D2.3: Final version of the Compilation of the Roadmaps and Grounding Actions for the Implementers

Asya Salnikova (ESF) | 20/12/2023
Eugenia Vilarchao (ESF) | 20/12/2023
Adam Brandstetter-Kunc (ESF) | 20/12/2023
Ildiko M. Ipolyi (ESF) | 20/12/2023

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Author(s)	Asya Salnikova, Eugenia Vilarchao, Adam Brandstetter-Kunc, Ildiko M. Ipolyi (ESF)
Contributor(s)	Marta Solis Mateos (CRG), Elena Maffia, Maya Fedeli (UniSR), Daniela Iacopino (T-UCC), Egle Butkeviciene (KTU)
Reviewer(s)	Gitte Kragh (AU), Claudia Iasillo, Alessio Livio Spera (APRE)
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List of Abbreviations

AU	University of Aarhus
APRE	Agenzia per la promozione della ricerca europea
CS	Citizen Science
CRG	Centre for Genomic Regulation
ECSA	European Citizen Science Association
EPE	Education & Public Engagement
ESF	Fondation Européenne de la Science
GA	Grounding Action
IA	Intervention Area
ICT	Information and Communication Technology
IPIC	Irish Photonics Integration Centre
KTU	Kaunas University of Technology
LERU	League of European Research Universities
OS	Open Science
PRBB	Barcelona Biomedical Research Park
RFO	Research Funding Organisation
RPO	Research Performing Organisation
R&I	Research and Innovation
RRI	Responsible Research and Innovation
SFI	Science Foundation Ireland
Tyndall	Tyndall National Institute University College Cork
UCC	University College Cork
UCL	University College London
UniSR	Università Vita Salute San Raffaele
UZH CC-CS	Competence Center Citizen Science, University of Zurich
WP	Work Package
ZSI	Zentrum für Soziale Innovation

Executive Summary

The current document, titled "Final version of the Compilation of the Roadmaps and Grounding Actions for the Implementers", was developed within the framework of the TIME4CS project which is funded by the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No 101006201.

The purpose of this Deliverable is to present the final version of the TIME4CS Roadmaps to achieve sustainable Institutional Changes in Citizen Science (CS), as developed and updated by the project's four Implementers (Tyndall National Institute, Kaunas University of Technology, Centre for Genomic Regulation, Vita-Salute San-Raffaele University), for the project period (2021-2023) and beyond (2024-2028).

This document links the final version of the Roadmaps developed on the basis of sustainability thinking for the medium and long-term vision, to concrete practical steps to be taken to ensure the continuation of the Institutional Change process in the post-project period.

Overall, twelve new Grounding Actions (GAs) have been planned by the Implementers for the post-project period to follow-up on the outcomes and explore new ways to continue institutional adoption of CS beyond the project lifetime. This sustainability reflection also results in a set of conclusions and recommendations for other CS practitioners who would be willing to learn from TIME4CS experiences.

Finally, this document also describes the activities organised by TIME4CS to assist the Implementers during the final year of the project in both the implementation of the planned GAs and the development of sustainability plans.

1. Introduction

The TIME4CS (Supporting sustainable Institutional Changes to promote Citizen Science in Science and Technology) project aims to support sustainable Institutional Changes at research performing organisations (RPOs), to promote CS and public engagement in science and technology.

The project is built on the concept that RPOs willing to achieve Institutional Change can learn from organisations that have already gone through some similar, well-planned transformational process, such as the three TIME4CS 'Front-Runner' organisations (Aarhus University, Citizen Science Centre Zurich, University College London).

The RPOs seeking to implement change, known in the project as 'Implementers' (Tyndall National Institute, Kaunas University of Technology, Centre for Genomic Regulation, Vita-Salute San Raffaele University), gathered experiences from the Front-Runners and used this information to develop and follow Roadmaps for Institutional Change centred around specific "GAs" – concrete measures and actions enabling an Institutional Change in the project period (2021-2023) and beyond (2024-2028). Each Implementer implemented at least one GA for each of four TIME4CS Intervention Areas - IAs (i.e. Research, Education & Awareness, Support Resources & Infrastructure, and Policy & Assessment) that have been identified as relevant to embedding CS and described in the Deliverable D1.3 "Lessons learnt repository of TIME4CS[1]".

The project consortium is composed of eleven partners from eight EU member States and one associated country. In addition to the four Implementers and three Front-Runners, there are four partners supporting the Institutional Change process, the knowledge transfer, the monitoring and evaluation, and the communication of the project outcomes (i.e. Agency for the Promotion of European Research, European Science Foundation, Centre for Social Innovation and Crowdhelix).

1.1 This document

This document presents the final version of the Institutional Roadmaps.

The Roadmaps provide a detailed, tailored, progressive and flexible action plan for each Implementer, defining the GAs to be carried out during the project lifetime, but also establish a basis for medium- to long-term progress.

The initial Roadmaps were developed by each Implementer in 2021 and described in the Compilation of Roadmaps and Grounding Actions for the Implementers - First version (D2.1)[2]. This initial version of the Roadmaps (D2.1) outlined 19 GAs defined by the Implementers for the project period (2021-2023) covering the four IAs mentioned above. Within this first version, most Implementers have devised GAs in relation to training, awareness raising, identification of CS contact points, development of CS policies/guidelines, and participation in CS networks.

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[1] https://doi/10.5281/zenodo.6402090

[2] https://doi.org/10.5281/zenodo.5743299

After the first year of implementation of the Institutional Roadmaps, the Implementers acquired a better knowledge of the institutional arrangements, barriers, resources, and best strategies to drive Institutional Changes in their institutional contexts. Considering these lessons learnt, a Compilation of Roadmaps and Grounding Actions for the Implementers - Second version (D2.2[3]) was developed. Overall, nine new GAs were defined, mainly focusing on the sustainability of the Institutional Changes for the post-project period (2024-2028).

This document presents the last formal revision of the Roadmaps and focuses particularly on the medium- and long-term goals, based on sustainability thinking. **In total, twelve new GAs have been planned by the Implementers for the post-project period**. They are mainly follow-up activities to those initiated during the project.

The document comprises seven chapters, including the Introduction (Chapter One). **Chapter Two** (Adapting the Roadmaps for the post-project period) describes the concept of sustainability of the Roadmaps and project activities undertaken to support the implementation and the subsequent revision of the previous version of the Roadmaps, leading to the final version described in this report.

Chapters Three to Six set out the final version of the Roadmaps, including each Implementer's plans to ensure the sustainability of the outcomes already achieved, as well as an overview of new planned Grounding Actions to be implemented in the post-project period.

Chapter Seven (Actions promoting sustainable Institutional Change) provides an overview of the Implementers' approaches and objectives for the post-project period as well as summarises recommendations and conclusions related to sustainability of the Institutional Change.

1.2 Relation to other TIME4CS work packages

The overall TIME4CS project incorporates eight Work Packages (WPs), running from January 2021 to December 2023.

WP2, for which this document is a deliverable, involves the definition and implementation of Grounding Actions by each Implementer. WP2 builds on the work of WP1, during which successful initiatives to support CS are reviewed and analysed to inform the initiatives undertaken by the Implementers, and WP3, which supports knowledge exchange between the Implementers and Front-Runners. WP2 also draws on the self-assessment and evaluation of CS policies and practices at the Implementers' institutions (WP5).

In turn, the work of WP2 feeds into WP3 and WP4, which focus on building capacity in the Implementers and external organisations to design, execute, support and evaluate CS projects.

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[3] https://doi.org/10.5281/zenodo.7491568

2. Adapting the Roadmaps for the post-project period

This chapter sets out the process for further adapting the Institutional Roadmaps and GAs described in D2.2[4], for the post-project period.

2.1 Actions carried out to support adapting the Roadmaps for the post-project period

Like in previous years, several TIME4CS activities supported the Implementers in the process of implementation and adaptation of the Roadmaps in the final year of the project and fed into the development of the sustainability plans.

2.1.1 Mutual learning opportunities

As part of WP3, a monitoring and mentoring scheme was developed to follow-up with the Implementers' work and provide the opportunity to exchange knowledge between the Implementers themselves (called "Implementers' Forum") and the Implementers and Front-Runners (called "Implementers' Journeys"). During the project lifespan, these meetings were held mostly online, except three of them which were organised in the context of the General Assemblies.

From March to May 2023, the mentoring visits aiming at illustrating and discussing the progress done by each Implementer in the respective Roadmap, took place. Each Implementer organised one mentoring visit to its host institution, which included a one-day event on site with representatives from all Front-Runners, support partners and local actors. Mentoring visits were also the occasion for each implementer to share specific questions and get tailored suggestions from the Front-Runners and support partners, including on the development and refinement of the sustainability plans. For further details: D3.5 - Report on TIME4CS Mentoring Programme[5].

An online mutual learning event focusing specifically on the Roadmaps' sustainability issues was organised and led by ESF on 27 June 2023. The exchanges involved all Implementers, Front-Runners and support partners. During the meeting, each Implementer presented the status of their GAs and the envisaged sustainability plans, got feedback and advice from other participants.

2.1.2 Capacity-building programme

A strong TIME4CS capacity-building programme also significantly contributed to further developing the Implementers' knowledge base necessary for proper implementation and revision of their respective Roadmaps as well as for the sustainability planning. The Train-the-Trainer workshop for the Implementers' core teams was organised back-to-back with the TIME4CS General Assembly in December 2022. Numerous trainings also run on four Training Days at Implementer institutions complementing the mentoring visits

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[4] https://doi.org/10.5281/zenodo.7491568
[5] https://doi.org/10.5281/zenodo.8082479

described above. These trainings were tailored to the needs of researchers as well as management and other staff members aiming at further visibility, recognition of CS methodologies and long-term commitment of the institution. For more details: D4.4 - Report on all Workshops[6]. The TIME4CS training programme also comprises a series of webinars and a free online course (MOOC) encompassing four training modules, publicly available[7] [8].

2.1.3 Evaluation updates and the Roadmaps' impact assessment by the end of the final year

As part of WP5, the Implementers did a stock-taking exercise in October and November 2023, to describe the outputs and outcomes of the Roadmaps' implementation in the final year of the project. To complement this activity, evaluation workshops led by ZSI and supported by ESF were held online in September and October 2023. These workshops served to evaluate individually with each Implementer the progress and impact of the GAs initiated under TIME4CS, as well as to discuss the lessons learnt throughout the project and further plans.

2.1.4 Stakeholder's co-creation workshops

Similar to previous years, co-creation meetings were organised by each Implementer bringing together their local stakeholders to discuss the updates and outcomes of the Roadmaps implementation and sustainability plans. These co-creation exercises were organised in October 2023 (CRG, Tyndall) and November 2023 (UniSR, KTU) and were supported by ESF. Overall, 45 stakeholders participated, among which nine belonged to the governance of the institution.

2.2 Sustainability, key principle of the Roadmaps

The eight-years long Roadmaps were developed by the Implementers with a view to ensuring sustainable Institutional Changes in three steps: initial version of the Roadmaps focusing on short-term goals (to be achieved during the project period), updated version after the first year of implementation looking at both short-term goals and sustainability plans, and then the final version fully focusing on the post-project medium and long-term goals.

For CS-related activities to carry out after the end of TIME4CS project, a five-year period has been considered divided into two sub-periods:

- The post-project period (2024-2026), mainly focused on the continuation of the Grounding Actions initiated under the project and the launch of new Grounding Actions;

- The stabilisation period (2027-2028), mainly aimed at consolidating a stable and comprehensive adoption of CS in the institution concerned.

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[6] https://doi.org/10.5281/zenodo.8083037

[7] https://doi.org/10.5281/zenodo.10402306

[8] https://eu-citizen.science/training_resources?keywords=Time4CS

The sustainability plans comprise actions to sustain the Roadmap's implementation outcomes, including the continuation of already initiated GAs, and the implementation of new GAs to be launched in the post-project period.

Various factors could affect the sustainability actions and slow down further institutionalization of CS, such as the presence of resistance to changes, leadership turnovers, lack of wider interest of researchers and managers to initiate and participate in CS projects, as well as limited funding issues.

As for the solutions, some proposals were put forth and sometimes practiced by the Implementers' teams to mitigate the risk of setbacks. A detailed account of these measures is provided in Chapter 7 of this document.

As the Institutional Roadmaps are tailor-made, the specific institutional contexts should be considered also for their sustainability. Implementers needed to reflect on how each new GAs should be planned and implemented, what further institutional arrangements and resources are needed for successful embedment of new GAs and the sustainability of recently implemented ones in the medium and long term.

2.3 Updated TIME4CS Roadmaps

The updated Implementers' Roadmaps share a common structure consisting of 6 sections as follows:

- **The institution**: This paragraph contains basic information about the Implementer.

- **The final year of implementation of the Roadmaps**: The Implementers provide a brief overview of the final year of implementation of the Institutional Roadmaps.

- **Grounding Actions**: All GAs initiated within the TIME4CS project are listed, including those developed in the first and second versions of the Roadmaps. To avoid repetition, the detailed descriptions in the current document are given only for the GAs that were launched in 2023 and will continue beyond the project lifetime as well as for the GAs that were included in a second version of the Roadmaps, but will start in 2024 and beyond, and therefore, in some cases were significantly updated compared to the second version. For a detailed description of previously developed GAs, the Deliverables D2.1 and D2.2 [9] could be consulted. These descriptions set out: the Intervention Area targeted by the GA; the aim of each GA; any prior experience the Implementer has in implementing similar initiatives; an overview of the co-creation exercises that fed into the GA's development; and an implementation plan setting out the individuals, organisations and resources involved, potential obstacles and mitigation measures.

- **The objectives and strategy for Institutional Change in the post-project period**: This section sets out the overall goals and strategy for Institutional Change in the post-project period.

- **Sustainability measures**: This section outlines the approaches and measures for sustaining the outcomes of the implementation of the GAs. Moreover, it presents the Implementers' plans for new GAs to be launched in the post-project period.

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[9] https://doi.org/10.5281/zenodo.5743298

- **Concluding remarks:** This section summarises the Implementers' practical measures to establish a sustainability plan for their respective Roadmaps.

3. Updated Roadmap for Tyndall National Institute

3.1 Tyndall National Institute

Tyndall National Institute is one of Europe's leading research centres in Information and Communication Technology (ICT) research and development and the largest facility of its type in Ireland. Established in 2004 as successor of the National Microelectronic Research Centre (NMRC founded in 1982) at University College Cork (UCC), the Institute employs over 460 researchers, engineers and support staff, with a full-time graduate cohort of 135 students, and generates over 200 peer-reviewed publications each year. With a network of 200 industry and customers worldwide, Tyndall generates 85% of its €30 M each year from competitively won contracts. Tyndall is also lead partner in European research partnership in its core areas of ICT, energy, health and the environment worth €48 M from Framework 7, including €10 M to industry in Ireland. Hosting the only fully complementary metal oxide semiconductor (CMOS) integrated circuit, micro-electronic mechanical systems (MEMS) and III-V wafer semiconductor fabrication facilities and services in Ireland, Tyndall National Institute is a globally leading centre in photonics, microsystems, micro/nanoelectronics and theory, modelling and design.

3.2 Final year of the implementation of the Institutional Roadmap at Tyndall National Institute

In total, Tyndall has seven GAs as follows:

- GA1 – Promote and support submission incorporation of CS dimension into research projects (Research)

- GA2 – Postgraduate module on CS (Education & Awareness)

- GA3 – Training programs for researchers (Education & Awareness)

- GA4 – Funding awareness/support (Support Resources & Infrastructures)

- GA5 - Supporting the development of an engaged research strategy (Policy & Assessment)

- GA6 – Sustainability of CS module (Education & Awareness)

- GA7 – Strategic planning of community engagement activities (Support Resources & Infrastructure).

In 2023, Tyndall did not add new GAs to its Roadmap compared to those described in the Deliverables D2.1 and D2.2 but focused on implementation of the GAs already planned and on developing comprehensive sustainability plans. However, as two GAs added to the previous version of the Roadmap were supposed to start (GA6) or started in 2023 (GA7), and have a strong middle and long-term vision component, more details and updates on them are given in section 3.3 of this document.

3.3 Grounding Actions

As mentioned above, Tyndall did not add new GAs compared to the previous versions of its Roadmap but continued the implementation of the GAs already planned. However, as the GAs 6 and 7 started in 2023 and have a focus on sustainability, more updates on them are given in the current document.

3.3.1 Grounding Action 6 – Sustainability of CS module (Education & Awareness)

This GA is closely related to GA2 (Postgraduate module on CS). As the CS module is being rolled out, Tyndall thought it would be good to identify ways of supporting uptake and explore potential further developments. Specifically, following the identification of a substantial obstacle related to the maintenance of developed module, this GA investigates development of strategic plans to ensure growth of the module and incorporation into wider Open Science modules already existing in UCC.

Objective(s) of the Grounding Action

Academic approval for the CS module was granted in September 2023. Once the CS module is delivered, this GA subsequently aims to develop a strategic plan to keep and expand this module in the curricula from 2024 onwards, potentially through development of a Master course.

Updated Implementation plan

Compared to the previous version of the Roadmap, Tyndall updated the activities planned.

Activity 1: Module size, teaching resources and time commitment

Activity 2: Maintenance of participation, size growth

Activity 3: Strategies for scaling from Tyndall to UCC size

Activity 4: Difference, complementarities of other Open science modules

As mentioned above, the module has finally been approved in September 2023. The major obstacle in the module sustainability is the sourcing of teaching personnel and time constraints of potential UCC staff in delivering the module. These activities will be carried out by the module responsible in close consultation with the head of graduate studies and the UCC community officer.

Stakeholders & Co-creation

The main actors are the module responsible in close consultation with the head of graduate studies (and the UCC community officer, as well as students, researchers, and lecturers. In the future, also the module responsible of other "engaged" research modules (CS falls under the umbrella of 'Engaged Research' at Tyndall) will be consulted and their experience leveraged to support module sustainability.

Potential Obstacles

At this stage the major obstacle in the module sustainability is the sourcing of teaching personnel and time constraints of potential UCC staff in delivering the module.

Timeline

Step	Activity	Responsible	Deadline
1	Consultation and open discussion on module size, teaching resources and time commitment	Module responsible with module co-creation team	2024 onwards
2	Consultation on participation uptake and sustainability of thereof	Module responsible with module co-creation team	2025 onwards
3	Strategies for scaling from Tyndall to UCC size	Module responsible with module co-creation team	2025 onwards
4	Difference, complementarities of other Open science modules towards Engaged research MSc	Module responsible with module co-creation team and other Engaged research module responsible. UCC teaching &learning departments	2025 onwards

3.3.2 Grounding Action 7 – Strategic planning of community engagement activities (Support Resources & Infrastructure)

This GA arises from the hiring of a Tyndall community officer and the need to create strategic connections between his activities and the wider activities carried out in UCC. It is an invaluable opportunity to scope projects and explore their feasibility and need at local communities' level.

Objective(s) of the Grounding Action

Work is necessary to map out the Tyndall community officer activities, to create strategic collaboration with its UCC counterparts and to link with other activities carried out within the Science Foundation Ireland (SFI).

Implementation plan

Equally to the GA6, the implementation plan has been updated as compared to the previous version of the Roadmap.

Activity 1: interface with IPIC management to define activities and community engagement

Activity 2: Widen activities at Tyndall level

Activity 3: Build synergies with UCC equivalent officers.

Activity 4: Build synergies with other SFI centers' equivalent officers towards maximisation/complementarity of engagement.

Some of these activities have started and they are ongoing. A collaboration has been established between Tyndall and UCC community officers and some projects identified. From 2024, also synergies with the other two Tyndall SFI centers Vistamilk and CONNECT 2 will be established. A collaboration has been established between UCC community officer and CONNECT 2 within the activities of the Academy of the Near Future. This model will constitute the base for the implementation of similar activities in the Cork city area.

Stakeholders & Co-creation

Main stakeholders are the Tyndall community officer, the UCC community officer and the Education & Public Engagement (EPE) officers in Irish Photonics Integration Centre (IPIC), CONNECT 2 and Vistamilk, researchers, community representatives.

Potential Obstacles

At this stage the major obstacle is the use of the Tyndall community officer for EPE activities instead of more strategic implementation of community engagement. Short of resources (personnel) is also an obstacle as well as efficient communication between parties.

Timeline

Step	Activity	Responsible	Deadline
1	Interface with IPIC management to define activities and community engagement	Tyndall community officer and EPE team	2024 onwards
2	Widen community activities at Tyndall level	Tyndall community officer and EPE team	2025 onwards
3	Build synergies with UCC equivalent officers	Tyndall and UCC community officers	2023 onwards
4	Build synergies with other SFI centers' equivalent officers towards maximisation/complementarity of engagement	Tyndall community officer and SFI centers EPE officers and community officers	2024 onwards

3.4 Objectives and Strategy for Institutional Change in the post-project period

3.4.1 Vision and Strategy

The work undertaken in 2023 has focused on creating awareness of CS at all levels (from postgraduate to researchers to high management) with the aim of training personnel and expansion of the role of Tyndall EPE managers in the middle and long term. Work will also be carried out in strengthening and consolidating the relationship with the UCC community officer, in order not to work in isolation and to build a strategic plan around community engagement in the post-project period.

The lack of funding is still an issue for Tyndall, as the majority of research groups are self-funded. However, as awareness of the importance of CS has grown, also opportunities for engaged research have grown within the SFI centres Vistamilk and CONNECT, of which Tyndall is part, for middle and long-term benefits. For example, within Vistamilk Tyndall researchers work in close contact with farmers in order to develop technological solutions. Consultations with farmers are also key to influencing policy around sustainable farming and adoption of novel smart-agricultural technologies. Within CONNECT, Tyndall researchers will collaborate with Trinity College researchers within the activities set by the Academy of the Near Future, delivering projects on sustainable cities and communities.

The biggest change in strategy and perhaps in vision is that there are many opportunities to incorporate an "engagement" aspect in the research carried out at Tyndall. Even if CS has not yet become the core of Tyndall activities, it has a potential to expand, enrich and complement these research activities.

3.4.2 Goals

This sub-section presents Tyndall's mid-term (achievable in the post-project period, 2024-2026) and long-term (achievable in the stabilisation period, 2027-2028) goals. To avoid repetition, the short-term goals (achieved on the project period, 2021-2023) could be consulted in the Deliverable D2.2.

Goals	Grounding Action	Status	Intervention Area	Type of Goal
Promoting and supporting incorporation of CS dimension into research projects	GA1	Original	Research	Middle-Term
Launch of a postgraduate module on CS for Science, Engineering and Food Science (SEFS) students	GA	Modified	Education & Awareness	Middle-Term
Implementation of training programs and awareness workshops for researchers	GA3	Original	Education & Awareness	Middle-Term
Raising funding awareness/support to stimulate i) the uptake of CS-based projects,	GA4	Original	Support Resources & Infrastructure	Long-Term

ii) the incorporation of CS aspects into research projects				
Increasing submission of CS based projects by 2% in the next five years and 10% in the long term.	GA5	Cancelled	Research	Middle-Term
Supporting the development of an UCC engaged research strategy	GA5	Original	Policy & Assessment	Long-Term
Ensuring sustainability and growth of CS module	GA6	New	Education & Awareness	Long-Term
Creating solid connections between Tyndall and local communities and finding opportunities for co-creation and co-development	GA7	New	Support Resources & Infrastructure	Long-Term

3.5 Sustainability measures

This sub-section describes Tyndall's plans to ensure sustainability of the outcomes per GA initiated as well as their hypotheses on new GAs to start in the post-project (2024-2026) and stabilisation (2027-2028) periods.

3.5.1 Actions to sustain the outcomes

Grounding Action (GA# - title)	Intervention Area	Sustainability Actions	Tentative Timeline
GA1 – Promoting and supporting incorporation of CS dimension into research projects	Research	Activities planned: 1. Establishing internal quarterly meetings to discuss funding calls and opportunities. 2. Establishing priority for community engagement and interdisciplinary collaborations within the research activities carried out in the SFI centres. Responsible: Tyndall PIs and research offices. Resources available.	2024

GA2 - Create a postgraduate module on CS	Education & Awareness	Activities planned: 1. Establishing a co-production team. 2. Creating course content. 3. Defining tutors/teachers. 4. Module accepted. Responsible: Module responsible and graduate office Needs: commitment from both Tyndall and UCC. Once the CS module is created and delivered, the GA7 will specifically address the sustainability plan for the module.	2024
GA3 - Elaborate a training program for researchers	Education & Awareness	Activities planned: 1. Specific trainings have been designed by UCC community officer in collaboration with Irish University Association and are being rolled with a train-the-trainer model. Such trainings are dedicated to EPE officers and will be continued after the end of the project. 2. In parallel, the workshops are being oganised for researchers and will also be continued. Responsible: Tyndall EPE officers, UCC and SFI centres EPE officers. Needs: SFI funding and established strategic priority. The workshops run routinely and are incorporated in the centers' activities.	2023 onwards
GA4 - Raising funding awareness/support	Support Resources & Infrastructure	Activities planned:	2023 onwards

to stimulate i) the uptake of CS-based projects, ii) the incorporation of CS aspects into research projects		1. Establishing quarterly meetings with EU programme managers. 2. Establishing support in proposal writing/training. Responsible: Tyndall PIs. Needs: an engaged group of EU programme managers. A periodical review of focused areas will be conducted internally and then communicated to the EU programme group.	
GA5 - Supporting the development of an UCC engaged research strategy	Policy & Assessment	Activities planned: 1. Embedding Engaged Research in the National strategic plan, supported by SFI-driven societal engagement plan. 2. Embedding Engaged Research in UCC strategic plan 2023-28, as priority area and part of the UCC research culture. Responsible: UCC and Tyndall community officers. Needs: established institutional support at UCC level. Implementation of the Wellcome Trust Pilot scheme will also be helpful: working with young researchers (training and Engaged Research modules development) and Living laboratories set up.	2024 onwards
GA6 - Sustainability of CS module	Education & Awareness	This GA is closely related to the development, approval, maintenance and possible expansion of the CS module. It is fully devoted to ensuring sustainability for this future module.	2024 onwards

		Responsible: module responsible and graduate studies office. Needs: designed module, institutional support for launch, maintenance and expansion.	
GA7 - Strategic community engagement strategy	Support Resources & Infrastructure	Activities planned: 1. Creating links between UCC office and newly hired Tyndall community officer. 2. Defining and embedding strategic plans in future SFI centres' activities. Responsible: Tyndall community officer and EPE officers. Needs: institutional and SFI support.	2023 onwards

3.5.2 New Grounding Actions to be launched in the post-project period (2024-2026).

The GAs 8, 9 and 10 are new GAs not mentioned in the previous version of the Roadmap. They will start in the post-project period.

Grounding Action (GA# - title)/ Intervention Area	Relation to the previous GA(s)	Brief description of the new GA	Tentative Timeline
GA8 – Establish stronger links between community officers and researchers to inform research activities/Support Resources & Infrastructure	Supporting the effort made within GA1 and GA4 by reinforcing exchanges between researchers and communities and support researchers into implementation of CS	Possible activities include: 1. Establishing strategic priorities for EPE officers. 2. Incorporating EPE activities within different research areas. 3. Consulting communities (CONNECT open day in Cork City council) Responsible: Tyndall and SFI EPE officers, researchers.	2024 onwards

		This GA can count on SFI centres support. Needs: more EPE and city/county councils' support. Possible obstacles: Bringing everyone on board. SFI pressure is essential to motivate actions.	
GA9 - Creative workshops to design community activities around ongoing research projects/Education & Awareness	Following GA3 as there is a need for more customised workshops/consultancy support on how to implement CS in research projects, was identified.	Possible activities include: 1. Creating opportunities for more workshops (follow up from initial workshop). 2. Creating support groups to help researchers to embed CS into research projects. Responsible: Tyndall and UCC EPE/community officers. Needs: access to institutional funding (overheads, etc).	2024 onwards
GA10 – Embedding Engaged Research within Tyndall People & Culture/Policy & Assessment	Follows GA5 to benefit from exchanges with active People & Culture Committee and introduce Engaged Research as part of Research Integrity Agenda.	Possible activities include: 1. Establishing links with People & Culture committee. 2. Starting consultation on how Engaged Research and CS can be incorporated. 3. Establishinig links with equivalent UCC committee. Responsible: Tyndall and UCC community officers, People & Culture committee members. Needs: institutional support.	2024 onwards

3.5.3 Stabilisation period (2027-2028)

All Tyndall activities started under TIME4CS will continue past the duration of the project. Tyndall is looking forward to measuring the tangible benefit resulting from the implementation of training programmes and will continue to raise awareness and provide training for researchers through the delivery of CS workshops dedicated to researchers.

Tyndall is also looking forward to implementing the CS module and monitoring its potential expansion. From a policy point of view, the developments are unfolding with the acquisition of a dedicated community officer and the receiving (UCC) of a grant to implement an Engaged Research pilot scheme. Also, crucially, spaces for citizen engagement and co-creation labs have been allocated to the new Tyndall north building. This enables Tyndall to create strong engagement opportunities with local communities.

3.6 Concluding remarks

This section summarises the practical measures Tyndall will take to sustain the implementation of its Institutional Roadmap in the post-project period.

Institutional arrangements

The first step is establishing regular internal meetings with participation of research support units, EU projects' unit, scientific project managers and researchers, aimed at discussing funding opportunities for CS activities and offering support in proposal writing. The next step is expanding CS activities to other departments of UCC through enhanced collaboration between Tyndall core team and relevant UCC officers, including integration of CS into the broader institutional agenda alongside Research Integrity and other strategic priorities.

Further development and promotion of the training programme

As a follow-up to currently implemented general workshops on CS aimed at researchers, new customized workshops around ongoing research projects will be developed. They will be targeted to different audiences such as researchers, scientific project managers, support units, and aim at helping researchers to embed CS into their activities and establishing interdisciplinary collaborations. Furthermore, a postgraduate course will be created in several steps as follows: establishing a co-production team, creating course content, defining tutors/teachers, developing a sustainability plan, administrative approval, launch and maintenance.

Stakeholder engagement

Engaging different stakeholders is crucial for the sustainability of the Roadmap. In addition to internal stakeholders such as governance, researchers and support units/officers, Tyndall will continue working with external ones such as local communities, particularly through Living Labs, and national research funder to support embedding CS as part of societal engagement in the National Strategic plan on Research & Innovation (R&I).

To implement the sustainability measures, institutional support as well as funding are required. However, Tyndall's strategy is clear and relies on a strong institutional commitment, including access to internal funding and support in developing successful proposals in the framework of external calls.

4. Updated Roadmap for Kaunas University of Technology

4.1 Kaunas University of Technology

Kaunas University of Technology is the largest technical university in the Baltic States. It has nine faculties, and eight research institutes, offers Bachelor, Master and Doctoral Degree programmes. The university enrols 7300 students (including 330 PhD students) and has approx. 1000 academic staff. The University seeks to become a strong science and innovation university, where the university studies are based on study and scientific research symbiosis. The mission of Kaunas University of Technology (KTU) is to provide research-based studies of international level, to create and to transfer knowledge and innovative technologies for sustainable development and innovative growth of the country, to provide an open creative environment that inspires leaders and talented individuals.

KTU is a member of many international associations (ECIU, EUA, CESAER, EUCEN, SEFI, EAIE, EDEN, Global Compact, IACEE, UICEE, BALTECH, ATUBS, ECSA). The University and its scholars are very active in European and wider international scientific cooperation. There is a wide spectrum of research teams, mostly working in interdisciplinary academic areas, including active participation in Framework, Eureka, COST or national programmes. KTU is/has been implementing 48 projects under H2020 and Horizon Europe programmes. It also hosts LiDA archive that is responsible for acquisition and dissemination of national and international data sets, data access to international data archives, national and international data analysis training.

4.2 Final year of implementation of the Institutional Roadmap at Kaunas University of Technology

In total, KTU has implemented four GAs (GA1-GA4) and is planning to implement one additional GA (GA5) in the post-project (2024-2026) period. Also, KTU plans to add three more GAs to sustain project results in stabilisation (2027-2028) period.

Originally planned GAs are as follows:

- GA1 – Research and networks (Research)

- GA2 – Non-formal education programs (Education & Awareness)

- GA3 – Virtual CS Hub and University Contact Point for CS projects (Support Resources & Infrastructure)

- GA4 – Strategic CS guidelines (Policy & Assessment)

Sustainability GA in post-project period is as follows:

- GA5 – Sustainability plans for the Virtual CS Hub (Support Resources & Infrastructure)

Additional sustainability GAs that were recently added and will be implemented in stabilization period are as follows:

- GA6 - Professional development of CS researchers through PhD studies (Education & Awareness)

- GA7 - Advancing non-formal CS education (Education & Awareness)

- GA8 - Sustain membership in CS networks (Research).

In 2023, KTU continued to implement the GAs 1-4. The GA5, included in the previous version of the Roadmap, will start in 2024 (post-project period). At the end of 2023, KTU added G6-G8 to sustain the results of the project in stabilization period (2027-2028).

Within GA1, a cooperation with the eu-citizen.science platform was initiated in January 2023 and KTU added projects to the platform as well as joined AB of ECS project. Moreover, a project proposal with a multidisciplinary team, including a Library, was developed and submitted. Research findings were presented at international conferences (e.g. C*Sci Conference 2023, poster presentation "The Role of University in Fostering Citizen Science: lessons learned from TIME4CS project") and disseminated to a wider public via media. The results of GA1 will sustain through the implementation of GA8 in stabilization period.

Within GA2, courses on Moodle platform were developed. The training sessions for researchers[10], and a MOOC session for the non-academic communities were organized. Feedback surveys were conducted, data analysed and improvements introduced. The non-formal educational programs on CS were integrated with the already established DAtA centre Methods' School[11]. A textbook (teaching materials) in Lithuanian on CS methodology, in support of the education programs, has been developed and approved by reviewers at the KTU Faculty of Social Sciences, Arts and Humanities. The results of GA2 will sustain through the implementation of GA6-GA7 in stabilization period.

Within GA3, a CS Hub was established by order of the dean, as part of the DAtA centre at the Faculty of Social Sciences, Arts and Humanities, a special web page[12] was developed and a coordinator – a CS contact person was officially appointed (deans order Jan 10th, 2023, No. V25-12-1). A discussion of the functions and the facilitation scope of the Contact Person was organized, a feasibility study on CS Hub's funding and resource mobilisation, accompanied with two-year activity plans, is being developed. As a result of these discussions KTU decided to move CS hub and Contact point to Library. . The results of GA3 will sustain through the implementation of GA5 after the end of TIME4CS project (post-project period). Within GA5 that will start in January-February 2024, a long-term strategy for sustainability of the CS Hub will be developed.

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[10] Links to the training sessions provided: https://data.ktu.edu/course/2023-m-sausio-11-d-mokymai-pilieciu-mokslo-taikymas-moksliniuose-tyrimuose/, https://data.ktu.edu/course/2023-m-kovo-13-d-mokymai-geroji-pilieciu-mokslo-praktika-ir-irankiai/, https://data.ktu.edu/course/2022-m-lapkricio-28-d-patirties-dalinimosi-seminaras-pilieciu-mokslo-projektu-rengimo-galimybes-ir-issukiai/

[11] https://data.ktu.edu/profile/egle_butkeviciene/

[12] https://data.ktu.edu/EN/

Within GA4, the University-wide CS guidelines were developed and discussed within the KTU community, to submitted to the internal KTU system to be adopted and disseminated..

4.3 Grounding Actions

As mentioned above, in 2023, KTU implemented four GAs initially planned and developed the sustainability plans. As GA5 "Sustainability plans for the Virtual CS Hub" will start in 2024 (post-project period), more details and updates are given in this document.

4.3.1 GA5 - Sustainability plans for the Virtual Citizen Science Hub (Support resources and Infrastructures)

During the implementation of the KTU Roadmap, and especially during the implementation of GA3 and GA4, stakeholders kept mentioning the importance of not only establishing a CS Hub at KTU, but also the importance of developing a sustainability plan for such a CS Hub before the end of the TIME4CS project. This need was particularly highlighted during the KTU Mentoring visit in March 2023. The establishment of the CS Hub at the DAtA Centre helped to institutionalize the CS service and support actions. However, the continued viability of such a Hub depends on the support, engagement and funding decisions of the whole institutional community, and is in the broader interest of the whole university, not just one faculty. Sustainability plans must therefore support the long-term integration of the CS Hub into the University's strategy, action plans and research priorities.

Under the GA3, KTU has established Virtual CS Hub and has appointed a contact point for CS projects. The main function of the hub is to build citizens' and researchers' communities and promote the CS methodologies and projects. The new GA5 will build on activities implemented under "Activity 3.6. To develop and adopt a feasibility study on Virtual Hub's funding and resource mobilization, accompanied with two-year activity plans" and will build a long-term strategy for sustainability of virtual CS Hub, including the continuation of activities implemented under all other 4 GAs. This GA will start in 2024.

Objective(s) of the Grounding Action
GA5 "Sustainability plans for the Virtual CS Hub" aims to build lasting capacity to sustain activities devoted to serve and build CS communities at KTU and with the societal partners. The sustainability plans will allow implementing the "Big vision" of CS at KTU, so as to ensure the viability of the Hub and continuity of CS service to the KTU and broader communities.

Implementation plan

Activity 1: setting up a long-term strategy for sustainability of Virtual CS Hub (further referred as "Hub"). Responsible team: CS Hub coordinator / contact person, head of the DAtA centre, head of KTU Library, KTU vice-rector for research.

Activity 2: creating a strategic action plan for educational activities and trainings that will be implemented by the Hub. Responsible person: CS Hub coordinator, head of the DAtA centre, KTU vice-rector for studies.

Activity 3: creating a strategic action plan for developing CS projects that will be implemented by the Hub. Responsible team: CS Hub coordinator / contact person, head of the DAtA centre, head of KTU projects department.

Activity 4: creating a strategic action plan for financial sustainability of the Hub. Responsible team: CS Hub coordinator / contact person, head of the DAtA centre, head of KTU Library.

Resources required:

1. Virtual platform: run and maintained by the KTU Library, with contact point also open at the DAtA centre webpage.

2. Human resources: the Hub needs 0,5 FTE (6PM per year) of an administrator position; currently sustained by research projects and partially funded by the University.

3. Financial resources: costs of maintenance and other hub activities are project-based.

GA5 "Sustainability plans for the Virtual CS Hub" implementation (developing the plans) is not resource-intensive and relies on the time, experience and expertise of the TIME4CS KTU core team.

Stakeholders & Co-creation

The KTU research community and the administration are the most interested in the development and implementation of sustainability plans. When preparing applications for various funding programmes and looking for inclusive research approaches, researchers often ask for help on how to plan and implement a CS project. Strengthening the CS Hub is of institutional interest. At the same time, CS Hub activities also facilitate the involvement of citizens, and thus serve stakeholders such as citizens' groups, NGOs, schools, organisations, etc.

The GA itself was co-created together with researchers and representatives of KTU administration and KTU Library. One of the most important decisions was to align the activities of the CS Hub at DAtA centre with the activities of KTU Library, that has continuous resources to support the Hub.

Potential Obstacles

There are no high probability or high impact factors that would prevent the development of sustainability plans for the Hub, i.e. the implementation of GA5. Yet there might be significant potential obstacles for implementing the sustainability plans and actions during the post-project (2024-2026) : funding, lack of wider interest and involvement of researchers with CS methodologies and projects as well as lack of motivation from the lay people (the citizens) to join CS projects and/or trainings, offered by the Hub.

Timeline

Step	Activity	Responsible	Deadline
1	Activity 1: setting up a long-term strategy for sustainability of Virtual CS Hub	CS Hub coordinator / contact person, head of the DAtA centre, head of KTU Library, KTU vice-rector for research	01/06/2024

2	Activity 2: creating a strategic action plan for education activities and trainings that will be implemented by the Hub.	CS Hub coordinator, head of the DAtA centre, KTU vice-rector for studies	01/10/2024
3	Activity 3: creating a strategic action plan for developing CS projects	CS Hub coordinator / contact person, head of the DAtA centre, head of KTU projects department	01/01/2025
4	Activity 4: creating a strategic action plan for financial sustainability of the Hub.	CS Hub coordinator / contact person, head of the DAtA centre, head of KTU Library	01/06/2025

4.4 Objectives and Strategy for Institutional Change for the post-project period

4.4.1 Vision and Strategy

The big vision in long-term perspective: KTU is an active member of CS initiatives, implementing multiple projects in CS (together with society). KTU is embedded into the main CS networks, such as ECSA, national Association of Citizen Science, ECIU University, and the Open science community. KTU is involved in different events, presenting research and practical experience in CS at conferences, seminars, workshops, webinars. KTU continuously serves in building and growing community of practice of researchers interested in implementing the CS projects as well as empowering a community of citizens and organizations, ready to join, initiate and lead CS projects. KTU establishes registered non-formal education programmes on CS and includes CS topics in formal education programmes. KTU is equipped with the infrastructure and organizational arrangements that enable and facilitate the development of CS by hosting virtual CS Contact Point. KTU acknowledges the importance of CS in strategic documents.

Current mission of the university is "to provide the research-based studies at international level; to develop and to transfer knowledge and innovative technologies for sustainable development of the State and development of innovations; to create an open creative environment which inspires talents and leaders"[13].

KTU has a strategic goal to implement the university's third mission: cooperation between university and society, assuring effective science communication and public participation in research. This is indirectly reflected in KTU strategy: "ENSURING EFFECTIVE COMMUNICATION. The University's communication system will be developed and expanded to effectively strengthen the image of KTU in the public domain, properly represent the achievements of the University's employees and clearly reveal the added value created by the University's community to all the interested parties".

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[13] https://en.ktu.edu/university/

There are no major changes in the vision and strategy compared to previous years of project implementation. The vision and strategy are comprehensive and guiding well the future developments, therefore no changes were suggested.

4.4.2 Goals

This sub-section presents KTU middle-term (achievable in the post-project period, 2024-2026) and long-term (achievable in the stabilisation period, 2027-2028) goals. To avoid repetition, the short-term goals (achieved in the project period, 2021-2023) could be consulted in the Deliverable D2.2.

Goals	Grounding Action	Status	Intervention Area	Type of Goal
To involve researchers of diverse career stages and disciplines from different fields into research project proposals on CS	GA1	Original	Research	Middle-Term
To disseminate research results on CS through different academic channels	GA1 GA8	Original New	Research	Long-Term
To engage researchers of diverse career stages and disciplines into a series of non-formal education sessions on the CS topics	GA2 GA7	Original New	Education & Awareness	Long-Term
To engage citizens and non-academic organizations into a series of non-formal education – MOOC – sessions on the CS topics.	GA2 GA7	Original New	Education & Awareness	Long-Term
To include CS topics in formal education programmes	GA2 GA6	Original New	Education & Awareness	Middle-Term
To establish sustainable non-formal education programmes on CS topic	GA2 GA7	Original New	Education & Awareness	Long-Term
To sustain a virtual hub for the CS projects and embed it into international networks	GA3 GA8	Original New	Support Resources & Infrastructure	Long-Term
To develop, adopt and disseminate CS guidelines among university academic and non-academic communities	GA4	Original	Policy & Assessment	Middle-Term
To include CS topic into strategic documents of the university	GA4	Original	Policy & Assessment	Middle-Term

To develop and implement a sustainability strategy for the CS Hub	GA5	New	Support Resources & Infrastructure	Middle -Term

4.5 Sustainability measures

This sub-section describes the KTU plans to ensure sustainability of the outcomes per GA initiated as well as their hypotheses on new GAs to start in the post-project (2024-2026) and stabilisation (2027-2028) periods.

4.5.1 Actions to sustain the outcomes

Grounding Action (GA# - title)	Intervention Area	Sustainability Actions	Tentative Deadline
GA1 – Research & Networks	Research	KTU core team will develop proposals to fund CS initiatives. Project proposal writing is a yearly routine driven by core teams research interests. Responsible: the CS Hub coordinator. The GA can count on KTU Faculty of Social Sciences, Arts and Humanities (FSSAH) support for project proposal writing. Institutional arrangements needed: some networks might require reference to official university address; projects require institutional affiliation of the researchers with the university.	No specific deadline planned
GA2 – Non-formal education	Education & Awareness	CS training courses and MOOC have become an integral part of the DAtA centre Methods School that has a long tradition of non-formal education programs management and implementation. Responsible: DAtA centre and Methods School coordinator, in partnership with the CS Hub coordinator.	No specific deadline planned

		The GA can count on KTU platform for open courses (open.ktu.edu); DAtA centre at FSSAH. The GA is consolidated with KTU non-formal education policies and FSSAH DAtA centre Methods School activities. However, more synergies with different projects aligning the needed training and education activities, are required.	
GA3 – Virtual CS Hub and University Contact Point for CS projects	Support Resources & Infrastructure	Sustainability and future viability of the Hub is ensured by co-creating the GA5 "Sustainability plans for the Virtual CS Hub". Activities planned: 1. Cooperation with the KTU Library to coordinate CS-themed activities (activities are continuous, no deadline). 2. Synergies with other projects and KTU strategic partners, e.g. ECIU University (activities are continuous, no deadline). A shared responsibility is up to the KTU representatives: CS Hub coordinator / contact person, head of the DAtA centre, head of KTU Library, KTU vice-rector for research. The strategic plans for the CS Hub are to be updated every two years. Resources: KTU FSSAH, KTU Library, project-based funding. Needs: the Hub functions under the DAtA centre at FSSAH, training platform provided by KTU, web	No specific deadline planned

		platform provided by DATA centre and KTU Library.	
GA4 – Preparation of CS guidelines	Policy & Assessment	Activities planned: 1. Incorporation of the CS related topics into KTU's strategic documents, thus ensuring that the CS priority is clearly and long-term anchored. 2. Disseminating and communicating about the guidelines to the researcher and other stakeholder communities to build awareness and lasting mindset. The KTU CS Guidelines were developed and become part of the University's research documentation and are subject to general document management processes. Responsible: CS Hub coordinator, representatives of KTU projects department. Resources: KTU document management system. No specific arrangements needed.	No specific deadline planned

4.5.2 New Grounding Actions to be launched in the post-project period (2024-2026).

This sub-section describes the GAs that will be launched in the post-project period. The GA5 is present in the table below despite it being part of the previous version of the Roadmap, for the reasons of timeline. The GA5 will start in 2024. The GA6, GA7 and GA8 are new GAs that will be launched in the post-project period and be implemented in the stabilization period.

Grounding Action (GA# - title)/ Intervention Area	Relation to the previous GA(s)	Brief description of the new GA	Tentative Timeline
GA5 – Sustainability plans for the CS Hub/Support Resources & Infrastructure	This GA will build on activities implemented within GA3.	An overview of the activities planned, responsible team, needs and resources could be found in sub-section 4.4.1 of this document. There might be significant potential barriers for implementing the sustainability plans and actions during the post-project and stabilisation periods: 1. Financial resources to sustain the continuous activities of the Hub, e.g. training sessions, CS project events, dissemination and outreach activities, etc. The barrier might be the situation if KTU will not attract sufficient financial recourses to maintain Hub's activities, or if funding becomes scarce and inconsistent. The inclusion of CS in the KTU strategy and the capacity building of researchers, which are planned in the TIME4CS grounding actions, should help to overcome such obstacles. 2. Lack of wider interest and involvement of researchers with CS methodologies and projects. The CS methodology is time and effort intensive, so some researchers will remain indifferent to such projects. The TIME4CS KTU core team believes that the foundations laid during the project and the ongoing activities to attract and train researchers have contributed to mindset building and	2024 onwards

		will eventually lead to the motivation and engagement of researchers. 3. Lack of motivation from the lay people (the citizens) to join CS projects and/or trainings, offered by the Hub. CS projects require scientific literacy and civic engagement. Only a small minority of citizens and representatives of various organisations have such interests. Nurturing of these interests through outreach activities and training will help overcome the obstacle of public disinterest.	
GA6 - Professional development of CS researchers through PhD studies/ Education & Awareness	The GA directly contributes to the sustainability of GA1 and GA3 to ensure the development of scientific knowledge on CS and train a new generation of professional CS researchers.	Activities planned: 1. Supervise the preparation of at least one thesis on a CS topic at FSSAH. 2. Participate in a sociology or political science PhD topic competition by proposing a topic based on CS methodology and attract at least one more PhD student. Responsible: FSSAH researchers working for the sociology and political science doctoral programs. Resources: nationally funded doctoral positions at FSSAH. Needs: supervisor and doctoral student should be affiliated with the FSSAH. Individuals or groups in the organization potentially interested in supporting the GA: DAtA centre, KTU Library.	Activity 1: Doctoral thesis to be defended approx. in 2028. Activity 2: Doctoral thesis to be defended approx. in 2030.

		Main obstacles: PhD admissions are highly competitive, so candidates interested in CS topics may not necessarily win a PhD position. To enhance the competitiveness of candidates interested in CS, the TIME4CS KTU core team works individually with potential candidates while they are still in their master's studies, helping them to participate in scientific conferences, publish papers, and thus, to increase their scores for scientific merit during the PhD application process.	
GA7 - Advancing non-formal CS education/Education & Awareness	This GA directly contributes to the sustainability of GA2.	Objective: to consolidate the non-formal CS education efforts throughout the University and advance education and awareness raising on CS. Activities planned: 1. To yearly analyze feedback surveys for the two DAtA centre non-formal education programmes "Citizen Science Fundamentals" and "Application of Citizen Science in Research" and carry out improvement actions, e.g. move the courses to open.ktu.edu and consider teaching in English. 2. Train a second lecturer for the non-formal education programmes, who could alternate training with the programme coordinator. 3. To hold bi-annual discussions with the KTU Library and the KTU Project Development Centre in order to take stock of CS non-formal education at KTU in order to ensure that courses do not overlap but complement each other in a meaningful way. If gaps are	Activity 1: is implemented yearly, as part of DAtA center non-formal education quality assessment action. Activity 2: the new trainer would be capable of alternate the CS programmes starting from 2026. Activity 3: the stock taking exercise will be implemented

		identified , new or substantially updated CS training courses will be developed.	every two years
		Responsible: DAtA Centre, coordinator of the Methods school; coordinator of the non-formal education programmes.	
		Synergize with: KTU Library.	
		Resources: KTU non-formal education infrastructure and the time efforts of the non-formal education programmes coordinator.	
		Individuals or groups in the organization potentially interested in supporting the GA: DAtA center, KTU Library.	
		Main obstacles of the GA: the CS non-formal education programmes are not charged (open for free participation) and therefore training facilitators' working hours are not directly paid (covered). FSSAH's support allows to overcome this challenge – the trainers are allowed to show these working hours as part of their yearly work plan. To address this issue in the longer term, project-based funding will be continuously sought.	
GA8 - Sustain membership in CS networks/Research	The GA directly contributes to the sustainability of GA1	Objective: to maintain KTU's active membership in the most important CS networks nationally and internationally. Activities planned: 1. To participate in the ECSA Biennial Conference to maintain active contacts between CS researchers. 2. To maintain active membership in at least one ECSA working group and	Activity 1: every two years. Activity 2: This is a continuous yearly activity.

		ensure the yearly payment of organizational membership in ECSA. 3. To maintain KTU's partnership in the national Citizen Science Association. Responsible: DAtA Centre coordinator of the Citizen Science Hub. Synergize with: KTU Library. Resources: FSSAH support for international conference participation; KTU Library and FSSAH joint efforts to cover ECSA organizational fees. Individuals or groups in the organization potentially interested in supporting the GA: DAtA center, KTU Library, KTU Project development center. Main obstacles: potential lack of interest or funds to pay for the organizational membership in ECSA and to pay for ECSA conference participation. Making CS a faculty wide and university wide priority helps in ensuring that the relatively small fee would be covered by the "internationalization" and "research visits" funds.	Activity 3: This is a continuous activity.

4.5.3 Stabilisation period (2027-2028).

The activities carried out during the project and in the post-project period will consolidate CS practices and institutionalise the infrastructure and services needed for CS. It is therefore reasonable to expect that the main activities will continue during the stabilisation period (2027-2028).

KTU will continue the already established and will initiate new memberships in professional CS oriented organizations and networks, therefore maintaining its international visibility. , Being a strong research-oriented university with highest national scores for research excellence in many units, KTU will be implementing international multidisciplinary research projects, and with the lasting mindset and CS awareness among its researcher community, many of those projects will employ participatory or CS based

methods. With an established dissemination and outreach service and with an effective system for supporting conference participation, the research results from CS projects will be regularly communicated to academic communities via conferences, and to multiple stakeholder communities via outreach events, science popularization articles or other forms of dissemination. The newly trained professional CS researchers will strengthen and further facilitate the research and networking-oriented activities related to CS topics.

KTU has started to establish a centre for non-formal education services, and with growing national support for lifelong learning, the number of such services at the university will steadily increase in the post-project period. The DAtA Centre's School of Methods already has a well-established presence and communities of learners, so the CS training programmes will be implemented annually and will attract an increasing number of learners during the stabilisation period. The Lithuanian textbook on CS published by the TIME4CS project will be used extensively by CS communities for informal or non-formal learning purposes, and an update and possible extension of this tool is foreseen during the stabilisation period.

Sustainability plans for the Virtual CS Hub will be launched in the post-project period and will be implemented during the stabilisation period, thus ensuring the long-term viability of the Hub. During the stabilisation period, the Hub will continue to provide facilitation, consultancy and other services and will function as a key driver of CS initiatives in the KTU and stakeholder communities. The young generation of professional CS researchers, as trained during PhD studies at FSSAH, will join the activities of the CS Hub and drive the ambition and initiatives even further.

The formal CS guidelines published by KTU, which were developed as part of the TIME4CS project, will continue to serve KTU researchers in the post-project period who wish to better understand how to incorporate CS methodology into their research. During the stabilisation period, it is foreseen to update these guidelines by initiating discussions between researchers and other stakeholders, and possibly expanding the content of the guidelines themselves to meet future needs.

4.6 Concluding remarks

This section summarises the practical measures KTU will take to sustain the implementation of its Institutional Roadmap in the post-project period.

Further support of virtual CS Hub

The continued viability of the CS Hub requires further support, engagement and funding decisions of the institution. A multi-dimensional sustainability plan for the CS Hub includes:

- Strategic action plan for sustaining the trainings developed: maintenance of the trainings in the curricula and expanding access to them to other faculties with support of the governance as well as running and maintenance of relevant virtual platform with support of the library;

- Strategic financial sustainability plan: access to internal funding as well as to external funding through various nationally and internationally funded CS-related projects.

- Strategic action plan for developing CS projects and facilitating the involvement of members of the public and other societal actors (schools, NGOs, etc.): targeted dissemination and outreach activities, exploring synergies between different CS-related projects implemented by KTU, mutual learning.

CS Contact Point to promote CS methodology and projects

Currently co-funded by the institution and CS projects, the institutional CS Contact Point will continue developing and implementing activities devoted to building CS community both inside and outside the institution in relation to societal partners.

Incorporation of CS related topics into KTU strategic documents

Making CS a part of KTU strategic priorities is an important step towards long-term commitment to support institutional adoption of CS.

Sustaining membership in CS national and international networks

Active participation in various national and international networks, including ECSA, is also an integral part of KTU sustainability plan to boost mutual learning, motivation of researchers to initiate and participate in CS projects as well as to further expand KTU integration into local, national and global CS community.

5. Updated Roadmap for Centre for Genomic Regulation

5.1 Centre for Genomic Regulation

The **Centre for Genomic Regulation (CRG**) is an international biomedical research institute of excellence, created in July 2000. It is a non-profit foundation funded by the Catalan Government through the Department of Business & Knowledge and the Department of Health, the Spanish Ministry of Science & Innovation, the "la Caixa" Banking Foundation, and includes the participation of Pompeu Fabra University.

The mission of the CRG is to discover and advance knowledge for the benefit of society, public health and economic prosperity. This requires an interdisciplinary scientific team focused on understanding the complexity of life from the genome to the cell to a whole organism and its interaction with the environment, offering an integrated view of genetic diseases.

The CRG is a unique centre in Spain, based in an innovative organization research model. Group leaders at the CRG are recruited internationally and receive support from the centre to set up and run their groups. An external evaluation panel, made up of renowned leaders in the different areas, evaluates them. The result of evaluations conditions the future of the CRG scientists, no matter whether they have open-ended or time-limited contracts. This ensures the mobility and the renewal of the workforce.

5.2 Final year of implementation of the Institutional Roadmap at Centre for Genomic Regulation

In total, CRG has seven GAs as follows:

- GA1 – Planning changes in organisational structures (Research)

- GA2 – Raising internal awareness & train researchers on CS (Education & Awareness)

- GA3 – Developing institutional guidelines on the implementation of CS projects (Support resources & Infrastructure)

- GA4 – Developing an institutional policy about CS projects (Policy & Assessment)

- GA5 – Appointing a CS contact point (Support Resources & Infrastructure)

- GA6 – Including CS sessions in the PhD course and other relevant training platform (Education & Awareness)

- GA8 – Exploring how to assess CS activities in researchers' internal evaluations (Policy & Assessment)

GA7 titled "Elaborating a digital CS course to be included in the CRG online training platform" (Education & Awareness) was canceled.

The final year of implementation of the CRG Roadmap has been very productive. The initial four GAs defined in the first version of the Roadmap have been fully developed and successfully implemented. Moreover, most

of the new GAs defined in the second version of the Roadmap, which aimed at making CS at the CRG sustainable, have also been partially or fully developed and implemented. Remarkably, a CS contact point has been appointed, which is one of the key actions for allowing CS projects to successfully develop and to ensure the use of the resources produced in the frame of the TIME4CS project.

Some of the GAs s implemented have already had a tangible impact on the institution, such as the inclusion of CS as an Open Science pillar of the CRG, the training workshops delivered by the Front-Runners from Aarhus University and the talks at the CRG PhD Course, whilst others, like the CRG CS guidelines, will be used when a CS project arises.

Importantly, during this year of implementation of the Roadmap, CS has been more present and relevant in internal conversations across different departments, and the scientists that attended the training workshops are more aware of CS and are open to use it due to its benefits. These conversations are especially frequent and fruitful with the appointed CS Contact point.

Beyond all this, the knowledge gathered from being part of the TIME4CS consortium has had an invaluable impact, since it has brought awareness about citizen science amongst key internal stakeholders. Although there are no CS projects running at this moment, recently, two research project proposals have included a citizen dimension.

5.3 Grounding Actions

CRG implemented seven GAs described in the Deliverables D2.1 and D2.2 and developed the sustainability plans. Three new GAs (GA9, GA10 and GA11) will be launched in the post-project period and are presented in sub-section 5.5.2 of this document.

5.4 Objectives and Strategy for Institutional Change for the post-project period

5.4.1 Vision and Strategy

The CRG Roadmap aims to promote a cultural change in the use of CS as a regular research methodology at the centre. After two years of the project, the vision and strategy for achieving this change are more focused and have a solid institutional structure that allows the Roadmap sustainability.

The current strategy for making CS at the CRG sustainable, and possibly the cornerstone of the project, is the appointment of a CS Contact Point. This person will contribute to identify and develop, together with the scientists, a CS methodology in project proposals when applying for grants. The final goal of this strategy is that researchers acknowledge by themselves what CS is and the benefits it can bring to research and society, so that this methodology would be widely used and demanded bottom-up in the long-term.

In parallel to this, another core part of the sustainability actions for the post-project is to create spaces for raising awareness about CS amongst CRG scientists, to foster discussions and to establish collaborations amongst CRG research groups or even with researchers from other institutions. The guidelines developed will be useful and important resources for scientists when using the methodology.

Finally, revising internal evaluation guidelines to recognise CS activities and allocating specific funding for a citizen science project would be crucial for encouraging researchers to explore and use the methodology during the post-project and stabilisation period.

5.4.2 Goals

This sub-section presents CRG middle-term (achievable in the post-project period, 2024-2026) and long-term (achievable in the stabilisation period, 2027-2028) goals. To avoid repetition, the short-term goals (achieved in the project period, 2021-2023) could be consulted in the Deliverable D2.2.

Goals	Grounding Action	Status	Intervention Area	Type of Goal
To raise awareness, promote the development of citizen science projects and foster collaborations through informative sessions about citizen science.	GA9	New	Education & Awareness	Middle-Term
To ignite curiosity and promote the 'scientific acceptance' of the citizen science methodology through a talk in the regular CRG scientific talks programme, given by a biomedical citizen science expert.	GA10	Modified	Education & Awareness	Middle-Term
To promote and support the development of citizen science projects by allocating internal seed funding for one citizen science project.	GA11	New	Support Resources & Infrastructure	Long-Term

5.5 Sustainability measures

This sub-section describes the CRG plans to ensure sustainability of the outcomes per GA initiated as well as their hypotheses on new GAs to start in the post-project (2024-2026) and stabilisation (2027-2028) periods.

5.5.1 Actions to sustain the outcomes

Grounding Action (GA# - title)	Intervention Area	Sustainability Actions	Tentative Deadline
GA1 – Planning changes in organisational structures	Research	It is unlikely that this change will be undone, but the CS Contact Point will take care that not only is CS part of the Open Science frame, but also to make it more relevant to the institute.	2024 onwards

		Responsible: CS Contact Point, from the Strategy and Funding team. Resources: having a CS Contact Point and the CRG citizen science website. No specific additional needs or arrangements.	
GA2 - Raising internal awareness & train researchers on CS	Education & Awareness	The attendants to the workshops - including the CS Contact Point - and talks gained a lot of information about CS. The CS Contact Point will spread this information to the scientists and support staff with whom she interacts and will be also promoting and recommending watching the talk delivered at the PhD Course, that was recorded. This talk is also available and has been disseminated to all the CRG. The Contact Point will also curate the resources section of the CRG citizen science webpage, which includes useful information, including trainings and webinars. All this will ensure that the knowledge gained during the training workshops and the talks at the PhD sessions remains. Responsible: CS Contact Point, from the Strategy and Funding team. The CS Contact Point would spread the information she knows gained during the trainings, will recommend watching the recorded talk at the PhD Course and will update the resources section of the CRG citizen science webpage and share it with the researchers and support staff. Also, the CS Contact Point would detect opportunities for inviting speakers or instructors for CS trainings addressed to the CRG community.	2024 onwards 2025 - for inviting a renowned scientist from the biomedical field who applied citizen science to their research project to give a scientific talk.

GA3 – Developing institutional guidelines on the implementation of CS projects	Support Resources & Infrastructure	The guidelines are available for all the CRG community and referred to from the CRG CS website. The CS Contact Point will recommend reading the guidelines when there is a citizen science project. The CS Contact Point, from the Strategy and Funding team, will promote the guidelines amongst the CRG community when it is necessary and will review and update them, if necessary, periodically.	Share the guidelines with the researchers that are planning to integrate CS in their projects. Timeline: Whenever it's necessary. Review the guidelines and update them if necessary. Timeline: 2026
GA4 – Developing an institutional policy about CS projects	Policy & Assessment	The policy is paused due to the CRG not being at the stage of implementing a CS policy yet, although the document is drafted. The CS Contact Point has access to the document and will recover it when it is the appropriate moment for a policy. The CS Contact Point would finish the policy document and promote it amongst the CRG community when it is necessary. The CS Contact Point would also review and update the document periodically.	This GA is suspended. No specific timeline for a moment, but this GA can be re-launched whenever necessary
GA5 - Appointing a CS Contact point	Support Resources & Infrastructure	The head of the Strategy and Funding team will ensure that there's always a CS Contact Point on their team.	The head of the Strategy and Funding team would meet with the CS Contact Point periodically to ensure the performance of their tasks. Timeline: Periodically from 2024
GA6 - Including CS sessions in the PhD Course and other relevant training networks	Education & Awareness	The Training and Academic Office has already incorporated a CS session in the PhD Course and will consider having this session in other relevant training networks in the future.	Organise the CS session annually during the PhD Course. Timeline: Annually from 2024 Explore other training networks where to

		The Academic and Training Office will organise the CS sessions together with the CS Contact Point.	include a session about CS. Timeline: Periodically from 2024
GA8 - Exploring how to assess CS activities in researchers' internal evaluations	Policy & Assessment	The Strategy and Funding team is working on how to assess CS activities and will ensure that this will be integrated in future internal evaluations.	To agree on how to assess CS in internal evaluations. Timeline: 2028

5.5.2 New Grounding Actions to be launched in the post-project period (2024-2026).

As mentioned above, the GAs 9, 10 and 11 are new GAs that will start in the post-project period. They were not part of the previous version of the Roadmap.

Grounding Action (GA# - title)/ Intervention Area	Relation to the previous GA(s)	Brief description of the new GA	Tentative Timeline
GA9 – Organise interactive sessions about CS / Education & Awareness	This GA contributes to GA2, since it aims at raising awareness amongst scientists on a regular basis.	This GA aims at not only creating more awareness about citizen science amongst CRG scientists, but also at showing its benefits through examples from CRG scientists that have integrated or considered to integrate the methodology in their research projects. ACTIVITIES: Design the content and format of the sessions, Invite the speakers, select the date and book the room/space, Disseminate the session to all the CRG community (and maybe to the other centres of the Barcelona Biomedical Research Park (PRBB), Deliver the session and follow up with	January 2024 - November 2024

		the participants about its impact on their projects. TEAMS: CS Contact Point, Communications team. RESOURCES: The people involved, the invited speakers, the room/space. INSTITUTIONAL ARRANGEMENTS: None. OTHER STAKEHOLDERS INTERESTED: Scientists from other PRBB centres, other biomedical research centres from Barcelona. OBSTACLES: Not to find speakers (internal or external), low attendance to the session, low impact of the session. To overcome them, the responsible of the task might ask other institutions for advice on the speakers, will share the workshop to scientists individually, will learn from the experience to improve for the next session in case it does not have the desired impact.	
GA10 - Invite a biomedical CS expert to deliver a scientific talk/ Education & Awareness	This GA contributes to GA2, since it aims at raising awareness amongst scientists on a regular basis.	This GA aims at raising awareness amongst CRG researchers about the CS methodology, showing its benefits in genomics research projects and promoting its scientific acceptance through a scientific talk delivered by an internationally renowned scientist. ACTIVITIES: Select the speaker, Invite the speaker, select the date and book the room, Disseminate the session to all the CRG community, Deliver the talk and follow up with the participants about its impact on their projects. TEAMS: CS Contact Point, Communications team.	January 2024 - November 2025

		RESOURCES: The teams involved, the invited speaker, the room. INSTITUTIONAL ARRANGEMENTS: None. OTHER STAKEHOLDERS INTERESTED: Scientists from other PRBB centres, other biomedical research centres from Barcelona. OBSTACLES: To not find speakers, low attendance to the session, low impact of the session. To overcome them, the responsible of the task might ask other institutions for advice on the speakers, will share the workshop to scientists individually, will learn from the experience to improve for the next session in case it does not have the desired impact.	
GA11 - Explore to allocate internal seed funding for one CS project	This GA contributes to GA1 and GA2, since it institutionalises and raises awareness about CS.	This GA aims at promoting and supporting the development of a CS project at the CRG by providing seed funding to a CS project selected through an open call. Since funding is always a limiting factor, it can be a motivation for developing CS projects. ACTIVITIES: Agree on allocating seed funding for a CS project through an internal call, Elaborate and validate the call, Launch the call, Select the winner project, Allocate the funding to the lab and follow up the development of the project. TEAMS: CS Contact Point (from the Strategy and Funding team), Head of the Strategy and Funding team, Director, Administrative Director, Communications team.	January 2024 - May 2028

		RESOURCES: The people involved, the allocated funding.	
		INSTITUTIONAL ARRANGEMENTS: Allocating internal funding for a citizen science project.	
		OTHER STAKEHOLDERS INTERESTED: Scientists from other institutes that might collaborate to the citizen science project.	
		OBSTACLES: To not agree on allocating internal funding, to not agree on the amount of the funding, having difficulties when elaborating the call, no project submitted to the call, poor projects or invalid CS methodologies described. To overcome them, the CS Contact Point will start conversations early so that there is time to agree on allocating the funding, will look for other CS calls and build up on the previous experience of the CRG with these calls, will encourage scientists individually to submit a project and will advise them on the methodology.	

5.5.3 Stabilisation period (2027-2028).

The above described GA9 and GA10 could be continued during the stabilisation period, since both actions might have great impact if carried out on a regular basis. GA11 will be initiated in the post-project period but will be executed during the stabilisation period, because since funding was not on the previous Roadmaps, conversations and arrangements need to be made before completing this GA.

5.6 Concluding remarks

This section summarises the practical measures CRG will take to sustain the implementation of its Institutional Roadmap in the post-project period.

CS Contact Point

Like KTU, CRG opted for appointing an institutional CS Contact Point to develop, with the scientists, a CS methodology in project proposals when applying for grants as well as to handle other CS-related requests.

Continuation of awareness raising and training activities focused on CS

Organisation of new regular interactive sessions aimed at researchers will contribute to a better understanding and acceptance of CS methodology through exploring concrete examples and good practices in applying CS. To boost attendance, the individual invitations of CRG researchers will be considered alongside general advertisement of the activities through the internal communication channels.

In addition, inviting a renowned scientist from relevant field (biomedical research) for a talk on his/her experiences in working on CS projects is also an important step towards wider use of this methodology within CRG research community.

Furthermore, CS sessions will be maintained in the PhD course. In the future, new training activities could be developed for other target groups.

Finally, freshly developed internal guidelines for researchers on how to develop and implement CS projects will be further promoted by CS Contact Point.

Exploring how to assess CS activities in researchers' internal evaluation

Integration of CS activities in researchers' evaluation could definitely become a driver for sustainable Institutional Change.

Exploring a possibility to allocate internal seed funding for CS project through an open call

Since funding is always a limiting factor, an internal seed grant could be a motivation to initiate and participate in CS projects. This measure could be implemented with institutional support in several steps as follows: elaboration and validation of the call, launching the call, selecting an awardee project, allocating the funding to the lab and following up on the development of the project.

6. Updated Roadmap for Università Vita-Salute San Raffaele

6.1 Università Vita-Salute San Raffaele

The **Vita-Salute San Raffaele University** (UniSR) is a prestigious Italian private not-for-profit university leading the most important national rankings. It hosts more than 5700 students and comprises the faculties of Medicine, Psychology and Philosophy. Since its establishment in 1996, teaching and research at Vita-Salute San Raffaele University have been tightly integrated, resulting in high quality education and training at all levels: specialized post-graduate masters, residency programs in various medical specialties, international PhD programs, undergraduate and graduate courses. It is currently the second largest School of Medicine in Italy.

UniSR is affiliated – for both clinical training and research activities – to IRCCS Ospedale San Raffaele (OSR), a research hospital and scientific institute recognised by the Ministry of Health and established in 1971 to provide specialized care for the most complex health conditions. The institute is recognized as a global authority in gene and cell therapies and perform cutting-edge translational research in areas such as oncology, immunology, infectious diseases, neuroscience, advanced imaging and genetics. With more than 100 high-tech laboratories and pre-clinical facilities, 60 clinical units and more than 500 ongoing clinical trials, at San Raffaele basic science translates quickly into clinical practice and clinical needs drive basic research.

In this unique environment, UniSR is able to offer students an unsurpassed training experience, in which scientific research, clinical practice and teaching activities effectively interact on a daily basis.

6.2 Final year of implementation of the Institutional Roadmap at Università Vita-Salute San Raffaele

In total, UniSR has eight GAs as follows:

- GA1 – Participation in a CS network (Research)

- GA2 – Implement changes in the organizational structures or functions (Research)

- GA3 – Set up information initiatives for researchers and training programs for students (Education & Awareness)

- GA4 – Set up informal opportunities for interactions with researchers (Education & Awareness)

- GA5 – Identify an institutional contact point for Citizen Science (Support resources & Infrastructures)

- GA6 – Adopt evaluation criteria for researchers' evaluation that consider CS (Policy & Assessment)

- GA7 – Develop Citizen Science methodology for research activities and projects (Research)

- GA8 – Organise debates or public events to promote CS (Education & Awareness)

In 2023, UniSR did not add new GAs compared to the previous version of the Roadmap but focused on implementation of already planned ones as well as on development of sustainability plans.

The final year of implementation of the Roadmaps within the project lifetime has been very relevant for improving the process of understanding and comprehension of the UniSR ecosystem, started with TIME4CS project. Prior to beginning the implementation of the GAs, the team involved in the project only had a theoretical and limited knowledge of the perception of CS and Public Engagement (PE) within the University. Furthermore, the level of information regarding CS and PE was totally fragmented, with several perceptions and ideas coming from different stakeholders involved.

During the final year of implementation, the core team, which is an informal group of actors with different expertise, has consolidated and further expanded, integrating more and more competences. Indeed, the team welcomed a colleague involved in impact monitoring and assessment and benefited from the assignment of a full-time dedicated person to CS.

A turning point for the implementation of UniSR's GAs was the mentoring visit in May 2023. This event allowed researchers, managers and core team to benefit from the knowledge and exchange with Front-runners institutions, consistently improving the raising awareness process started in UniSR.

The third year of the project has been also key for better reflecting on opportunities and internal barriers, strengthening UniSR's awareness and knowledge of CS and starting an opening up process, looking outward, as a competent actor in the field of CS.

6.3 Grounding Actions

As mentioned above, in 2023, UniSR continued implementation of seven GAs as described in the Deliverables D2.1 and D2.2, as well as established a sustainability potential for its Institutional Roadmap. Both the GA7 "Develop Citizen Science methodology for research activities and projects" and the GA8 "Organise debates or public events to promote CS", were added to the previous version of the Roadmap. GA7 has started already in 2023 and will continue after the end of the project. GA8 will start in 2024 and is presented in sub-section 6.5.2 of this document.

6.4 Objectives and Strategy for Institutional Change for the post-project period

6.4.1 Vision and Strategy

UniSR is fully committed to ensuring the quality, trustworthiness and reproducibility of the research conducted by its investigators by upholding high standards of integrity, working to foster an environment in which the responsible conduct of research is explicitly discussed and encouraged. To achieve this goal, the integration of CS through institutional changes is fundamental. UniSR participation in the TIME4CS project is

providing a relevant support in this process, collecting best practices from other project partners and sharing experiences related to CS.

The selected GAs allow UniSR, in the medium to long term, to achieve some relevant goals. Firstly, being part of an international CS community is of great support in implementing institutional changes within our organization by bringing in new points of view, experiences and inspiration. Joining such a community has started a cascade process, where core group members involved in the community can transfer the new approaches and the inspirations received from the community to other actors within the organization, allowing the change to become structural and then institutional.

Being part of TIME4CS has also contributed to the internal organizational change started in 2021. The creation of a multidisciplinary core team deeply improved this process. The core team is acting as an institutional trigger, pushing the raising awareness process within UniSR, spreading the knowledge on CS among researchers and other managers. This started process is expected to continue after the end of the project.

6.4.2 Goals

This sub-section presents UniSR middle-term (achievable in the post-project period, 2024-2026) and long-term (achievable in the stabilisation period, 2027-2028) goals. To avoid repetition, the short-term goals (achieved in the project period, 2021-2023) could be consulted in the Deliverable D2.2.

Goals	Grounding Action	Status	Intervention Area	Type of Goal
Transferring novel concepts, different approaches and methodologies into R&I activities implemented in our institution.	GA1	Original	Research	Middle-Term
Engaging the supporting services in the process.	GA2	New	Research	Middle-Term
Definition of a workflow to support researchers regarding CS practices.	GA2	New	Research	Middle-Term
Increasing expertise and knowledge of researchers regarding CS.	GA3	Original	Education & Awareness	Middle-Term
Stimulating an internal dialogue regarding CS.	GA3	Original	Education & Awareness	Long-Term
Making researchers from different fields talking together, increasing comprehension and widening the view each one has of the CS practice in his/her own field.	GA4	Modified	Education & Awareness	Middle-Term

Collecting best practices and creating opportunities for experimenting new solutions or experiences.	GA4	Modified	Education & Awareness	Long-Term
Attracting the interest of researchers in CS.	GA6	Modified	Policy & Assessment	Middle-Term
Encouraging the researchers, especially early stage, to apply Open Science and CS practices in a systematic way	GA6	Original	Policy & Assessment	Long-Term
Definition of effective case studies to be shared with the research community.	GA7	Original	Research	Middle-Term
Increased interest of the research community in CS.	GA7	Original	Research	Long-Term
Strengthening UniSR's expertise in CS and in other topics relevant to strengthen the relationship between science and society.	GA8	Original	Education & Awareness	Middle-Term
Widening the audience of seminars, engaging more people and, potentially, building an ecosystem of actors interested in CS and Public Engagement.	GA8	Original	Education & Awareness	Long-Term

6.5 Sustainability measures

This sub-section describes the UniSR plans to ensure sustainability of the outcomes per GA initiated as well as their hypotheses on new GAs to start in the post-project (2024-2026) and stabilisation (2027-2028) periods.

6.5.1 Actions to sustain the outcomes

Grounding Action (GA# - title)	Intervention Area	Sustainability Actions	Tentative Deadline
GA1 - Participation in a CS network	Research	UniSR joined ECSA in April 2022. After becoming member of ECSA, the institution started joining up to three Working Groups (WGs) so far. This participation will be continued. The	2024 onwards

		core team will continue participating in ECSA WGs. Depending on the inputs collected from WGs, an ad-hoc methodology should be developed, to ensure the knowledge transfer from ECSA to UniSR community and vice-versa.	
GA2 - Changes in the organisational structures/functions	Research	The core team was created in October 2021 and has continued being active and improved during the project. It will remain active also after the end of the project. The process of engaging research supporting offices, started in March 2023, will proceed also after the end of the project. The core team is responsible for this activity.	2024 onwards
GA3 - Information sessions and training programmes	Education & Awareness	The activities planned within this GA have been implemented. All the activities launched (i.e. series of seminars "Science and Society"; Bits of Citizen Science; posting relevant information in social media; training to students; etc.) will also be continued after the end of TIME4CS.	2024 onwards
GA4 - Set up informal opportunities for interactions with researchers	Education & Awareness	This GA was suspended, but the core team will assess the opportunity to work on this activity again, after the end of the project.	2024 onwards
GA5 - Identify an institutional contact point for CS	Support Resources & Infrastructure	The creation of a dedicated email address (April 2022) and of a section on CS in the UniSR intranet (March 2023) has been accomplished. The support provided by the core team through the email address and the upload of relevant materials in the intranet will continue also after the end of the project.	2024 onwards

GA6 - Adopt evaluation criteria for researchers' evaluation that consider CS	Policy & Assessment	The core team will dedicate specific attention to identify an adequate methodology to spread information regarding the adoption of the new evaluation criteria which embed CS (the criteria should be adopted at the end of the project).	2024 onwards
GA7 - Develop CS methodology for research activities and projects	Research	This GA has just started and will be continued in 2024. The first phase has been focused on the identification of potential case studies to work on as potential pilot. The activities are currently being implemented. Core team will be responsible for continuing this GA. It will work on the identified projects, providing support on CS. Keeping with offering researchers support and knowledge on CS will strengthen the reputation of the core team, attracting more researchers and their interest.	End of 2024

6.5.2 New Grounding Actions to be launched in the post-project period (2024-2026).

The GAs 8, 9 and 10 are new GAs that will start in the post-project period. They were not mentioned in the previous version of the Roadmap.

Grounding Action (GA# - title)/ Intervention Area	Relation to the previous GA(s)	Brief description of the new GA	Tentative Timeline
GA8 – Organise debates or public events to promote CS/Education & Awareness	This GA will contribute to GA2, especially to the organisation of the series of seminars "Science and Society". Indeed, this GA will represent an evolution of GA2.	Objectives of this GA: Strengthening UniSR's expertise in CS and in other topics relevant to strengthen the relationship between science and society. Widening the audience of seminars, engaging more people and, potentially,	January 2025

		building an ecosystem of actors interested in CS and Public Engagement. Activities planned: Definition of a calendar with selected topics (and speakers) to be covered with the seminars. Identifying the target audience. Launch of the first seminar open to external stakeholders. The core team will be responsible for this activity. Collaboration with patients' association, strengthened during the implementation of GA7 can be supportive for this GA. Potential obstacles: Difficulties in the identification of topics and especially of speakers. Difficulties in reaching and engaging stakeholders/target audience.	
GA9 - Becoming theorists and practitioners of CS/Research	This GA aims at producing scientific articles and papers as results of pilot projects on CS, developed under GA7.	In the framework of pilot projects (GA7), there is a possibility to produce a paper/article focused on CS activities. To achieve this, the UniSR core team will work together with researchers in implementing pilot projects and monitor this activity, thus expanding the GA7. The main obstacle which can be faced is to achieve relevant results to be translated into scientific articles.	2024-2028
GA10 - Integrating a training module focused on CS, into different degree programs/Support	Leveraging the work done under GA3 in delivering a training course to the students of the master's degree in nursing and	The UniSR core team will work on: - consolidating the training module on CS; - discussing with the Faculty Deans and Chairs for Degree Courses to explore the	From 2024 onwards

| Resources & Infrastructure | Midwifery, of the Master's degree in Communication of Science and Health, and PhD students, UniSR will work on the opportunity to integrate a course on CS in other Degree courses. | opportunity to integrate the training module on CS in the educational offer.

The core team will work on this activity, engaging the academic staff.

The main obstacle could be engaging professors. The core team will define a strategy to engage them in this activity. | |

6.5.3 Stabilisation period (2027-2028).

During the stabilisation period, the core team will continue and improve all the GAs. UniSR will focus on consolidating activities started during the project (e.g. organization of seminars, archive, training activities, Bits of CS newsletter), building a structural CS competence and practice within the institution.

6.6 Concluding remarks

This section summarises the practical measures UniSR will take to sustain the implementation of its Institutional Roadmap in the post-project period.

Participation in a CS network

Membership of ECSA will be continued to ensure mutual learning and knowledge transfer from ECSA to UniSR community and vice-versa.

Continuation of communication activities

Regular publications on CS topics on UniSR social media and dedicated section on UniSR Intranet, newsletters, organisation of debates and other public events will contribute to further support institutional adoption of CS.

Creation of a dedicated email address for UniSR research community on CS matters

This measure helps to centralise and handle CS-related requests for knowledge base building, giving advice on funding opportunities and good practices, thus reinforcing the long-term ability to orientate the researchers on different aspects of applying CS methodology.

Exploring a possibility to integrate CS into researchers' evaluation

UniSR has already made an important step by integrating OS as a larger concept, into researchers' evaluation. The next step would be reflecting if and how CS activities could also be included as a specific criterion for researchers' evaluation.

Further development of the training activities

This measure consists in consolidating the trainings on CS already developed in the framework of TIME4CS project for a specific degree (i.e. master's degree in nursing and midwifery, master's degree in communication of science and health, and PhD students) and potentially expanding them to different degree curricula. Widening the audience could also be helpful for increasing the number of students and researchers involved in CS activities and supporting the Institutional Change in the middle and long term.

7. Actions promoting sustainable Institutional Change

This chapter reflects on some key aspects of the Institutional Change process beyond the project lifetime and the Implementers' sustainability plans.

7.1 Lessons learnt from the Implementers' sustainability plans

On the basis of the practical measures developed by the Implementers to ensure sustainability of their respective Institutional Roadmaps and described above, three main lessons learnt have been identified.

Embedding sustainability reflection in the Institutional Roadmap from the early stages of its design and implementation

Thinking strategically about how to establish a sustainability potential for the actions within the Roadmap is crucial for successful Institutional Change. The sustainability plans are to be developed while the project is still running, and the institution has resources to co-create these plans.

Using a combination of top-down and bottom-up approaches in the sustainability plans

To foster Institutional Change process in the post-project period, the Implementers opted for both top-down and bottom-up approaches. The bottom-up approach looks at a personal commitment of people to change their own mindsets, views and behaviors when they decide to engage in Institutional Change process for the adoption of CS. In the top-down approach instead, internal institutional structures such as procedures and norms are subject to change. In the sustainability plans, as well as in the first development of the Institutional Roadmaps, these two approaches complement each other.

The Implementers developed sustainability measures that require strong governance support, namely the appointment of institutional CS Contact Point, maintenance of a virtual CS Hub, or launch of new CS courses. On the other hand, doing small CS projects thanks to internal seed funding could progressively lead to emerging the CS champions who, in turn, could multiply their efforts bottom-up and enable sustainable Institutional Change.

Building on the outcomes of the Grounding Actions already implemented

Many sustainability measures and new GAs follow-up the initially planned and implemented GAs, expand and diversify them.

During the project lifetime, the Implementers developed trainings on CS for specific target groups such as researchers and PhD students. For the post-project period, they also envisaged the creation of new, more customized trainings for other target groups such as research support staff or Master level students.

Another example concerns communication activities. During the project lifetime, the Implementers launched multiple activities to attract researchers' interest in CS, such as regular publications on CS theme on the institution's social media and Intranet, information events and newsletters. For the post-project period, they also planned to organize debates and inspiring public talks with the participation of external renowned scientists to share concrete examples of applying CS in relevant scientific field.

7.2 Common challenges and possible mitigation approaches

Despite the significant differences between the Implementers' institutions, that span from socio-cultural and geographical to scientific fields, common challenges as regards sustainability of the Institutional Roadmaps could be identified. This section describes the three most common challenges the Implementers faced in the process of developing sustainability plans for their Institutional Roadmaps as well as possible mitigation approaches.

Sustained institutional commitment

Potential leadership turnovers, changes in institutional priorities and contexts may pose challenges to the sustainability plans for the Roadmaps and GAs.

The key mitigation approach taken by the Implementers was incorporating CS-related actions and arrangements directly into the institutional strategic documents, maximizing and complementing engagement efforts. This could also foster the implementation of relevant activities since it could provide them with permanent legitimacy within the institution. Having CS as part of the institutional plan at the start of the Institutional Change process could be challenging, but it should be seen as an integral component towards achieving full and sustainable integration.

Another approach is to expand CS activities to different faculties, departments, involve research support units, especially training units and libraries, on a regular basis and if possible, with support of institutional CS Contact Point.

Stakeholder engagement

Despite the numerous benefits, spanning both scientific and societal dimensions, CS methodology is both time and effort intensive, and as a result, many researchers, managers as well as members of the public remain indifferent towards its adoption and engagement.

Continuous awareness raising campaigns tailored to the needs of each of the targeted groups, making the Grounding Actions as visible as possible could be helpful in this regard. It is more difficult to slow down or stop these activities when they are known by everyone within the institution.

Optimising feedback and opinion collection from researchers, including "researcher mind" in design of CS activities and trainings, at different levels of the institution, could trigger sustainable change as well. Newly trained professional CS researchers and support staff members will strengthen and further facilitate the research and networking-oriented activities related to CS themes.

Integrating CS, or Open Science as an umbrella term, into researchers' evaluation guidelines and possibly recruitment process is another powerful tool to sustain interest to initiate and participate in CS projects.

An interesting approach is also to additionally support Master-level students willing to work on CS topics and attract them as future PhD candidates and researchers. Explaining the methodology, supporting them in preparing scientific papers and getting higher scores for a scientific merit in a competitive environment of PhD positions could contribute to building awareness on CS and lasting mindset.

Ensuring funding for continuation of CS-related activities

Organising CS research initiatives and information events, providing training, developing and spreading communication materials, but also sustaining staff working on or with CS at the institution, require funds.

Researchers often struggle to find financial support for their projects, even more so in the case of experimenting with innovative methodologies. While big initiatives involving multiple research groups and partners can request grants at national and/or EU level, small CS projects could not rely on these funding opportunities. Providing institutional funds for such initiatives, usually in the form of small grants, may encourage the researchers to adopt CS.

Identifying the national research funding organisation(s) in a specific country, checking calls for proposals' topics and requirements could be useful for scoping potential funding opportunities. Sometimes regional and local organisations also provide funding for CS projects as part of participatory or public engagement activities. For more recommendations enriched by TIME4CS partners' experiences, including on funding-related matters: D1.4 "TIME4CS statement to encourage Institutional Changes to promote Citizen Science"[14].

With the launch of the Horizon Europe framework programme, citizen engagement has become a horizontal prerequisite of successful proposals and, correspondingly, access to EU funding. Therefore, in addition to promoting scientific and societal values of CS as such, the institutions and researchers willing to get their projects funded, should think strategically how to engage with CS and increase their chances in the application process.

7.3 Conclusions on sustainable Institutional Change process

Institutional embedment of CS is a long process, different in every RPO. The TIME4CS Implementers started their transformative journey three years ago, and their willingness to act, learn from the Front Runners, support partners and each other, share and apply knowledge for change was remarkable.

All Implementers noticed a significant increase in awareness and understanding of CS amongst their internal stakeholders at all levels. Indeed, it was very important to first understand fully what CS is, as well as its benefits, impacts and challenges to take into consideration. Sometimes the knowledge received was also spread to a larger ecosystem of local actors, such as civil society organisations, authorities and industry representatives.

Having a clear, well-defined, but flexible Institutional Roadmap was an ultimate condition for sustainable transformation. Putting the GAs into a strategic framework with realistic timelines, goals, tasks and responsibilities of institutional actors, indicators of success at both institutional and individual (researchers, students, other targeted groups) levels proved successful in assisting the Implementers' core teams and triggering change. A co-creative approach engaging different stakeholders that could or should be impacted

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[14] https://doi.org/10.5281/zenodo.10201230

by the change, contributed to tailoring the Roadmaps to specific institutional contexts, including needs-based adaptations of the Roadmaps and sustainability plans.

Substantial reflection on sustainability of the GAs from the early stages of the Roadmaps development and implementation was crucial for progress and visibility of the changes. New Grounding Actions planned for the post-project period built on the original and modified ones as well as on their outcomes for continuity and expansion of institutional engagement with CS.

Although the process of Institutional Change is obviously challenging and sometimes there could have been contextual changes or obstacles that were hard to prevent, the flexibility of the Roadmaps and willingness to continue facilitated the establishment of new institutional arrangements or adaptation of the existing ones. Reflecting on access to funding, creating informal interest groups (for example, a network or an internet-based group involving researchers, students, other staff members) interested in exchanging ideas and examples of peers who apply CS in their research activities, also contributed to the acceptance of CS at individual and institutional levels and to awaken curiosity.

Each institution team needs to understand how a new action or measure can be embedded in their context according to their own scientific field, geographical and historical background, leadership style, type of institution and other particularities, i.e. it cannot be changed simply because of a leadership turnover or other staff or priority changes.

Sometimes starting or continuing small exploratory CS projects could progressively lead to a significant cultural change and having multiple CS champions. Identifying and supporting these CS champions seem essential for the sustainability of the Roadmaps. This could be related to the fact that students and staff can provide the bottom-up pressure to push for further institutional transformations. Senior management CS champions can also influence the decision-making processes from top-down which would have a direct impact in modifying the structures in the organisations.

Time is needed to ensure a sustainable, visible and effective change at the institutional level. Planning a step-by-step strategy, monitoring and evaluating the progress and adjusting the actions to the needs of the institution and researchers, are pivotal to succeed in this process.