



Cos4Cloud

**Co-designed Citizen Observatories Services for the EOS-
Cloud**

H2020 programme: Research and Innovation action

D 8.4 Evaluation of KT materials deployed

20230131, Version R1.2



Project funded by the European Commission within the
Horizon 2020 Programme (2014-2020)

Grant Agreement No.	863463
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Type		
R	Document, report excluding the periodic and final reports	
DEM	Demonstrator, pilot, prototype, plan designs	X
DEC	Websites, patents filing, press & media actions, videos, photos, etc.	
SOF	Software, technical diagram, etc.	
OTHER	Flyers, etc.	

Dissemination level		
PU	Public, fully open.	X
CO	Confidential, restricted under conditions set out in Model Grant Agreement	
CI	Classified	

Revision history

R#	Date	Description/Reason of change	Deliverable contributors
R0.1	20230102	Strucutre, Revision and addition of contents	Sonia Liñán
R0.2	20230119	Creation of the first version	Sonia Liñán, Ángela Justamante, Claudia Fabó
R1.0	20230126	Revision and addition of contents	Sonia Liñán, Ángela Justamante, Claudia Fabó
R1.2	20230131	Final revision	Miguel Hernández, Karen Soacha

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Citation

This document is a public deliverable. This report can be cited as *Cos4Cloud consortium (2023)*. Liñán, S., Justamante, A., Fabó, C. Cos4Cloud's Evaluation of KT materials deployed - Report (D8.4).

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Executive Summary

This Knowledge Transfer Report aims to describe and evaluate Knowledge Transfer activities undertaken by the Cos4Cloud project between M1 (November 2019) and M39 (January 2023).

The main goal of this document is to create a shared understanding of the Knowledge Transfer (KT) Plan implemented in Cos4Cloud and their assessment according to defined indicators.

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1. Background

Cos4Cloud (Co-designed citizen observatories for the EOS-Cloud) is a project funded under H2020 by the European Commission. It has designed and developed 13 technological prototypes and implemented these services to improve citizen observatories (COs).

The project is carried out within the framework of the European Open Science Cloud (EOSC), a virtual space aimed at European scientific staff. Therefore, some of the services, once created, have been made available via the EOSC. By the end of the project the services Pl@ntNet, Cos4Bio, MOBIS and AUTHENIX are registered in EOSC Marketplace, however, this will not guarantee their sustainability in the EOSC ecosystem. Cos4Cloud's ultimate goal is to render these platforms more global, sustainable and viable over time by integrating citizen science (CS) into the EOSC, and bringing citizen science projects as a service for both the scientific community and society at large.

The innovative services that aim to improve the citizen science data quality have been designed, prototyped, and implemented using deep machine learning, automatic video recognition, advanced mobile app interfaces, and other cutting-edge technologies, based on data models and data protocols validated by traditional science. The new services provide mechanisms to ensure the visibility and recognition of data contributors, and the tools to improve networking between various stakeholders. The design of new services has been user-oriented and carried out in the framework of a broad spectrum of co-design and testing workshops, engaging a wide range of stakeholders from society, government, industry, academia, agencies and research, who have helped to co-design the service's requirements.

All the products, innovative methodologies and outputs generated throughout the project have been disseminated and communicated using different channels and actions depending on the target public to ensure knowledge transfer. This deliverable describes Cos4Cloud's Knowledge Transfer plan, including the knowledge outputs identified by the project, the stakeholders, the channels used to transmit this knowledge, the actions and the evaluation after three years of implementation.

2. Introduction

2.1. Forms of Knowledge

There is no single definition of knowledge, so the scope of the term knowledge transfer is hard to narrow. We need to define what knowledge is before creating a knowledge transfer plan. In Cos4Cloud, we used the knowledge classification described in the Report “Metrics for Knowledge Transfer from Public Research Organizations in Europe” (1). According to this report, there are three major formal knowledge forms in which knowledge can be carried and hence transferred:

- **Codified knowledge** expressed through language (including mathematics), for example as scientific literature, process documentation or patents,
- **Internalised by people who have acquired codified knowledge and knowhow** through study, instruction, and experience, for example, graduates or experienced researchers leaving their institutions to work in an enterprise, in a school, etc.,
- **Embedded in tools or artefacts** that are more or less ‘ready to use’ such as machinery, software, new materials or modified organisms; often called ‘technology’.

2.2. What is Knowledge Transfer (KT)?

According to the Report by the European Commission's Expert Group “Knowledge Transfer Metrics” (2), “Knowledge Transfer is about getting research and expertise put to use which, by its nature, is wide-ranging and complex. In practice, KT indicators adopted internationally are diverse and range far wider than the traditional measures of patenting, licensing, number of spin-offs and revenue. In many countries, they extend over different channels of industry engagement, e.g. including research collaboration, and often move beyond industry to encompass other “non-academic” users and engagers.”

During the last decade, knowledge transfer has moved from the more traditional concept of commercialisation and monetisation towards a more rounded approach that considers co-creation and the dissemination of research results and outputs with and to non-academic third parties (2). This new approach is represented in Figure 1, from the Report “Knowledge Transfer Metrics” by the European Commission's Expert Group (2), and it is the KT approach followed in the Cos4Cloud project.

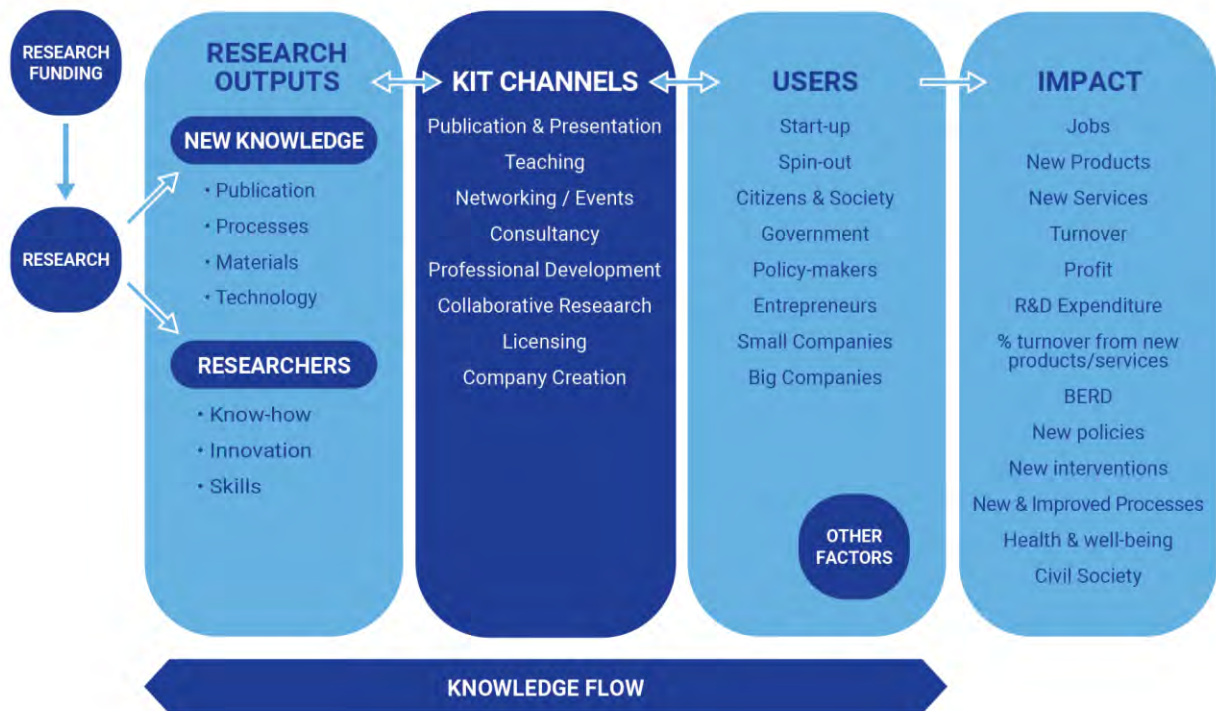


Figure 1. Knowledge Transfer: from research to impact. Author: Report “Knowledge Transfer Metrics” by the European Commission's Expert Group (2). Infographics adapted according to the Cos4Cloud brand manual.

2.3. Knowledge Transfer channels

Knowledge transfer occurs in channels of interaction between the generators of knowledge and the target stakeholders. Hence, KT needs to be carried out to match the target stakeholders' needs. Also, it is essential to consider that knowledge can be reproduced, mediated, and transformed through those same channels of interaction. To select the proper KT channels, it is essential to understand the motivations of the stakeholders your KT aims to target, as well as to know the channels that they usually use and for what.

KT channels should, therefore, not be limited to patenting, licensing, spin-offs and commercial revenue. KT channels should also include the following:

- Publication and presentations
- Teaching
- Networking/Events
- Consultancy
- Collaborative research
- Company creation

- Communication and dissemination channels: social media, website, newsletter, infographics, reports, factsheets, videos, webinars, impact on traditional and digital media, etc.

2.4. Evaluating Knowledge Transfer

To evaluate KT in the Cos4Cloud framework, we have followed the recommendations of both Reports, “Knowledge Transfer Metrics”, by the European Commission’s Expert Group (2,3). The indicators recommended by the reports mentioned include both inputs and outputs, and the evaluation should include a core set of indicators combined with a supplementary set of indicators. The KT indicators fall into four groups:

Table 1. KT Input and Output Indicators. Author: Report “Knowledge Transfer Metrics” of the European Commission’s Expert Group (2). Abbreviations in Table 1: Knowledge/TechnologyTransfer Offices; KT: Knowledge Transfer; PRO: public research organisation.

Inputs		Outputs	
Internal Context	Environment	Activity	Impact
PRO & KTO characteristics	National factors that influence	Delivery through KT channels, PRO/KTO actions	Longer term economic and societal returns

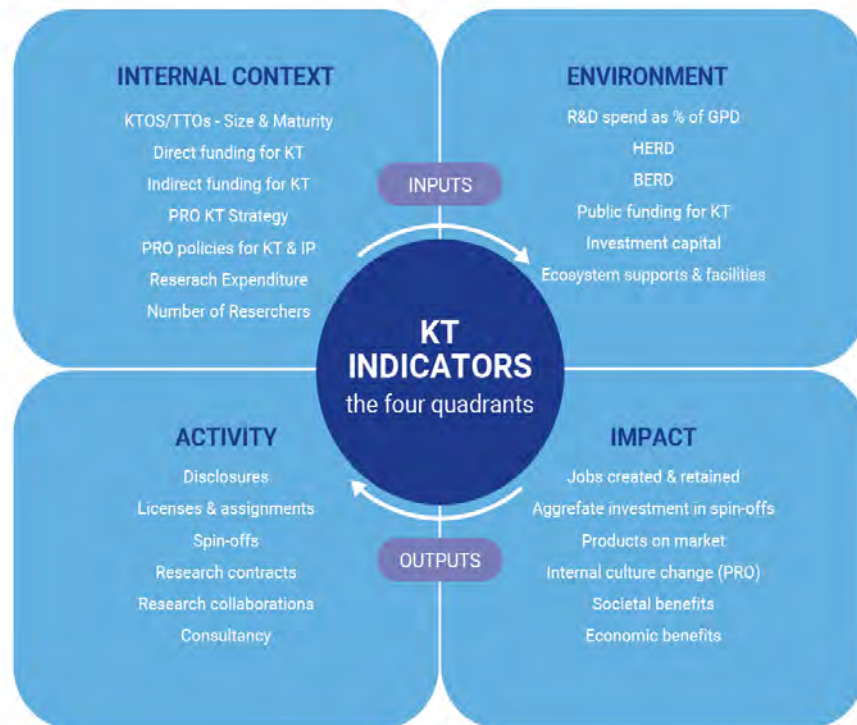


Figure 2: Input and Output KT Indicators: the four quadrants. Author: Report “Knowledge Transfer Metrics” of the European Commission’s Expert Group (2). Abbreviations in Figure 2: KTOS/TTOs: Knowledge/Technology Transfer

Offices; KT: Knowledge Transfer; PRO: public research organisation; IP: intellectual property; HERD: Higher Education Expenditure on Research and Development; BERD: Business Expenditure on Research and Development." This infographic is adapted according to the Cos4Cloud style.

According to the 2022 Report, input indicators describe the environment in which KT is performed, both within the public research organisation (PRO) and at the regional and national levels and can have a significant impact on the outcomes that can be achieved. For example, a low level of attention to KT within the PRO through a lack of strategy or funding for KT will result in minimal outputs (2,3).

3. The Cos4Cloud Knowledge Transfer Plan

Cos4Cloud's KT Plan is a 5-step process to promote optimal exploitation of the project's research outputs (Figure 3). It is necessary to specify that the knowledge in Cos4Cloud has been generated following an open-science approach.

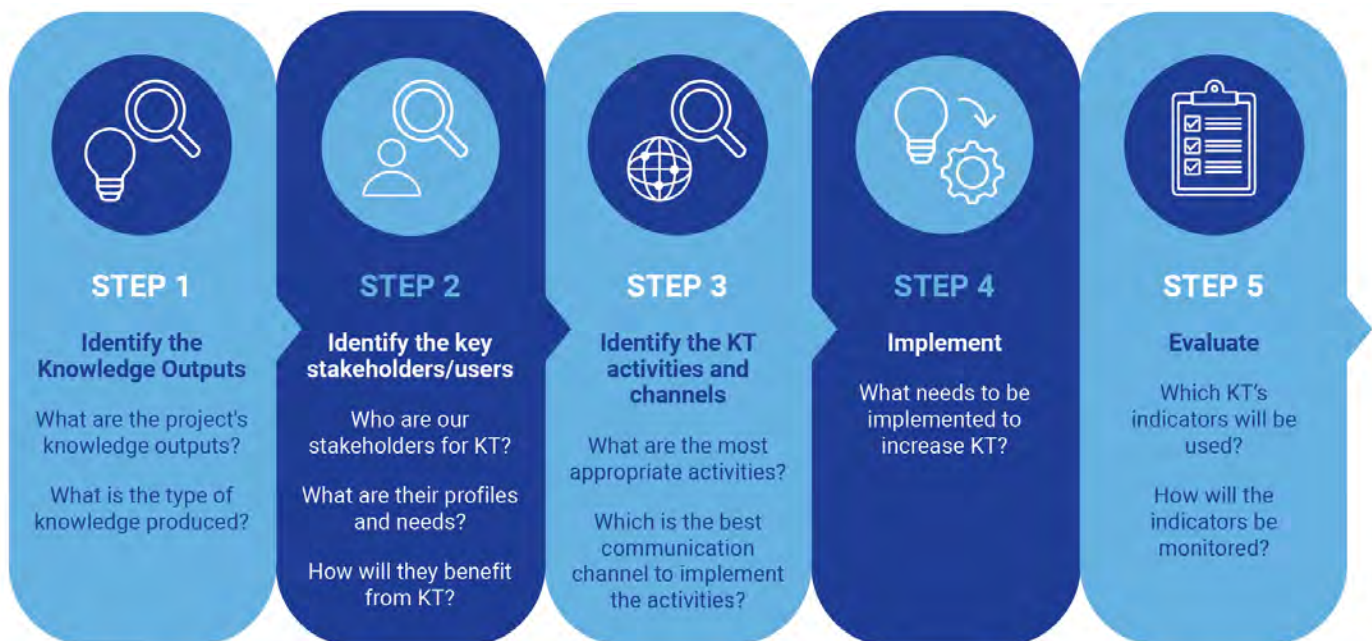


Figure 3: Cos4Cloud's KT plan.

4. Step 1- Identify the Cos4Cloud Knowledge Outputs

In Cos4Cloud, we identified four Knowledge Outputs (KO) that we aimed to transfer to different stakeholders. These knowledge outputs and their classification are developed below in Table 2.

Table 2. Cos4Cloud Knowledge Outputs, classification and examples of KT materials.

	Knowledge Outputs (KO)	Type of knowledge and examples of KT materials
1	Cos4Cloud innovative vision: using co-design to create new technological services and integration into the EOSC.	<u>Codified knowledge:</u> <ul style="list-style-type: none"> • Research publications • Research posters • Conference abstracts • News and Social Media • Promotional materials
2	Technological services: 13 cutting-edge services for COs	<u>Codified knowledge:</u> <ul style="list-style-type: none"> • User Guidelines • Research publications • Research Posters • Conference abstracts • News and Social Media • Design and promotional materials <u>Embedded in tools or artefacts</u> <ul style="list-style-type: none"> • Software, Services and Prototypes
3	Co-design as a service: co-design and testing of technological services	<u>Codified knowledge:</u> <ul style="list-style-type: none"> • User Guidelines • Case studies • Process documentation • Conference abstracts • News and Social Media • Promotional materials
4	Educational resources: online course, educational case scenarios for training educators in use of citizen science (CS) in the schools and specific training to use the citizen observatories (COs) in the Cos4Cloud context	<u>Codified knowledge:</u> <ul style="list-style-type: none"> • Guidelines • Case scenarios • Process documentation • Conference abstracts • News and Social Media <u>Internalised knowledge:</u> <ul style="list-style-type: none"> • Researchers acting as teachers in schools and universities.

5. Step 2 - Identify the key Cos4Cloud stakeholders

Knowledge transfer must be focused, specific and targeted, so it is essential to define the target stakeholders of the KT before starting to plan KT activities. In Cos4Cloud, we define KT stakeholders as the target public taking up the research knowledge outputs and using them to bring change that leads to impact. Considering this, we have identified two main types of KT stakeholders in Cos4Cloud:

- **Knowledge workers:** Those who transform the research knowledge outputs into a new service, product or policy. For example, developers creating new citizen observatories (COs) services; policymakers, start-ups, NGOs, researchers, the co-design community, etc.
- **Knowledge beneficiaries:** Those that will implement and use the research knowledge outputs. For example, teachers, naturalists, citizens, researchers, etc.

Some of the Cos4Cloud KT stakeholders, such as the Cos4Cloud co-design community, were involved in the project activities and were jointly responsible for research inputs, development or dissemination and can be described as co-producers of the research.

Cos4Cloud has several target audiences and stakeholders, well described in **D7.1 'Exploitation Plan - ex ante identification and evaluation of project opportunities'** (4) and **D8.2 'Communication Plan'** (5). For KT purposes, four of those stakeholders were selected as the most relevant ones. These are: the citizen science community, education stakeholders, academia, government (public authorities and decision-makers). We wanted to focus our efforts on a few stakeholders and create a focused plan instead of trying to reach a more global audience and all potential stakeholders at once, which could be inefficient (since not targeted) and a waste of economic and human resources. The four stakeholders selected, as well as their benefits and the use of the knowledge transferred, are described in Table 3.

Table 3. Cos4Cloud's primary stakeholders for Knowledge Transfer.

Stakeholder	Description	Benefits / Use of the knowledge
Citizen science community (Knowledge workers & beneficiaries)	<ul style="list-style-type: none"> • Citizen science experts • Managers of COs • Citizen science associations such as ECSA, ACSA, CSA, CitSci Asia, RICAP • Local/national networks and groups. • Members of the Cos4Cloud 	<p><u>Cos4Cloud innovative vision</u></p> <ul style="list-style-type: none"> • Access to open information about CO and CS in the Cos4Cloud Evidence Hub and Toolbox. <p><u>Apply or build on the Cos4Cloud technological services:</u></p> <ul style="list-style-type: none"> • Improve users' experiences and

	community	<p>increase engagement to the COs.</p> <ul style="list-style-type: none"> • Increase the quality of the citizen science data. • Create or improve their COs with new functionalities and cutting-edge technological services, such as data visualisation, data quality assessment based on peer-to-peer validation or AI identification of biodiversity observations. <p><u>Apply the Co-design methodology</u></p> <ul style="list-style-type: none"> • Design or improve COs and/or CS projects: involving end users in the development and testing process ensures that the CS project or the CO will meet the needs of its users. • Increase engagement and recruitment.
Education stakeholders (Knowledge beneficiaries)	<ul style="list-style-type: none"> • Primary and secondary school teachers • University teachers • Environmental educators • Learning technology experts • Pedagogical experts • Teacher's associations 	<p><u>Apply or build on the Cos4Cloud technological services:</u> Use the Cos4Cloud services as a tool for learning, for example:</p> <ul style="list-style-type: none"> • Data analysis and data visualisation (MECODA). • Technology - hardware (FASTCAT). • Identify plants (PI@ntNet-API). <p><u>Apply the Co-design service</u></p> <ul style="list-style-type: none"> • Use the co-design methodology in the classrooms to teach about collaborative methodologies in technological design. <p><u>Educational resources:</u> Use of the ready-to-use educational resources to teach through CS, for example:</p> <ul style="list-style-type: none"> • Skills in designing and conducting scientific research. • Biodiversity and environmental science knowledge in general. • Awareness about current biodiversity-related issues and the role of participatory science in Europe and other regions.
Academia (Knowledge workers & beneficiaries)	<ul style="list-style-type: none"> • Universities • Research centres • Scientific societies and experts in environmental science 	<p><u>Cos4Cloud innovative vision</u></p> <ul style="list-style-type: none"> • Access to cutting-edge and open information in the Cos4Cloud Evidence Hub and Toolbox.

	<ul style="list-style-type: none"> • Researches coordinating • CS projects • Researchers specialised in AI 	<ul style="list-style-type: none"> • Access to a free source of data. <p><u>Apply or built on the Cos4Cloud technological services:</u></p> <ul style="list-style-type: none"> • Access to ready-to-use services (software and tools) in the EOSC marketplace. • Improve users' experiences and increase engagement with the COs. • Increase the quality of the citizen science data. • Create or improve their COs with new functionalities and cutting-edge technological services, such as data visualisation, data quality assessment based on peer-to-peer validation or AI identification of biodiversity observations. <p><u>Apply the Co-design service</u></p> <ul style="list-style-type: none"> • Design or improve projects: involving end users in the development and testing process ensures that the project will meet the needs of its users. • Increase engagement and recruitment.
<p>Government: public authorities and decision-makers</p> <p>(Knowledge workers & beneficiaries)</p>	<ul style="list-style-type: none"> • Local and regional governments • Environmental agencies • Public health agencies • Education agencies 	<p><u>Cos4Cloud innovative vision</u></p> <ul style="list-style-type: none"> • Access to cutting-edge and open information in the Cos4Cloud Evidence Hub and Toolbox. • Access to a free data source in favour of creating evidence-based policies. <p><u>Apply or build on the Cos4Cloud technological services:</u></p> <ul style="list-style-type: none"> • Access to ready-to-use services (software and tools) in the EOSC marketplace. <p><u>Apply the Co-design service</u></p> <ul style="list-style-type: none"> • Possibility to apply co-design when creating new processes or policies. <p><u>Educational resources:</u></p> <ul style="list-style-type: none"> • Build on Cos4Cloud educational resources to create courses and protocols for educators and introduce CS into the schools and educational scenarios.

6. Step 3 - Identify the Cos4Cloud KT channels

To identify the suitable activities and channels to transfer Cos4Cloud knowledge, we considered the identified stakeholders and how to best target them. The list of channels and actions is described in Tables 4 to 7. Some of the actions are useful both for KT and the dissemination, communication and exploitation of the results of Cos4Cloud. They have been designed (and implemented) jointly by members of WP5, WP6, WP7 and WP8:

- WP5 led the co-design activities, as well as the demonstrative events such as the BioMARató (more information in **D5.2 'Co-design service platform for citizen observatories: methodological guide'** (7), **D5.3 'Service performance challenges report'** (8) and **D5.4 'Users case documented, including the services scalability analysis'** (9)).
- WP6 led the education activities, as well as the creation of success stories, service guides and the creation of the Evidence Hub and Toolbox (more information in **D6.3 'Citizen-science toolbox and evidence hub'** (10), **D6.5 'Design and evaluation of school-based CS activities'** (11) and **D6.6 'Training material available online and capacity building report'** (12)).
- WP7 led the dissemination and exploitation activities (more information in **D7.2 'Dissemination and marketing strategy'** (13) and **D7.3 'Strategic plan for the exploitation and dissemination of the results (PEDR)'** (14)).
- WP8 led the communication actions (more information in **D8.2 - 'Communications plan'** (5)) and the actions in the framework of the co-design workshops are described in **D5.1 'Co-designed services for COS4CLOUD report'** (6). Communication actions were implemented both through Cos4cloud communication channels and the communication channels of the consortium members.

Table 4. Knowledge Transfer Channels and actions used in Cos4Cloud for Knowledge Output 1.

Knowledge Output 1 - Cos4Cloud innovative vision: using co-design to create new technological services, and integration into the EOSC		
Stakeholder	Channel	Action
Citizen science community	Publications	<ul style="list-style-type: none"> • Publication of research papers by the consortium • Creation of a Cos4Cloud presentation • Creation of a Cos4Cloud research poster • Creation of a Cos4Cloud leaflet and

		<p>informative poster</p> <ul style="list-style-type: none"> • Interactive infographic summarising the project research and its main outputs
	Networking/Events	<ul style="list-style-type: none"> • Participation of Cos4Cloud partners in conferences • Organisation of ECSA webinars about the project • Organisation of webinars about the project in collaboration with other institutions or projects
	Collaborative Research	<ul style="list-style-type: none"> • Creation of synergies with other projects, including communication activities on social media and website, organisation of jointly events and activities, etc
	Training/Teaching	<ul style="list-style-type: none"> • Training webinars and workshops about the use of COs
	Communication channels: Social media, website, blog, newsletter, videos and webinars	<ul style="list-style-type: none"> • Communication and dissemination of the Cos4Cloud vision on co-design and integration into the EOSC
	Evidence Hub and Toolbox	<ul style="list-style-type: none"> • Communication and dissemination of the information published in the Cos4Cloud Toolbox and Evidence Hub, including all the products and outputs generated during the project lifetime.
Education stakeholders	**No specific channels selected for this output**	**No specific actions designed for this output**
Academia	Publications & presentations	<ul style="list-style-type: none"> • Publication of research papers by the consortium • Creation of a Cos4Cloud presentation • Creation of a Cos4Cloud research poster • Creation of a Cos4Cloud leaflet and informative poster
	Networking/Events	<ul style="list-style-type: none"> • Participation of Cos4Cloud partners in conferences
	Collaborative Research	<ul style="list-style-type: none"> • Creation of synergies with other EU funded projects
	Communication channels: Social media, website, blog, newsletter, videos and webinars	<ul style="list-style-type: none"> • Communication and dissemination of the Cos4Cloud vision on co-design and integration into the EOSC
	Evidence Hub and Toolbox	<ul style="list-style-type: none"> • Communication and dissemination of the information published in the Cos4Cloud Toolbox and Evidence Hub

Government	Publications	<ul style="list-style-type: none"> • Creation of policy briefings • Creation of case studies and success stories
	Networking/Events	<ul style="list-style-type: none"> • Cos4Cloud presentations in events and meetings with government presence
	Communication channels: Social media, website, blog, newsletter, videos and webinars	<ul style="list-style-type: none"> • Communication and dissemination of the Cos4Cloud vision on co-design and integration into the EO SC
	Evidence Hub and Toolbox	<ul style="list-style-type: none"> • Communication and dissemination of the information published in the Cos4Cloud Toolbox and Evidence Hub

Table 5. Knowledge Transfer Channels and actions used in Cos4Cloud for Knowledge Output 2.

Knowledge Output 2 - Technological services: 13 cutting-edge services for COs		
Stakeholder	Channel	Action
Citizen science community	Publications	<ul style="list-style-type: none"> • Publication of research papers by the consortium • Service infographics • Service documentation • Service training guidelines • Interactive infographic summarising the project research and its main outputs
	Networking/Events	<ul style="list-style-type: none"> • Participation of Cos4Cloud partners in technological conferences, CS conferences, AI conferences and all the topics related to Cos4Cloud services
	Teaching	<ul style="list-style-type: none"> • Organisation of ECSA webinars about the services • Take advantage of the co-design and testing workshops to teach how to use the Cos4Cloud services
	Collaborative Research	<ul style="list-style-type: none"> • Creation of synergies with other EU-funded projects
	Communication channels: Social media, website, blog, newsletter, videos and webinars	<ul style="list-style-type: none"> • Communication and dissemination about the services, as well as their news and updates • Regular updates of the service's section on the website • News in the blog and newsletter about new developments and updates of the services • Creation of video tutorials and video-interviews with the service leaders

	Evidence Hub and Toolbox	<ul style="list-style-type: none"> • Communication and dissemination of the information published in the Cos4Cloud Toolbox and Evidence Hub
Education stakeholders	Publications	<ul style="list-style-type: none"> • Service infographics • Service documentation • Service training guidelines • Specific presentations of the services targeted at teachers and educators (to use during the educational activities in the framework of WP5 and WP6)
	Teaching	<ul style="list-style-type: none"> • Invite educators to join the ECSA webinars about the services • Use the educational activities in the WP5 and WP6 framework to teach education stakeholders how to use the Cos4Cloud services
	Communication channels: Social media, website, blog, newsletter, videos and webinars	<ul style="list-style-type: none"> • Communication and dissemination about the services, as well as their news and updates • Regular updates of the service's section on the website • News in the blog and newsletter about new developments and updates of the services • Creation of video tutorials and video-interviews with the service leaders
	Evidence Hub and Toolbox	<ul style="list-style-type: none"> • Communication and dissemination of the information published in the Cos4Cloud Toolbox and Evidence Hub
Academia	Publication & presentations	<ul style="list-style-type: none"> • Publication of research papers by the consortium • Service infographics • Service documentation • Service training guidelines • Interactive infographic summarising the project research and its main outputs
	Networking/Events	<ul style="list-style-type: none"> • Participation of Cos4Cloud partners in conferences with academia attendance
	Collaborative Research	<ul style="list-style-type: none"> • Creation of synergies with other EU funded projects
	Communication channels: Social media, website, blog, newsletter, videos and webinars	<ul style="list-style-type: none"> • Communication and dissemination about the services, as well as their news and updates • Regular updates of the service's section on the website • News in the blog and newsletter about new developments and updates of the services

		<ul style="list-style-type: none"> • Creation of video tutorials and video-interviews with the service leaders
	Evidence Hub and Toolbox	<ul style="list-style-type: none"> • Communication and dissemination of the information published in the Cos4Cloud Toolbox and Evidence Hub
Government	Publications	<ul style="list-style-type: none"> • Creation of case studies focused on the services
	Networking/Events	<ul style="list-style-type: none"> • Cos4Cloud presentations in events and meetings with government presence
	Communication channels: Social media, website, blog, newsletter, videos and webinars	<ul style="list-style-type: none"> • Communication and dissemination about the services, as well as their news and updates
	Evidence Hub and Toolbox	<ul style="list-style-type: none"> • Communication and dissemination of the information published in the Cos4Cloud

Table 6. Knowledge Transfer Channels and actions used in Cos4Cloud for Knowledge Output 3.

Knowledge Output 3 - Co-design as a service: co-design and testing of technological services		
Stakeholder	Channel	Action
Citizen science community	Publications	<ul style="list-style-type: none"> • Co-design presentation • Co-design infographic • Co-design Guideline (D5.2) on Zenodo • Interactive infographic summarising the project research and its main outputs
	Networking/Events	<ul style="list-style-type: none"> • Participation of Cos4Cloud partners in CS conferences
	Teaching	<ul style="list-style-type: none"> • Use of the co-design and testing workshops to teach how to apply the Cos4Cloud co-design methodology • Use of the internal consortium meetings to teach how to apply the Cos4Cloud co-design methodology
	Collaborative Research	<ul style="list-style-type: none"> • Creation of synergies with other EU funded projects
	Communication channels: Social media, website, blog, newsletter, videos and webinars, Telegram	<ul style="list-style-type: none"> • Communication and dissemination about the co-design and testing events • Regular updates of the co-design section on the website • News in the blog and newsletter about the co-

		<p>design methodology</p> <ul style="list-style-type: none"> • Specific Telegram and mail messages to the Cos4Cloud community
	Evidence Hub and Toolbox	<ul style="list-style-type: none"> • Communication and dissemination of the information published in the Cos4Cloud Toolbox and Evidence Hub
Education stakeholders	Publications	<ul style="list-style-type: none"> • Co-design presentation • Co-design infographic • Co-design Guideline (D5.2) on Zenodo • Interactive infographic summarising the project research and its main outputs
	Networking/Events	<ul style="list-style-type: none"> • Participation of Cos4Cloud partners in CS and education conferences to explain the application of the co-design methodology in schools
	Teaching	<ul style="list-style-type: none"> • Use the educational activities in the framework of WP5 and WP6 to teach how to use the Cos4Cloud co-design methodology
	Communication channels: Social media, website, blog, newsletter, videos and webinars	<ul style="list-style-type: none"> • Communication and dissemination about the co-design and testing events • Regular updates of the co-design section on the website • News in the blog and newsletter about the co-design methodology applied to educational scenarios
	Evidence Hub and Toolbox	<ul style="list-style-type: none"> • Communication and dissemination of the information published in the Cos4Cloud Toolbox and Evidence Hub
Academia	Publication	<ul style="list-style-type: none"> • Co-design presentation • Co-design infographic • Co-design Guideline (D5.2) on Zenodo • Interactive infographic summarising the project research and its main outputs
	Networking/Events	<ul style="list-style-type: none"> • Participation of Cos4Cloud partners in conferences with academia attendance
	Collaborative Research	<ul style="list-style-type: none"> • Creation of synergies with other EU funded projects
	Communication channels: Social media, website, blog, newsletter, videos and webinars	<ul style="list-style-type: none"> • Communication and dissemination about the co-design and testing events • Regular updates of the co-design section on the website

		<ul style="list-style-type: none"> News in the blog and newsletter about the co-design methodology
	Evidence Hub and Toolbox	<ul style="list-style-type: none"> Communication and dissemination of the information published in the Cos4Cloud Toolbox and Evidence Hub
Government	Publications	<ul style="list-style-type: none"> Creation of success stories
	Networking/Events	<ul style="list-style-type: none"> Cos4Cloud presentations in events and meetings with government presence
	Communication channels: Social media, website, blog, newsletter, videos and webinars	<ul style="list-style-type: none"> Communication and dissemination of co-design and testing events Regular updates of the co-design section on the website News in the blog and newsletter about the co-design methodology
	Evidence Hub and Toolbox	<ul style="list-style-type: none"> Communication and dissemination of the information published in the Cos4Cloud Toolbox and Evidence Hub

Table 7. Knowledge Transfer Channels and actions used in Cos4Cloud for Knowledge Output 4.

Knowledge Output 4 - Educational resources: online course and educational case scenarios for training educators in the use of CS in the schools		
Stakeholder	Channel	Action
Citizen science community	Publications	<ul style="list-style-type: none"> Research publications by Cos4Cloud consortium researchers Educational Guidelines (D6.5 'Design and evaluation of school-based CS activities') Educational case scenarios
	Networking/Events	<ul style="list-style-type: none"> Participation of Cos4Cloud partners in education and CS conferences
	Communication channels: Social media, website, blog, newsletter, videos and webinars, Telegram	<ul style="list-style-type: none"> Communication and dissemination of Cos4Cloud educational resources Regular updates of the education section on the project website News in the blog and newsletter on the application of the educational resources
	Evidence Hub and Toolbox	<ul style="list-style-type: none"> Communication and dissemination of the information published in the Cos4Cloud Toolbox and Evidence Hub

Education stakeholders	Publications	<ul style="list-style-type: none"> • Educational case scenarios • Educational Guidelines (D6.5 'Design and evaluation of school-based CS activities')
	Networking/Events	<ul style="list-style-type: none"> • Participation of Cos4Cloud partners in education conferences
	Teaching	<p>*** All the teaching and training activities developed and implemented by NKUA in Athens in the framework of WP5 and WP6*** (see Deliverable D6.5 'Design and evaluation of school-based CS activities')</p>
	Communication channels: Social media, website, blog, newsletter, videos and webinars	<ul style="list-style-type: none"> • Communication and dissemination of Cos4Cloud educational resources • Regular updates of the education section on the project website • News in the blog and newsletter on the application of the educational resources
	Evidence Hub and Toolbox	<ul style="list-style-type: none"> • Communication and dissemination of the information published in the Cos4Cloud Toolbox and Evidence Hub
Academia	Publication	<ul style="list-style-type: none"> • Research publications by Cos4Cloud consortium researchers • Educational Guidelines (D6.5 'Design and evaluation of school-based CS activities') • Educational case scenarios
	Networking/Events	<ul style="list-style-type: none"> • Participation of Cos4Cloud partners in conferences with academia attendance
	Collaborative Research	<ul style="list-style-type: none"> • Creation of synergies with other EU funded projects
	Communication channels: Social media, website, blog, newsletter, videos and webinars	<ul style="list-style-type: none"> • Communication and dissemination of Cos4Cloud educational resources • Regular updates of the education section on the project website • News in the blog and newsletter on the application of the educational resources
	Evidence Hub and Toolbox	<ul style="list-style-type: none"> • Communication and dissemination of the information published in the Cos4Cloud Toolbox and Evidence Hub
Government	Publications	<ul style="list-style-type: none"> • Creation of success stories and case studies
	Networking/Events	<ul style="list-style-type: none"> • Cos4Cloud presentations in events and meetings with government presence • Meetings with local education agencies

	Communication channels: Social media, website, blog, newsletter, videos and webinars	<ul style="list-style-type: none"> • Communication and dissemination of Cos4Cloud educational resources • Regular updates of the education section on the project website • News in the blog and newsletter on the application of the educational resources
	Evidence Hub and Toolbox	<ul style="list-style-type: none"> • Communication and dissemination of the information published in the Cos4Cloud Toolbox and Evidence Hub

7. Step 4 - Implement the Cos4Cloud KT Plan

All the specific actions described in Tables 4 to 7 have been implemented between M1 (November 2019) and M39 (January 2023) mainly by the co-design and the communication team of the project, which comprised the following consortium members:

Knowledge Transfer core team on Knowledge Output 1 to 3:

- Ángela Justamante, communication specialist, CREAM
- Sonia Liñán, communication specialist, ICM-CSIC
- Claudia Fabó, engagement and communication, ECSA
- Tim Woods, engagement and communication, ECSA
- Karen Soacha, co-design coordination, ICM-CSIC
- Blanca Guasch, design manager and co-design specialist, Science for Change
- Álex Amo, IT & data officer, Science for Change
- Miguel Hernández, circular economy and odour specialist, Science for Change

Knowledge Transfer core team on Knowledge Output 4:

- Maria Daskolia, Associate Professor in Environmental and Sustainability Education, NKUA
- Dimitris Gkatzos, PhD in Educational Sciences at the NKUA
- Anna Trigatzi, PhD student at EEL/ NKUA
- Maria Pliota, MEd, MSc, member of the Environmental Education Lab-NKUA
- Naya Grillia, Doctoral Researcher at the NKUA

Collaborators:

- Sasha Woods, Researcher for Impact and Innovation, EarthwacH
- Janice Ansine, Project Manager (Citizen Science), Open University

8. Step 5 - Evaluate the Cos4Cloud KT

Even though the reports “Knowledge Transfer Metrics” (2,3) advise using both input and output indicators for KT, most of the KT input indicators proposed are applied to research institutions and not to research projects. Therefore, they cannot be applied to the Cos4Cloud project. Accordingly, we report exclusively KT output indicators in this document. We chose different KT output indicators for each action, taking into account the indicators suggested by the reports “Knowledge Transfer Metrics” (2,3).

The Cos4Cloud Grant Agreement specifies that this document should focus on the outputs of subtask 8.3.6 - ‘Cos4Cloud Workshops & Update-meetings’. Concrete and detailed information on the outputs of these events in relation to KT can be found in this document in section ‘9. KT during the Cos4Cloud events’. This information complements the evaluation of the Cos4Cloud KT detailed in Tables 8 and 9.

8.1. Setting the KT indicators

The core and supplementary indicators for Cos4Cloud Knowledge Transfer are reported un Table 8 bellow.

Table 8: Core and supplementary indicators for Cos4Cloud Knowledge Transfer. **Knowledge Outputs are referred to:** (1) Cos4Cloud innovative vision: using co-design to create new technological services and integration into the EOSC (2) Technological services: 13 cutting-edge services for citizen observatories (COs), (3) Co-design as a service: co-design and testing of technological services; (4) Educational resources: online course, educational case scenarios for training educators in use of citizen science (CS) in the schools and specific training to use the COs in the Cos4Cloud context. **Stakeholder’s acronyms:** CSC: Citizen science community; ES: Education stakeholders; A: Academia; G: Government.

Action	Core indicator	Supplementary indicators	Knowledge Output				Stakeholders			
			1	2	3	4	CSC	ES	A	G
Publication of research articles	Number of publications	Number of downloads or visualisations	X	X		X	X	X	X	
Creation of a Cos4Cloud presentation	Number of times partners have used the template in events		X				X		X	
Creation of a Cos4Cloud research poster	Number of downloads	Number of page views on the website	X				X		X	

		(section: graphic materials)										
Creation of an informative poster	Number of page views on the website (section: graphic materials)	Number of printed copies										
Creation of a Cos4Cloud leaflet	Number of page views on the website (section: graphic materials)	Number of printed copies	X					X		X		
Creation of infographics to explain the services	Number of downloads on the website	Number of printed copies	X	X				X	X	X		
Participation in conferences & workshops to present Cos4Cloud	Number of conferences and workshop	Typology of attendees	X	X	X	X		X	X	X	X	X
Organisation of workshops and webinars presenting some of the Knowledge Outputs	Number of workshops, webinars and trainings	Number of attendees	X	X	X	X		X	X	X	X	X
Use the co-design and testing workshops to present and teach about the Cos4Cloud Knowledge Outputs	Number of events organised	Number of attendees	X	X	X			X		X	X	
		Typology of attendees										
Synergies with other EU funded projects	Research collaboration agreements with other CS projects	Number of events jointly organised	X	X	X	X		X	X	X	X	X
Creation of policy briefings	Number of policy briefings created	Typology of the policy briefings	X	X	X							X
Creation of case studies and success stories	Number of documents created	Number of downloads	X	X	X			X	X			X
Generation of Service documentation	Number of documentation published in public repositories	Number of visits to the website		X				X	X	X	X	X
Creation of service training guidelines	Number of training published on the website	Number of visits to the services section on the website		X				X	X	X	X	X
Interactive infographic summarising the project research and its main outputs	Number of visits to the website	Number of downloads	X	X	X	X		X	X	X	X	X
<i>*This KPI will be available once</i>												

<i>the infographic is published on the website in February 2023.</i>											
Creation of video tutorials and video-interviews with the service leaders	Number of videos	Number of views		X				X	X	X	X
Co-design presentation on Zenodo	Number of downloads	Number of views			X			X	X	X	X
Co-design infographic	Number of visits to the co-design section on the website	Number of printed copies			X			X			
Co-design as a service: methodological guide <i>*This guideline was published in December 2022, so there are still no many downloads or views</i>	Number of downloads	Number of views			X			X			
Communication and dissemination activities in collaboration with the EOSC	Number of documents created	Typology of the documents (case studies, piece of news, etc.)		X	X			X	X		X
		Number of downloads									
		Number of views									
Communication about the Knowledge Outputs	Number of newsletters & Event mailings	Subscribers to the newsletter									
	Number of pieces of news	Total visits to the blog									
	Number of press releases	Number of impacts in the media (including newspapers, radio & TV)		X	X	X	X	X	X	X	X
	Number of social media publications	Social media reach									
	Number of dedicated sections on the website for the Knowledge Outputs	Number of visits of each Knowledge Output page on the website									
Educational Guidelines	Number of guidelines	Number of attendees to the online training for educators				X		X			

Educational case scenarios	Number of case scenarios	Number of teachers using the case scenarios				X		X		
Educational network	Number of members					X		X		

8.2. Reporting of the indicators

The graphic materials, including infographics, case studies, success stories, etc. will be published in Zenodo and added to the Evidence Hub and Toolbox with a link, so that the project can monitor the downloads and views of these materials in one place beyond the project life. The last update of the KPIs of Table 9 is 25/01/23 and may vary in the future.

The graphics of the website visits including the total visits and the visits to the blog, co-design, be part of our community, services, graphic materials, and news on education are shown & the social media reach evolution, including LinkedIn, Twitter, YouTube and Instagram are shown in Annex 1: Website visits and social media reach graphics.

Table 9. Reporting on the core and supplementary indicators for Cos4Cloud Knowledge Transfer.

Action	Core indicator	Year 1	Year 2	Year 3	Supplementary indicators	Year 1	Year 2	Year 3
*Publication of research articles	Number of publications	12	22	13	N/A			
Creation of a Cos4Cloud presentation	Number of times partners have used the template in event	More than 50			N/A			
Creation of a Cos4Cloud research poster	Number of times used in a conference	More than 5			** Number of page views on the website (section: graphic materials)	80	151	330
Creation of an informative poster	** Number of page views on the website (section: graphic materials)	80	151	330	Number of printed copies	2		

Creation of a leaflet	** Number of page views on the website (section: graphic materials)	80	151	330	Number of printed copies	55 in total		
Creation of infographics to explain the services	Number of downloads on the website	N/A	111	338	Number of printed copies	40 in total		
Participation in conferences & workshops to present Cos4Cloud	Number of conferences and workshops	70	30	33	***Typology of attendees	2362	2678	6014
						<ul style="list-style-type: none"> • 32% academia • 32% general public (most of them belong to the 'citizen science community') • 25% other (most of them educational stakeholders) • 4% civil society • 4% industry • 1% medias • 0,5% investors & customers • 2% policy makers 		
Organisation of workshops and webinars presenting some of the Knowledge Outputs	Number of workshops, webinars and trainings	6	3	5	Number of attendees	800	230	343
Use the co-design and testing workshops to present and teach about the Cos4Cloud Knowledge Outputs	Number of events organised	23			Number of attendees	890		
					***Typology of attendees	<ul style="list-style-type: none"> • Academia: 31,2% • Industry: 1,1% • Public authorities: 3,8% • General public: 63,8% 		
Synergies with other EU funded projects	Research collaboration agreements with other CS projects	5			Number of events jointly organised	3	5	5
Creation of policy briefings	Number of policy briefings created	N/A	N/A	2	Typology of the policy briefings	#1: Citizen science to support progress of the UN		

					<i>WP8 is currently working to produce them and once ready they will be published in Zenodo</i>	Sustainable Development Goals under climate change pressures. Cos4Cloud Policy Brief #2: Sustainability of services for Citizen Observatories (COs). Cos4Cloud Policy Brief		
Creation of case studies and success stories	Number of documents created	5			Number of downloads <i>They are about to be published in Zenodo, so we still have not registered downloads</i>	N/A		
Generation of Service documentation	Number of documentation published in public repositories	13 guidelines in total			Number of visits to the services' section on the website	495	2112	2425
Creation of service training guidelines	Number of training published on the website	13 guidelines in total						
Interactive infographic summarising the project research and its main outputs <i>This KPI will be available once the infographic is published on the website in February 2023.</i>	Number of visits to the website	N/A	N/A	N/A	Number of downloads	N/A	N/A	N/A
Creation of video tutorials and video-interviews with the service leaders	Number of videos	6			Number of views	184		
Co-design presentation on Zenodo	Number of downloads Spanish version	65			Number of views	144		
	Number of downloads English version	147			Number of views	255		
Co-design infographic	Number of views on the website	1862			Number of printed copies	25		

Co-design as a service: methodological guide <i>This guideline was published in December 2022, so there are still not that many downloads or views</i>	Number of downloads	N/A	N/A	54	Number of views	N/A	N/A	67
	News on the EOSC portal website				3 in total			
Communication and dissemination activities in collaboration with the EOSC	Number of documents created	EOOSC in practice stories	3 (+1 upcoming) in total	Number of downloads	331			
				Number of views	847			
	Report 'Key Exploitable Results of Horizon 2020 EOSC-related projects'	1 in total	Number of downloads	301				
			Number of views	343				
Communication about the Knowledge Outputs	Number of newsletters & Event mailings	8	20	7	Subscribers to the newsletter	570		
	Number of piece of news	18	37	36	Total website visits to the blog	6662		
	Number of press releases	2	2	2	Number of impacts in the media (including newspapers, radio & TV)	7	14	22
	Number of social media publications	1046	1240	1117	**** Social media reach	Linkedin	386 followers & 37.30K impressions	
Instagram						287 followers & 21.5K impressions		
Twitter						1373 followers & 503.26K impressions		
YouTube						84 subscribers & 1373 videos' views		

	Number of dedicated sections on the website for the Knowledge Outputs	5	Number of visits of each Knowledge Output page on the website	Total website visits: 104143 Be part of our community section: 1693 Services section: 20493 News on education: 2808 Co-design section: 1862
Educational Guidelines 'D6.6 Training material available online and capacity building report	Number of guidelines	1	Number of attendees to the online training for educators	23
			Number of views in the EClass platform	3526
Educational case studies	Number of case studies	25 school case studiesç - 6 postgraduate university case studies 2 university undergraduate case studies	Number of attendees	600
Educational case scenarios	Number of educational case scenarios	6	Number of teachers using the educational case scenarios	32
Educational network members	Number of members	253		

* More information on the scientific publications and specific KPIs to evaluate them will be provided in 'D8.5 Evaluation of project impact'.

** The indicator 'Number of page views on the website (section: graphic materials)' result is the same in Actions 'Creation of a Cos4Cloud research poster, informative poster and leaflet because these materials are published on the same page on the Cos4Cloud website.

*** The indicator 'Typology of attendees' result is an approximate value, as the project has not had complete information on some of the events in which partners have participated. In this calculation are also included those organised events organised by Cos4Cloud, as the communication team has collected information on the participants' profiles through the sign-up forms.

**** The way Cos4Cloud has measured the 'Social Media Reach' by monitoring the followers and impressions for each social media. (1) The followers give information on the people who are engaged with the project and follow our latest news and events and (2) the impressions help measure the number of people who have seen and engaged with a post, even if they didn't click or comment.

9. KT during the Cos4Cloud events

One of the most relevant channels to get Knowledge Transfer in Cos4Cloud was the events the project organised and attended during its lifetime. On the one hand, each partner has participated in several events with oral presentations, posters, exhibitions, forums, etc., all of which have been an opportunity to explain our work and disseminate project outputs. On the other hand, the project has organised a series of events, including training, courses, BioBlitzes, Hackathons, Datathons, co-design and testing events and other promotional activities, which have addressed one or several Knowledge Output goals.

9.1. Type of events organised by Cos4Cloud

For the purpose of this document, we are focusing on the evaluation of Knowledge Transfer in:

- A. Training events, including activities related to demonstration events such as BioBlitzes and Datathons
- B. Co-design and testing events
- C. Requirement workshop, held on M1
- D. Exploitation roadmap workshop held on M32
- E. General communication and dissemination workshops
- F. Internal Annual Meetings
- G. Network expansion workshop, it will be held on M40 as final event both for the Cos4Cloud communities and as a networking event inviting stakeholders such as ECSA, RICAP and other H2020 funded projects.

At the time of writing this document, the Network expansion workshop had not yet taken place, therefore the result cannot be included.

The details and in-depth information for each event where Cos4Cloud was present, either as an organiser or as a participant, are in **Annex 2: Dissemination events table**, divided into year 1, year 2 and year 3 (the total audience is an estimation and there are some missing events that some partners have not reported.).

A. TRAINING ACTIVITIES

- **General training and webinars related to the BioBlitzes:** The Cos4Cloud project organised a BioBlitz every year under the name of 'BioMARató'. In the framework of these activities, the project has organised online and face-to-face seminars to explain

what the activity consists of, how to upload observations to the citizen science platform Natusfera and MINKA and how to identify species. In addition, at the end of the activity and as recognition to the participants and their contributions we have (1) designed infographics that collect the main results and statements from some of the participants, (2) written a press release and (3) organised events where we have explained what their observations have been used for.

In particular, during the first 14 months of the project Cos4Cloud organised the BioBlitz: Virtual Marine BioMARathon. Plans had to be shaped around the challenges of Covid-19 and the Virtual Marine BioMARathon was essentially an online workshop to simulate a face-to-face BioBlitz. This allowed us to organise three different workshops. During these sessions we explained how to identify marine species and how to use a citizen science App to upload the photos to Natusfera.

- Link to Virtual Marine BioMARathon: [workshop 1](#), [workshop 2](#) and [workshop 3](#).

During the first year the project also organised a mini BioBlitz with iSpot to capture a map of autumn's wildlife. Regarding the mini BioBlitz with iSpot, the results of the activity were analysed and summarised in an online presentation within the National Biodiversity Network 2020 Conference, where the Cos4Cloud project was also presented.

- [Link to the iSpot / NBN 2020 Conference BioBlitz results and highlights of iSpot opportunities to get involved.](#)

During the second year, the communication team also organised an [informative talk about the BioMARató](#); a [talk about marine biology to identify marine species](#) and the event '[Would you always eat the same? Marine selective predation](#)'. In addition, in the framework of the BioBlitz BioMARató and UrbamarBio, the team also organised a series of online webinars and "face-to-face" presentations to present a marine species guideline that has been created thanks to the participants. <https://cos4cloud-eosc.eu/blog/presentation-of-the-barcelones-marineguide/>

During the third year, the BioBlitz was jointly organised with another EU funded project: MINKE. This has allowed us to amplify the location of the BioBlitz to Italy, specifically in the Tremiti Island (Italy). Specific actions to train, engage and promote the event in Italy were undertaken by the MINKE project.

- [Link to BioMARató 2022 results](#)

- **Training during the Bio-Datathon ‘Trees for life, trees for learning’:** From December 2022 to January 2023, NKUA and CSIC organised a Bio-datathon. This activity aimed to evaluate some tools and services developed within the Cos4Cloud project, as well as to create new ways for students to visualise data using MECODA.

To do so, Greek postgraduate students in education and educational technology participated in two training workshops, one about MINKA and another one about MECODA.

Students were asked to fill evaluation questionnaires of the tools and services used during the Bio-Datathon.

- [Link to the Bio-Datathon.](#)

- **Training during the ‘Bio-DATathon: A unique validation event of biodiversity data!’:**

From the 7th of December until the 15th of January, Cos4Cloud organised an online Bio-datathon to validate as many species observations as possible using Cos4Bio. The aim was to teach participants how to use the Cos4Bio portal and evaluate it. To do so, the project created a guideline for the activity explaining what Cos4Bio is and how to validate species through this portal.

Participants were asked to fill evaluation questionnaires of Cos4Bio.

- [Link to the Bio-DATathon](#)

- [Link to the training guideline in Spanish, Catalan and English](#)

- **Training during the datathon with the ‘Escola Gravi’ school’s students:**

On the 16th of January and the 20th of January 2023, Cos4Cloud organised a datathon with highschool students from the Escola Gravi in Catalonia. The aim was that (1) they learn to analyse odour data coming from the OdourCollect app using MECODA, (2) and then they evaluate the tool.

The datathon was divided into two sessions, in one of them the Cos4Cloud team taught them how to use MECODA and in the second session they used the tool to analyse odour data using different case studies and stories.

Participants were asked to fill evaluation questionnaires.

- **Training on citizen observatories:** All the information on the training on COs is detailed in **D6.6 'Training material available online and capacity building report'** (12). In these documents we explained some of them as they are also part of the Cos4Cloud knowledge Transfer strategy.
 - **'[Monitoring plant biodiversity with Pl@ntNet](#)':** This webinar introduced the [Pl@ntNet platform](#) and its usage for educational projects focused on plant biodiversity monitoring.
 - **'[How to create your own air quality sensor with CanAirIO?](#)':** The project organised two editions of this workshop, in Spanish and English, the aim was to explain to attendees how citizen science can contribute to air quality monitoring and the step-by-step instructions of how to build and use the low-cost sensor that the project uses.
 - **'[Tackle odour pollution with OdourCollect](#)':** The aim of the workshop was to explain to participants why it is important to measure odour pollution, how citizen science can be an ally to monitor it and how to participate in [Cos4Cloud and OdourCollect projects](#).
- **Training and courses aimed at teachers:** All the information on the educational activities is detailed in **D6.5 'Design and evaluation of school-based CS activities'** (11).

Note: The BioBlitzes, Hackathons & Datathons organised during the project lifetime are further explained in **D5.3 'Service performance challenges report'** (8), including the description, results and evaluation.

B. CO-DESIGN AND TESTING EVENTS

Several co-design and testing activities were held during the project, and we have used them as a Knowledge Transfer activity too, as they have been a great example of knowledge transfer, as participants have (1) learned about the Cos4Cloud project; (2) experienced the co-design methodology, enabling them to replicate it in other projects and (3) learned how to use the services and why they are useful. All the information on the co-design and testing activities is described in **'D5.1 Co-designed services for COS4CLOUD report'** (6).

In addition, the project has organised the event '[Co-designing tools for citizen science](#)' focused on teaching how to apply the co-design in citizen science.

As a result, a presentation in English and Spanish was published on Zenodo and also summarised in an infographic.

- [Link to the Spanish version](#)
- [Link to the English version](#)

During the ECSA Conference 2022, the Cos4Cloud team also organised the workshop '[Co-designing solutions for the sustainability and governance of citizen observatories](#)'. The aim was to (1) teach participants how to apply the co-design methodology and (2) co-design solutions to increase sustainability and contribute to the governance of citizen observatories. The main workshop's results will be summarised in a presentation, sent to the participants and promoted on social media. As a result, the co-design team produced a presentation [available in Zenodo](#).

As a result of the experience and lessons learned during the co-design and testing activities, the co-design team also produced a '[Co-design as a service: methodological guide](#)' that will enable anyone interested in co-design to implement the methodologies that Cos4Cloud has developed by following the guideline.

C. REQUIREMENT WORKSHOP

The requirement workshop took place in Barcelona from 11th to 14th of November 2019 in the framework of the project kick-off meeting and was led by CSIC-ICM as the coordinator of the Cos4Cloud project. Members of the Cos4Cloud advisory board and organisations from three different sectors (academia, industry and civil society) participated. The results and the evaluation of this workshop are available in the **D8.1 'Summary report on inputs of the AB and panels at Requirements Workshop'** (6).

D. EXPLOITATION ROADMAP WORKSHOP

A workshop with consortium partners to define the Cos4Cloud exploitation roadmap took place on 9th June 2022.

The exploitation workshop focused on the following aims:

- Software licences: justifying choices
- Co-design: discussing IP
- Sustainability: The consortium should decide and approve as soon as possible a concrete sustainability plan to allow enough time in the project to be spent to set up grounds for sustainability.

- Exploitation: concrete plans for scaling up with onboarding of new content/services/communities
- Commercial partners, based on the comment from reviewers: The project is still debating potential joint exploitation that overlaps with the plans of providing services as open source. Since several partners are already running their open science communities, the use of open source solutions is very relevant. The involvement of the commercial partners is however still unclear.

The main outcome from the workshop was an update to the project's Intellectual Property, which was produced as a deliverable. The second outcome was the poll regarding which stakeholders were a priority (for financial support but also for dissemination more generally). These results will also be used as a starting point of the 'D7.5 Exploitation plan'. The poll's results are reflected in the **Annex 3: Cos4Cloud Exploitation workshop Mentimeter results**.

E. GENERAL DISSEMINATION AND COMMUNICATION WORKSHOPS

During the project lifetime Cos4Cloud has organised several workshops to explain what the project is about, its services and results. The events are the following:

- **'Let's talk about citizen observatories!'** to explain the Cos4Cloud project and share lessons learned about the challenges of citizen observatories.
- **'Introducing Cos4Cloud: how will it benefit the citizen science community?'**: This workshop was co-organised with ECSA and aimed to explain the Cos4Cloud project and some of its services to the citizen science community.
- **'Engaging the society beyond data collection'**: Cos4Cloud organised this workshop as a Satellite Activity of the Event "A Predicted Ocean", an Ocean Decade Laboratory organised in the framework of the United Nations Decade of Ocean for Sustainable Development.
- **'Cos4Cloud and its services for the citizen science community'**: The event was organised by ECSA in the Cos4Cloud framework and it was an opportunity to briefly introduce the Cos4Cloud project and present two of its services: MOBIS and FASTCAT-Cloud to the citizen science community.
- **'How to introduce citizen science projects into schools?'**: This workshop aimed to find synergies between different entities from Barcelona and Athens on introducing citizen science into the schools curricula. During the meeting, several key education and citizen science stakeholders presented their work and explored potential collaborations. This workshop also contributes to reuse all the methodologies and

guidelines on education and citizen science that NKUA has developed during the project lifetime.

F. INTERNAL ANNUAL MEETINGS

Cos4Cloud has organised Annual Meetings every year. These meetings have been an opportunity to exchange the knowledge generated during the project, facilitating partners the understanding of the project as a whole to be able to disseminate its results. In each of the meetings, collaborative methodologies were implemented and resulted in the creation of indicators, evaluation mechanisms, identification of potential for collaboration between consortium partners, etc. The first Annual Meeting took place in November 2020.

The second Annual Meeting took place in November 2021. This meeting was focused on explaining the services and their progress and coordinating the agile test plan. Moreover, to help partners, an interactive questionnaire was designed in [Mentimeter](#) and shared with them during the meeting to evaluate their knowledge on the services and learn more about them (results in **Annex 4: Second Annual Meeting: Services Mentimeter survey results**).

In addition, Cos4Cloud is organising a Final Meeting. This meeting will take place on February 2nd and 3rd 2023. The idea is, on the one hand, to share all the projects' achievements and, on the other hand, organise collaborative sessions focused on two main topics: (1) Cos4Cloud's major impacts in the context of EOSC and the citizen science community; (2) how can the project partners contribute to the project's results sustainability in the medium and long term (services, tools, networks & communities). In addition, the project partners will co-create the contents of the policy briefing 'Sustainability of services for COs'.

G. NETWORK EXPANSION WORKSHOP

Cos4Cloud plans to organise a final online workshop at the end of February 2023 (M40) to:

- 1) Share the main outputs and achievements of the project and explain to the attendees where they can find these materials
- 2) Present the Evidence Hub & Toolbox to the citizen science community
- 3) Acknowledge the Cos4Cloud community for their contribution in the different phases of the project: co-design, testing, educational activities, etc. To recognise their contributions, we will invite some of them to do a brief presentation about their experience participating in Cos4Cloud.

- 4) Strengthen and expand the alliances created during the project with other stakeholders as part of the Cos4Cloud knowledge transfer, dissemination and exploitation strategy.

We will post this video on the ECSA & Cos4Cloud's YouTube channel and the website.

9.2. Organised events' evaluation: Key Performance Indicators

For the events Cos4Cloud has organised, the communication team (WP8) has established specific Key Performance Indicators (KPIs) to assess the knowledge transfer events' performance organised by the project that are different from those that appear in section 8. These indicators were established in the Cos4Cloud communication plan to assess the organised events and keep improving the methodology and content throughout the project. According to these KPIs, the communication team has designed a post-event survey to be sent to or shared with participants to assess the activity performance. In particular the indicators to evaluate the events organised by Cos4Cloud are:

- 1) The number of attendees.
- 2) The [Net promoter score](#), a widely used metric to measure participants satisfaction by asking respondents to rate the likelihood that they would recommend a company, product, or a service to a friend or colleague. This metric allows us to analyse if they are engaged with the project and interested in using its products or results.
- 3) The number of views, only for those activities or events, is posted on YouTube.
- 4) The knowledge outputs they address.
- 5) Typology of the stakeholders present during the event.

The results of these KPIs are described in Tables 10 to 12. The views on YouTube in Tables 10 to 12 are the numbers updated on 25/01/22 and may vary in the future.

Table 10. KPIs report of the Cos4Cloud events during Year 1.

EVENTS YEAR 1												
Event	N° of participants	Net Promoter Score	Link to YouTube	Views on YouTube	Knowledge Output				Stakeholders			
					1	2	3	4	CSC	ES	A	G
Let's talk about citizen observatories !	100	20% (5 answers in total)	YouTube link	120	X				X		X	
Monitoring plant biodiversity with Pl@ntNet	76	N/A	YouTube link	293				X	X		X	
How to create your own air quality sensor with CanAirIO?	294	59% (22 responses in total)	YouTube link (English version)	Views in English: 95 Views in Spanish: 285	X			X	X		X	
Tackle odour pollution with OdourCollect	20	59% (22 responses in total)	YouTube link.	Views: 200	X			X	X		X	
BioMARató Virtual	275	60% (10 responses in total)	Youtube link	225				X	X	X	X	
Requirement Workshop	35	N/A	N/A	N/A	X	X	X	X	X		X	

Table 11. KPIs report of the Cos4Cloud events during Year 2.

EVENTS YEAR 2												
Event	N° of participants	Net Promoter Score	Link to YouTube	Views on YouTube	Knowledge Output				Stakeholders			
					1	2	3	4	CSC	ES	A	G
Engaging society beyond data collection	53	55%. (9 responses in total)	Youtube link	63	X				X		X	
Introducing Cos4Cloud: how will it benefit the citizen science community?	60	15% (7 responses in total)	Youtube link	69	X	X			X		X	
Cos4Env co-design event	10	50% (4 responses in total)	N/A	N/A		X	X		X		X	
FASTCAT-Cloud/Edge co-design event	20	50% (6 responses in total)	N/A	N/A		X	X		X		X	
MOBIS & Cos4Bio co-design events	46	23% (17 responses in total)	N/A	N/A		X	X		X		X	
MOBIS second co-design event.	95	55% (9 responses in total)	N/A	N/A		X	X		X		X	

BioMARat6 2021	117	82% (30 responses in total)	N/A	N/A				X	X	X	X	
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Table 12. KPIs report of the Cos4Cloud events during Year 3.

EVENTS YEAR 3												
Event	N° of participants	Net Promoter Score	Link to YouTube	Views on YouTube	Knowledge Output				Stakeholders			
					1	2	3	4	CSC	ES	A	G
Cos4Cloud and its services for the citizen science community	60	67% (3 responses in total)	Youtube link	69	X	X			X			
Co-designing tools for citizen science	28	N/A	Youtube link	22			X		X		X	
Co-designing solutions for the sustainability and governance of citizen observatories	25	33% (15 responses in total)	N/A	N/A	X		X		X		X	X
Innovative tools to introduce citizen science into schools	20	85% (13 responses in total)	N/A	N/A		X	X			X		

Testing FASTCAT - Grupo FELIS	20	100% (7 responses in total)	N/A	N/A		X	X		X			
Testing MECODA ICTIO	32	N/A	N/A	N/A		X	X		X			
Testing MECODA & Escola Virolai	15	N/A	N/A	N/A		X	X			X		
BioMARató	200	N/A	N/A	N/A				X	X	X	X	
Bio-Datathon: Trees for life, trees for learning MINKA training workshop	27	70% (23 responses in total)	N/A	N/A		X		X		X		
Bio-Datathon: Trees for life, trees for learning MECODA training workshop	27	70% (23 responses in total)	N/A	N/A		X		X		X		
Exploitation roadmap workshop	19	N/A	N/A	N/A		X			X		X	
How to introduce citizen science projects into schools - Collaboration between	11	N/A	N/A	N/A				X	X	X		

Athens and Barcelona													
Datathon with 'Escola Gravi' school	27	27% (15 responses in total)	N/A	N/A									
Bio-Datathon with Cos4Bio 'A unique validation event of biodiversity data!'	29	25% (4 responses in total)	N/A	N/A									

Conclusions

Cos4Cloud's methodology to develop and monitor its KT strategy was based on common practices implemented by the H2020 community as well as on requirements and recommendations coming from the funding agency, the European Commission.

It is important to underline that some aspects of a KT strategy cannot be evaluated in a quantitative manner and have been challenging to measure. Having said that, the Cos4Cloud methodology for KT transfer and its evaluation has proven itself effective for keeping track of the consortium efforts in KT, monitoring the Cos4Cloud KT activities and whether they were aligned with the target stakeholders and the KT goals, as well as to adjust the strategy if necessary. The implementation and evaluation of the Cos4Cloud Knowledge Transfer framework has been a unique opportunity to understand KT within the project which provides us with some practical lessons to make this transfer effective. In the case of Cos4Cloud, setting up clear KT Outputs and key stakeholders was crucial for developing the project's KT strategy, as well as involving all the members of the consortium in its implementation. Besides, in Cos4Cloud, the events were key for the success of the KT strategy; they allowed us to be in direct contact with the community and make this transfer more effective.

In general, the evaluation of the KT in Cos4Cloud has been positive. The different actions implemented, thanks to the joint work between the communication, co-design, outreach

and dissemination teams, managed to achieve the KT of the main project outputs to a large number of target stakeholders. Nevertheless, knowledge transfer activities will continue after the project ends, thanks to the Evidence Hub and Toolbox, the EOSC and the fact that all materials will be uploaded to Zenodo before the end of the project. The Cos4Cloud consortium is committed to continue transferring the results and work carried out during the project and for that they will have different materials available, such as an interactive infographic of the project that will remain online for up to 5 years after the end of Cos4Cloud and contribute to the project's legacy.

Abbreviations

AI: Artificial Intelligence

CO: Citizen Observatory

CS: Citizen Science

EC European Commission

EU European Union

JRC: Joint Research Centre of the EC

KO: Knowledge Outputs

KT: Knowledge Transfer

PRO: Publicly Funded Research Organisation. PROs include universities and colleges.

SME: Small and medium-sized enterprises

UX: User experience

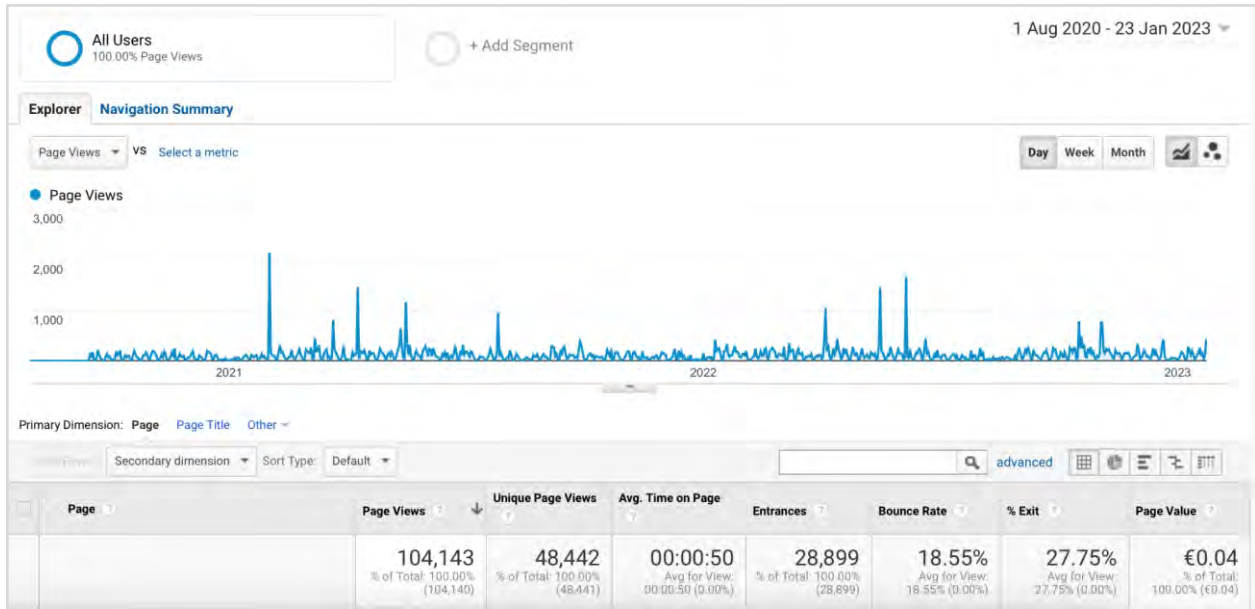
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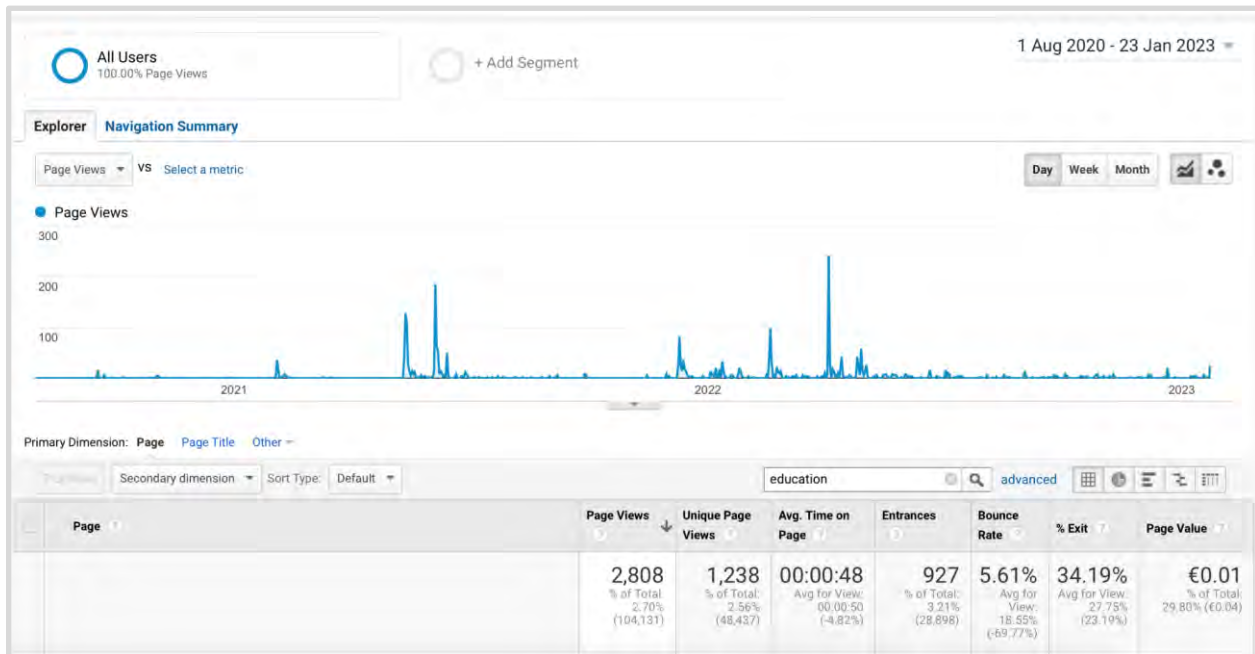
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Annexes

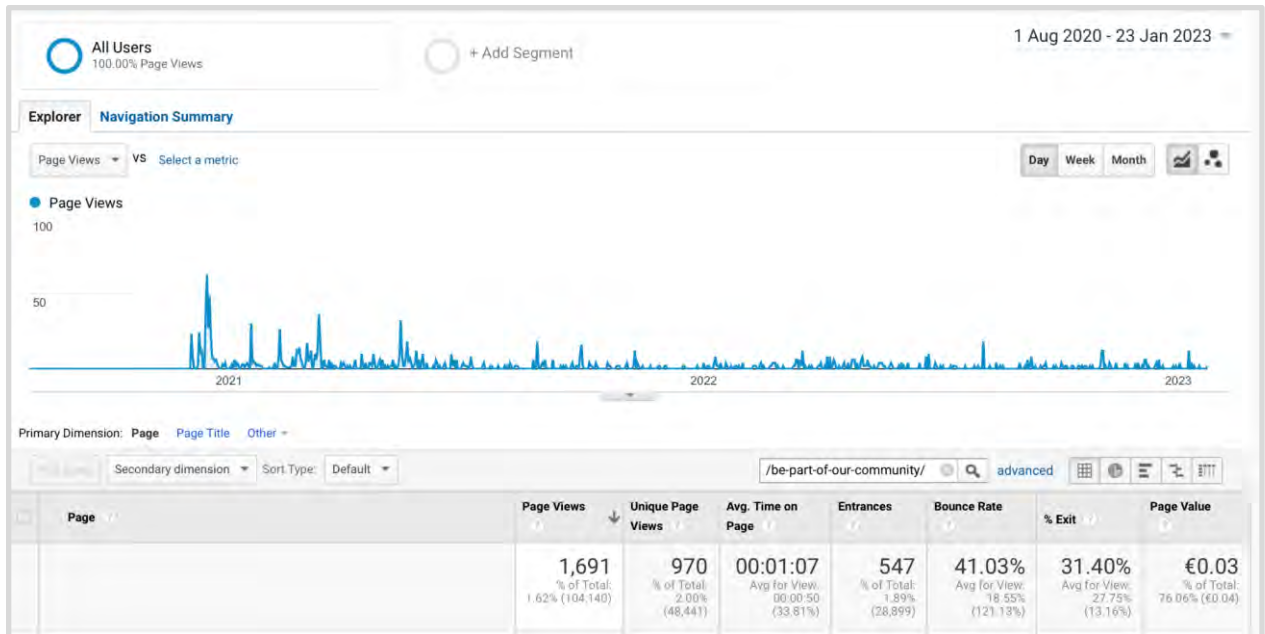
Annex 1. Website visits & social media reach graphics.



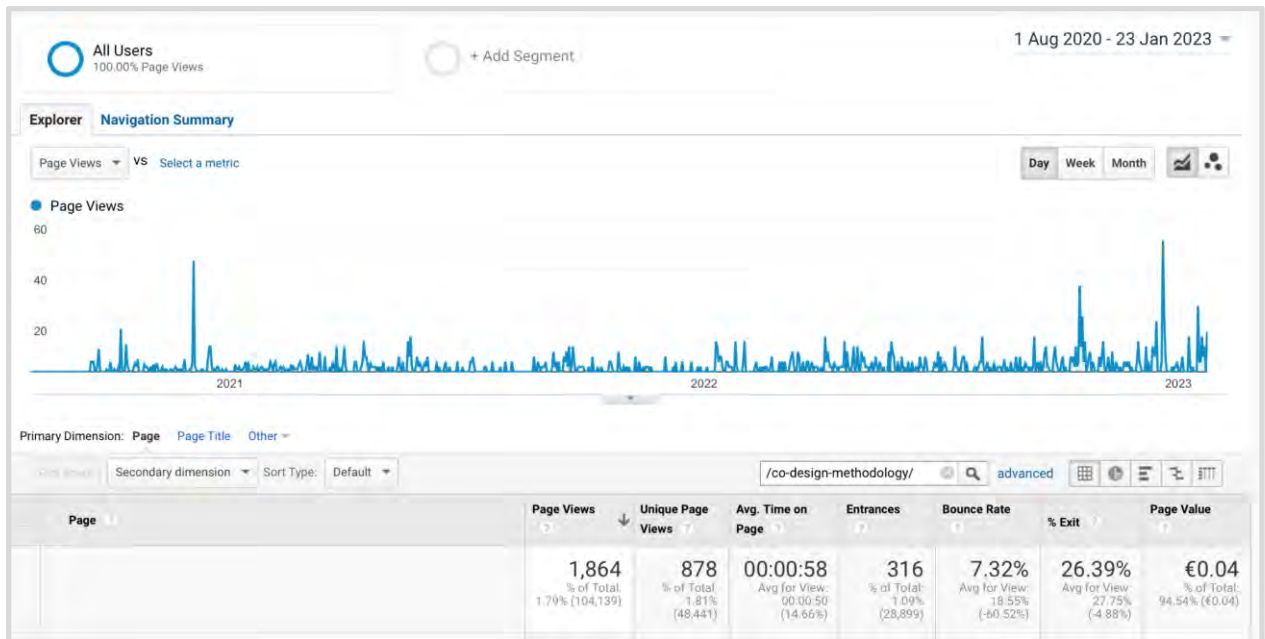
Total website visits 'page views'. Source: Google Analytics, 01/08/20-23/01/23.



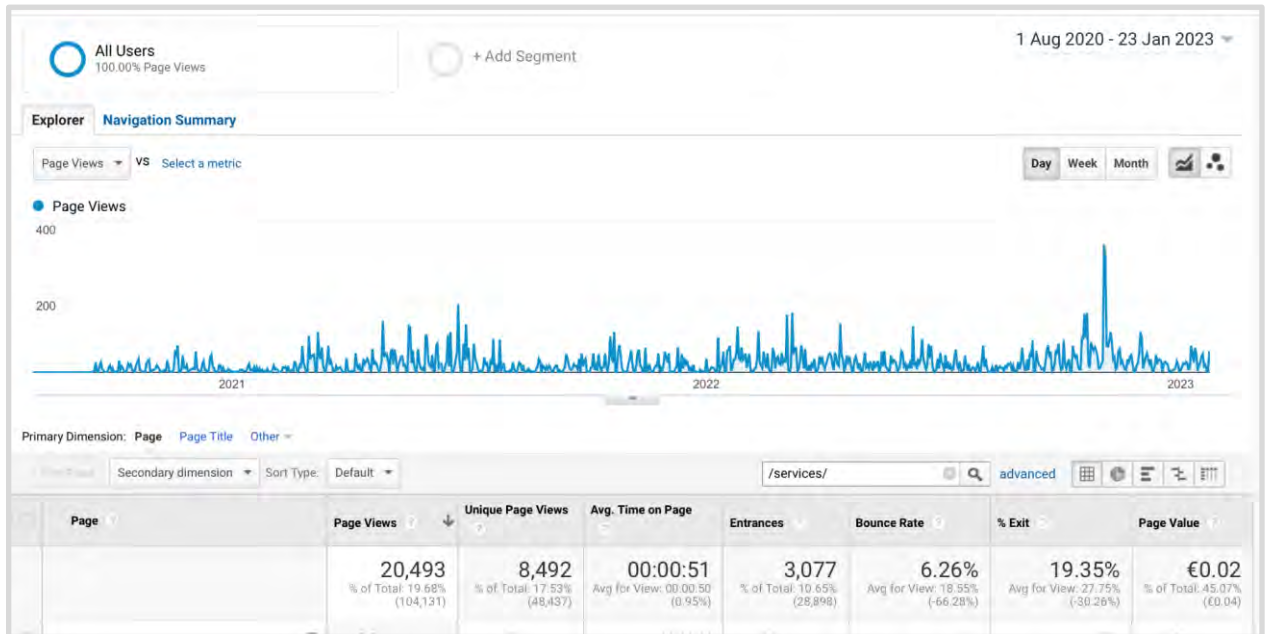
Total website visits 'page views': education. Source: Google Analytics, 01/08/20-23/01/23.



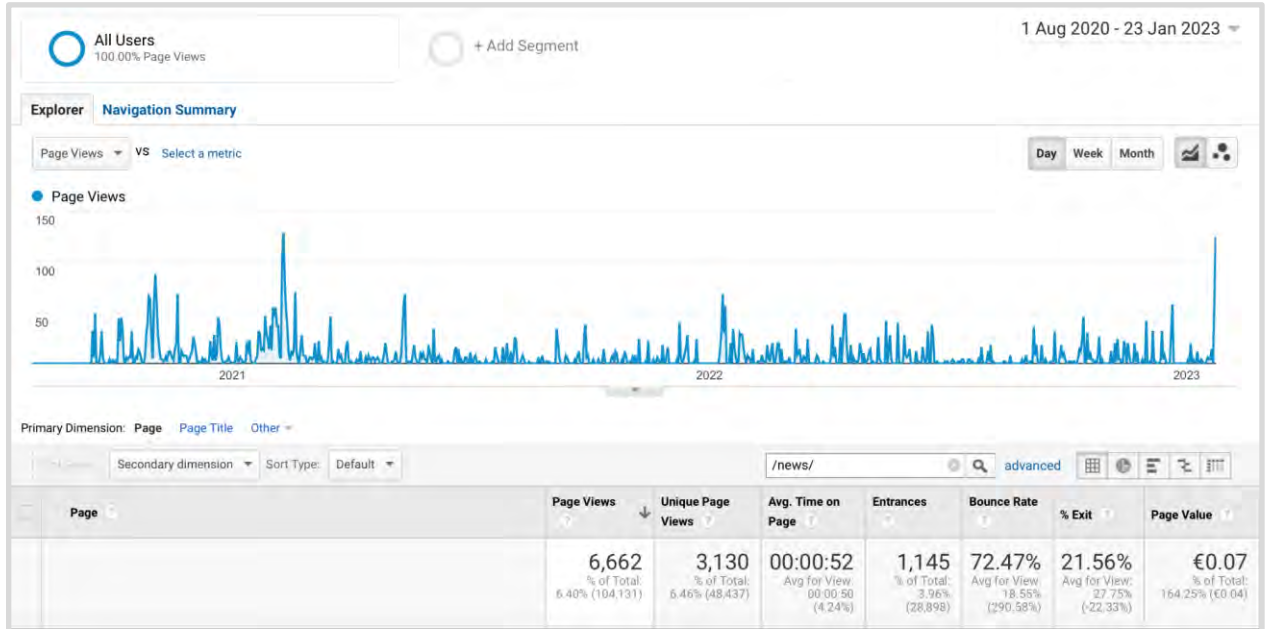
Total website visits 'page views': be part of our community. Source: Google Analytics, 01/08/20-23/01/23.



Total website visits: co-design. Source: Google Analytics, 01/08/20-23/01/23.



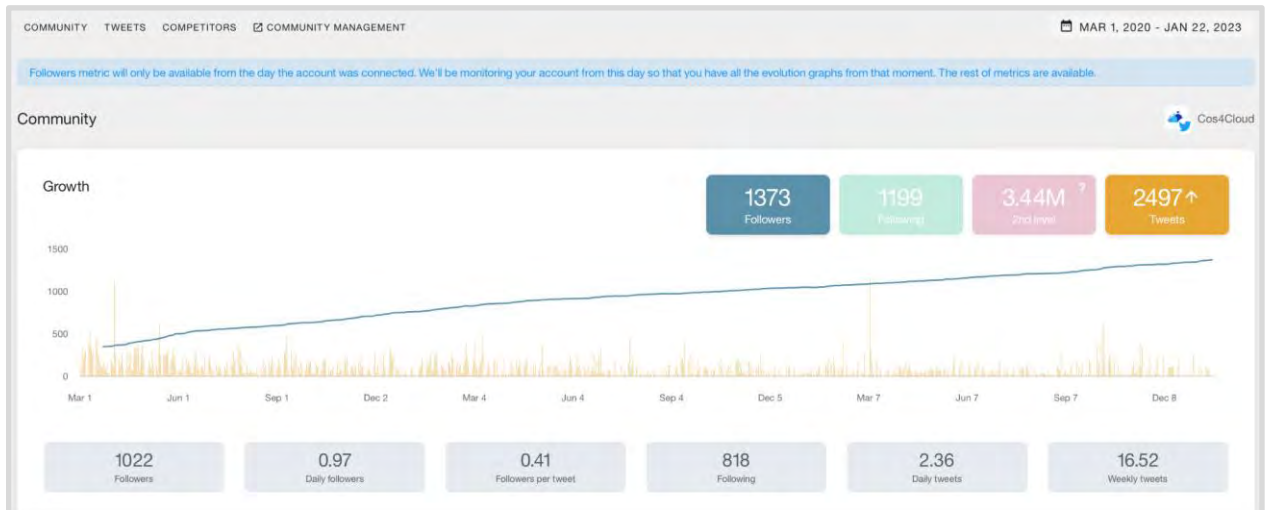
Total website visits 'page views': services. Source: Google Analytics, 01/08/20-23/01/23.



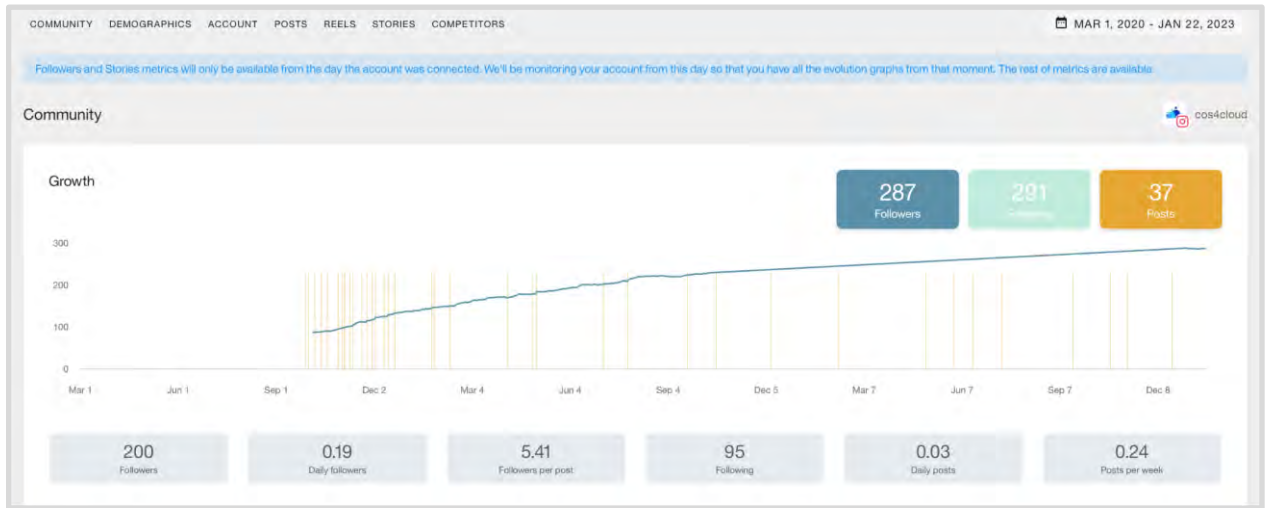
Total website visits 'page views': news. Source: Google Analytics, 01/08/20-23/01/23.



Social media research evolution: LinkedIn. Source Metricool, 01/03/20-22/01/23.



Social media research evolution: Twitter. Source Metricool, 01/03/20-22/01/23.



Social media research evolution: Instagram. Source Metricool, 01/03/20-22/01/23.



Social media research evolution: YouTube. Source Metricool, 01/03/20-22/01/23.

Annex 2: Dissemination events table

[Link to the dissemination events' table \(includes the events during year 1, year 2 and year 3\)](#)

Annex 3: Cos4Cloud Exploitation workshop Mentimeter results.

[Link to the document in PDF format.](#)

Annex 4: Second Annual Meeting: Services Mentimeter survey results

[Link to the document in PDF format.](#)