

netCommons
Network Infrastructure as Commons

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Executive summary

This is the final Progress and Management report, reporting the technical summary together with financial and effort details relative to the second reporting period from July 2017 to December 2018. netCommons is now finished, as reported in detail in all the technical deliverables it has reached all its intended goals, in some areas with greater satisfaction and in others with more effort and modifying the detailed work and goals based on the feedback received from communities. Both the research and innovation parts have been properly developed, and appropriate attention and effort has been allocated at the inner and outer loop level as defined in the Description of Action (DoA).

The document is organized as follows: Chapter 1 contains the main body of reporting, with the summary of the technical work carried out in each Task, as well as the effort (PMs) devoted to each WP by each partner. Specific pointers to the technical deliverables where the objectives have been met and where the results of the project can be found help the reader navigate into the project achievements and seek the project outputs that are of major interest to him. Chapter 2 and Chapter 3 quickly update on the dissemination and data management, while Chapter 4 reports on the financial details as well as the inevitable minor deviation of work from the foreseen activity reported in Annex 1 of the DoA.

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List of Acronyms

AB	Advisory Board
B4RN	Broadband for the Rural North
CC	Community Currency
CN	Community Network
DC3	Dynamic Coalition on Community Connectivity
DMP	Data Management Plan
DoA	Description of Action
EECC	European Electronic Communications Code
FLOSS	Free Libre Open Source Software
GAIA	Global Access to the Internet for All IRTF RG
GDPR	General Data Protection Regulation
ICN	Information-Centric Networking
ICT	Information and Communication Technologies
IoT	Internet of Things
IT	Information Technology
IPR	Intellectual Property Rights
ISOC	Internet Society
LQDN	La Quadrature Du Net
MEP	Member of the European Parliament
P2P	Peer-to-Peer
PM	Person Month
RED	Radio Equipment Directive
RIA	Research and Innovation Action
RP1	First Reporting Period
RP2	Second Reporting Period

1. Explanation of the work carried out by the beneficiaries and overview of the progress

1.1. Objectives

As already done in D7.2 [1], we report here a summary of the objectives from netCommons DoA for the sake of easy reference.

“Community Networks (CNs) are bottom-up initiatives to realize communication networks with a participatory and grassroots organization that are blooming in several European Countries. Community Networks use peer-to-peer technologies to achieve an ambitious societal goal: the realization of a fairer Information and Communication Technologies (ICT) ecosystem.

The first objective of netCommons is to produce high-impact interdisciplinary research on, and together with, Community Networks, in order to resolve some of the problems that CNs face, and foster their growth and their long-term sustainability. We identify three open issues that need to be addressed to help the growth of CNs: i) their governance models, ii) their sustainability, and iii) their technical decentralization.

The second objective of netCommons is to extend the experience and the results obtained in the context of CNs to a broader research area, giving a strong contribution to the development of key themes for Internet Science and CAPS. Thus, the goal is the investigation of social, legal, political, and economic premises are needed to build a more sustainable ICT world, and how grassroots initiatives such as Community Networks can play a role to influence such process.”

All the technical deliverables foreseen by netCommons have been finalized and uploaded on the Participants' Portal. All deliverables are also available as public documents through the project [website](#). Moreover, the netCommons website gathers the overall achievements of netCommons and serves as a reference for tracing the project results. Material deriving from the long-term impact of netCommons are still being uploaded and will be uploaded for several months and years to come.

The website also hosts the [list of scientific publications](#) of netCommons, [links to Open Source software](#) developed by the project, and the [two Open Data sets](#) produced by netCommons. Since a companion deliverable (D7.5 [2]) is devoted to the scientific production, open data-sets and website impact, these activities are only mentioned here, without additional details.

The results achieved in each WP are reported in Sec. 1.3 and they broken down per WP and Task. Since this progress report marks the end of the second Reporting Period, but also of the entire project, we summarize, for each WP, the use of Person Month (PM) resources and, if needed, comment on the deviation from the projected effort anticipated in the DoA in this second Reporting Period.

Resource use, in terms of PMs is rounded to the nearest integer for readability (on ECAS portal numbers are instead reported with two digits). Where useful, for the sake of completeness, we also summarize the content of D7.2 [1] and D7.7 [3], the Technical Management & Progress Reports delivered at the end of the first Reporting Period and in the middle of this second Reporting Period; only Tasks active during Second Reporting Period (RP2) are reported. The report of per WP resource usage is split between First Reporting Period (RP1) and RP2, so that the overall picture PM allocation is clear. The PM allocation of RP1 is reported in the first line while that of RP2 and the grand Total in the second and third line respectively.

1.2. Actions and Changes after the first Review (Sept. 2017)

The first review of the project, ending RP1 was held in Brussels on September 22, 2017. It was characterized by a frank and open discussion that helped us focusing better the work to be carried out and how to improve dissemination and the presentation of the work to maximize the impact. A minor rewording of D4.1 (D13) “European Legal Framework for CNs (v1)” [4] was suggested and promptly implemented.

All the other comments were discussed in the review report, reported here for the sake of completeness (see Appendix A), where compensative actions were proposed and accepted in October 2017. Most notably an amendment to the DoA was proposed adding D3.6 (D47) “Deployment experiences with a Multi-Disciplinary approach” [5] to allow more time for the interactions between netCommons and CNs to refine the participatory design methodology studied and developed in Task 3.1.

During the review it was also made clear that deliverables will only be considered during the final review, and not assessed and accepted during the course of the project. For this reason some deliverables, which do not represent a milestone, but only archival documents made available to the community, were delayed in order to include additional work and dissemination results, as well as to guarantee a better final output thanks to longer discussions and multi-cycle improvements of the document. In no way this has ever slowed down the work of the project.

1. Explanation of the work carried out by the beneficiaries and overview of the progress

1.3. Explanation of the work carried per WP

1.3.1. WP1 "Governing the CNs: Organizational Models for Sustainable Growth and Advocacy Capacity-Building"

Total Resource usage

PM used: RP2 (RP1)	Total PM in DoA	Comment
12.6 (27)	36	No major deviation observed, the WP required some more resources than planned

Per partner person months

	UniTN	UPC	UoW	CNRS	nethood	AUEB-RC
RP1	0.5	17.0	0.3	8.2	–	1.0
RP2	0.4	5.9	–	6.3	–	–
Total	0.9	22.9	0.3	14.5	–	1.0

Deliverables foreseen during the reporting period with due month and actual delivery

- D1.4 Report on the Governance Instruments and their Application to CNs (v2) — M24 (December 30, 2017)
- D1.5 Community Networks and Political Advocacy — M24 (February 19, 2018)

WP1 ended at M24, thus during this second reporting period lasted only six months, producing the two deliverables listed above. D1.4 [6] concluded Task 1.2, completing and extending the work presented in D1.3 [7] at the end of RP1. D1.5 [8], instead addresses how CN activists can achieve leverage on regulators and policy-makers to foster the well being of CNs.

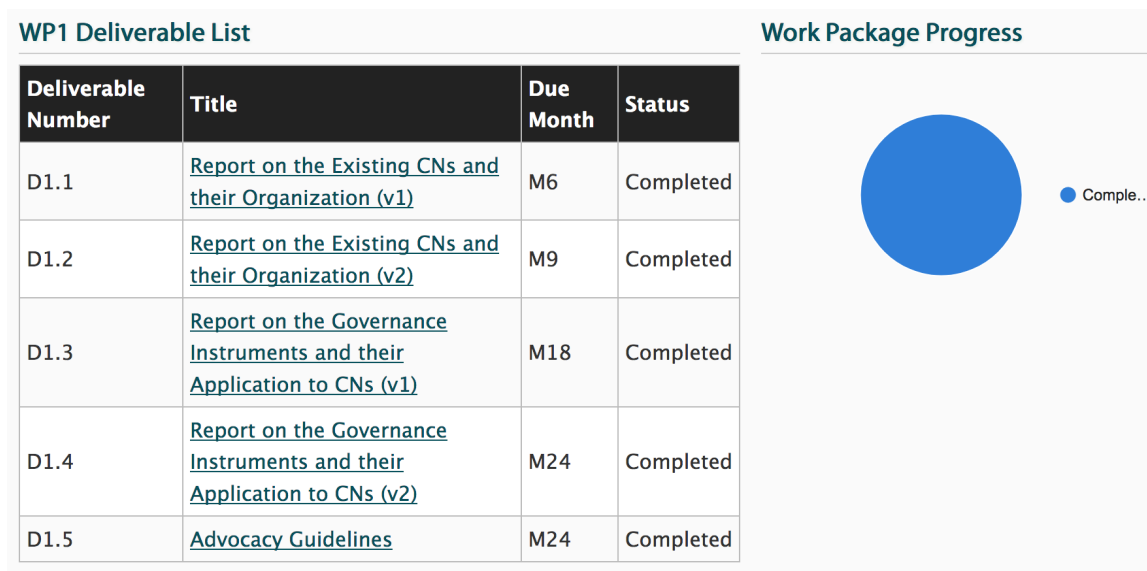


Figure 1.1: WP1 completed all the work and deliverables foreseen in the DoA

Detailed per Task Report

Task 1.2	Title: Improving governance: maximising the impact on CN
Leader: UPC	Contributors: CNRS
Duration: M11–M24	Output: D1.3 (D16), D1.4 (D19)

Continuing the work presented in D1.3 [7], the Task organized activities along five lines reflected in the organization of D1.4 [6] and briefly summarized below. The last part of work focused on the application of previous results towards re-engineering CNs: comparisons of internal and external organizational models and patterns, and interaction with selected CNs to incorporate sound governance instruments within the management of CNs. Finally, the Task also tackled local applications use analyzing the case of community clouds in guifi.net, formalized as an open commons framework, and sustained by the software development in WP3. The results achieved in influencing CNs are extremely satisfactory. Indeed, not only CNs members and activists welcomed the interaction with netCommons researchers, but it turned out that in many cases they seek for external recognition and also external support and cooperation.

- **Comparison of external organizational models.** For the comparison of the features of external organizational models, we have looked at several CNs, some already studied in RP1 and new ones, and discussed with members or representatives of each of them. We have worked with them to identify and diagnose opportunities for organizational development and refine their and our own models and provide a basis for comparison.

CNs differ in many aspects but all share the value proposition of reduction of the digital divide in their communities. This is achieved with different services, usually comprising at least voice calls and Internet access. In one interesting case, given the lack of basic infrastructure, the solar-powered communication network also supports electricity and lighting for node hosts. In all cases communities have strong bounds with their local environment, and they need and count on the support of a range of local key partners. Participants are often called customers, and the customer relationships are more or less formalized depending on the maturity and scale of the models. The sustainability models relate to the balance between costs and revenues, either direct or indirect. We typically find the need for voluntary work, external required contributions (donations) such as hardware or backhaul. The typical source of direct contributions are usage fees, but in some cases these cannot cover the costs and therefore additional contributions have to come from donations or other external sources. A wide range of indirect benefits, typically positive social impact in the target communities, are diffused, but differ in each locality. These positive impacts on the communities are important to determine, understand and maximize, even though they may be hard to quantify.

- **Comparison of internal organizational models.** In contrast to the external organizational model, which show how a CN interacts with its environment, the inside view provides the anatomy and the physiology of a CN. The internal organizational model represents the architecture of the governance instruments involving the participants of a CN that makes its external organizational model work. Instruments adopted can be summarized into five groups: 1. Good practices, 2. Procedures and internal regulations, 3. Agreements, 4. Ground rules, 5. Local socio-legal framework/environment. The organization and interrelations of the functions and instruments of each group is complex and influenced by local practices, legal framework and many other factors. Interestingly, the degree of formalization of the external model is directly related to the degree of formalization of the internal model. Several aspects seem to have an influence on the structure of the internal and external canvas. As the scale of a CN grows, the time, complexity and therefore cost of coordination also grows, and coordination can be facilitated by stipulations, like organizational procedures, computer-support tools, and more, as interactions are decoupled from being in the same place and same time.
- **Mapping of organizational patterns.** The organizational patterns and anti-patterns (i.e., negative pat-

1. Explanation of the work carried out by the beneficiaries and overview of the progress

terns) were identified and described in D1.3. The patterns and anti-patterns identified cover most of the relevant elements of the generic internal view identified before. The final part of the Task extended the analysis in D1.3 with a mapping of these patterns and anti-patterns with respect to the CNs cooperating with netCommons.

- **Analysis of organizational change.** This part of the work has been devoted to follow the organizational changes (*re-engineering*) that some CNs started as a consequence of the interaction with netCommons. The timing of these changes are not under the control of netCommons, because we do not have control on the timing when communities may (or may not) adopt practices, take decisions and implement them, so the work carried out analyzed which CNs took action during the course of the project and which may follow later on.
- **Community Clouds in guifi.net.** We have developed an organizational framework for community clouds as open commons. This work has been a joint activity between netCommons and the guifi.net Foundation that has contributed a lot of time and ideas to develop this model. The extension of the organizational framework beyond the networking service to include computing and storage resources, platform services and application oriented services is a major contribution to expand the organizational and governance model of CNs to a new domain, cloud computing, and a timely basis for pilot activities with Cloudy in the third year of the project, where the model can be tested and revised from the experience of using Cloudy in other communities.

Task 1.3	Title: Advocacy capacity-building: maximising the impact on the policy maker
Leader: CNRS	Contributors: UPC
Duration: M18–M24	Output: D1.5 (D20)

This Task has built new advocacy reasoning based on D1.3 [7], D1.4 [6], D5.1 [9] and D2.2 [10].

The work of the task presented in D1.5 [8] answers the following questions: What are the appropriate organizational modes to engage in political advocacy in order to foster the growth of community networks as cooperative platforms? What are the successful mediation of their interactions with other actors in the telecom sector and the local, national and European policy environments? In short, how can a CN build political advocacy capacities?

After the appropriate analysis of past success (and not) stories, the deliverable presents four sets of recommendations to help CNs organize their advocacy capabilities and activities. These four sets of recommendations contributed to the goals and impact of netCommons in the following ways:

- Explains why advocacy is key to ensure legal sustainability and growth for CNs, and how CNs can contribute reforming telecom policy;
- Surveying advocacy tools and practices of CNs so that efforts may become more effective even with limited resources; indicating forms of collaborations with other civil society initiatives on the commons and digital rights fields in order to join forces and develop long-term partnerships;
- Developing governance internal processes proposed in Task 1.2 to define underlying political values prior to developing policy positions to contribute to the legal framework to improve decision-making processes;
- Raise awareness on the commons-based alternative models and values carried by CNs to all MEPs involved in telecommunications law reform; include CNs and CNs support framework in UNESCO indicators on Internet Universality.

This work has been functional to further legal analysis and recommendations developed in WP4. In this deliverable, we also presented the Notes on the European Electronic Communications Code that have been an important part of the advocacy effort in netCommons.

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1.3.2. WP2 “Sustainable Growth in CNs: Socially, Economically and Technically Sustainable CNs”

Total Resource usage						
PM used: RP2 (RP1)		Total PM in DoA	Comment			
11.1 (39)		37	No major deviation observed in RP2			
Per partner person months						
	UniTN	UPC	UoW	CNRS	nethood	AUEB-RC
RP1	7.5	–	14.8	–	6.4	14.7
RP2	3.7	–	–	–	1.1	6.3
Total	11.2	–	14.8	–	7.5	21

Deliverables foreseen during the reporting period with due month and actual delivery

- D2.6 Economic Sustainability of CNs (v2) — M24 (May, 2018)
- D2.7 Monitoring CNs: Report on Experimentations on CNs (v2) — M24 (December, 2017)
- D2.8 Incentives for Participation in CNs (v2) — M30 (October, 2018)

WP2 considered the sustainability of CNs. Its goal was to define the politics and the ethical principles behind CNs, and propose a correct definition of sustainability in the context of CNs with reference to all its different dimensions (social, economic, political, technological and ethical). Next, it studied incentives for the bootstrapping and sustainable growth of the CNs and monitoring tools to study the sustainable growth of communities. The three deliverables in the second part of the project go in depth in each of the mentioned items.

Detailed per Task Report

Task 2.2	Title: Incentives for Participation and Active Collaboration in CNs
Leader: AUEB-RC	Contributors: Nethood
Duration: M4–M30	Output: D2.3 (D8), D2.8 (D28)

While Task 2.1 has been concerned with the broader notion of sustainability in CNs, Task 2.2 deals with how the sustainability objective can actually be realized in these networks.

The research work during the first reporting period, as summarized in D2.3 [11], addressed more holistically the term incentive, covering procedures, practices and mechanisms that could serve the rich socioeconomic and cultural context of sustainability. On the contrary, in this second reporting period, the research activities focused on incentive mechanisms from a purer economic viewpoint. Hence, D2.8 [12] is devoted to ways to share the deployment and operational costs of a CN as well as the possible revenues from it, which can incentivize the engagement of different CN stakeholders. Existing and newly introduced pricing policies, subscription schemes, and network deployment cost sharing are analyzed and assessed in this respect.

This way, D2.8 serves the more ambitious objective in task 2.2, i.e., to develop elements of a theory for the economics of community networks. Such a theory has been missing so far; in very few cases has the deployment of a CN followed some “business plan”. As many of these initiatives mature and questions of scalability and sustainability become more relevant, people running these networks will increasingly pursue insights and guidelines for sustainably funding the deployment and operation of their CNs. D2.8 could be seen as one of the first attempts to: (a) identify existing relevant research work in economics, primarily, and computer science; and (b) carry out novel research, that could serve this purpose. Note that this work is instrumental for the recognition

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Figure 1.2: WP2 completed all the work and deliverables foreseen in the DoA

and thus acceptance of CNs as players in the arena of communication networks. While we know almost everything about classical network economics, since we cannot still frame CNs in some accepted economic theory, it is hard to explain them to policy makers and give a perspective view of their future development. The theoretical work carried out in task 2.2, and D2.8 in particular, has contributed to fill this knowledge gap.

The work in D2.8 is inspired by the economics (one could use the term “business models”) of concrete CN instances, which are highly representative of the broad variety CNs exhibit with respect to the different types of actors involved in them and the environment in which they grow (rural vs. urban): Broadband for the Rural North (B4RN) CN in Lancashire, UK, guifi.net CN in Catalonia, Spain, and Sarantaporo.gr CN, in Greece. The first two CNs represent CN success stories in Europe and worldwide, with strong elements of novelty in the chosen technology, business model, and strategy. The third CN is a younger initiative, which has been strongly dependent on public subsidy during its deployment phase, and has now been experimenting with novel subscription schemes to render its operation self-sustainable. Both the models and the proposed/analyzed mechanisms can find application to many more CNs across the world, possibly with adaptations accounting for the particularities and constraints of the specific environment.

Briefly, we summarize a model for determining optimal subscription prices for wireless CNs, which captures the evolutionary growth of wireless community networks, giving insights to the relation between the original investment on the network infrastructure and proper pricing policies. This model is also at the base of a research effort that bridges WP2 and WP3 on the scalability of CNs, reported in D2.8 and D3.5. We focus also on the distinct model of the B4RN CN for deploying fiber cable infrastructure and propose the truthful cost sharing mechanism as a tool for managing the funding of the project and concluding upon its economic sustainability. Analysing the existing models in light of the available literature motivated proposal of an innovative subscription scheme that has been introduced in the Sarantaporo.gr CN as a means to motivate the engagement of the

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community in its funding. We study its features in an analytic framework, and give concrete advice to the community.

Finally, we analyse from a theoretical point of view the synergies with for-profit entities (a key part of the Guifi.net expansion). We propose and analyze models for such synergies in two different scenarios: (a) the for-profit actors provide Internet access over the shared community network infrastructure; and (b) the shared resources are storage space and computational capacity. In particular, we explore the suitability of different cost-sharing mechanisms regarding the equilibrium strategies they induce in the games that emerge between the involved for-profit actors.

Task 2.3	Title: Economic Sustainability and Alternative Currencies
Leader: Nethood	Contributors: AUEB-RC
Duration: M4–M28	Output: D2.4 (D9), D2.6 (D21)

There are at least two very good reasons that render the study of alternative currencies worthwhile in the context of CNs. First, studying the relevance of alternative currencies to the economic sustainability of CNs is very important in light of the recent hype around combining cryptocurrencies with Internet access sharing –a development which was not anticipated at the time of writing the netCommons proposal. Second, by its very nature, the design of a Community Currency (CC) involves the decomposition of an economic system, in our case the CN, and its surrounding economy, into different parts. This process helps in identifying structural issues and opportunities for collaboration with other sectors of the economy, which could be pursued even if the corresponding community currency is not actually implemented.

In the second half of the project we have explored novel currency models that could serve the needs of CNs, as these stem from their distinct economic, social, and political dimensions. More specifically, in D2.6 [13] we refine and analyze the district currency model, a “commons-based” currency model, and we improve and further develop a simulation game based on this currency model. The game has proven most successful in both explaining the district currency model itself and revealing some of the basic principles behind the nature of money and the complexity of currency design. In D2.6, we report the game design as well as the lessons learned through six implementations of it. We also include guidelines for people who wish to run their own variants of the game.

The task has also analyzed possible integration scenarios of existing alternative currency models with different types of community networks, from the novel and untested district currency model to the most visible success stories in this field like Sardex.net, including possible combinations of those. This analysis and the resulting community currency schemes are then presented as alternatives to current assumptions of how an economy built on top of blockchain-based schemes, like Ammbr, could look like. More specifically, we stress the need to distinguish between the “accounting” function that cryptocurrencies perform and the management of tokens, which could be in line with the principles of commoning, promoted by netCommons.

Task 2.4	Title: Monitoring instruments for CNs
Leader: UniTN	Contributors: AUEB-RC
Duration: M4–M28	Output: D2.5 (D10), D2.7 (D22)

The focus of Task 2.4 has been on producing instruments to monitor the sustainable growth of CNs from both technical and social viewpoints. These instruments are intended to serve as open source libraries that the CNs can use to embed into the web-based platforms they already use to manage their communities.

Through the multi-layer analysis of an existing network (ninux.org) in D2.5 [14] (in RP1), we have shown that the network features several sustainability problems related to the presence of single points of failure. In Deliverable D2.5 we describe a set of metrics, together with the source code needed for their computation,

1. Explanation of the work carried out by the beneficiaries and overview of the progress

which let someone “feel the pulse” of a CN and understand their level of decentralization and the possible presence of single points of failure. Such metrics are applicable to the network topology graph of a CN, but also to the social network graph, which can be derived through the analysis of communication instruments used by the community such as mailing lists. With these instruments, it is possible to perform a multi-layer analysis and identify those CN nodes that are critical for the robust operation of the network as well as those people who are key for the community to thrive. Since people own nodes, the two factors are strongly correlated and must be analysed together.

In D2.7 [15] we have further developed this theme in two directions. The first one is the development of new metrics, theory and source code. This thread has been largely assisted by scientific publications that let us delve deeper into the methodology and develop it further according to the feedback from the academic and research community. The analysis of two running networks suggests that CNs, albeit being part of the family of “spatial networks”, behave in a different way depending on external conditions. In spatial networks, contrary to other networks such as social networks, the nodes have a distinct position in physical space. Models of spatial networks typically tend to generate networks with a strong spatial hierarchy, where the geographical areas under the “influence” of each node are disjoint. In our study, one of the analysed CN confirms this, while another exhibits a different pattern. We consider this an important result strongly pointing to theory gaps like those mentioned earlier with regard to the network economics field in task 2.2. Whereas there are countless research works that explain the features of traditional communication networks under a graph theoretical point of view, we lack a grounded theory that explains how CNs evolve under a topological point of view. This gap make CNs hard to explain and hard to consider by the research community as realistic alternatives to the well-known model of traditional networks; our research has tried to fill this gap.

The second direction of progress has dealt with the integration of the aforementioned metrics with existing software monitoring tools of CNs. In this regard, our work has focused on two currently used platforms, NodeShot and OpenWISP2. The two pieces of software have been created by members of the ninux.org network and by a community of people including a few developers from ninux, respectively. Whereas NodeShot is only used by the ninux community, OpenWISP2 is of broader interest; thus, we have focused our developments on this platform. We integrated in OpenWISP2 a new visualization mode for a generic network map, which enables the community, or the network manager, to spot critical points of failure, focusing on the features of the network topology. We also interacted with several ninux islands, showing the results of our analysis. We have shown (see the letters attached to D2.7 and D6.3) that the results of our research have raised concerns and stimulated at least two islands (Florence and Cosenza) to take actions to change their way of making new nodes, both in the technical and in the organizational approach.

1.3.3. WP3 “Enriching CNs: Applications, Technical Excellence, Local Fruition”

Total Resource usage

PM used: RP2 (RP1)	Total PM in DoA	Comment
45.7 (48)	64	No major deviation observed, as in RP1 more effort has been devoted to the WP than foreseen in the DoA

Per partner person months

	UniTN	UPC	UoW	CNRS	nethood	AUEB-RC
RP1	20.6	13.0	–	–	5.5	8.7
RP2	24.4	4.3	–	–	5.9	11.0
Total	45	17.3	–	–	11.4	19.7

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Deliverables foreseen during the reporting period with due month and actual delivery

- D3.3 Multi-Disciplinary Methodology for Applications Design for CNs, including Design Guidelines and Adoption Facilitation (v2) — M24 (April, 2019)
- D3.4 Release of New Open Source Software for All Applications (v2) — M24 (March 2019)
- D3.6 Deployment experiences with a Multi-Disciplinary approach — M31 (October 2018)
- D3.5 Report on the Results of the Socio-Technological Experimentation of Open Source Software — M36 (January 2019)

WP3 is structured along four different tasks. Task 3.1 is devoted to understanding methodologies of participatory design and adapting them to the environment of CNs. Tasks 3.2, 3.3 and 3.4 are instead focused on the development (or adaptation) of software applications for CNs.

Although the two lines of action are not explicitly pipelined, they are correlated, as the methodology proposed by T3.1 was tested and applied in the other tasks. In one case it was possible to test the development of a new application using the methodology “from scratch”, in the other two cases it was used to guide the deployment of the applications.

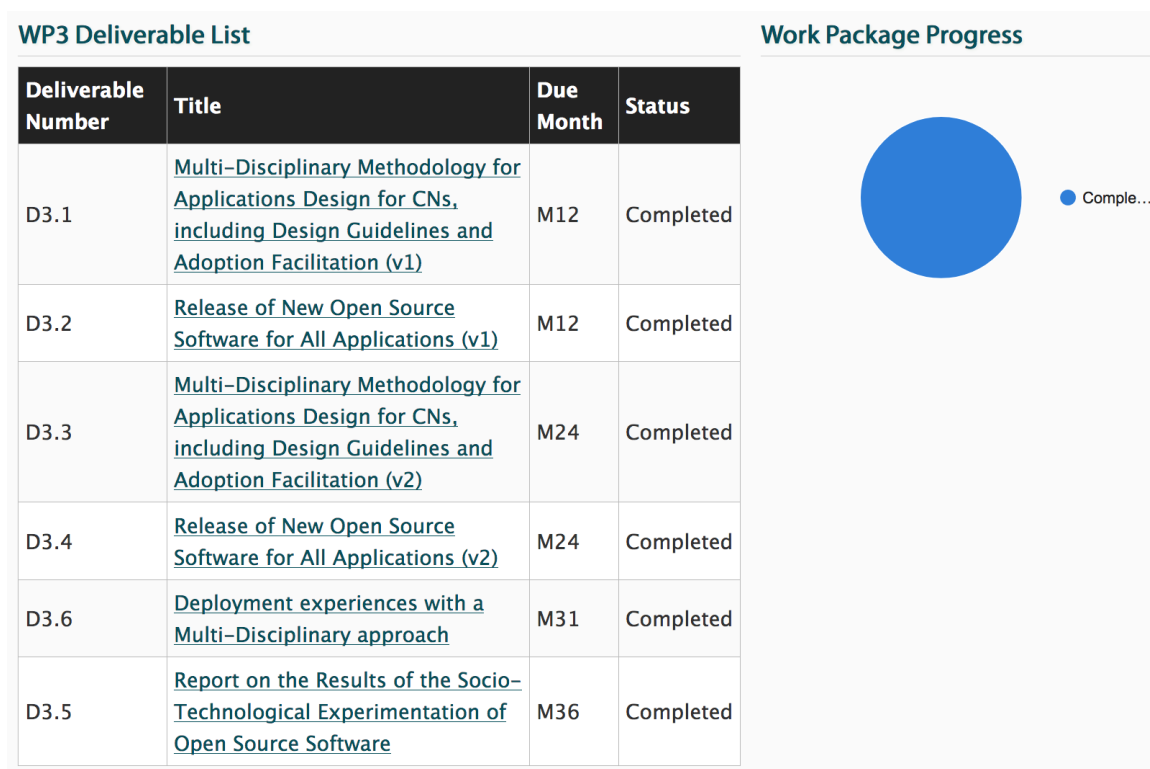


Figure 1.3: WP3 completed all the work and deliverables foreseen in the DoA

Detailed per Task Report

Task 3.1	Title: Transdisciplinary methodology for participatory design and adoption of local applications
Leader: Nethood	Contributors: UniTN, UPC, AUEB-RC
Duration: M4–M24	Output: Deliverable D3.1 (D11), D3.3 (D12), D3.5 (34), D3.6 (D47)

Applications for CNs should aim at two main development goals.

- They should operate toward local collective awareness, social cohesion, citizen engagement, and conviviality. This should be a shared goal between active participants of a CN, local communities and citizens that could be served by the CN, and local authorities that can facilitate the process.
- They have to be autonomous and run without relying on the existence of Internet connectivity.

To achieve the first goal, in netCommons we have early aimed at engaging citizens in the design process and build context-specific applications that address real needs of real communities. In Task 3.1, we have developed a participatory design process methodology that was first presented in D3.1 [16] (in RP1) and then finalized in D3.3 [17] and D3.6 [5] and has been subject to a continuous process of monitoring and improvement, as reported in D3.5 [18]. The methodology has been published in D3.3 and D3.6, and is has been condensed in a booklet¹ and a set of “cards”² ready to be used for its application in field. By nature, the methodology is a moving target, always improving and evolving, and it has become an asset for NetHood participatory research activities³.

The methodology was shaped by:

- Different threads of field work experience. The main one is the long-term process initiated at Sarantaporo.gr Community Network including both a “learning” process and an “app design” process. Other relevant experiences are the creation of a new neighbourhood CN in Athens, the participation in the development of a Free Libre Open Source Software (FLOSS) platform for self-organized learning in the city (Openki.net), and the development of a participatory design process for a similar scenario in a pilot in Zurich for the CAPS project MAZI;
- Knowledge exchange with other CAPS projects that have expertise and activities around the topic of participatory design, addressing the question of how we can produce generic methodologies and lessons learned out of highly contextualized experiences;
- A Re-reading of the Open Technology Institute⁴ experience in the US through the lens of our own recent experiences in the field and discussions with activists that participated in the SEED Grants project.

The methodology is based on two components: The first is a list of recommended actions that might need to be taken by the project team, organized in different Processes, and Threads, together with evaluation metrics. This list has been compiled based on our own experience in the context of the Sarantaporo.gr case study, and more specifically the design of a smart farming application called AppLea, but also other experiences around the world, as described in D3.3. The second component is a recommended process for team work inspired partly by popular agile methodologies like Scrum, and Jazz improvisation. The process, which draws an explicit analogy with music, has been composed toward the end of the project and is currently under test.

The principles of the methodology were proposed in D3.1 and its first draft was included in D3.3. In Y3 of the project we delivered D3.6 and D3.5 that contain the final version and the results of its use and experimentation within CNs we cooperated with in netCommons. Feedback about the methodology was collected in two different ways: 1) through personal interviews and 2) through detailed reviews received by those involved in the three

¹ See <https://www.netcommons.eu/sites/default/files/pd-methodology-booklet-v0.6.pdf>.

² See https://www.netcommons.eu/sites/default/files/pd-methodology-booklet-v0.6_cards.pdf.

³ See <http://nethood.org/studio/>.

⁴ See <https://commotionwireless.net/>.

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different software development tasks. The feedback led to the improvement of the recommendations' list and the simplification of the overall process. The decision to shape the methodology together with the development of AppLea (see Task 3.4) was key to the successful development of the methodology since AppLea is the only software that has been fully developed inside the project and has proven to be a fundamental source of feedback for the methodology itself.

Task 3.2	Title: Community Clouds
Leader: UPC	Contributors: Nethood
Duration: M6–M36	Output: D3.4 (D24), D3.5 (D34)

Task 3.2 focuses on Cloudy, a GNU/Linux distribution designed to host local applications inside a CN. It was first released as the product of the CLOMMUNITY FP7 project and it was further developed and maintained within netCommons. One of the key limitations of Cloudy at the end of CLOMMUNITY project was the complexity of adding and maintaining new applications in the bundle of applications present in and supported by the distribution. To solve this issue, the Cloudy distribution has been “dockerized”; namely, as described in D3.2, the many applications it supports run in Docker containers.

In the second half of the project, the focus of Cloudy-related work has been on the continuous development, maintenance, and the extension of Cloudy with more proof-of-concept modules that made it appealing for new and future applications. On the development side, D3.3 introduced the Docker-compose functionality in the Cloudy architecture, which enables developers to propose complex services that require more than one docker containers for higher reliability and security. This was not possible before and now is the building block to support new and complex applications. Among them, we mention the fact that Cloudy was further expanded to support the Internet of Things (IoT) world, which is one the hottest topics in ICT these days.

Furthermore, Cloudy was at the center of the development of two new technologies, Information-Centric Networking (ICN) and Blockchains. In the first case, the Umobile project⁵ used Cloudy as the base platform to test, for the first time, the use of ICN on mesh networks. In D3.5 we report on these advances and current ongoing publications. Note that ICN is a theme that has received a large attention from the ICT community and thus, it is extremely important to start to shape and test its application to mesh networks, in order to show that mesh networks can actually catch-up with the recent advances in networking coming from other fields. In the second case, UPC was involved into the experimentation of Blockchain for mesh networks by the AmmbrTech start-up, which is a recently created company investing in Blockchain-based mesh networks. Blockchain for networking and mesh networks is another theme that is raising attention, and AmmbrTech is one of the first players that moved in this challenging market. We consider this collaboration as a positive result of the project, and their interest as a recognition of the value of our work. UPC will continue to cooperate with AmmbrTech after the end of netCommons in a testbed set-up within the Guifi network. This cooperation were documented in D3.6 and also in D6.3 [19].

T3.2 made further advances in the research related to service and gateway placement in CNs, which will guide the future work on evolution and optimization of the Cloudy service.

Task 3.3	Title: Live Streaming Software (PeerStreamer)
Leader: UniTN	Contributors: UPC
Duration: M6–M36	Output: D3.4 (D24), D3.5 (D34)

Task 3.3 is dedicated to Peer-to-Peer (P2P) video streaming. In particular, Task 3.3 has selected PeerStreamer as the base platform for further development. PeerStreamer is a P2P live video streaming platform developed in the EU FP7 NAPA-WINE project. T3.3 has developed PeerStreamer adapting it to the many platforms a CN

⁵UMOBILE: H2020 #645124 project: <https://cordis.europa.eu/project/rcn/194285/factsheet/en>, <http://www.umobile-project.eu/>

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can use. After submission of D3.2 [20] PeerStreamer was already able to run directly on wireless routers (with OpenWRT/LEDE operating system that is used by thousands of nodes in many CNs).

Subsequent work has led to integrate PeerStreamer with the new docker-based Cloudy platform and Serf, the P2P service discovery mechanism adopted by Cloudy. This integration has required substantial work since the application had to be re-engineered to become a web-based application and yet, we do not have the necessary support from open source software and open standards to provide a seamless, universal, peer-to-peer live streaming solution. At the end of the Task, as described in D3.4 [21], PeerStreamer is a full-fledged live streaming solution that leverages the Cloudy platform to provide a distributed live video streaming service for CNs, based on the Open WebRTC standard. The PeerStreamer-ng application was completed with PartyHub, a component to realize many-to-many video-conferencing. PartyHub is now included in the main tree of PeerStreamer-ng and it can be used both online and within community networks. This development opens the way to many new fields of applying this technology, as it is the first (to our knowledge) open source peer-to-peer live conferencing system available.

To achieve these results we engaged several CNs in a process of testing and feedback of various kinds, as described in D3.5 [18]. We have tested PeerStreamer-ng and PartyHub in several occasions and it was used in two groups of the ninux community network (see D3.5 but also the letters included in D6.3,[19]). The process of interaction with CNs led us to better shape not only the software, but also the narrative around it, in an effort to come up with a design that brings a practical advantage to CNs in the use of PeerStreamer.

D3.5 reports also on two more software development activities that were carried out in the last year of the project. Even if they were not part of the specific objective of the work packages, they are integral part of our development efforts together with the ninux CN: the first deals with a hardware/software project promoted by one of the members of the ninux network which we helped supervise also thanks to the multi-disciplinary methodology, and that is now having an interesting development with the foundation of a start-up; the second is the beginning of a new ambitious software project, which tries to bridge the work in WP2 and WP3 on the scalability of CNs and to offer communities a tool to predict the evolution of the network as it grows, helping to take the correct decisions in investing and setting-up new nodes. This latter project uses open data to predict the scalability and affordability of a mesh-based CN in a specific geographical area, depending on the density of buildings, their height, the performance of current radio devices and their cost. This effort was guided by the need to try to quantify how much we can make CN networks scale maintaining their distributed, mostly unplanned approach. We now have a base on which we can propose new research in the next years, with the goal to give specific and grounded suggestions to the communities, but also to the policy makers on where a mesh network can be used successfully, where it can compete with other technologies, and where instead it might be less convenient than other technologies.

Task 3.4	Title: Crowdsourcing Software
Leader: AUEB-RC	Contributors: –
Duration: M6–M36	Output: D3.4 (D24), D3.5 (D34)

Task 3.4 deals with the development of the AppLea mobile application (formerly named CommonTasker). A preliminary release of this new application was made available after D3.2, and its goal was to crowdsource tasks in a CN. The general idea was that CN users can use the application to jointly organize events and actions, exchange knowledge and tips on their work, get help with manual tasks, and even share tools and machinery with each other. During the second half of the project the app was largely modified compared to the initial design, thanks to constant interaction and feedback received from the members of Sarantaporo.gr community network. It is now stably used by a group of farmers in the Sarantaporo.gr community network.

The development of AppLea was initiated as a brand new project by the AUEB team for the community of Sarantaporo.gr and progressed as a highly participatory design process, building on the methodology developed in T3.1. The mobile app was being continuously tailored to the needs of the community based on continuous

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interactions involving AUEB, Nethood, and local community members. As a result AppLea was tailored to the collection of data from the local farmers on their every day activities in their farms and aims to become their de facto smart assistant and online calendar. Through several custom-made modules of the app, the users can: (a) build profiles comprising the size and location of their farms/fields, the cultivation and its type (biological/traditional), as well as machinery they possess; (b) log all kinds of activities they carry out in their fields; (c) share data with other farmers in controllable manner with granular self-control on the privacy of their entries; (d) filter these entries across time/field/cultivation and construct reports for agronomists or cooperatives; (e) have in-app embedded information about weather, relying on local weather stations; (f) exchange photos out of their farms and tips through chatting through a customized social component.

At the same time, these data can become the missing cornerstone for the provision of smart farming services to the community by external stakeholders/commercial service providers over the CN. This way, the app turns the CN into a key asset for both the community and external stakeholders, scaling up the importance of the CN for the local economy and paving the path for long-term synergies that can foster the sustainability of the network.

The third year of the project marked the beginning of the actual experimentation with the app under actual conditions of intended use. Decisive to this end, much as throughout the app participatory design and development process, was the engagement of the local community of the Sarantaporo.gr CN. The feedback from this field of experimentation has been the main driver for the development activities around the app. AppLea now has a stable base of users, documented in D3.5.

We consider AppLea a key result of netCommons, as it marks a product of three key assets in the netCommons project: the development of open source software, the multidisciplinary methodology, and the involvement of CNs from the very beginning of the software design process.

1.3.4. WP4 "CNs as Commons"

Total Resource usage						
PM used: RP2 (RP1)		Total PM in DoA	Comment			
51.2 (20)		45	No major deviation observed, but also WP4 required more resources than planned			
Per partner person months						
	UniTN	UPC	UoW	CNRS	nethood	AUEB-RC
RP1	13.4	–	–	6.5	–	–
RP2	22.6	3.0	8.8	16.8	–	–
Total	36	3.0	8.8	23.3	–	–

Deliverables foreseen during the reporting period with due month and actual delivery

- D4.2 European Legal Framework for CNs (v2) — M24 (January 2018)
- D4.3 European Legal Framework for CNs (v3) — M30 (August 2018)
- D4.4 Political and Ethical guidelines for an Alternative Internets — M33 (December 2018)
- D4.5 Best Practices Guide for CNs — M36 (January 2019)

During RP2 Task 4.1 has been completed, while Tasks 4.2 and 4.3 have been carried out completely. If Task 4.1 developed an analysis of the European Legislation that affects CNs, Task 4.2 has explored the political (in the philosophical meaning of the term) and ethical reasons for supporting and sustaining CNs. Finally Task 4.3 has collected, systematized, and presented in D4.5 [22] the best practices that a CN should put in action to maximize its potential success.

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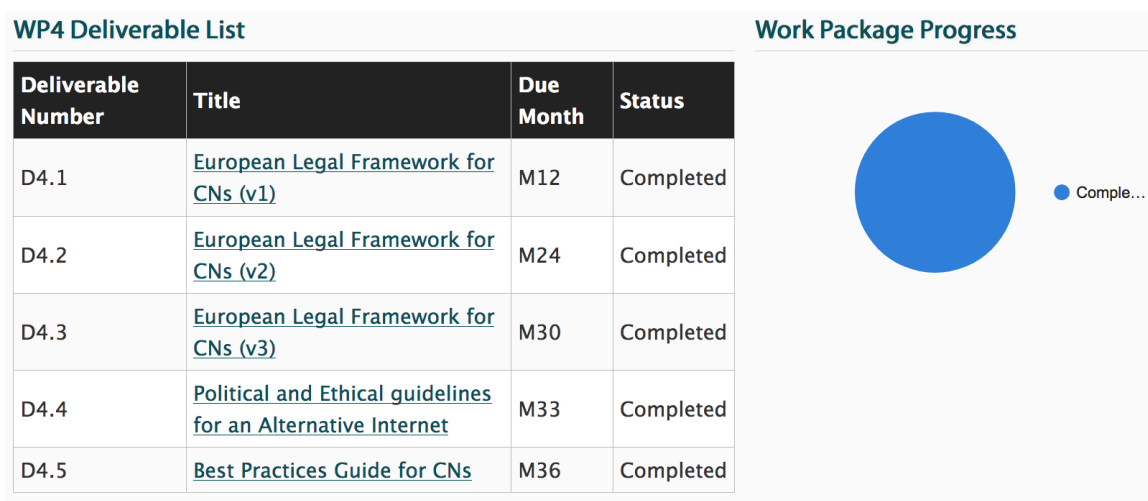


Figure 1.4: WP4 completed all the work and deliverables foreseen in the DoA

Detailed per Task Report

Task 4.1	Title: Legal Framework of CNs
Leader: CNRS	Contributors: UniTN
Duration: M7–M30	Output: D4.1 (D13), D4.2 (D25), D4.3 (D29)

The work in Task 4.1 reviewed and analyzed selected existing legislation and case law relevant to Community Networks. The goal was to describe the current legal framework, the one in which European CNs have developed, trying to understand whether the existing laws allow the prosperity of the current CNs and of new ones, or they impair them, and inform other tasks of the project on how to possibly modify legislation to nurture CNs. The content of D4.1 [4] was reported in RP1. After delivery of D4.1, the task moved on and it has regularly produced the follow-up deliverables D4.2 [23] and D4.3 [24].

This deliverable, which draws on the findings of D4.1 [4], D4.2 described the research activities undertaken during M13-M24 for T4.1, focusing on two main lines of activity:

1. the investigation of the actual application of EU law by Community Networks,
2. the description of the changes needed in EU law for electronic communications to encourage the development of CNs.

In the first line of activity, D4.1 described existing legislation and case law relevant to Community Networks and aimed at understanding whether the current law empowers or impairs the prosperity of exiting CNs and the birth of new ones.

Complementing the description in D4.1, D4.2 analyzed the actual application of law by and within CNs. To allow a better understanding of the law and its application, D4.2 includes a description of the novelties of 2017 in terms of legislation and case law with particular attention to personal data protection and data retention, which currently are among the most topical issues in EU law. More precisely, the main novelties that the ePrivacy Regulation brings are highlighted and commented pinpointing the impact on CNs. The deliverable also goes into detail on the current status of data retention norms in Europe in light of the most important cases decided by the Court of Justice of the EU highlighting how EU and National rules are often contradictory on this topic.

After the introductory part regarding the current legal framework, the report thoroughly describes how CNs actually apply EU law. Two main sources of information have been used to obtain evidence on the actual appli-

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cation of law. First, face-to-face interviews with CNs' members were conducted by netCommons researchers; second, output of a survey designed to collect further data from other CNs. The results of the survey, which are analyzed and described in detail, are the basis to draft some initial preliminary guidelines that have informed the work of Task 4.3.

The findings highlight that a possible solution to both liability and personal data protection issues would be the adoption of an agreement between each CN and its users. A contract could distribute liability and at the same time be the right tool through which the CN can manage personal data protection duties as imposed by European law.

With regard to the second line of activity, D4.2 illustrates what changes in European Union regulation for electronic communications are needed to shape upcoming laws also according to CNs' characteristics. It mainly focuses on the adoption of the new European Electronic Communications Code, on its impact on CNs and on the amendments that would favour CNs' prosperity. This part of the deliverable is strictly linked to Task 1.3 on "Advocacy capacity-building" and to D1.5 [8] that describes the advocacy activities carried out by the research group and includes guidelines for effective advocacy.

The results of our analysis highlights a mixed and in general rather complex scenario. On the one hand, legislation and regulations are utterly unaware not only of CNs, but in general of the fundamental needs for the correct development of digital communications for the benefit of citizens; in particular there is a complete lack of consideration and understanding of distributed (not decentralized, but truly distributed, without the presence of a central coordination, either legal or technical) communications infrastructures. On the other hand, CNs have in general a very vague understanding of the legislation and the requirements that are posed to anyone handling a communication infrastructure, and this clearly hampers the development and jeopardizes the sheer existence of many of them, which would probably not survive a "legal accident."

Running the interviews and collecting the survey answers had a measurable impact on CNs. First of all we found out that the apparent lack of attention of many CNs to legal details is not due to negligence, but the utter difficulty in accessing legal advice and finding a way in the maze of rules and regulations. The interaction with netCommons had the immediate impact of helping them re-think their situation, and also have a legal advice. Furthermore, D4.2 gave preliminary guidelines on how to deal with civil liability and personal data protection issues under EU legal framework, which clearly has an impact on CNs life.

D4.3 is the final deliverable of Task 4.1 and is composed of two parts: a descriptive one, and the presentation of the active role played by netCommons, in coordination with CNs, regarding the legal framework and its interpretation.

The descriptive part offers a final update of the European legal framework, including current ongoing changes that were left out for further analysis in the previous two deliverables. It covers four main topics that are key to the activity of CNs: 1) civil liability, 2) data protection law, 3) data retention law, and 4) telecommunication law. Important results of netCommons efforts and collaboration with Community Networks and digital rights groups are highlighted, as we successfully influenced the legislative process on the European Code of Electronic Communications over the past years, ensuring that this legislation provides special rules for Community Networks. This means that in the future, the special regulatory needs of CNs will have to be taken into account by telecom policy-makers at both the EU and national levels. We also developed a more substantial analysis on data retention law, which the survey conducted last year proved to be a problematic issue for many CNs.

Concerning data protection law, D4.3 gives an overview of the framework of the General Data Protection Regulation (GDPR) regarding the processing of personal data, which will inform upcoming guides to be written by the team on this very issue. An analysis on data retention was added in the light of the Tele2 case law of the Court of Justice of the European Union, where we touch on the actual application of this legal framework by and within Community Networks. This analysis provides an overview of the "actual practice" of CNs regarding these legal requirements. Here too, we update the results of the survey conducted in 2017 and presented in D4.2 and offer a more extensive analysis of the results. This study gathers replies of CNs from six EU countries (France, Italy, Germany, Greece, Portugal and Slovenia). It focused on five main areas: organisation, services

offered, relationship with users, data protection and data retention law. About organisation, it was highlighted that most respondents are organised as an association. Yet, some of them do not have a legal form, enjoying the informal relationship allowed by this kind of structure. This idea is in line with the way decisions are taken in these structures (consensus-driven). In this regard, all respondents acknowledged the importance of a distribution of power and a horizontal approach as well as a participative and collective decision process within the community. Regarding services provided by CNs, the core of their activity is to provide an Internet access (through WiFi mostly, but sometimes through optical cables too). However, they very often offer several additional services such as hosting, e-mail or Tor node services which can imply extra subtleties in terms of civil liability.

Concerning the nature of the relationship with users, the ‘informal’ relationship is also favoured. The results of the survey we conducted show that most of the respondents do not use a contractual form to enter in contact with their users. However, there is a different kind of proximity built with the user since there is often a requirement to be a member of the community in order to access to the service provided. This implies a flexible and trust-based relationship with the users. Yet, it can create difficulties regarding data protection law. Besides, CNs tend to highly favour privacy in their relationship with their users.

This concern is also shown through their data retention habits, as a large part of the respondents declared that they do not retain any data. A minority of the respondents, however, retain data in compliance with their national laws. According to our analysis, these national laws are often not in compliance with European law. As for data protection law, CNs did not seem to be aware of the wide scope of the notion ‘personal data’ and the deliverable recommended that they anonymize data to avoid non-compliance with data processing requirements.

D4.3 then move to more “active research” and presents specific legal guidelines so that community networks can comply with their current legal requirements. These guidelines refine those previously drafted in D4.1 and D4.2 in order to offer to CNs a clearer view on their compliance, and they can be summarized as follows.

- Civil liability has proved to be a problem for a number of CNs, particular in Germany where Freifunk participants for years had to deal with the risk of third party infringement (people accessing the open Freifunk networks to share copyrighted works, which in turn motivated right-holders to sue people sharing their connections). In Germany, Freifunk and its allies successfully campaigned for a change in the legal framework, which is not perfect but significantly reduce the legal risk. Although our joint advocacy efforts around the European Code of Telecommunications failed to create a liability exemptions for people sharing their connections, we feel that, generally speaking, even the McFadden case law of the Court of Justice of the European Union does not entail strong legal risks for users sharing their wireless connection with their vicinity. CNs enacting special privacy and anonymity protections by running VPNs or relays for the TOR networks should also feel free to do so.
- Data protection should be a significant concern for EU CNs in the months to come, especially in light of the increased sensitivity to this issue in the wake of the implementation of the General Data Protection Regulation. To ensure the lawfulness of personal data processing, including security measures and transfer of data, anonymising and pseudonymising data as much as possible, and various strategies such as mapping existing practices related to data processing, and ad hoc processes to manage potential data leaks and inform users are urgently called for.
- Although we make these recommendations with a degree of cautiousness considering the commitment of some CNs to informal organization processes, we feel that entering into a contract with the users of CN’s services can be an interesting solution to mitigate the risks associate with the applicable liability regime as well as the data protection framework. For the same reasons, incorporating a CNs through a non-profit legal status will also help alleviate legal risks and clarify the distribution of liability within the community, so that it can reflect on these risks and anticipate them rather than act in the context of a legal crisis.
- On data retention, CNs face a particularly thorny issue considering the legal limbo surrounding these legal obligations established across Europe to facilitate law enforcement. Given the 2014 and 2016 rulings

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of the Court of Justice of the EU, which invalidated obligations for indiscriminate, blanket data retention, 17 Member States are, according to our analysis, still in breach of this crucial case law. Although netCommons has helped establish a Europe-wide advocacy and litigation effort on the issue, it will probably be months, or years, before all ambiguities are finally resolved. In the meantime, we have highlighted various strategies that we have observed in the course of research, inviting CNs to choose that which they deem to be most appropriate. These strategies range from the most “conservative” (i.e., deciding to respect national law at the expense of the right to privacy as construed by the “Supreme Court” of the EU in its case law), to the most “activist” (i.e., defying national law while invoking this European case-law to highlight the lack of regard of national lawmakers for EU law and fundamental rights, which bears the risk of litigation and, possibly, fines or even jail).

This part is complementary to the general guidelines developed in Task 4.3.

The second part of active research reported in D4.3 is complementary to D1.5 [8] and relies on its conceptual framework and its recommendations regarding advocacy. This part of the deliverable also details several actions based on litigation, advocacy or dissemination intended to create a better legal and practical framework for CNs. It provides an overview of our interactions with various CNs as well as policy-makers over these issues in the past months.

Task 4.2	Title: Political-Economy, Policy and Ethical Guidelines
Leader: UoW	Contributors: CNRS
Duration: M28–M33	Output: D4.4 (D31)

Task 4.2 was devoted to identify ethical and political foundations for Community Networks, and define political economy and policy guidelines that can contribute to fostering an alternative Internet that is more participatory, co-operative and community-oriented. The two sets of guidelines build on ethics discussed in D4.4 [25] itself, and on netCommons previous work presented in D5.4 [26] and the work just discussed in Task 4.1.

netCommons implicitly assumes that it is good to advance and support network commons. Two questions derive:

1. How can network commons and digital commons be ethically justified?
2. Why is it morally good to advance the commons and digital commons?

The answer to these questions lies within the domain of computer ethics, which discusses moral questions that concern computer technology and tries to formulate principles that can be used for reflecting on how digital resources (infrastructures, software and content) should, or should not, be used. Community networks supply access to communication and computing infrastructure as a common good. They are thus classifiable in a generic way as a digital common, although they differ substantially from traditional digital commons in that they are considered infrastructures that not only create and store, but also process, handle, and transmit information.

The commons and the digital commons are applications of the notion of the “common good”. In ethics, this notion has been especially discussed in virtue ethics, an approach that goes back to Aristotle. Alasdair MacIntyre, the most well-known contemporary Aristotelian philosopher, relates Aristotle’s notion of the common good to the notion of communication. The means of communication (including computers and computer networks) mediate human communication. How they are organised and governed is an important moral question for contemporary information societies. In network commons, the ownership, control and decision-making of digital networks are shared in a community. Furthermore, the community shares the common moral value that network commons are an important way of organising digital infrastructures. Thus the network commons are an expression of moral virtues such as benevolence, generosity, altruism, sociability, camaraderie, friendship, and co-operation. Commons-based peer production, such as setting up and participating in community computer networks, is a way of advancing a good society.

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D.4.4 also argues on the conclusions of D5.4 [26], where it emerges that the Internet is contradictory: although it contains elements of the commons, it is dominated by the principles of commodification and commercialisation, monopoly structures, and non-transparent privacy-unfriendly processes in handling user information. This part of the work is strictly intertwined with the policy workshop organised and conducted at the University of Westminster on 15 May 2018, which brought together a number of stakeholders to discuss political economy and legal aspects of the current and an alternative Internet, the place of CNs in it, as well as the opportunities and limits for/to change.

The guidelines, developed and discussed in detail in D4.4, can be compacted down to an effective bullet list:

Economic:

- Connectivity and access to resources for all should be guaranteed, together with challenging Internet monopolies and fostering diversity at the layers of applications and services,
- Users and communities should be involved in the definition of their information and communication needs, and the design of relevant technologies (services, applications);

Political:

- Internet access and provision of network services should respect the protection of the privacy of users' data, and provide opportunities for active user involvement in the management of their data, as well as the necessary skills for such involvement,
- The public sector should have an important role in Internet investment, Internet regulation, as well as in ensuring that mechanisms for learning, education, engagement and training of citizens are available;

Cultural:

- Internet access and provision of network services should be underpinned by a community culture, which provides mechanisms for recognition, respect, diversity and common learning through commons-based peer production;

Legal/Policy:

- Community Networks should be invited to the policy table,
- Unnecessary regulatory and financial burdens for Community Networks should be lifted,
- Civil and criminal liability for people sharing Internet access should be limited,
- The spectrum commons should be expanded,
- Open-access rules on private and public telecom infrastructures should be updated,
- Free software and user freedom in radio equipment should be protected,
- Other measures supporting the development of Community Networks should be explored.

Task 4.3	Title: Best practices guide for CNs
Leader: CNRS	Contributors: UniTN,UPC, UOW
Duration: M25–M36	Output: D4.5 (D35)

Task 4.3 is naturally a collector of the many discussion, actions, findings, and analyses that were carried out during the three years of the project, mainly from the legal/policy point of view, but also including some technical considerations (albeit never at an engineering level) and global visions.

Its only deliverable, D4.5 [22] is also a book on how to bootstrap a Community Network (it will be evident from its structure and language, far less technical and academic than other deliverables of netCommons). With the proper changes, it will be published after the end of the project including the comments and suggestions that may come from its early reading by Community Networks and also by netCommons Reviewers and Advisory

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Board. It will be illustrated, copy-edited, and published by the Association for Progressive Communications in 2019, thus contributing (we hope) to the future impact of netCommons.

Drawing from the material produced by netCommons, the first version of this deliverable was composed during a writing residency week held in Vic, Catalonia in October 2018, where netCommons gathered a team of 9 researchers and CN practitioners together with an illustrator and a facilitator.

Meant for a wide audience, the book includes several anecdotes –or stories– as well as legal, technical, governance, economic, and policy material extracted from our 3-year-long research project. Its goal is to guide the reader through a set of actions aimed at setting up and foster the growth of a Community Network, but also, for policy makers, local administrations and the general public to create the right conditions to let Community Networks bloom and flourish.

The book is organized in six Parts that group 25 short chapters. The Parts address different topics, starting from high level definitions of what Community Networks are and why they are important in society and in the global communications scenario. Next come more technical parts that address how to bootstrap a Community Network and how to let it grow properly and how to make it sustainable. As, after three years of work and research, it is now evident that a single recipe for the success of a Community Network does not exist, the book takes an exemplify and experiment approach. The exemplification starts from (success) stories and frame them into a more general and methodological process to highlight positive patterns (negative ones are not analysed in this Deliverable, as they were included into many other documents, and to keep the document to an acceptable size). The experiment takes the form of questions and reasoning upon them to help the reader and practitioner to elaborate a correct strategy for his/her own context: social, cultural, economic, political, and geographic.

The deliverable is completed by a seventh Part with five appendices. They include the Pico-Peering Agreement, an example of document formalising the interactions between volunteers, owners of individual network nodes; a template for a Terms of Use that will make the Community Network using it legally safe and robust (at least in Europe); Guidelines for Policy makers on how to foster Community Networks, and finally a glossary to navigate into the complexity of legal and technical terms that are needed to understand a Community Network and a list of reasoned Suggested Readings to strengthen knowledge on specific themes and find appropriate resources to step up know-how and technical skills.

The work done by UPC in Task 4.3 converged also in the intensive, one week course, on community networks held in November in Santo Domingo (in Spanish), as part of the Workshop for Latin America and the Caribbean (WALC) 2018, and reported in detail in Section 2.1.8 of D6.3 [19], as well as two chapters in the GISWATCH 2018 and two sections in the “The Community Network Manual: How to Build the Internet Yourself” book of the Dynamic coalition on Community Connectivity, reported both in Section 2.2.5 of the same deliverable.

1.3.5. WP5 “Internet Science: Interdisciplinary Perspectives through the Lens of CNs”

Total Resource usage						
PM used: RP2 (RP1)		Total PM in DoA	Comment			
13.2 (16)		28	Minor modifications to Task 5.5 following the outcome of RP1 review			
Per partner person months						
	UniTN	UPC	UoW	CNRS	nethood	AUEB-RC
RP1	0.1	–	6.8	8.9	0.4	–
RP2	–	–	7.4	0.1	5.7	–
Total	0.1	–	14.2	9.0	6.1	–

1. Explanation of the work carried out by the beneficiaries and overview of the progress

Deliverables foreseen during the reporting period with due month and actual delivery

- D5.4 Alternative Internet's Political Economy — M27 (August 2018)
- D5.5 Community Networks and the Right to the City — M30 (November 2018)

The tasks active in WP5 during RP2 developed two different line of research. Task 5.5 ends the research line opened by Tasks 5.3 and 5.4 with the analysis of the survey on the political economy perspective. Task 5.2 instead carried on the idea of finding parallels and merging the development of rights and commons in both the physical space and cyber space in modern cities.

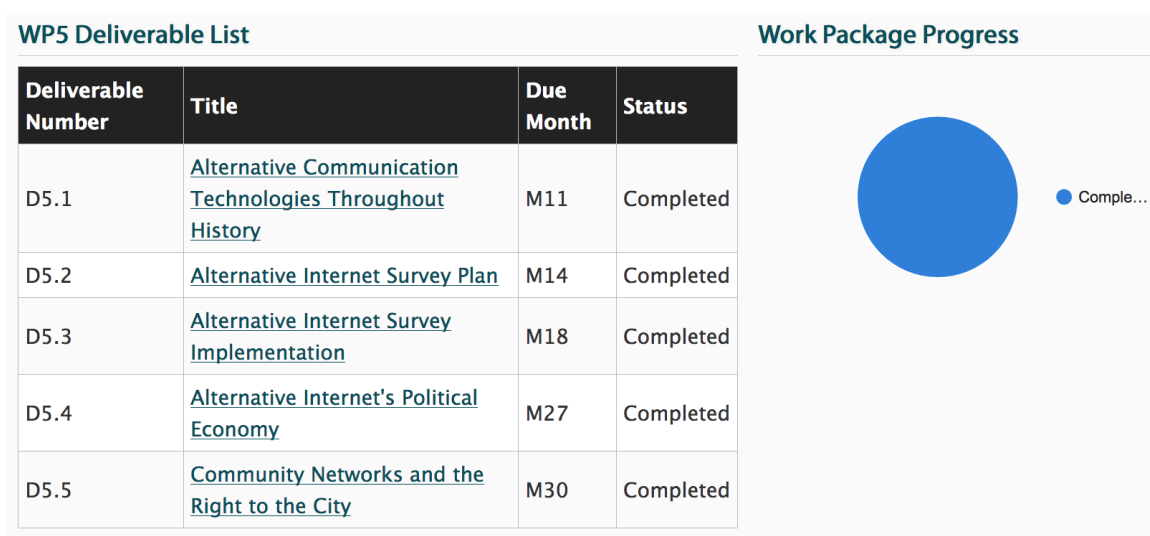


Figure 1.5: WP5 completed all the work and deliverables foreseen in the DoA

Detailed per Task Report

Task 5.5	Title: Interpreting the Alternative Internet's Political Economy
Leader: UoW	Contributors: –
Duration: M20–M27	Output: D5.4 (D27)

D5.4 [26] concludes Task 5.5, building on the data collected with the survey described in D5.3 [27].

The Alternative Internet Survey used the open-source online platform *limesurvey*⁶ to design the survey and collect data. The survey closed on 22nd January 2018 when we hit our target of 1000 completed questionnaires. The target of the survey were sufficiently competent and frequent Internet users, notably Information Technology (IT) professionals, academics, university technicians and administrative staff, and students, explained in D5.2 [28]. Respondents were selected using a purposive sampling method. More specifically, they were recruited through targeted email lists primarily in the main project partner countries but also beyond, as detailed in D5.3. Although not representative of the Internet user population, this public of Internet users is likely to be more appropriate for the topics the survey addresses and potentially better at tackling the complex and sometimes technical questions that are involved. With hindsight, this group of users have given us rich material in the open questions, something that can help possibly help the CN agenda.

⁶<http://limesurvey.org>

As described in D5.2, the design of the online survey questionnaire has been based on the inclusion of different categories of questions, separated in five Sections labeled from A to E. After a short explanation of the aims of the questionnaire and the provision of the relevant consent form (in Section A), Section B, drawing on other similar surveys, includes a set of questions about the Internet usage and the digital skills of the respondent. Subsequently, Section C, which can be seen as the core section of the questionnaire, addresses various concerns that the respondent might have as an Internet user, relating to areas such as:

- Privacy and data control,
- Digital labor and advertising/consumer culture,
- Monopolies of information provision,
- Internet governance and electronic democracy,
- Opinions around Community Networks.

Section D explicitly asks respondents to consider community networks as an alternative and also seeks to elicit their views as to the potential of such networks. Finally, Section E includes demographics of the respondents, as well as certain attitudes that they might have towards life and society, which might be indicative of the likelihood to support community initiatives.

The analysis presented in D5.4 focuses on the rich material provided in the open questions regarding, in particular, the five themes listed above. The responses to the open questions express the perceptions, attitudes and sense-making of the chosen public of Internet users with regard to the existing Internet but also, and more significantly, with regard to potential alternatives where concerns and problems are identified, exploring in particular the potential future of CNs, their purpose and sustainability. These are some of the core themes of the netCommons project. The analysis presented is qualitative and interpretive and is expected to be useful for CNs but also national and European policy-makers and regulators. At a more specific level, D5.4 complements D2.1 [29] and D2.2 [10] and served as input to WP4, specifically to Task 4.2 and partially to Task 4.3.

Regarding **privacy and data control**, respondents express strong concerns about the monopolistic power of a handful of commercial companies that rely on harvesting personal data using extensive tracking and profiling practices, and the use of data for commercial but also political benefit. There was frustration about the lack of alternatives and the inability to use a service unless one surrenders personal data. In response to these concerns, respondents indicate what steps they have taken, including the use of anonymization and encryption tools, which overall they find cumbersome and not necessarily effective.

Equally, regarding **monopolies of information provision**, the responses to the questions on Facebook and Google reveal strong concerns about their ad-driven business model which relies on personal data, their increasing market power and intrusiveness, the potentially severe adverse effects for citizenship, democracy and the public sphere, but at the same time, even if a few responses mention alternatives to these dominant platforms, there are doubts about whether one can stop using them totally.

Regarding **Internet governance and electronic democracy**, the open question on subscriptions to news content reveals contradictions, the most notable one being that between the funding of (quality and credible) journalism and content generally on the one hand and the potential for exclusion and implications for democracy on the other. In terms of alternatives, respondents suggest market structure and organizational models (e.g., new news ventures and non-profit news provision, including community media; and various funding methods, such as state subsidies and public service media, micro-payments, donations, crow-funding etc.), as well as behavioral interventions (e.g., regulation for free and independent press).

Lastly, the survey reveals strong support for **alternatives** (Section D), even though understandings for alternatives varied from increasing market competition, non-commercial arrangements, decentralization of infrastructure and power, less surveillance and less expropriation of work. Overall, respondents perceive alternatives as favorable to choice, allowing personal involvement and experimentation, which in turn link to sustainability. Turning to CNs in particular, respondents acknowledge challenges (e.g., scale, resources, community spirit, motives, opposition from established market players); yet, they see CNs as offering various advantages, such as

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affordable Internet connection, closing the digital divide, enhancing social cohesion, strengthening community ties and associate them with democratic participation and involvement in the running of the network, promotion of digital rights and gaining of technical expertise. The need for greater awareness and more information about CNs was emphasized.

Turning to the term “community”, some respondents explain the term is neither progressive nor benign by default. Some warn that community initiatives can end up reinforcing local power structures, rather than empowering more citizens; and question whether such indicatives can address privacy issues.

Finally, some respondents equate CNs merely with Internet connectivity and are unsure whether CNs can provide alternatives to existing powerful services and platforms. Additionally, some caution that local content can reinforce closure and exclusion, others see the local focus as an advantage, and yet regard global and local services as complementary.

The answers to closed questions have been used in the interpretation of the open text questions, but are not reported in D5.4 because the respondent sample and the structure of the survey lacks the proper statistical correlation (de-correlation) properties to make these answers statistically meaningful. However, to avoid wasting the information they contain, and the effort done to collect them, we published these answers in a [dedicated section](#) of netCommons web site.

Task 5.2	Title: Community Networks and the Right to the City
Leader: Nethood	Contributors: –
Duration: M20–M30	Output: D5.5 (D30)

Task T5.2 has been the extension of the concept of the ‘right to the city’ for the case of hybrid urban space, both in theory and in practice, and to highlight the important role that CNs can play for empowering citizens to claim their right to the hybrid city.

The term “the right to the hybrid city” was coined by Panayotis Antoniadis and Ileana Apostol in 2014 and since then theoretical work has been published, with titles like “the right to the digital city,” “informational rights to the city,” and more. This body of work makes clear the threats on privacy, freedom of expression and self-determination posed by the domination of big tech corporations in the Internet market. By and large it has reinforced the argument that the very right identified by Henri Lefebvre is at stake in the digital space of cities, and further broadened the view on the meaning of the right to the city in today’s ICT-mediated city life.

Given that, the work of this task is focused toward making a step further beyond awareness and theoretical justification of what seems obvious today: the digital is an inseparable part of the city fabric and is subject to a wide variety of rights and claims for ownership and self-determination.

D5.5 [30] report the outcome of the theoretical work developed, and first elaborates on the concept of the right to the city, in particular on the right to difference, from an actor perspective. This was not addressed in depth in previous literature, and can be very useful for Internet scholars and activists. As an extension of that, in the section following the literature review, D5.5 makes a comparison of digital networks with the early days of railways’ development and their associated services, looking also at their impact on spatial development and on the political economy of territory.

Next, D5.5. reports on three long-term threads of practical work that will hopefully help all interested parties, including urban and digital activists, to engage in the required future coalitions between different areas of commoning for the right to the hybrid city.

More specifically, these threads are referring to:

- The development of a series of interdisciplinary and transdisciplinary ‘encounters’ between urban and digital activists. Their purpose is to analyze examples from past and current struggles in both domains pointing to similarities, differences, and strategies for collaboration, promoting CNs as a key urban ICT infrastructure for supporting local services and applications. Until the writing of this deliverable three

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of such encounters of two-four hours duration have been organized, all of them organized instead of the single workshop that was envisaged and promised in the DoA.

- The development of a prototype hybrid neighborhood node, L200, a hybrid urban living lab in the centre of the city of Zurich, serving both as a hub for exchanges between urban and digital activists and as a living exhibition of alternative technologies like self-hosted services. See <http://langstrasse200.ch/pub/digital/>.
- The development of a “CN model” appropriate for integration with the Swiss cooperative housing model in the form of a) specific “requirements” for developers integrated in an architectural competition for an on-going cooperative housing project, b) an analogy with organic agriculture and a speculative description of a future cooperative housing model.

1.3.6. WP6 “Dissemination”

Total Resource usage

PM used: RP2 (RP1)	Total PM in DoA	Comment				
27.9 (12)	36	No major deviation observed				
Per partner person months						
	UniTN	UPC	UoW	CNRS	nethood	AUEB-RC
RP1	1.6	1.6	0.7	1.2	6.5	1.0
RP2	10.6	2.1	0.7	3.5	5.5	5.5
Total	12.2	3.7	1.4	4.7	12	6.5

Deliverables foreseen during the reporting period with due month and actual delivery

- D6.2 Dissemination Report: Summary of Dissemination Actions and Adoption of netCommons Solutions During the First Year — M24 (August 2018)
- D6.3 Dissemination Report: Summary of Dissemination Actions and Adoption of netCommons Solutions During the First Year — M36 (January 2019)

WP6 has three different tasks, which address different communities; indeed, from a general point of view the activity in each task is the same: Maximize the diffusion of netCommons ideas and results and increase the footprint of dissemination trying to reach not only technical communities, but also policy makers and the general public. Moreover, netCommons tries continuously to keep in contact with CN members to foster the adoption of novel technologies and best practices in CNs themselves. The three Tasks converge in a single deliverable per year, describing the dissemination activities, thus in RP2 two deliverables were due: D6.2 [31] and D6.3 [19].

Detailed per Task Report

Task 6.1	Title: Proactive dissemination towards CNs
Leader: UPC	Contributors: All
Duration: M5–M36	Output: 6.2 (D26), 6.3 (D36)

Also during RP2 netCommons has been very active in reaching out to activists and managing to establish strong links with CNs. Chapter 4 in both D6.2 (year 2) and of D6.3 (year 3) are devoted to describe such interactions together with the meetings and local events dedicated to local authorities, stakeholders, etc. These interactions

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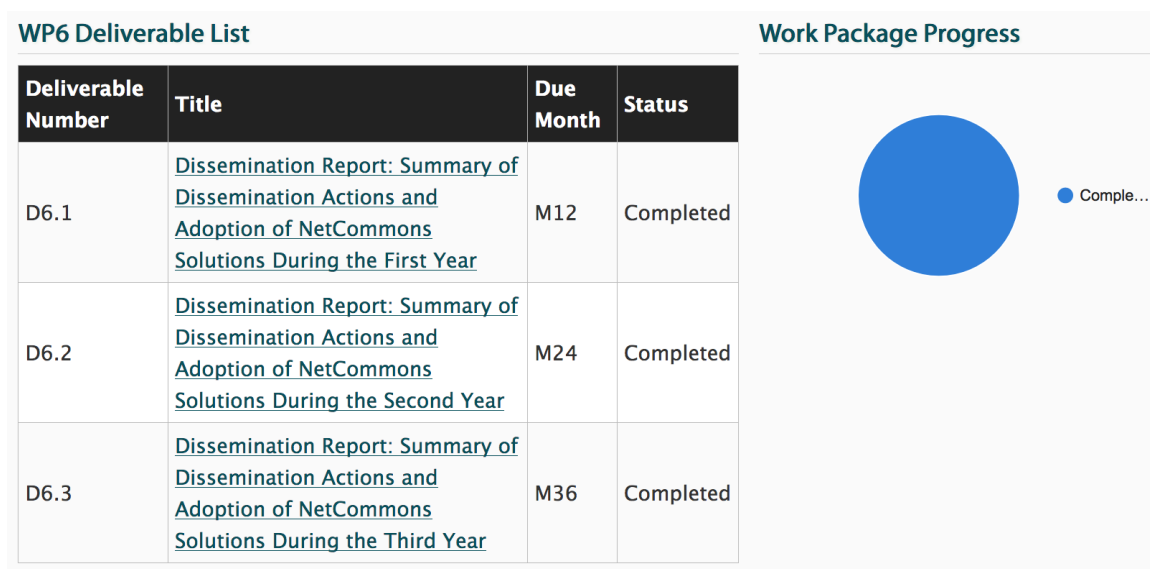


Figure 1.6: WP6 completed all the work and deliverables foreseen in the DoA

expanded from the initial contacts of netCommons researchers to cover several CNs in Spain, Italy, Greece, France, Germany in the second year and also in Africa and Latin America in the third year.

Direct interaction with guifi.net, FFDN, FreiFunk, Sarantaporo.gr, ninux, helped diffusing the knowledge and the activity of netCommons in these CNs and gain reputation to get in contact with other stakeholders. The continued interaction with Global Access to the Internet for All IRTF RG (GAIA) and Internet Society (ISOC) made netCommons well known in tens of other communities running a CN, or actively seeking to build one. Chapter 6 in both D6.2 and of D6.3 details the impact that netCommons research and activities had on different CNs.

Task 6.2	Title: Outreach to authorities, stakeholders, institutions, and the academic community
Leader: Nethood	Contributors: All
Duration: M7–M36	Output: 6.2 (D26), 6.3 (D36)

netCommons organized or participated into a series of meetings that are described in detail in Chapters 3 of both D6.2 and D6.3 depending on the year they were held. In this context some of the meetings and actions represent important achievements and impact. The following list highlights some of the dissemination events with more impact.

- An Open Letter to EU Policy-Makers: “Making Regulation Work for Community Networks”, in March 2017, and the corresponding press releases;
- Detailed notes on the individual amendments of the European Electronic Communications Code (EECC) before decisive votes in European Parliament in collaboration with La Quadrature Du Net (LQDN) and a second open letter;
- A focused workshop in the European Parliament coordinated by Member of the European Parliaments (MEPs) Miapetra Kumpula-Natri and Julia Reda and participated by other members including José Bové; This was followed by two more workshops in the European Parliament in which netCommons was invited.
- Both social and technical comments and contributions to positively influence the development of the Radio Equipment Directive (RED), whose revision, currently under discussion, may severely hinder the

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growth and the sheer existence of CNs that exploit innovative open source resources;

- Initiation of the telecommons mailing list as a platform for communication exchanges across different CNs and coordination of joint actions such as the Open Letter to EU;
- Participation in the formation of a new ISOC Special Interest Group on Community Networks.
- A workshop at UNESCO in Paris, that finally lead to recognize Community Networks and to include them in the final version of the [UNESCO's Internet Universality Indicators](#).
- Organization of a conference at the Sarantaporo area with distinguished guests like ISOC's Jane Coffin and VillageTelco's Steve Song (also part of the Advisory Board), followed by a high profile event at Impact Hub Athens with the participation of the Hellenic National Telecommunications and Posts Commission, National Regulator, the City of Athens (Chief Digital Officer), and the Greek FOSS association.
- A one week intensive course on community networks in Spanish, organized as part of the Workshop for Latin America and the Caribbean (WALC) 2018 (Track 7) to train activists coordinated by [Fundación EsLaRed](#).
- Several contributions to the [GISWatch 2018 book on Community Networks](#).
- The fundamental contribution given to the Dynamic Coalition on Community Connectivity (DC3) book [The community network manual: how to build the Internet yourself](#).

Coming to academic dissemination, netCommons produced in the end 99 peer-reviewed publications in all the disciplinary sectors involved in the project, while others are still in production are are going to be submitted for publication soon, and will still bear thanks to netCommons. Several are trans- or inter-disciplinary, involve authors from different fields and partners and have contaminated academic communities, notoriously refractive to contamination, with ideas coming from other fields. As D7.5 [2] is entirely devoted to the publications supported by netCommons, listing all of them separated by year and typology, we do not report the list here, nor discuss in detail citation indexes, downloads and other figures that can be found in that deliverable.

Besides the peer-reviewed papers, netCommons researchers also gave a number of presentations in national or informal gatherings, produced a few white papers and in general is pushing the knowledge about CNs inside academia, also through the organization of seminars in University courses, also outside Europe.

netCommons constantly cooperated with several other CAPS projects like MAZI, CAPSELLA, EMPATIA and others.

Task 6.3	Title: Outreach to media and general public
Leader: Nethood	Contributors: All
Duration: M7–M36	Output: 6.2 (D26), 6.3 (D36)

During RP2 Task 6.3 continued to seek dissemination means outside the traditional actors interested, i.e., to reach the general public. netCommons members accepted interviews on local and national media as the occasions came and participated in public events. Without the pretense of being exhaustive here (D6.2 and D6.3 report a detailed list), we recall:

- An interview, in Greek, included in a program of the national television ERT3 called “Antidrastririo”, broadcasted on May 25th and May 29th 2017 <http://webtv.ert.gr/ert3/25me2017-antidrastririo-kina-kekinoniki-allilengya-ikonomia> dedicated to alternative economies, the interview starts around minute 2.
- The article by Panayotis Antoniadis “*How to build an organic internet and stand up to corporations*” on The Conversation Global, <https://theconversation.com/how-to-build-a-more-organic-internet-and-stand-up-to-corporations-70815>.

Together with the article published in 2016 on Do It Yourself Networking <https://theconversation.com/diy-networking-the-path-to-a-more-democratic-internet-67216>, this paper collected more than 15000 reads according to the platform.

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- “AFTER:FuturiDigitali” A local event sponsored by Reggio Emilia Municipality discussing experiences of bottom-up networking in the aftermath of the deployment of a “municipal network” in Coviolo a small segregated hamlet in the municipality of Reggio Emilia.
- The article by Félix Tréguer, “*Directive sur le droit d’auteur: l’affrontement factice des deux têtes du capitalisme informationnel*” appeared on “Le Monde”.
- “Hyperlocal radio and do-it-yourself networks bring information closer to home” an article by Rex Merrifield published on Horizon The EU Research & Innovation Magazine, Jan. 10, 2019, discussing community communication and networking, including material on netCommons deriving from a couple of interviews with Renato Lo Cigno

In conclusion the dissemination activities of netCommons went well beyond the standard Research and Innovation Action (RIA) project expectations and also, in some sense, beyond our initial goals. Apart from scientific publications and impact, and beyond the expected interaction with CNs, indeed, netCommons researchers were extremely proactive and able to cull, gather, and catch opportunities and synergies arising during the course of the project. Possibly the best example of this has been the inclusion in the EECC of amendments proposed by netCommons researchers together with other activists that specifically concerns and nurture Community Networks, as we documented in detail in D1.5 [8].

1.3.7. WP7 “Management”

Total Resource usage

PM used: RP2 (RP1)	Total PM in DoA	Comment
15.4 (8)	17	No major deviation observed

Per partner person months

	UniTN	UPC	UoW	CNRS	nethood	AUEB-RC
RP1	6.2	0.3	0.6	0.5	0.6	0.1
RP2	11.7	0.7	0.7	0.7	0.4	1.3
Total	17.7	1.0	1.3	1.2	1.0	1.4

Deliverables foreseen during the reporting period with due month and actual delivery

- D7.3 Data Management Plan (v2) — M24 (June 24, 2018)
- D7.7 Technical Management & Progress Report – M27 — M27 (December 5, 2018)
- D7.5 Report on the publications and data download, use, and citation — M36 (March 1, 2018)
- D7.4 Management & Progress Report (v2) — M36 (March 7, 2018 — this preliminary version)

Besides the day-by-day management of the project, WP7 has maintained the contacts with the EC (four different Project Officers were assigned to netCommons in sequence), developed and maintained the web-site, handled issues about Open Access and Open Data. The work done on Open Access and Open Data management in particular, reported in D7.3 [33] is remarkable, as it discusses important issues on these important topics that are normally ignored by both the scientific community and the stakeholders of public research.

1. Explanation of the work carried out by the beneficiaries and overview of the progress

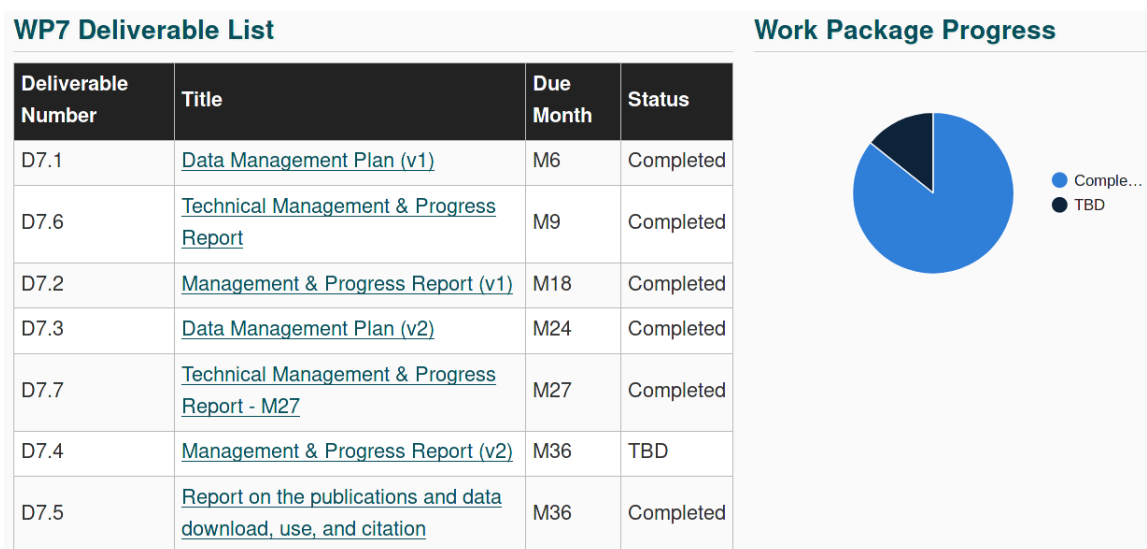


Figure 1.7: WP7 completed all the work and foreseen in the DoA; obviously this deliverable is not yet finalized.

Detailed per Task Report

Task 7.1	Title: Administrative and Scientific Management
Leader: UniTN	Contributors: All
Duration: M1–M36	Output: D7.7 (D38); D7.4 (D32)

The management of netCommons has been smooth, with only minor deviations from the original DoA discussed at the end of this part. At the end of RP1, following the suggestions of the reviewers and the PO (see Appendix A), we decided to add a deliverable to Task 3.1, and this lead to an Amendment of the DoA accepted on February 7, 2018.

The project organized seven formal check points under plenary meeting the last of which will be held the day before the review meeting:

- Jitsi on-line meeting to coordinate activity after the first review meeting, early October 2017
- Plenary meeting organized by CNRS in Paris, January 2018;
- Jitsi on-line meeting to coordinate activity, March 2018
- Plenary meeting organized by Nethood in Athens (in conjunction with the Sarantaporo workshop), July 2018;
- Jitsi on-line meeting to coordinate activity, early October 2018
- Three Jitsi on-line meeting to coordinate preparation of the final deliverables, November and December 2018;
- Pre review meeting in Brussels, March 12, 2019.

Moreover, besides mailing lists (one per WP, plus one for management, a global one and one for the interaction with the Advisory Board) where scientific discussion is regular and that are logged and used as official communication means, netCommons maintains regular on-line weekly meeting on a jitsi room named “happy hour”, where researchers exchange informal news, discuss ongoing research and consult with the WP coordinator Leonardo Maccari.

There has never been the need to have special meetings of the Management Board to take actions as no major

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obstacle was encountered. The formal decisions were regularly voted in person or on-line, all decisions were taken unanimously.

Task 7.1 also maintained the contracts with the Advisory Board (AB), regularly invited them to Plenary meetings and to other relevant events. The AB composition remained the same:

- Adam Burns;
- Stefania Milan;
- Juürgen Neumann;
- Allison Powell;
- Ramon Roca;
- Arjuna Sathiaselan;
- Stephen Song;

but Arjuna Sathiaselan resigned at the end of July 2018 due to his increased involvement in Ammbr. Given the project was smoothly proceeding toward its end, the Management Board decided not to substitute him.

As already mentioned in D7.2 [1] Task 7.1 has taken care of netCommons web site and its stable and regular availability. The domains `netcommons.eu` and `netcommons.it` have been registered by the coordinator through the Italian Registrar GARR, and will be maintained for the foreseeable future. The web site <https://netcommons.eu> has been constantly kept up to date and reports the project activity, blogs, events, the public versions of deliverables, publications and any additional information useful to disseminate project results. D7.5 [2] together with the publications summaries reports on the web site visibility and visits.

As explained in D8.1 netCommons does not have, as primary goal, studies on human beings or research that has as subject of investigation human beings. However, it is an interdisciplinary project that involves, besides technology, also legal studies and societal studies whose focus is on CNs, thus netCommons researchers necessarily interact with people involved in CNs and they often have to ask information from both CNs's activists and general Internet users to understand the perception of CNs in society, and the understanding of legal matters by people that operate and/or use CNs. Thus, to fulfill the research objectives of netCommons, researchers carried out interviews with the risk of people's privacy, or, in some extreme cases expose them to risks that may be difficult to predict, like legal litigation.

netCommons devoted to handle any personal or sensitive data in the appropriate manner, both following legal mandates and state-of-the-art best practices, and also following the General Data Protection Regulation (GDPR) after its enforcement in all of Europe in May 2018.

Task 7.2	Title: Open Access Management
Leader: UniTN	Contributors: All
Duration: M1–M6,M12,M18,M23-24,M35-36	Output: D7.3 (D18)

The goal of Task 7.2 has been setting guidelines and the best practices to ensure that the project achieves the highest possible level of Open Science. Given the nature of netCommons research this is of the utmost importance, and the absence of Intellectual Property Rights (IPR) claims made the goal fully achievable. All netCommons publications but one (a German translation available only as printed book of an English publication, this latter instead available in Open Access) are available in Open Access.

D7.3 [33] re-discussed the policies adopted by the project consortium to ensure that rules on Open Access to Publications and Open Research Data are met. Moreover it has set the principles used by the consortium in managing the data produced during the project and the policies and technical measure taken to protect people privacy and data security in case personal data is collected during the research. In particular it has detailed the procedures that the consortium adopts to make all scientific publications, both peer-reviewed and non peer-reviewed, fully available according to Open Access best practices, guaranteeing that they are correctly archived

in multiple repositories, available through the project web site and properly indexed through metadata.

Regarding Data Management, and in particular Open Scientific Data, D7.3 introduced an open discussion on the different nature of data compared to creative production and thus the need to find different licensing contracts, that are however not yet available from the community.

Beyond publication and data, netCommons produced also software, which is all licensed Open Source, normally under Creative Commons licenses. The project opened a specific repository on github (<https://github.com/netCommonsEU>) where all the software is available.

1.4. Impact

At the end of the project, both on the side of academic research (see D7.5 for details in citation and scientific impact of the project) and on the side of political and societal impact, netCommons fully achieved the impact foreseen in Annex 1, Part B, Section 2, without major deviations or reduction of the impact expected. The dissemination activity collected in WP6 research and activities have been presented and explained widely to several different communities in all of Europe and beyond.

Indeed, we claim that netCommons impact on the “ecosystem” of Community Networks has been even larger than what could be initially foreseen. This happened especially at the institutional level of policy makers, where netCommons has been able to catalyze the activity of several advocacy teams and associations, coordinating actions that led to the modification, in favour of Community Networks, of the EECC.

2. Update of the plan for exploitation and dissemination of result

No changes in exploitation and dissemination are foreseen at this point of the project.

3. Update of the data management plan

The Data Management Plan (DMP) has been updated in D7.3 [33] including best practices on Open Data management, and a very interesting discussion on the availability of copyright licenses actually suitable for data and what a derivative work may mean or imply when applied to data. No major in the Open Access or Open data management and strategy as to be noted.

4. Deviations from Annex 1

The project did not have any significant deviation from the DoA, either for what to goals and objectives are concerned or from the financial, budget point of view, even if overall the project has been slightly overspending, specially from the PM and human resources used (about 30% more PMs). The reasons for this overspending have been already discussed, but in general we can state that in some cases more junior researchers were employed and in other cases the work load was simply larger than initially foreseen to achieve the project goals. As in any research project there are obviously minor changes done in course of action due to changing conditions, e.g., new regulatory proposals, or preliminary findings, or simply to opportunities unforeseeable months in advance. For instance, as documented in the relevant technical deliverables, we had the opportunity to influence the European Electronic Communication Code, and this was not foreseen in the DoA, but it's definitely an important achievement of the project. Similarly, some industrial cooperation stemming from the great interests into cryptocurrencies and similar blockchain-based distributed solutions in the aftermath of Bitcoin 'explosion' was obviously not mentioned in the DoA.

The following two sections report details on minor changes in Tasks objectives and in the use of resources, we include in the discussion also some of the changes resulting from the discussions in the first review meeting.

4.1. Tasks

We consider significant a deviation from Annex 1 when an Objective or Milestone outcome is qualitatively different from the original goals, i.e., when the results reached are not in full agreement with the DoA description, we do not comment instead on results that went beyond the original description, but without a clear deviation, neither on delays that did not affect the development of the project. The two tasks where one can identify a slight change in the outcome as compared to the DoA description are Task 3.1 and Task 5.4.

For what Task 3.1 is concerned, as already mentioned in this document, after the first review meeting we added a deliverable dedicated to collect more results on the application of the cooperative design and deployment methodology, and this is clearly a deviation, but it is reflected in the Amendment of December 2017, and partially also justify the additional PMs dedicated by UniTN to WP3. The methodology has been experimented in different contexts, and we have obtained "mixed" feedback, some positive and some lukewarm, indicating that not all communities are ready to engage with organizational models and working methodologies different from the ones they are familiar with. Also, even with a focused effort to derive, from the general methodology, simplified procedures to be applied in specific contexts, the outcome of the research clearly indicates that the matter is too complex to allow deriving a simple 'cookbook' that anyone can adopt without a specific education. However, these observations do not hamper the value of the work done, which can find a full application in sufficiently structured situations, and now represent the state of the art for further development of participatory design methodologies.

Task 5.4 analyzed in detail and with a qualitative approach the many open-answer questions included in the survey, as suggested by the reviewers. The quantitative analysis of the answers is available on a [netCommons web site section](#) without further post-processing, as further processing and analysis was deemed superfluous by the reviewers, yet we think that making it available to the community is useful. Indeed, this approach maps the Survey analysis better to the general political economy and ethical analysis done in WP5 and WP2.

4.2. Use of resources

According to our internal definitions of best practices for project management, we considered significant a deviation of at least 10% from the estimated budget, while we consider marginal the additional PMs dedicated to the project to achieve its goals, even when it is around 30%, because this deviation simply indicates that the partners have worked seriously and with dedication to avoid jeopardizing the project achievements.

Partner n° 1: UNITN

No major deviation from the estimated budget during the project:

- The budget spent during RP1: 304 503.61 €
- The effort spent during RP1: 49.87 PM
- The budget spent during RP2: 436 617.26 €
- The effort spent during RP2: 73.46 PM

UniTN has used slightly less than 50% of the budget in RP1 and slightly more during RP2, which is perfectly in line with the fact that UniTN, according to the Gantt, had more work in the second half of the project than in the first one. Globally UniTN is slightly overspending.

From the effort point of view, UniTN is overspending due to the involvement, to a larger extent than initially foreseen, of young post-doctoral personnel (roughly 42 PM total), but also of a young graduate (Virginie Aubree) for a full year substituting Federica Giovanella who left for a maternity leave and then decided to resign from the project, obviously this had a non marginal impact on the re-training overhead. Post-Doc personnel has in Italy a lower salary, but is also less experienced, requiring more time to perform some of the tasks.

Partner n° 2: UPC

No major deviation from the estimated budget for during the project:

- The budget spent during RP1: 214,163.75 € (after a minor adjustment of 7,857.86 € on RP1)
- The effort spent during RP1: 31.73 PM
- The budget spent during RP2: 110,618.98 €
- The effort spent during RP2: 16.00 PM

Most of the work (2/3 of the effort) done by UPC was concentrated in the first half of the project (WP1 and software development in WP3) Globally (M1-M36) UPC is overspending (7.19%) in cost. In terms of effort, UPC is slightly overspending (14%) due to additional work in the analysis and development of organizational models WP1 (14%), software development in WP3 (16%) and dissemination activities in WP6 (15%). The higher overspending in effort with respect to costs is due to the involvement of additional personnel with lower salary. Overall we achieved our plans and in some activities we exceeded our expectations. Work with communities has been more demanding than expected and the favorable environment and interest from international organizations and diverse communities have fed our work but required at the same time more in-depth effort to document and report about the research results from the project.

Partner n° 3 UOW

Some small deviation from the estimated budget for during the project:

- The budget spent during P1: 200 013.59 €
- The effort spent during P1: 23.23 PM
- The budget spent during P1: 175,391.85 €
- The effort spent during P1: 17.44 PM

In RP1, more personnel has been dedicated to WP2 than originally foreseen in the DoA; in particular UoW has dedicated more than 15 PM to this task while the original plan was only 4 PMs. Christian Fuchs, the UoW Contact Point, stated that there has been a misunderstanding between the work to be done in WP5 (where UoW is underspending) and WP2, so that more man power was needed on this Work Package. Moreover, he declared

that “The UoW person month rate is lower than expected, differing somewhat from the Grant Agreement. Although we aim at being as precise as possible in forecasting how the work will be divided and carried out, it is in a dynamic research environment not always possible to perfectly plan this in advance, which is here the case for UoW. The staff members in the project have very different salary ranges, which has thus affected the person month rate, making it lower than expected. At the same time, the work was lengthier than initially expected, some of which carried out by a new staff member. We have therefore had to invest more person months than outlined in the Grant Agreement in order to meet our set objectives.” These personnel changes and additional resources allocation, have not modified the progress of the WP that was finally concluded with success.

In RP2 instead there have not been major deviations.

Also UoW is slightly overspending and has devoted more effort (PMs) than initially planned to the work, especially to WP4.

Partner n° 4: CNRS

No major deviation from the estimated budget for during the project:

- The budget spent during RBP1: 153 791.65 €
- The effort spent during RP1: 25.38 PM
- The budget spent during RP2: 208,716.89 €
- The effort spent during RP2: 27.32PM

The effort and budget are in line with previsions.

Partner n° 5: NETHOOD

No major deviation from the estimated budget for during the project:

- The budget spent during RP1: 163 427.23 €
- The effort spent during RP1: 19.45 PM
- The budget spent during RP2: 151 765.84 €
- The effort spent during RP2: 18.51 PM

The effort is marginally larger than what foreseen, while the budget is in line with previsions, Nethood fully used its assigned resources in CHF, but due to change fluctuations the amount in € results slightly less.

Partner n° 6: AUEB-RC

No major deviation from the estimated budget for during the project:

- The budget spent during RP1: 141 467.83 €
- The effort spent during RP1: 24.76 PM
- The budget spent during RP2: 121 273.75 €
- The effort spent during RP2: 24.15PM

Also AUEB-RC is overspending both as money and as PMs are concerned.

Partner	1 UNITN		2 UPC		3 UOW		4 CNRS		5 nethood		6 AUEB-RC		TOTAL	
	M1-M36 Planned (according to the DoA)	Actual (M1-36)	M1-M36 Planned (according to the DoA)	Actual (M1-36)	M1-M36 Planned (according to the DoA)	Actual (M1- 36)	M1-M36 Planned (according to the DoA)	Actual (M1-36)	M1-M36 Planned (according to the DoA)	Actual (M1-36)	M1-M36 Planned (according to the DoA)	Actual (M1-36)	M1-M36 Planned (according to the DoA)	Actual (M1-36)
WP1	0.0	0.9	20.0	22.9	0.0	0.3	15.0	14.5	0.0	0.0	1.0	1.0	36.0	39.6
WP2	9.0	11.2	0.0	0.0	4.0	14.8	0.0	0.0	6.0	7.5	18.0	21.0	37.0	54.5
WP3	24.0	45.0	15.0	17.3	0.0	0.0	0.0	0.0	10.0	11.4	15.0	19.7	64.0	93.4
WP4	21.0	36.0	3.0	3.0	3.0	8.8	18.0	23.3	0.0	0.0	0.0	0.0	45.0	71.1
WP5	0.0	0.1	0.0	0.0	14.0	14.2	8.0	9.0	6.0	6.1	0.0	0.0	28.0	29.4
WP6	12.0	12.2	3.0	3.7	3.0	1.4	3.0	4.7	12.0	12.0	3.0	6.5	36.0	40.5
WP7	12.0	17.7	1.0	1.0	1.0	1.3	1.0	1.2	1.0	1.0	1.0	1.4	17.0	23.6
TOTAL	78.00	123.06	42.00	47.90	25.00	40.80	45.00	52.70	35.00	38.00	38.00	49.60	263.00	352.06

Table 4.1: Actual PM effort during the entire project (M1–M36) versus the planned in the DoA.

5. Conclusions

At the end of the project netCommons has reached all its goals, and in some cases has exceeded them, as in the number and impact of scientific publications as well as in the policy making impact. This Deliverable has summarized the technical and management effort of the project, with specific pointers to the technical deliverables where the objectives have been met.

This deliverable is still provisional as two partners, namely UPC and CNRS were still unable to complete the bureaucratic procedures on ECAS due to internal technical problems. However, the provisional data, as well as the continuous monitoring of the project during its lifetime, make us confident that final figures will not differ significantly from those reported here, and that the information available in this version is detailed and accurate enough for the review discussion.

Bibliography

- [1] R. Lo Cigno, R. Guidolin, and L. Maccari, “Management & Progress Report (v1),” netCommons Deliverable D7.2, Aug. 2017. <https://netcommons.eu/?q=content/technical-management-progress-report>
- [2] L. Maccari, R. Guidolin, and R. Lo Cigno, “Report on the publications and data download, use, and citation,” netCommons Deliverable D7.5, Feb. 2019. <https://netcommons.eu/?q=content/report-publications-and-data-download-use-and-citation>
- [3] R. Lo Cigno, L. Maccari, and R. Guidolin, “Technical Management & Progress Report – M27,” netCommons Deliverable D7.7, Dec. 2018. <https://netcommons.eu/?q=content/technical-management-progress-report-m27>
- [4] M. Dulong de Rosnay, F. Giovanella, A. Messaud, and F. Tréguer, “European Legal Framework for CNs,” netCommons Deliverable D4.1 (v1), Dec. 2016. <http://netcommons.eu/?q=content/european-legal-framework-cns-v1>
- [5] A. Papageorgiou, P. Antoniadis, M. Karaliopoulos, G. Klissiaris, V. Chryssos, L. Maccari, R. Lo Cigno, F. Freitag, and L. Navarro, “Deployment experiences with a Multi-Disciplinary approach,” netCommons Deliverable D3.5, Oct. 2018. <https://netcommons.eu/?q=content/deployment-experiences-multi-disciplinary-approach>
- [6] L. Navarro, R. Baig, and F. Freitag, “Report on the Governance Instruments and their Application to CNs (v2),” netCommons Deliverable D1.4, Dec. 2017. <https://netcommons.eu/?q=content/report-governance-instruments-and-their-application-cns-v2>
- [7] S. Crabu, L. Navarro, M. Dulong de Rosnay, D. Franquesa, and F. Tréguer, “Report on the Governance Instruments and their Application to CNs (v1),” netCommons Deliverable D1.3, June 2017. <https://netcommons.eu/?q=content/report-governance-instruments-and-their-application-cns-v1>
- [8] F. Tréguer and M. Dulong de Rosnay, “Community Networks and Political Advocacy,” netCommons Deliverable D1.5, Feb. 2018. <https://netcommons.eu/?q=content/advocacy-guidelines>
- [9] D. Trudel and F. Tréguer, “Alternative Communication Technologies Throughout History,” netCommons Deliverable D5.1, Dec. 2016. <http://netcommons.eu/?q=content/alternative-communication-technologies-throughout-history>
- [10] C. Fuchs, M. Michalis, and D. Boucas, “The Multiple Aspects of Politics of Sustainability in Community Networks: Definitions, Challenges, and Countermeasures (v2),” netCommons Deliverable D2.2, Jan. 2017. <http://netcommons.eu/?q=content/multiple-aspects-politics-and-sustainability-cns-definitions-challenges-and-countermeasure-0>
- [11] P. Antoniadis, M. Karaliopoulos, G. Klissiaris, I. Koutsopoulos, and P. Micholia, “Incentives for Participation and Active Collaboration in CNs (v1),” netCommons Deliverable D2.3, Jan. 2017. <http://netcommons.eu/?q=content/incentives-participation-cns-v1>
- [12] M. Karaliopoulos, P. Micholia, and I. Koutsopoulos, “Incentives for Participation and Active Collaboration in CNs (v2),” netCommons Deliverable D2.8, Oct. 2018. <https://netcommons.eu/?q=content/incentives-participation-cns-v2>
- [13] J. Martignoni, P. Antoniadis, and M. Karaliopoulos, “Economic Sustainability of CNs (v4) Community Currencies for Community Networks,” netCommons deliverable D2.6, May 2018. <http://netcommons.eu/?q=content/economic-sustainability-cns-v2>
- [14] L. Maccari and R. Lo Cigno, “Monitoring Instruments for CNs (v1),” netCommons deliverable D2.5, Dec. 2016. <http://netcommons.eu/?q=content/monitoring-instruments-cns-v1>

- [15] L. Maccari and R. Lo Cigno, “Monitoring CNs: Report on Experimentations on CNs,” netCommons Deliverable D2.7, Dec. 2017. <https://www.netcommons.eu/?q=content/monitoring-cns-report-experimentations-cns-v2>
- [16] P. Antoniadis, I. Apostol, P. Micholia, G. Klissiaris, V. Chryssos, and M. Karaliopoulos, “Multi-Disciplinary Methodology for Applications Design for CNs, including Design Guidelines and Adoption Facilitation (v1),” netCommons Deliverable D3.1, Jan. 2017. <http://netcommons.eu/?q=content/multi-disciplinary-methodology-applications-design-cns-including-design-guidelines-and>
- [17] P. Antoniadis, I. Apostol, A. Papageorgiou, M. Karaliopoulos, G. Klissiaris, and V. Chryssos, “Multi-Disciplinary Methodology for Applications Design for CNs, including Design Guidelines and Adoption Facilitation (v2),” netCommons Deliverable D3.3, Apr. 2018. <http://netcommons.eu/?q=content/multi-disciplinary-methodology-applications-design-cns-including-design-guidelines-and>
- [18] L. Maccari, L. Baldesi, R. Lo Cigno, F. Freitag, L. Navarro, M. Karaliopoulos, and A. Pilichos, “Report on the Results of the Socio-Technological Experimentation of Open Source Software,” netCommons Deliverable D3.5, Jan. 2019. <https://netcommons.eu/?q=content/report-results-socio-technological-experimentation-open-source-software>
- [19] I. Apostol, R. Lo Cigno, P. Antoniadis, L. Maccari, L. Navarro, M. Karaliopoulos, M. Dulong de Rosnay, and M. Michalis, “Dissemination Report: Summary of Dissemination Actions and Adoption of netCommons Solutions During the Third Year,” netCommons Deliverable D6.3, Jan. 2019. <https://netcommons.eu/?q=content/dissemination-report-summary-dissemination-actions-and-adoption-netcommons-solutions-durin-1>
- [20] N. Facchi, F. Freitag, L. Maccari, P. Micholia, and F. Zanini, “Release of All Open Source Software for all Applications (v1),” netCommons Deliverable D3.2, Dec. 2016. <http://netcommons.eu/?q=content/release-new-open-source-software-all-applications-v1>
- [21] L. Maccari, L. Baldesi, N. Facchi, R. Lo Cigno, F. Freitag, L. Navarro, R. Messeguer, M. Karaliopoulos, P. Micholia, and A. Pilichos, “Release of All Open Source Software for all Applications (v2),” netCommons Deliverable D3.4, Mar. 2018. <https://netcommons.eu/?q=content/release-new-open-source-software-all-applications-v2>
- [22] P. Antoniadis, I. Apostol, V. Aubrée, A. Burns, M. Michalis, J. Neumann, R. Roca, and F. Tréguer, “Best Practices Guide for Community Networks,” netCommons Deliverable D4.5, version 1.0, Jan. 2019. <https://www.netcommons.eu/?q=content/best-practices-guide-cns>
- [23] F. Giovanella, M. Dulong de Rosnay, A. Messaud, and F. Tréguer, “European Legal Framework for CNs (v2),” netCommons Deliverable D4.2, Jan. 2018. <https://www.netcommons.eu/?q=content/european-legal-framework-cns-v2>
- [24] V. Aubree, M. Giovanella, Federica and Dulong de Rosnay, A. Messaud, and F. Tréguer, “European Legal Framework for CNs (v3),” netCommons Deliverable D4.3, version 1.0, Aug. 2018. <https://www.netcommons.eu/?q=content/european-legal-framework-cns-v3>
- [25] D. Boucas, C. Fucks, M. Michalis, V. Aubree, and F. Tréguer, “Political and Ethical guidelines for an Alternative Internets,” netCommons Deliverable D4.4, version 1.0, Dec. 2018. <https://netcommons.eu/?q=content/political-and-ethical-guidelines-alternative-internet>
- [26] D. Boucas, M. Michalis, and L. Ghiro, “Alternative Internet’s Political Economy,” netCommons Deliverable D5.4, Aug. 2018. <https://netcommons.eu/?q=content/alternative-internets-political-economy>
- [27] D. Boucas and M. Michalis, “Alternative Internet Survey Implementation,” netCommons Deliverable D5.3, June 2017. <https://netcommons.eu/?q=content/alternative-internet-survey-implementation>
- [28] —, “Alternative Internet Survey Plan,” netCommons Deliverable D5.2, March 2017. <https://netcommons.eu/?q=content/alternative-internet-survey-plan>
- [29] C. Fuchs, M. Michalis, and D. Boucas, “The Multiple Aspects of Politics of Sustainability in Community Networks: Definitions, Challenges, and Countermeasures (v1),” netCommons Deliverable

- D2.1, June 2016. <http://netcommons.eu/?q=content/multiple-aspects-politics-and-sustainability-cns-definitions-challenges-and-countermeasures>
- [30] P. Antoniadis, I. Apostol, and A. Papageorgiou, “Community Networks and the Right to the City,” netCommons Deliverable D5.5, Nov. 2018. <https://netcommons.eu/?q=content/community-networks-and-right-city>
- [31] P. Antoniadis, L. Maccari, and L. Navarro, “Dissemination Report: Summary of Dissemination Actions and Adoption of netCommons Solutions During the Second Year,” netCommons Deliverable D6.2, Aug. 2018. <https://netcommons.eu/?q=content/dissemination-report-summary-dissemination-actions-and-adoption-netcommons-solutions-durin-0>
- [32] C. Fuchs, F. Giovanella, R. Guidolin, R. Lo Cigno, and L. Maccari, “Data Management Plan (v1),” netCommons Deliverable D7.1, Jul. 2016. <http://netcommons.eu/?q=content/data-management-plan-v1-0>
- [33] R. Caso, C. Fuchs, F. Giovanella, R. Guidolin, R. Lo Cigno, and L. Maccari, “Data Management Plan (v2),” netCommons Deliverable D7.3, June. 2018. <http://netcommons.eu/?q=content/data-management-plan-v1-0>

A. RP1 Review Report

We report here the review report prepared by the consortium and accepted by the PO after the first review meeting, describing the actions undertaken by the consortium to improve the project based on reviewer's comments.



netCommons (network infrastructure as commons)
 Next-generation Internet - RIA - GA 688768

REVIEW REPORT
 CONSORTIUM COMMENTS AND COMPENSATIVE ACTIONS

Introduction

First of all, we wish to express our appreciation for the frank and open discussion that the reviewers and the PO have led during the review meeting in Brussels, helping us focusing better the work we are carrying out and how it is perceived by people who follow it from the outside.

This document is based on the written report and recommendations we received after the meeting. All quoted sentences refer to the official documents of the official report of procedure PMOC-688768-1. This document is conceived to give all proper responses to these comments, including (very few) rebuttals and all novel actions we are undertaking to fulfil the new requirements during the prosecution of the project. Quoted sentences at the beginning of each section (in italics) are meant to help follow the reasoning of the document, understand why we propose specific actions to be taken, and why others, which may as well follow from these comments, cannot be taken. We do not report here the positive comments received, which we have however greatly appreciated, because they obviously do not require actions on our side.

The document is organized per-WP, plus an initial section devoted to general comments and management-related ones, so that it is easier to understand the impact on the project work and coordination; this is applied, even when the review comments were not grouped by WP, so that quoted references may come from different parts of the Review Report.

Before entering into details, let us recall that netCommons is a **Research and Innovation Action (RIA) financed in the Call: H2020-ICT-2015, Topic: ICT-10-2015 b, Multidisciplinary research on collective awareness platforms (Internet Science)** whose goal is to *"provide a better understanding of the obstacles and opportunities which are fundamental to the development of collective awareness platforms"* (community networks in our case). Hence, the research orientation of netCommons, which renders it different than the overwhelming majority of CAPS projects, is not a matter of "self-declaration". On the contrary, netCommons, as an RIA, was originally conceived and financed to carry out long-term, high-impact, innovative and multidisciplinary research work. This is reflected both in the Consortium (majority of researchers and academics, some of which with activist profiles, and fewer pure activists) and the DoA. As explained therein, and presented during the review, we organized our research along two domains, aiming at global and local impact, respectively.

Research work along the first domain focuses on long-term impact mainly targeted to the scientific community and the policy makers. The ultimate goal of this research effort is to produce societal impact by coping with the distortions that today hamper the proper development of bottom-up, self-aware initiatives and empower people with the rights to access information, communicate, express freely their thoughts, and manage properly their



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personal and sensitive data. The second domain features applied research with scientific relevance but with a short-term applicability to communities.

The proceedings of the research activities that aim at global impact include research articles, and advocacy-building for CNs, ranging from actively organizing their federal representation across Europe to giving them voice in regulatory and policy-making processes (e.g. Open Letter to EC and workshop in the European Parliament). The results of the research activities that aim at local impact include the development of software, the transfer/replication of good practices and lessons learned across different CN instances, training activities, and a lot of interactive work with the communities in cooperatively developing governance and financing models that can be used by them and enhance their sustainability.

General issues and management (WP7)

Remarks and notes from the Review Report

Commission required modifications. None

Reviewers' comments concerning the first reporting period.

"CAPS are expected to support environmentally aware, grassroots processes and practices enabling citizens to:

- share knowledge,*
- make better informed decisions as consumers,*
- nudge collective environmentally-savvy behavioural changes, and*
- set up more participatory democratic processes."*

Thus research is supportive to the societal aims, not the other way around. These aims should not be merely a façade for pet academic projects.

The main objective of Netcommons – and the reason why it was awarded with CAPS-funding, is "[to] produce high-impact interdisciplinary research on, and together with, Community Networks, in order to resolve some of the problems that CN's face, and foster their growth and their long-term sustainability." (italics added).

All deliverables of the project should clearly contribute to this main objective. The other way around, any activities that do not directly contribute to this objective should be omitted or at least minimized.

Our general impression is that Netcommons has already made several good contributions to the functioning of CN's. However, this is not really (or really not) clear from the current reports. A lot of pages (and efforts) are devoted to things that do not directly contribute to the main objective. On the other hand, the concrete contributions that have been achieved are not (or badly) reported upon."

Reviewers' recommendations for future work.

"For the sake of legitimization of the (funding of the) project we strongly recommend to make these successes more visible. In the next round of deliverables, the reports should start with the description how this work has contributed to the main objective. Subsequently, the report should show in a convincing manner how this has actually has been done."



<http://netcommons.eu>

"Netcommons is founded on the assumption that CN's are (still) relevant. However, this assumption should not be taken as a given. Also, the assumed success of 'best practice' CN's should be critically assessed (e.g., we believe that the current sustainability of guifi and nunix is quite fragile).

Notwithstanding the relative (in)efficiency of CN's vis-à-vis private networks from a broad perspective a legitimate argument could be the presence of more options (i.e., secure sufficient variation in the overall technological evolution of connectivity).

The consortium should engage with its topic from a critical perspective, addressing its shortcomings as well as its strengths so as to ultimately improve the chances of CNs to become a viable alternative in the medium and long term."

"In contrast to most other CAPS projects in Netcommons no separate budget has been allocated to pilots. This is because Netcommons is supposed to have a generic impact on all CN's that are being studied, and indirectly on all CN's.

Sarantaporo has been adopted as a pilot (thus is has to financially self-sufficient – see next item). We very much welcome the ongoing 'action research' in Thessaly. Having said this, it is a relatively small pilot and there is a real risk that it might collapse in due time. We therefore strongly recommend to spread the risk and establish more 'pilots' by pro-actively trying to get lessons learned from Netcommons being adopted/implemented by other CN's (e.g., transferring the investment practice from B4RN to guifi). These actions/interventions should then be well- documented as a 'case'."

"[taken from 'Impact'] In a sense, Netcommons revolves around dynamic innovation. That is, CN's could be regarded as an alternative to established market forces (i.e., large telecom operators). Although at various occasions it is stated that CN's should "provide more than just affordable internet access" this argument (rightful as it be) should not be used as a disclaimer. Thus, at the end of the day CN's should indeed be competitive from an economic point of view with networks from commercial providers. B4RN is an interesting case in this respect (note that it is especially competitive due to the outsourcing of digging to volunteers). The transfer of some of B4RN's investment strategies to Guifi-net (which is not so competitive as is often assumed) is therefore highly relevant. The Sarantaporo case – which is basically a hybrid model where a CN is used as a cost-efficient manner to establish the costly last mile for a commercial venture – is another interesting model. In sum, in the two selected cases (Guifi.net and Sarantaporo) Netcommons does focus on the right innovation activities but overall, more attention should be paid to the competitive edge of CN's (including a fair assessment of the economic viability of current 'best practice' CN's).

"The focus of the project (rightfully) is on communities and cooperatives, not on firms. Indirectly, Netcommons might have an impact on SME's that are (getting) involved in CN's (maybe to some extent in the Sarantaporo case but certainly so the case of Guifi.net)."

Consortium comments and compensative actions

We appreciate the motivation we received by the reviewers to further improve our effort in producing and documenting the impact of our work on communities. At the same time, we also stress the importance of the effort we have to dedicate to the long-term scientific results. We strongly believe that both domains contribute equally to the success of our project. To achieve this goal, netCommons coordinator will closely monitor that all activities, even the day-by-day and informal interactions, which have probably been under-reported in


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the first reporting period, are duly reported and highlighted in the upcoming deliverables. **Moreover, deliverables will explicitly state the contribution of the deliverable to the one of the main objectives of netCommons**, even when this may be self-evident to the authors (but can clearly be less evident to other readers).

We fully agree that the sustainability of CNs is still fragile, we believe this has been documented across several deliverables, we also believe that the fragility is mainly due to lack of proper legislation, rather than technical or economic problems. Special attention, as suggested by the reviewers, will be devoted to evidence the reasons of these fragilities in the second part of the project, and to help CNs overcome them. **To this end, UniTN is recruiting an additional techno-legal researcher to increase the consortium capabilities in legal analysis and advocacy.**

It has been correctly highlighted that netCommons does not have a pilot. This is true, and this is a strategic choice of the project: Selecting a pilot would mean distort (with undue support) the development of a single (or maybe 2-3) CN, but not contributing to the global development and understanding of the phenomenon, its reasons and its weak points, and neither contribute to the local impact on CNs at large. The interaction with Sarantaporo.gr is not managed as a pilot: netCommons researchers do not have any direct involvement in its planning, development, or management. We think the entire involvement of Sarantaporo.gr has been partially misunderstood, surely due to mistakes we did in its description and representation. Indeed, both in WP3 and in WP2, the interaction with Sarantaporo.gr has been an on-field experimentation of participatory design and deployment. The role of netCommons researchers has constantly been a yeast to make the local community aware of what they were doing, and in showing them that the growth must come from local needs, and not from external intervention. More on this topic will be discussed in WP2 and WP3 sections. In any case netCommons coordination in the second half of the year will guarantee that a broader interaction with different CNs is implemented and documented.

Given the substantial amount of work required to improve the interaction and participatory design process with CNs requested by the reviewers, the Consortium will open an amendment procedure to add one deliverable at M30 (see the section about WP3).

We believe that creating bridges between different CNs, so that best practices and positive results can be exported and also hybridized is very important, and in this we fully agree with the reviewers' comments. We also fully agree that economic sustainability is very important, albeit sustainability does not always mean a competitive edge on commercial operators.

As we show in WP1, CNs often act in underserved areas where there is no alternative. When they provide connectivity in places where market players are already established, they deliver connectivity in a way that is better aligned with the public interest of the community (not necessarily of the entire population, as the ninux example clearly show). So, in any case, they remain a great option to guarantee a healthy ecosystem, an alternative that need to be promoted and preserved from an Internet Science point of view, which goes beyond economy.

B4RN is in practice a cooperative ISP, and it does have its own goals and models. These are important in the context where B4RN operates, and they can clearly be exported to other places and cases. Freifunk instead operates on an entirely different basis, and does not even consider itself (or better the collection of its participants) as an ISP, or as competitors to commercial ISPs, thus in this case a "competitiveness" analysis would not be applicable. We will do our best to understand different "business models and cases" and to export positive ones to other contexts. We will also further investigate the competitiveness of



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guifi.net, to the extent where this can apply in the specific context, although we do not understand the foundation of the reviewers' statement that guifi.net is less competitive than normally thought: we do not claim it is wrong, we simply need more investigation to understand it.

We also appreciate the suggestion that netCommons may have an indirect impact on SMEs that operate, around, within, or in general close to the "ecosystem" of a CN, and we will devote some effort to understand and document this, being well aware of the extreme difficulty to collect such information on firms that are not directly tied to the project. Indeed, in re-considering the involvement of GAIA epicheirein, or better GAIA επιχειρείν, as this Greek word is difficult to say the least to translate in English, in the participatory development in Sarantaporo (see the part on WP3 for more details), we have realized that indeed netCommons can have an impact on SME ... or even on large enterprises, by twisting their behaviours and services toward the needs of communities served by CNs.

We want to close this general ad management part discussing briefly women representation in netCommons. We fully agree that women in netCommons are underrepresented: women are barely 20% or so in netCommons personnel. However, we claim that this is already a success: netCommons is an ICT project and women in ICT are underrepresented and this cannot be ascribed to netCommons. If we look at the legal team of netCommons we see that women are 50%, moreover there are women involved in every institution. netCommons is doing all it can to be "better than average" in this, but it cannot subvert the sheer fact that our society still consider Computer Science and Engineering a male field. Indeed, on-field work with CNs actively support the idea that women can be involved just as males in community building, even on-line, and this is rightfully represented by the participatory work done in Sarantaporo.gr and beyond.

WP1

Remarks and notes from the Review Report

Commission required modifications.

"D1.4 should strongly focus on showing and quantifying how the project has impacted on CN practices."

Reviewers' comments concerning the first reporting period. None

Reviewers' recommendations for future work.

"... all impact aspects have yet to be reported. D1.4 should strongly focus on showing and quantifying how the project has impacted on CN practices"

Consortium comments and compensative actions

We agree that in the first 18 months of the project no direct impact of netCommons activities on CN has been reported. Indeed, regarding T1.2 and D1.4 the DoA describes it as "A monitoring phase for the evaluation of the initial impact of the recommendations will also be carried out", so we fully agree with the comment and the suggestion to strongly focus D1.4



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on the impact, and we also agree on the implicit assumption that we have to testify the initial impact and not speculate on the long-term impact in D1.4.

Given the timeframe and the resources available, the outcome can only be qualitative (a quantitative evaluation would imply several years of detailed and very complex measures). As part of the monitoring we are collecting accounts and letters from the CN involved to reflect the initial impact of the project recommendations.

We also plan to provide an update of the overall impacts in a later phase of the project, after the completion of the task in M24. **This update may even include some local quantitative indicators and it will be produced as part of D6.3 Dissemination Report, either as a specific chapter or as a separate, public document summarized in the Deliverable.**

WP2

Remarks and notes from the Review Report

Commission required modifications. *None*

Reviewers' comments concerning the first reporting period. *None*

Reviewers' recommendations for future work. *None*

Consortium comments and compensative actions

Albeit there is no mention of WP2 in the Review Report, we deem it appropriate to summarize the intended work and its objectives for the remaining project lifetime. WP2 carries out research aiming at both global and local impact (refer to our introductory notes).

During the discussion at the meeting it has been clear that Deliverables did not convey fully the goals of the WP and its achievements. The theoretical work has been perceived as completely detached from the project goals. We do not want to enter here into a lengthy (and unfeasible) discussion on the theory developed and how it influences subsequent work and analysis, we just notice that the consortium will do its best to clarify the relationship in future documents.

WP3

Remarks and notes from the Review Report

Commission required modifications. *The results of D3.1 must be tested on and validated by all partners. The first part of D3.3 must incorporate this content.*

Reviewers' comments concerning the first reporting period.

"Although the creative (...) deal with GAIA epicheirein is applauded – Netcommons develops a mobile app on top of GAIA's back-end at no costs in return for GAIA investing in the physical infrastructure from the Sarantaporo CN – the potential risks of getting GAIA aboard



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should be carefully assessed and described. These risks are that (1) GAIA does not (fully) follow up on its in-kind investments and (2) it used the micro data that is collected from the Sarantaporo CN members in a manner that is not in line with the spirit of CAPS/Netcommons (e.g., reselling this information to third parties)."

"The costs related to the use of in-kind contribution provided by third parties declared in the financial statements been not yet satisfactorily explained. Again we refer to the involvement of GAIA epicheirein in the Sarantaporo. We do believe that "you can make money without doing evil" but we would like to see the presumed in-kind contribution of GAIA formally elaborated."

Consortium comments and compensative actions

We understand that the reviewers by asking that all partners apply a participatory design methodology really means that partners involved in development and deployment of applications with CNs try to make use of the methodologies experimented in T3.1 and presented in D3.1 (and D3.3). We fully agree on this remark. It is important to notice that the work of co-creation done with Sarantaporo.gr must be understood and viewed as a way to bring forward this validation in time, and not as a conclusive step. As well highlighted in D3.1 participatory design is a process and not a crystallized recipe. Indeed, the experience in Sarantaporo.gr shows that distilling a methodology is complex to say the least, and that the process requires more time than initially estimated.

For this reason, and to meet the reviewers' comments and additional requests, the consortium will start an amendment of the DoA by which D3.3 at M24 will report on the proposed methodology in a way that can be applied by the other tasks, and add a further deliverable at M30 that will describe the application of the methodology to specific applications in different CNs.

Regarding the **participation of GAIA in netCommons**, we remark here that **it is not formalized as a third party that is giving in-kind contribution to the realization of the project. GAIA took no commitment to the realization of the goals of netCommons, and it did not take over any tasks that were included in the DoA.**

In fact, GAIA and the smart farming services it provides, emerged as a consequence of the participatory design process in Sarantaporo.gr (workshop on November 26th, 2016), where it was invited as an expert stakeholder in the area of smart farming services. The local community showed strong interest in the services provided by GAIA to the point of reorienting the mobile app developed in Task 3.4 and pursuing actively the engagement of this company (with 30% of its shares in the hands of agricultural cooperatives across Greece) in the Sarantaporo.gr network.

The efforts of netCommons at this point focused on empowering the engagement of GAIA to participate in a co-creation process, matching their interests (as a private firm with strong cooperative dimension) with the interests of the Sarantaporo community. As such, we consider it a big success of netCommons to be able to make this partnership happen, in order to have a real impact on the community. Furthermore, we consider it also a big success of the participatory process that made it possible to make these overlapping interests emerge.

It is important to note that at the moment no data is collected from the Sarantaporo community by the application, let alone given to GAIA. A realistic objective for their involvement in the short-term (within the duration of netCommons) is to run a demo for the


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provision of smart farming services over the Sarantaporo.gr network. In this demo, GAIA will adapt their sensors to work with WiFi technology (as opposed to GSM that they now use, but does not work properly in the area), moreover they will purchase sensing equipment and the nodes to be installed in one or more farms in the network to run the demo.

We really regret that the involvement of GAIA has been completely misunderstood, and we will make all possible effort in future documents to clarify upfront the role, engagement level and contribution to netCommons impact of any possible stakeholder of (or using the services of) CNs.

On the mobile app side, there is ongoing work to embed privacy control in the app. The issue has been discussed extensively, also in response to the review comments, in a recent session of the participatory design thread involving the AUEB team, Nethood, and two members of Sarantaporo.gr (Nov 8th, 2017). The app user will have the option to choose which posts (data) will be “local” and which will be shared with the community in return for having access to the data others share (reciprocity principle) and offers/gifts from the CN and the service provider. Practically, in the longer-term, “local” might mean that the information is stored at a box at the home/farm or a cloud infrastructure implemented within the CN (e.g., the Cloudy solution developed in guifi.net) of a user (as a private super-practical e-calendar) and “shared” would mean stored in the cloud of the provider. Note that this is a feature that differentiates the app from existing offers (mainly Web-based) and it is in line with the privacy and data ownership aspirations met in many users of CNs.

In this longer term, after the project ends, the involvement and in-kind contributions of GAIA may prove key to the sustainability of the application but, more importantly, for the economic sustainability of the CN. At the same time, it could also prove a major step towards the evolution of a business/funding model for CN that will engage private sector entities in ways that respect the values and principles of commons. It is only at that time, as far as the Sarantaporo.gr community and GAIA decide to continue this partnership, that they will set the exact formal terms of this cooperation (including privacy issues) beyond the experimentation phase in the duration of netCommons.

WP4

Remarks and notes from the Review Report

Commission required modifications.

“Impact on CNs (and impact of CNs on policy-makers themselves) must be improved and documented.

In the remaining iterations of 4.1 (4.2 and 4.3), the current data practices of case-study CNs should be documented, as well as the (specific, measurable) impact of the project on improving their legal practices (e.g., actual changes/extensions being made to legal conditions/by laws from CN's). Consider drafting generic (modular) legal texts, much akin Creative Commons.”



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Reviewers' comments concerning the first reporting period.

"The conclusion under 4.7 [of D4.1] should be phrased differently. Although both reviewers thrive on creativity the current phrasing clearly cannot be accepted. One should not advice to dodge laws. Creativity is very much welcomed but within the boundaries of current legislation. This passage needs to be rephrased.

Since the Deliverable will be rejected to allow for this correction, the consortium is also advised to review the Deliverable and reconsider its understanding of Data Protection law as a deterrent for decentralised networks (this panel considers that the figure of the data controller/processor allows for decentralisation.

Also, the use of 'smart contracts' or other innovative ways of establishing digital trust and relationships could be explored)."

Reviewers' recommendations for future work.

"The current work is too much focused on policy impact. Impact on CNs (and impact of CNs on policy-makers themselves) must be improved and documented. In the remaining iterations of 4.1 (4.2 and 4.3), the current data practices of case-study CNs should be documented, as well as the (specific, measurable) impact of the project on improving their legal practices (e.g., actual changes/extensions being made to legal conditions/by laws from CN's). Consider drafting generic (modular) legal texts, much akin Creative Commons."

Consortium comments and compensative actions

First of all, we are grateful to the reviewer to explicitly tell us that the wording of Section 4.7 in Deliverable 4.1 could be interpreted in a very different way from its meaning, even in a way someone could understand that the use of the word 'creative' may support or advise unlawful behaviors. As this interpretation was by far away from the goal and semantics of the sentence (which contains the words 'comply with their data protection obligations') and of the overall document, we already **rephrased it following the reviewers' suggestions and the new Deliverable has been submitted and accepted by the Commission and it is also available on netCommons web site.**

We take into account the useful comment that we should better document interactions and legal information provided by our team to CNs. **We are in the process of documenting the impact of D4.1 on the CNs, as planned in the DoA, in D4.2. The iteration between D4.1 and D4.2 consists in presenting legal results of D4.1 to the CNs, and gathering their reaction and practices through interviews,** as a manner of collecting the impact of the legal framework and of our initial analysis on them, in order to produce a refined version of the legal framework analysis enriched by the CNs vision and experience. As for documenting the impact of CNs on policy-makers with regards to the legal framework, this is meant by the DoA to be documented in D1.5, which is scheduled between M18-24.

Regarding the words "current data practices", if what is meant is data retention practises, they are currently being documented by consulting with FFDN and helping them to change their policy in light of recent European Court of Justice case law (instead of reflecting the national legal framework only so far, which is being possibly invalidated by the ECJ).

We are also documenting legal information we are providing to Ninux based on their demands. However, we cannot commit to do the same for all CNs, it will depend on their specific needs, on the occurrence of changes in the law, and on our resources. So as for documenting the impact of the project on "improving their legal practices (e.g., actual



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changes/extensions being made to legal conditions/by laws from CN's)", in the case they need to develop or modify their terms of use or by-laws, we will be able to do that. But the absence of such development or modification may mean that none was needed in the first place because they were already in line with the law, or because no change of law happened in the meanwhile. Finally, it must be considered that such changes in the CNs legal practices will mostly take place after the legal recommendations will have been delivered at M36, thus they will be part of the long-term impact of the project, going beyond its termination.

The ideas of drafting generic or modular legal texts similar to Creative Commons licenses is appealing, but it is unfortunately not feasible. Such effort, grounded at a completely different scale, involving years of work of many lawyers, was initially focusing on only one side of one branch of law (copyright) in one jurisdiction, while the legal framework of CNs involves different areas (data protection, liability, security, etc) and any text could be different from country to country, even in the foreword. Besides, it is not certain that the already existing generic legal texts, PICO Peering & FONN agreement, need extra clauses, or are "missing" something that WP4 results would discover. netCommons cannot and should not self-proclaim as a standardisation authority. Harmonisation of practices might emerge (or not, it is not necessarily desirable) after the project: **Best practices are due M36 and we can suggest making these guidelines, produced throughout interaction and incremental development of the deliverables, a kind of common legal foundation of items to consider for the movement as it continues to grow.**

We also point out that delegation, decentralisation and distribution have different meaning, both in the legal community, in the political science community and in the engineering community. Detailed definitions of the different levels which can be more or less (de)centralized were provided in section 4.6 of the deliverable, right before the 4.7 conclusions. We fully agree that the upcoming Data Protection Directive from the EU addresses decentralization through delegation, but so far, as any other regulation on data manipulation, it does not consider distributed management, distributed algorithms and federated consensus. Albeit probably worded differently, this entirely new approach, fundamental for bottom-up initiatives is what part of the research tackled by netCommons is pursuing.

Smart contracts are meant to facilitate the verification or the enforcement of contracts. We do not see any clause in by-laws or contracts or internal policies which could be verified or revoked in such a way, in the current or future realm of CNs activities or use of contracts. Moreover, we doubt that such schemes respect the values or trust-based forms of governance developed by several CNs. The development and the implementation of smart contracts at the by-law level is very costly, and benefits are not proven, thus we cannot commit in including them in legal recommendations. **In any case, we will keep an open eye on the development of smart contract and distributed ledger technologies and their possible application to the management of CNs if not to their governance.**

Policy can both designate internal policies (terms of use) of CNs or policy-making, the process of drafting and changing the law. D4.1 only deals with explanation/implementation of the law (as planned in the DoA, its title reads: 'current legal framework'), therefore we do not understand how WP4 could have focused too much on policy impact, as this was its only


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original goal. Advocacy activities (which is what we understand by 'policy impact' and will be specifically addressed in D1.5) are mentioned in the draft of D4.2 with the goal of explaining the impact of the legal framework on CNs to policy-makers. **We will further potentiate these aspects and the impact of the legal framework on CNs as suggested, having however in mind that an entire deliverable is devote to them later in the project.**

Actually, it is the current law as described in the deliverables which threatens the sustainability of CNs, so it is not by making them change their "by-laws" (which address governance, a different topic than legal framework), or making them extend their "legal conditions" that any positive impact of the legal work will be achieved for CNs. What is needed is a change of the law which applies to CNs. In order to achieve that, and solve the legal problems faced by CNs, the only way is through impact on policy-makers. Therefore, we consider that in order to fulfil netCommons objectives, we have (also) to keep a sharp focus on policy impact, because what is needed to change the law is lobbying, as correctly pointed out by the reviewers, and the first step for proper pressure-making activities is the understanding of the law; next comes the reporting of legal difficulties faced by CNs to the policy-maker. **We are already going in this direction in the writing of D4.2, where we include the analysis of how the legal framework impact on CNs.**

CNs legal problems are not coming from their by-laws, even if some work can be done to improve governance (which is reported under WP1) and streamline data protection (e.g., upgrade to ECJ case law and not stay in national law as we assist FFDN). **Therefore, if the metric of success of the project is, as rightfully recalled by the reviewers, the "direct impact it has eventually had on the CN's",** we need to put an emphasis on the choice of the right variables to be impacted by our results. netCommons is trying to define the most appropriate means (e.g., replies to legal questions, legal information notes, explanations provided to CNs on the legal framework part, briefs to the policy-makers, advocacy strategies, interaction between purely legal and technical regulations, etc.) that can be used to **achieve a positive direct impact of law on CNs.**

WP5

Remarks and notes from the Review Report

Commission required modifications.

"WP5 needs to make sure it delivers a good quality result in line with the effort and resources used. This is not the case at the moment, and so the consortium should take all the necessary measures to that aim."

Reviewers' comments concerning the first reporting period. WP5:

"There are very serious issues with the survey (both in terms of sampling and protocol design). As a result, the validity of the data is too low to be used for any serious statistical purposes. We recommend not to waste any more efforts on attempts to improve the quality of the data – they are beyond repair. Instead, we recommend to re-use the answers that are given to open questions as (valuable) input for a qualitative analysis of issues that are flagged by this (peculiar) population in order to achieve the goals of T5.2 and T5.3"



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Reviewers' recommendations for future work.

"At the end of the project, the resources used in WP5 will be assessed in light of the results obtained (both in terms of effort and quality). The consortium must make an effort to improve this relationship and the results of this WP."

Consortium comments and compensative actions

Following the advice of the reviewers we will focus in the analysis (D5.4) on the qualitative aspects generated from the open questions. **More specifically, we will employ critical discourse analysis of the responses to the open questions to identify discourses and opinions of users and create a typology and documentation of ideal-typical responses.** We will possibly link these response types with particular use profiles (in terms of demographics and Internet usage) in an attempt to identify patterns.

The analysis along the above lines will provide useful data in relation to the following questions: a) what users find lacking or problematic, or in any case what they are concerned about in the standard Internet b) what users find interesting or appealing in the prospect of using community networks c) what users find difficult or challenging in terms of community networks.

Such information is expected to provide valuable insights into how community networks are perceived of by users who are either familiar with them or less so and can be used by CNs themselves as part of their efforts to become more visible, well-known and ultimately sustainable. In this respect, the survey is expected to produce results that will feed back to the overall sustainability issue (WP2), the legal aspects of CNs (WP4).

WP5 will carefully document the resources employed in preparing the survey and analysing its results, and clearly explain the value obtained out of it. The quantitative analysis of closed answers will be left in the background as suggested by the reviewers; however, it automated processing exploiting the experience in statistical analysis present in the consortium will be considered to check if it can still be used after verifying its validity against sound mathematical stochastic de-correlation and de-biasing tests. Some of the effort spent in deciding the sectioning and grouping of questions can be reused as background information for the above automatic processing.

WP6

Remarks and notes from the Review Report

Commission required modifications.

"In D6.3 please include a section on impact assessment. It must provide an explanation and metrics on how all the promises from the DoW and the workplan objectives per each WP have been addressed, with a specific emphasis on impact on CNs and output goals. Document formal and informal interactions with CNs."

Reviewers' comments concerning the first reporting period. None



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Reviewers' recommendations for future work.

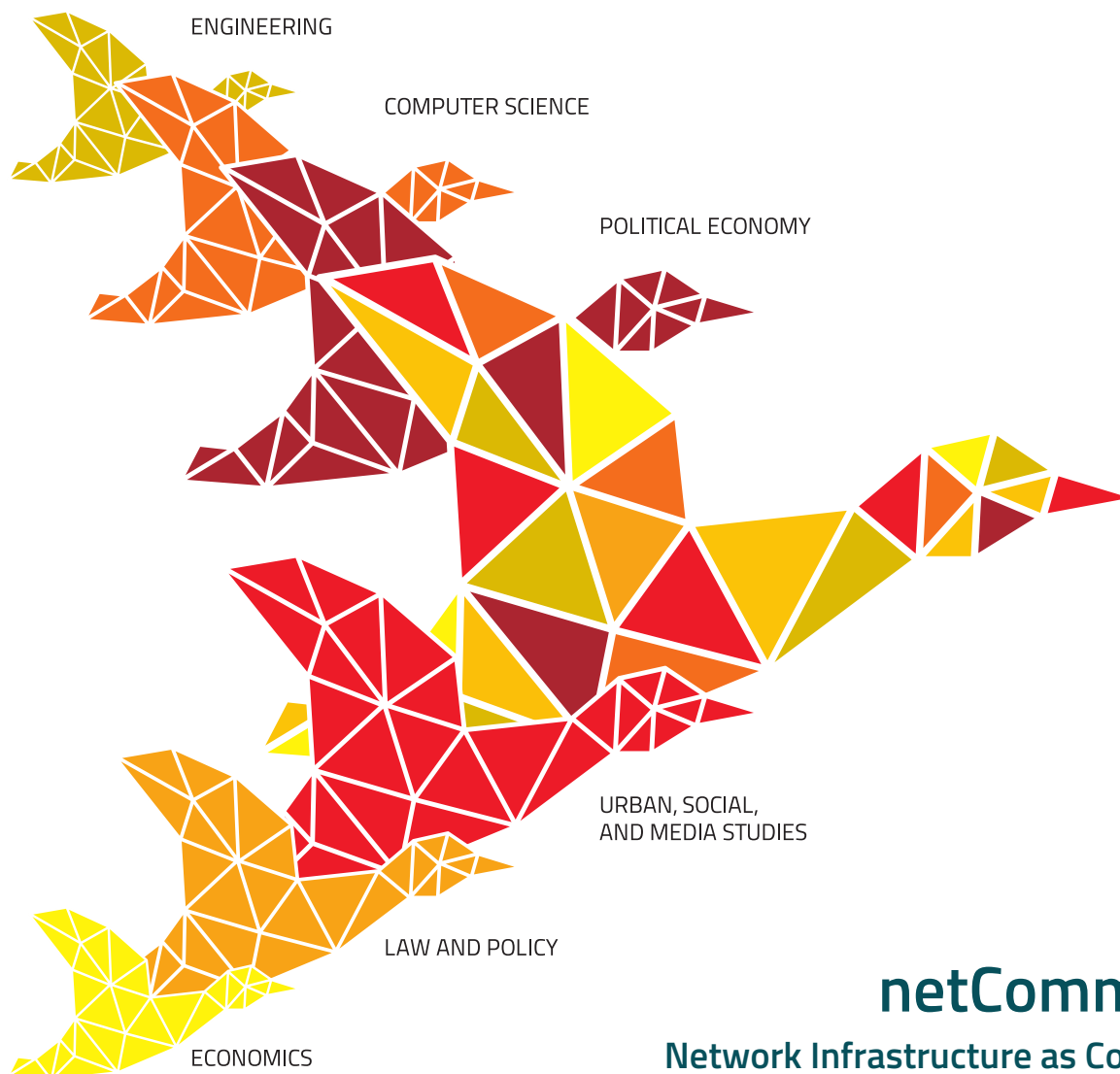
"In D6.3 include a section on impact assessment. It must provide an explanation and metrics on how all the promises from the DoW and the workplan objectives per each WP have been addressed, with a specific emphasis on impact on CNs and output goals. Document formal and informal interactions with CNs."

Consortium comments and compensative actions

We agree with this comment and request and **we will include a dedicated section summarizing the impact both in D6.2 and in D6.3.**

There is a lot of impact on communities and CNs, but this is spread out in various places and deliverables, and the summary of dissemination presented in D6.1 has probably not been so effective in highlighting it, as noted D6.1 lacks a single section distilling the impact of all dissemination activities. However, it must be noted that D6.1 refers only to the first year of the project, so only to one third of the work ... and far less dissemination activities, as they obviously started after a few months of work.

Some more comments and corrective actions addressing the impact are commented in the general initial section.



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