonging to the community.

The message to be transmitted should be that although copies of open-source software can be obtained from various repositories for free, all rights subsisting in the software generally remain with the owner. These include the rights to copy the source code, modify it, and create derivative works for a profit. The capacity of a third party to exercise these rights depends on the licence granted by its owner.

There is a wide spectrum of licensing models. The more permissive licences allow a user to adapt open-source software to create derivative works, without restrictions on how such derivative works should be licensed subsequently. In contrast, the more restrictive licences may require licencees to make the source codes of derivative works available to the public as well.

Raising awareness or provide training to NGI third parties on open source most used licences may keep motivation high and reward community

⁵ Federico Chiarelli; Vivien Devenyi; Debora Di Giacomo; Chloé Dussutour (2020), Open Source Software Country Intelligence Report - Netherlands



members with the “sense of ownership”, which is a key factor recognised by literature⁶ for open-source communities’ sustainability.

Below we provide two brief examples of licenses commonly used in OSS.

Copyleft licenses: a copyleft license allows the user to modify and redistribute a software program at will. The licensee’s obligation under a copyleft license is to make relevant downstream technologies available to all comers (including the original licensor) under the same terms as provided by the original license. No one (including the original licensor and his or her licensees) obtains any special privilege regarding any next-generation technology, such as a right to preview any improvements or exclusive sublicensing rights to any improvements.

The two most important aspects of a copyleft-style license are:

1. The definition of “improvements” (or an equivalent term) which determines which further innovations must be licensed on the same terms as the initial licensed innovation
2. The definition of “external deployment” (or equivalent), which determines under which circumstances the obligation must be fulfilled.

These above-mentioned elements may be adjusted by the licensor to create a copyleft license providing an appropriate balance of incentives to contribute to an OS project.

Academic licenses: another type of open-source license is the academic license. These licenses do not require users to make externally deployed improvements available to the licensor on the same terms as the original

⁶ Matthew B. Perrigino, Benjamin B. Dunford, Paul G. Biondich and Theresa Cullen, Benjamin R. Pratt (2020), Psychological ownership in open source electronic medical records communities



technology; in some cases, the downstream user's only obligation is that the developer must give the innovator credit for the innovation.

3.5 TECHNOLOGICAL MATURITY

The sustainability of an open-source community is also driven by its technological maturity. Both the quality of the outputs and the structure of the software itself are key factors in maintaining developers' motivation, building a community's reputation and attracting new members.⁷

At NGI level, it may be possible to monitor technological quality of proposed solutions by third parties, by integrating in NGI Open calls the following indicators (listed by Crowston et al, 2006) related to output quality:

- Software creation and maintenance
- Code base quality
- Software use
- System consequences

In addition to output quality, software structure (software's code base) is an element determining the technological maturity of an open-source community and could be evaluated at individual NGI project level.

3.6 FUNDING

Last but not least, an important factor influencing open-source communities' sustainability is funding of open-source projects.

⁷ Debora Di Giacomo, Barbora Kudzmanaite, Vivien Devenyi, Chloé Dussutour, Maha Shaikh (2020), Key success factors of sustainable open source communities



The NGI Initiative on this regard can boast the strength and clear value proposition of offering NGI third parties on the one hand the possibility to award public funding through NGI Open calls to fund their project, on the other, to increase economic sustainability of third parties' project through business acceleration services as the ones offered, for example, by TETRA or eSSIF-LAB projects. There are different examples already of NGI beneficiaries entering NGI programmes with one NGI RIA

Needless to say, a clear open-source business model is a key component to ensure sustainability of OSS and providing capacity building in this regard, is a key element for sustainability (e.g., TETRA bootcamps and design thinking and IP related webinars).

The attraction of private investment towards NGI open-source projects is also another important element of economic sustainability and thoroughly tackled by capacity building activities (e.g., TETRA bootcamps and fundraising related webinars), business ignition phases from NGI projects, as well opportunities stemming from interaction with non-NGI stakeholders, such as the case of NGI Explorers (please refer to chapter4). Lastly, economic sustainability of NGI third parties' projects could be fostered by approaching end-users with current NGI solutions in place. In this regard, the development of an online repository with all the more than 600 third parties' projects clustered by NGI project, country, status and technology domain, can serve as basis for marketing strategies promoting the clustered NGI solutions according to potential end users, turning NGI into an "open-source one stop shop for private and public entities", aligned with European values.



4 QUALITATIVE INTERVIEWS WITH NGI PROJECTS

The information of this section stems from bilateral interviews conducted by TETRA with coordinators and/or partners of the following NGI Research and Innovation Actions (RIAs):

- NGI Zero
- NGI Discovery
- LEDGER
- NGI Explorers
- NGI DAPSI
- NGI POINTER
- eSSIF-Lab

The interview comprised the following questions:

What was the RIA contribution towards ICT-24-2018-2019 expected impact (where applicable)?

- Shape a more human-centric evolution of the Internet
- Create a European ecosystem of top researchers, hi-tech startups and SMEs with the capacity to set the course of Internet evolution.
- Generate new business opportunities and new Internet companies with maximum growth and impact chances, notably through the creation of startups and their scaling up in Europe.
- Integrating research and innovation communities; development of common visions and enhanced science – industry collaborations in each of the technology domains.
- (If applicable) European research and innovation leaders driving the debate for a human-centric Internet research and policy strategy.

Partners

Civitta | ESN – European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava
© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147
Page 38 of 66

Business
Accelerator
for NGI >>>

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



- (If applicable) New Internet applications / services, business models and innovation processes strengthening the position of European ICT industry in the Internet market.
- (If applicable) Global visibility in the media of the debate on a human-centric Internet; citizens' priorities influencing the evolution of the Internet.

Additionally, NGI RIAs were asked to provide examples, links, documentation (if applicable) per each of the points mentioned above.

Partners

Civitta | ESN - European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava
© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147
Page 39 of 66

Business Accelerator for NGI >>>

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



4.1 NGI ZERO AND NGI DISCOVERY

What was the RIA contribution towards ICT-24-2018-2019 expected impact (where applicable)?

- Shape a more human-centric evolution of the Internet

In both projects the objective was to support human centric technology on all layers of the internet, from open-hardware and tools to internet protocols.

The idea of a more human centric internet is a very interesting one for both projects as they believe that to be human centric, technology has to be transparent, privacy-friendly, accessible and secure as possible.

One of the ways to ensure at least some of these dimensions are guaranteed is, for example, by strictly selecting open-source or open-hardware developments, as well open-process or open-standard projects. This is a strict requirement that was applied to both NGI Zero and NGI PET open calls.

The reason for this approach to be human centric, is that this is one of the ways to guarantee people can interact or inspect a software on their own terms, basically as they please, without someone else deciding how it should work, where data should go or should be stored. Of course, there is a degree of limitations in this, but the possibility for people to take the technology and use it basing on their own needs, should always be included if one wants to build a more human centric internet.

Restricting grants only to open-source projects, according to the NGI projects, solves a great deal of problems such as transparency, where users are unaware of multiple processes going on in the background, as they use their app or software, or while they visit a website.

Additionally, open-source provides a level of guarantee that the funded projects or work will continue to be available and useful after the (NGI)



project, providing contributions to technology commons.

The cascade funding mechanism, when applied with a strictly selection of projects, can itself play an important role in making the internet more human.

- Create a European ecosystem of top researchers, hi-tech start-ups and SMEs with the capacity to set the course of Internet evolution.
- Integrating research and innovation communities; development of common visions and enhanced science – industry collaborations in each of the technology domains.

The two NGI projects provided a cumulative answer to the points mentioned above.

Creating an ecosystem can be quite a challenge, one of the elements that adds difficulties is that people applying for NGI Zero and Discovery kind of grants, can work on the project during their off hours. They want to advance technologies and work on projects they couldn't, within their businesses or work.

The approach of the NGI projects towards their ecosystem is to encourage checking each other's work, benefitting from each other's code. Some problems can be tackled in different ways so it is not needed to reinvent the wheel every time.

Especially with new onboarded NGI thirds parties' projects, NGI Zero and Discovery try to redirect them to past NGI third parties using similar technologies, working with the same programming language or trying to solve similar problems.

The NGI projects also organised online events focused on one type of technology or servers for this purpose.

Partners

Civitta | ESN - European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 41 of 66

Business Accelerator for NGI >>>>

info@tetraproject.eu | business.ngi.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



- Generate new business opportunities and new Internet companies with maximum growth and impact chances, notably through the creation of start-ups and their scaling up in Europe.

Within the two NGI projects, they saw a growth of small-scale SMEs, rather than the creation of new companies or organisations from scratch. They have a number of SMEs which managed to grow significantly during the course of both NGI projects as they were able to expand their servers and applications.

- European research and innovation leaders driving the debate for a human-centric Internet research and policy strategy.

This is out of the scope of the NGI projects, however, when interacting with policy changers they contributed to policy making with regard to technology commons and open-source software.

- New Internet applications / services, business models and innovation processes strengthening the position of European ICT industry in the Internet market.

The two NGI projects have held a number of presentations about “Activity Pub”: a protocol for centralised social networking: it is a way for people to host their own server and interconnect, or hosting other servers or applications: from blogging to sharing videos and applications.

They also had presentations for the European Data Protection supervisor on the benefits stemming from switching to some of these open-source technologies, or trying other social media solutions that institutions are using.

Partners

Civitta | ESN - European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 42 of 66

Business Accelerator for NGI >>>

info@tetraproject.eu | business.ngi.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



4.2 LEDGER

What was the RIA contribution towards ICT-24-2018-2019 expected impact (where applicable)?

- Shape a more human-centric evolution of the Internet

The human centric aspect is very much applicable to LEDGER because it is at the core of the project: it is one of the main selection criteria in every open call. Human centric aspect of the applications has to be at the core of every proposal received by the project.

Human centric design was also a central topic around which the NGI project organised several bootcamps for their beneficiaries.

All teams must be open-source and have their own repository on GitHub, LEDGER itself has its own repository and profile on GitHub.

- Create a European ecosystem of top researchers, hi-tech start-ups and SMEs with the capacity to set the course of Internet evolution.

Fundingbox (coordinator) has a massive community itself: on the Fundingbox platform they have many different technology communities, one also for LEDGER of course, and right now they have more than 1.000 users. Of course, it is a wide range of stakeholders, ranging from individuals, programmers, researchers, to start-ups, SMEs and academia. Consortium partners added additional members focused on blockchain and decentralisation approached, they took part in many events around open-source, blockchain and privacy by design. One of these is [FOSDEM](#), thanks to the collaboration with the organisers of the event, different members of their community joined LEDGER and they keep attending the event.



- Generate new business opportunities and new Internet companies with maximum growth and impact chances, notably through the creation of start-ups and their scaling up in Europe.

It depends on the different third parties' projects. LEDGER had six different sectors where it was working on. Some third parties' projects are very innovative and therefore they are not ready for scaling yet, LEDGER is working to carry on their ideas and foster the development of MVPs. Other third parties' projects are currently focused on getting customers and making revenue, other third parties' projects applied for public funding and joined, for example, NGI DAPSI and TRUBLO, others like [PROSUME](#) and [GMeRiT5](#) won the EIC Horizon Prize "Blockchains for social good", with a considerable funding considering the size of the projects. Talking about numbers, LEDGER has created more than 100 jobs, raised more than EUR 1 million of additional public funding, raised more than EUR 20 million of additional private funding and won 17 awards.

- Integrating research and innovation communities; development of common visions and enhanced science – industry collaborations in each of the technology domains.

As mentioned above, LEDGER community is wide and very diversified, from professors to companies. Despite all these differences, LEDGER managed to gather their members around two core values: decentralisation and European values. Of course, open-source is also a common factor across their beneficiaries, but it is possible to see that the two values mentioned above are really able to unite the community. When it comes to industry collaborations, project partner Blumorpho, was leading the business ignition and guiding their beneficiaries on how to access markets and get their product market-ready. They used their networks to liaise beneficiaries with potential early adopters, ran interviews

Partners

Civitta | ESN – European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 44 of 66

Business Accelerator for NGI >>>

info@tetraproject.eu | business.ngi.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



with them and organised events, pitching, webinars and demo days where private, public organisations and investors were invited. LEDGER worked to connect their beneficiaries with the “industry the is out there”.

- (If applicable) European research and innovation leaders driving the debate for a human-centric Internet research and policy strategy.

N/A.

- (If applicable) New Internet applications / services, business models and innovation processes strengthening the position of European ICT industry in the Internet market.

LEDGER has been working on these aspects on three levels: the acceleration of 34 beneficiaries' projects; finding ways to make the beneficiaries' projects applicable with toolkits and lessons learnt, including conversations with industry and benchmarking exercises and at last technology and coding, meaning that LEDGER worked on the blockchain and decentralised technologies of their beneficiaries to simplify access to public funding. The use case was the Fundingbox platform where with project partners a timestamping mechanism for open calls' proposals and evaluations was created. The timestamping mechanism is open-source and therefore can be adopted by public buyers willing to create more transparent processes.

- (If applicable) Global visibility in the media of the debate on a human-centric Internet; citizens' priorities influencing the evolution of the Internet.

N/A.

Partners

Civitta | ESN - European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 45 of 66

Business Accelerator for NGI >>>

info@tetraproject.eu | business.ngi.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



4.3 NGI POINTER

What was the RIA contribution towards ICT-24-2018-2019 expected impact (where applicable)?

- Shape a more human-centric evolution of the Internet

NGI POINTER is addressing fundamental technologies at protocol level, fixing issues and exploring co-applications of human-centric internet. The project has been working on Port Control Protocol (PCP) which offers better connectivity solutions and doesn't include limited number of internet access, becoming part of standardisation processes and co-applications of human centric internet.

- Create a European ecosystem of top researchers, hi-tech start-ups and SMEs with the capacity to set the course of Internet evolution.

NGI POINTER beneficiaries, in most cases, did already know each other before applying to POINTER open calls through communities they already belonged to.

When announcing the open calls, all beneficiaries were targeted and dedicated events were organised, giving the chance to beneficiaries to have short presentations of their work. This was a good moment for the beneficiaries to get to know each other, there have been cases where beneficiaries have been using each other's applications without knowing each other. While in other cases there was a clear overlapping of beneficiaries' projects, especially within Linux community and [W3C](#).

The difficulty at community level encountered by the project lies within the "3 main categories of NGI third parties": entrepreneurs, activists and researchers. The three typologies of NGI third parties have clear different



objectives and approaches and sometimes interaction across the three is not easy.

Majority of NGI POINTER beneficiaries is individuals, followed by universities and start-ups, the rest of the beneficiaries consists in organisations of internet activists, who gathered around a project or idea. They might look like start-ups but have no business plan and don't intend to have one.

- Generate new business opportunities and new Internet companies with maximum growth and impact chances, notably through the creation of start-ups and their scaling up in Europe.

The example of [Lightmeter](#), which participated in TETRA bootcamps and webinars, was brought: Lightmeter works on email server infrastructure. The team created a business plan at the time they were a team of individuals, now they are a business and have been selected by U.S. technology start-up accelerator [Ycombinator](#).

Lightmeter is a good example of how a business steered by European values can attract interest and become successful in the U.S.

- Integrating research and innovation communities; development of common visions and enhanced science – industry collaborations in each of the technology domains.

The example of [SCiON project](#) was brought: Scion is a research project composed of 60-70 researchers globally working on alternative architecture for the internet. SCiON has been running for quite some time (since 2017) and has a number of ISPs that are currently offering SCiON as a solution. A company, [Anapaya](#), that was part of the project, offers SCiON

Partners

Civitta | ESN - European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 47 of 66

Business Accelerator for NGI >>>

info@tetraproject.eu | business.ngi.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



services at commercial level with good interest raised by those willing to adopt SCiON routing mechanisms (as more secure).

Anapaya is now working with different ISPs for this new routing mechanism with a financial model based on subscription.

SCiON and Anapaya are an example of how NGI, via a research project such as SCiON, was able to establish a company that offers attractive services and use cases for industry.

Another relevant example is the [Solid project](#), focused on data sovereignty. NGI POINTER is working with a company named [Digital AI](#) which is offering their services to various municipalities and heritage foundations, building their non-industry customer base.

- (If applicable) European research and innovation leaders driving the debate for a human-centric Internet research and policy strategy.

NGI POINTER performs ethical reviews of all projects, only one project was asked to provide a separate deliverable on the matter. The project

- (If applicable) New Internet applications / services, business models and innovation processes strengthening the position of European ICT industry in the Internet market.

Please refer to the points mentioned above.

- (If applicable) Global visibility in the media of the debate on a human-centric Internet; citizens' priorities influencing the evolution of the Internet.

Partners

Civitta | ESN - European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 48 of 66

Business Accelerator for NGI >>>

info@tetraproject.eu | business.ngi.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



Aside from NGI POINTER Twitter account, the project is increasing the visibility in the media of the debate on a human-centric Internet via podcasts which are published on [Acast](#).

Partners

Civitta | ESN - European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 49 of 66

Business Accelerator for NGI >>>

info@tetraproject.eu | business.ngi.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



4.4 NGI DAPSI

What was the RIA contribution towards ICT-24-2018-2019 expected impact (where applicable)?

- Shape a more human-centric evolution of the Internet

DAPSI's focus was on data portability, therefore by its nature, the project worked to provide citizens with more control over their personal data, which enforces the NGI objective of a more human internet.

The funded projects are working to overcome those technical barriers related to data portability, including GDPR and therefore contributing also to privacy of internet users.

- Create a European ecosystem of top researchers, hi-tech start-ups and SMEs with the capacity to set the course of Internet evolution.

When one wants to create an ecosystem, it cannot be done alone as many different entities have to be aligned to the ecosystem. For this reason, DAPSI partners have always considered DAPSI as part of the big picture of digital infrastructure. For example, if a company implements a new standard and other companies or service providers do not use such standard, the ecosystem will simply not work. They have to be aligned and for this reason DAPSI always worked to implement services as neutral as possible, focusing on service providers' interest rather than end user interest.

To build a European ecosystem in the wide picture of digital infrastructure, you also need industry, legal standards as it is not just related to the technical part. For example: due to GDPR, it is mandatory for service providers to provide data portability, however, enforcing such rules is still



not in fully in place and still needs enforcement perhaps by higher authorities.

With regards to their beneficiaries, they have a total of 46 projects funded across three Open Calls and the majority of them is either a start-up or an SME, such as Data or AI consultancy companies or software companies.

- Generate new business opportunities and new Internet companies with maximum growth and impact chances, notably through the creation of start-ups and their scaling up in Europe.
- Integrating research and innovation communities; development of common visions and enhanced science – industry collaborations in each of the technology domains.

DAPSI saw projects that started with at the stage of idea and the COVID-19 crisis changed their vision on how they can bring a real project, starting from an idea, adapted to the markets and realities that exist. This is an advantage for these very young projects as they are agile and can rapidly adapt to these changes, market needs and opportunities.

Our work in DAPSI consisted in supporting them better understanding their market, while having an ambitious vision.

The example of the [ALIAS](#) project was highlighted, which started in a lab and had a very research-focused vision. DAPSI expanded their vision steering their project also towards industry, with the result their team grew, they made an industry publication titled “GDPR portability the Forgotten right” and managed to attract private pre-seed investment for a total amount of EUR 600.000,00 and won the French National Research and Technology competition for a prize of EUR 250.000,00.

Another example is the [DPELLA](#) project which first partnered with GU Ventures, an incubator from Gothenburg University, and second got

Partners

Civitta | ESN - European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 51 of 66

Business Accelerator for NGI >>>

info@tetraproject.eu | business.ngi.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



accepted in the MobilityXlab, an Incubator sponsored by Ericsson and Volvo.

The overall approach was therefore to support the research-oriented projects discovering how their product or solution could be interesting beyond their own research community, transforming a research project into a more experimental one which also industry could be interested in.

- (If applicable) European research and innovation leaders driving the debate for a human-centric Internet research and policy strategy.

DAPSI participated in panels, debates and events related to data portability, for example the session at the NGI Forum “How to make data portability go mainstream”. However, working in close contact with policy makers is not in the scope of their project.

- (If applicable) New Internet applications / services, business models and innovation processes strengthening the position of European ICT industry in the Internet market.

From the technical point of view the whole data portability topic highly affects the business model. Nowadays for example social networks have a business model combined with advertisement brokers, again, highly focused on service provider interest since end users cannot choose what kind of data to share.

From the end user perspective, such business model is not complete as they should have the possibility to choose if and what kind of data they would like to share.

DAPSI could see a general shift from SaS or freemium business models, to more end-user focused business models. There are now companies or organisations understanding that to keep their clients, they have to pay.

Partners

Civitta | ESN - European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 52 of 66

Business Accelerator for NGI >>>

info@tetraproject.eu | business.ngi.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



This is also beneficial in general for open-source (OS) projects as these interactions help OS projects to expand their vision beyond their own OS communities.

- (If applicable) Global visibility in the media of the debate on a human-centric Internet; citizens' priorities influencing the evolution of the Internet.

DAPSI contributed several times to bring to the public discussion the topic of data privacy and data portability by organising events with speakers from multiple disciplines, such as GDPR legal experts, internet innovators, non-for-profit data-related and privacy organisations, etc. The objective was to bring the discussion around the past, the present and the future of data portability and also the solutions that can be developed to move forward in this field.

In terms of global visibility, the publication “GDPR portability the Forgotten right” mentioned above had over 75.000 downloads and attracted wide visibility also from the United States.

Partners

Civitta | ESN - European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 53 of 66

Business Accelerator for NGI >>>>

info@tetraproject.eu | business.ngi.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



4.5 NGI EXPLORERS

What was the RIA contribution towards ICT-24-2018-2019 expected impact (where applicable)?

- Shape a more human-centric evolution of the Internet

The topics of NGI Explorers open calls were shaped using the 10 topics identified at the NGI Forum in 2018. The topics were broad and ranged from cybersecurity to 5g, from AI to IoT and big data, in that sense NGI Explorers covered a broad range of topics following the NGI mission of shaping a human centric evolution of the internet. NGI Explorers did so under two perspectives: very research-oriented projects often focused on standardisation or projects with products below TRL 5.

- Create a European ecosystem of top researchers, hi-tech start-ups and SMEs with the capacity to set the course of Internet evolution.

In order to support and facilitate interaction among their funded projects, NGI Explorers created in their platform [f6s](#) an online private group with all their beneficiaries. NGI Explorers could see how they interacted, cheered each other up and updated each other on certain situations or tips with regard to US.

It was interesting to witness such interactions, especially considering how diversified their beneficiaries are: many researchers, innovators, but also start-ups and SMEs.

- Generate new business opportunities and new Internet companies with maximum growth and impact chances, notably through the creation of start-ups and their scaling up in Europe.



When the project started in 2019, the first Open Call attracted researchers and therefore NGI Explorers did not have any beneficiary working on product development. However, the second and third Open Calls did attract a considerable number of third parties who, thanks to the opportunity of travelling to the U.S., were introduced to a different mindset and ideas they would have never considered otherwise. They understood how their projects and technologies could embrace an entrepreneurial mindset.

There are two examples to be highlighted on how NGI Explorers contributed to merging scientific and entrepreneurial mindsets: explorers Igor Kotsiuba and Roberto Medina Bujalance from Open Call 2, each participated in TETRA bootcamps, who are respectively a researcher and an entrepreneur, are currently developing a business and are now in consultation to scale-up. Another example is explorer Cristina Marquez, a young graduate who is creating her own start-up. All the three explorers are collaborating with the respective three U.S. partners and are benefitting from their networks.

The fact NGI Explorers' beneficiaries could access U.S. networks and stakeholders played a crucial role with regard to creating new businesses. An example is explorer Tiago Cristovão who is working on AI applied for bridges' maintenance and safety with the project "Bridge Monitoring with Predictive Intelligence". He is working in close contact with public U.S. partner municipality of Portland as they could find their niche and use cases since in the United States there are cities with hundreds of bridges (website: <http://matereo.com/home-2/>).

Another example is explorer Selvakumar Ramachandran who had an entrepreneurial idea on using a Virtual Reality platform and 5G for immersive tourism experiences. His business is currently growing in the

Partners

Civitta | ESN - European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 55 of 66

Business Accelerator for NGI >>>

info@tetraproject.eu | business.ngi.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



U.K. and people are providing him video shootings from all over the world (website: <https://eyemmersive.co.uk/>).

In general, 25 out of 47 explorers reported they are progressing with scaling up their research and ideas.

- Integrating research and innovation communities; development of common visions and enhanced science – industry collaborations in each of the technology domains.

NGI Explorers did integrate research and business communities with also concrete scale-up examples as mentioned above, additionally, the partnering with the United States was extremely beneficial not only for business development, but also to foster a change of mentality: U.S. universities or research centres have an entrepreneurial approach towards research, while in Europe the two dimensions (business and research) are less interlinked. Industrial collaboration with research centres is a consolidated reality and the explorers could experiment, and some benefit from this different attitude by exploiting the networks and stakeholders provided by the U.S. host.

- (If applicable) European research and innovation leaders driving the debate for a human-centric Internet research and policy strategy.

Overall, policy dimension was out of the scope with the project, however, explorers have been working on white papers concerning ethics and AI and digitalisation. The explorer Martin Serrano collaborated with the National Institute of Standards and Technology (NIST) of the United States for drafting recommendations on KPIs measuring digitalisation in relation with COVID-19 pandemic, which are currently under approval.

Partners

Civitta | ESN – European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 56 of 66

Business Accelerator for NGI >>>

info@tetraproject.eu | business.ngi.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



- (If applicable) New Internet applications / services, business models and innovation processes strengthening the position of European ICT industry in the Internet market.

Please refer to the examples of business opportunities fostered by U.S. networks and stakeholders provided in the previous points.

- (If applicable) Global visibility in the media of the debate on a human-centric Internet; citizens' priorities influencing the evolution of the Internet.

NGI Explorers by its nature contributed to global visibility in the media on human-centric internet, through interactions and organisation of events and webinars in collaboration with U.S. hosts. For example, explorer Martin Serrano organised a very formal webinar in collaboration with NIST while explorers.

Partners

Civitta | ESN - European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 57 of 66

Business Accelerator for NGI >>>>

info@tetraproject.eu | business.ngi.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



4.6 ESSIF-LAB

What was the RIA contribution towards ICT-24-2018-2019 expected impact (where applicable)?

- Shape a more human-centric evolution of the Internet

The eSSIF-Lab project funds and accelerates projects enhancing or extending the project's Self-Sovereign Identities (SSI) framework, thus providing more open and trusted solutions for digital identities and their applications (e.g., online electronic transactions), guaranteeing privacy for all users, which is a key component of a more human-centric evolution of the Internet.

- Create a European ecosystem of top researchers, hi-tech start-ups and SMEs with the capacity to set the course of Internet evolution.
- Generate new business opportunities and new Internet companies with maximum growth and impact chances, notably through the creation of start-ups and their scaling up in Europe.

eSSIF-Lab provided one common answer to the two points mentioned above, due to the interrelation and interoperability work performed by their ecosystem, indeed, eSSIF-LAB had 54 subgrantees and the uniqueness of the ecosystem developed and the overall project's approach was the work and effort dedicated to interoperability of the solutions of their subgrantees, leading to libraries and other types of software that can be used and re-used by others. Among their subgrantees, there are integration projects that are actually proving and using softwares developed by other eSSIF-LAB-funded projects.



Important effort was dedicated also to standardisation.

An example in this regard is [Walt.id](#), a start-up established in the context of eSSIF-Lab, which developed an SSI wallet and made sure its compliance with a set of standards such as ETSI, as well several ISO and IFS standards. Four eSSIF-Lab subgrantees integrated the open-source solution of Walt.id and used some of Walt.id services to prove that the technology provided by Walt.id can be used in different sectors such as education and healthcare.

Another example highlighted by eSSIF-Lab is [Evernym](#), which was acquired by Avast for an undisclosed amount between the end of 2021 and beginning of 2022. The activities of Evernym within the eSSIF-Lab programme were focused on developing an open-source issuer and holder verifier structure of enterprise quality and worked with [IATA](#) on its application in an environment such as airports., in particular, in relation to COVID-19 pandemic. Evernym demonstrated that their solution can be easily integrated into IATA applications, by allowing users to easily demonstrate their “COVID-19 compliance” (e.g., vaccines and swabs). They also actively worked on standardisation as one important aspect to be standardised was the protocol automatically guaranteeing vaccination certificates of end-users who would simply need to share the specific certification. The protocol’s interoperability is compliant with Aries.

A third example highlighted by the project is [Sphereon](#), which focuses on bringing a protocol for presentation exchange (DIF Presentation Exchange) to DIF/W3C SSI solutions compatible with Aries Present Proof Protocol v2 using a layered approach to achieve both integration and interoperability.

Several other eSSIF-Lab subgrantees already made use of Sphereon open-source implementation which is now being standardised and about to be ready for publication. For example, [Gataca](#) subgrantee made their own implementation of the same protocol and together with Sphereon,

Partners

Civitta | ESN - European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 59 of 66

Business Accelerator for NGI >>>

info@tetraproject.eu | [business.ngi.eu](#)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



performed an interoperability test to demonstrate different compatible implementations.

The eSSIF-Lab ecosystem was mainly composed of start-ups, SMEs and research organisations.

- Integrating research and innovation communities; development of common visions and enhanced science – industry collaborations in each of the technology domains.

As mentioned above, eSSIF-Lab ecosystem, besides being characterised by the “interoperability approach”, was composed mainly of start-ups, SMEs and research organisations. There are even universities taking part in eSSIF-Lab programme, such as Athens University of Economics and Business in the context of the project [Enabling Zero Trust Architectures using OAuth2.0 and Verifiable Credentials \(ZeroTrustVC\) implements Authentication and Authorization for HTTP-based resources using JWT-encoded Verifiable Credentials](#).

Different start-up/SME subgrantees, such as Gataca, collaborate with local universities, all revolving around one core value: Self-Sovereign Identities, consisting in the idea it is possible, on one hand to reduce bureaucracy in a more efficient way, compared to centralised databases, and on the other, having higher levels of assurance which could for example allow making business decisions faster, more effectively and with lower risk. To summarize: reducing bureaucracy while maintaining privacy.

- (If applicable) European research and innovation leaders driving the debate for a human-centric Internet research and policy strategy.

eSSIF-Lab organised regular meetings with actors such as EBSI (European blockchain Service Infrastructure) and eIDAS (electronic IDentification

Partners

Civitta | ESN - European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 60 of 66

Business Accelerator for NGI >>>

info@tetraproject.eu | business.ngi.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



Authentication and Signature) representatives to coordinate several eSSIF-Lab subgrantees' components contributing to the EBSI programme, guaranteeing also their compatibility (e.g. [Walt.id](#), [Gataca](#), [Danube Tech](#)).

With regards to eIDAS, contributions were provided by, for example, [Quadible](#) which integrated AI technology in their platform to ensure continuous authentication of end-users by learning their behavioural patterns such as the way they move, the way they use their devices, their biometrics and transactional patterns.

Several eIDAS privacy requirements received different inputs from the community eSSIF-Lab is part of.

Additionally, eSSIF-Lab was in constant dialogue with the ITRE Committee of the European Parliament and held meetings with ISED (Innovation, Science and Economic Development Canada) as explained in this [report](#).

- (If applicable) New Internet applications / services, business models and innovation processes strengthening the position of European ICT industry in the Internet market.

eSSIF-Lab contributed in this regard through their two main pillars which are respectively infrastructure-oriented and business-orientes. Within the latter, business coaching (e.g., business planning and pitching) was provided by eSSIF-Lab partner Bluemorpho. An example in this regard is [Genia](#) with their project Upstream Dream which, during their business coaching, realised how their target market and market maturity was not ready yet (e.g., eIDAS compliance) with their original business idea, which led to a new adaptation of their business model.

- (If applicable) Global visibility in the media of the debate on a human-centric Internet; citizens' priorities influencing the evolution of the Internet

Partners

Civitta | ESN - European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 61 of 66

Business Accelerator for NGI >>>

info@tetraproject.eu | [business.ngi.eu](#)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



N/A.

Partners

Civitta | ESN - European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 62 of 66

Business Accelerator for NGI >>>

info@tetraproject.eu | business.ngi.eu



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147

5 CONCLUSIONS

In the previous sections elements fostering sustainability of open-source communities were explored basing on literature review and insights from NGI-Research-and-Innovation-Actions-funded projects, with concrete examples from their beneficiaries.

In the light of the above, TETRA identified elements that can contribute to fostering or that might obstruct sustainability of the NGI community. With regard to the latter, possible countermeasures and suggestions are provided.

Elements fostering sustainability	Elements obstructing sustainability
<p>NGI provides more than 600 solutions, some of which already compliant with different standards, whose majority is open-source, which in turn provide different value propositions and solutions for individuals willing to work or join NGI Community and companies or organisations willing to adopt them.</p>	<p>Possible need to incentivise periodical onsite/online meetings for NGI third parties, fostering coordination and sense of belonging. The meetings could be organised:</p> <ul style="list-style-type: none"> • Around technological clusters, with the objective of incentivising interaction among NGI third parties making use of same technologies. • Around specific problems third parties are working to solve (e.g., privacy and data portability), with the objective of exploring different approaches and technologies working to solve same problems. <p>Open and public discussions on software-related developments enabling privacy (as commons value across different NGI Projects and third parties) could be organised to motivate developers to contribute to their ideas and facilitate interaction across NGI third parties Periodical participation as NGI Initiative could be considered in the context of FOSDEM, an annual non-</p>

Partners

Civitta | ESN - European Startup Network | Startup Division | IPIL | Q-Plan | FVA New Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 63 of 66

Business Accelerator for NGI >>>

info@tetraproject.eu | business.ngi.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



	commercial, voluntarily organised European event focused on free and open-source software development.
NGI third parties share common NGI and European values, enhancing motivation of its members.	By its nature, NGI does not have centralised governance. Collaboration with key open-source national actors could be established or enhanced to provide new members to the NGI Community and improve coordination and central governance of the NGI Community.
Central online repository with all clustered NGI solutions available at www.ngi.eu increases visibility of its members, facilitates marketing activities and identification of solutions basing on country, keyword, status, category.	Possible actors are identified among the countries with higher number of NGI third parties (Germany, France and the Netherlands):
Capacity building activities focused on intellectual property, OSS business model and fundraising is implemented by different NGI projects, enhancing NGI third parties' capacities of providing economic sustainability of their projects.	<ul style="list-style-type: none"> • Open-source Business Alliance e.V. (OSB Alliance) – Germany • Institut für Rechtsfragen der Freien und Open Source Software (ifrOSS) – Germany • The German Unix User Group (GUUG) – Germany • Center for the Cultivation of Technology – Germany • Open Source for Equality - Germany • Adullact – France • The Union of Free Software and Open Digital Enterprises (CNLL) – France • La Fabrique des Mobilités - France • Code for NL – the Netherlands • Delta10 – the Netherlands • SURE – the Netherlands • The Standardisation Forum – the Netherlands • The Forus Foundation – the Netherlands • The Foundation for Public Code – the Netherlands • Waag technology & society – the Netherlands
Interoperability (of NGI-funded solutions) is a factor fostering economic sustainability of NGI solutions, their adoption by third parties, standardisation, as well cooperation among NGI beneficiaries who can mutually benefit from their respective work.	
Collaboration with U.S.-based institutions and	Centralised mechanism and indicators to monitor technology maturity could

Partners

Civitta | ESN – European Startup Network | Startup Division | IPIL | Q-Plan | FVA New Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 64 of 66

Business Accelerator for NGI >>>

info@tetraproject.eu | business.ngi.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



<p>research organisations proved to be beneficial for both economic sustainability (e.g., provision of use cases) and in terms of lessons learnt on research and industry collaboration.</p>	<p>be shared or made more prominent among NGI Community members. Possible indicators could be:</p> <ul style="list-style-type: none"> • Software creation and maintenance • Code base quality • Software use • System consequences <p>Best practices on standardisation protocols could be shared and made accessible for NGI Community members.</p>
--	--

TABLE 23 – ELEMENTS FOSTERING AND HINDERING SUSTAINABILITY

Partners

Civitta | ESN - European Startup Network | Startup Division | IPIL | Q-Plan | FVA New Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 65 of 66

Business Accelerator for NGI >>>

info@tetraproject.eu | business.ngi.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147



6 REFERENCES

Napararat, D., Finnegan, P., & Cahalane, M. (2015). Healthy Community and Healthy Commons: 'Opensourcing' as a Sustainable Model of Software Production. Australasian Journal of Information Systems, 19.

<https://doi.org/10.3127/ajis.v19i0.1221>

Gamalielsson, J., Lundell, B., Sustainability of Open-source software communities beyond a fork: How and why has the LibreOffice project evolved?, The Journal of Systems and Software (2013),

<http://dx.doi.org/10.1016/j.jss.2013.11.1077>

Federico Chiarelli; Vivien Devenyi; Debora Di Giacomo; Alessandro Zamboni; Eleonora Zoboli (2020), Open-source Software Country Intelligence Report – Germany

Federico Chiarelli; Vivien Devenyi; Debora Di Giacomo; Chloé Dussutour; Alessandro Zamboni; Eleonora Zoboli (2020), Open-source Software Country Intelligence Report – France

Federico Chiarelli; Vivien Devenyi; Debora Di Giacomo; Chloé Dussutour (2020), Open-source Software Country Intelligence Report – Netherlands

Matthew B. Perrigino, Benjamin B. Dunford, Paul G. Biondich and Theresa Cullen, Benjamin R. Pratt (2020), Psychological ownership in open-source electronic medical records communities

Debora Di Giacomo, Barbora Kudzmanaite, Vivien Devenyi, Chloé Dussutour, Maha Shaikh (2020), Key success factors of sustainable open-source communities

Partners

Civitta | ESN - European Startup Network |
Startup Division | IPIL | Q-Plan | FVA New
Media Design | Pedal | LOBA | BIC Bratislava

© 2019-2022 TETRA



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 825147

Page 66 of 66

Business
Accelerator
for NGI >>>

info@tetraproject.eu | business.ngi.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825147

