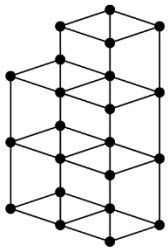

doing it together science

Grant agreement no. 709443

DITOs

Doing It Together science

Coordination & Support Action

D5.1 Terms of reference and evaluation templates

Work Package: 5

Due date of deliverable: Month 6

Actual submission date: 29.11.2016

Start date of project: June 01 2016 Duration: 36 months

Lead beneficiary for this deliverable: Dr. Erich Prem (eutema)

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Reviewer: Simon Gmajner (Kersnikova)

Project co-funded by the European Commission within the H2020 Programme (2014-2020)		
PU	Public	**X**
CO	Confidential, only for members of the consortium (including the Commission Services)	
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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 709443

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Acknowledgement

The DITOs project has received funding from the European Union Horizon 2020 programme under grant number 709443.

Reference

Please cite this work as:

DITOs Consortium, 2016. *Doing It Together science: Terms of reference and evaluation templates.* UCL, London.

Document Identification Sheet

Project ref. no.	709443
Project acronym	DITOs
Project full title	Doing It Together Science
Document name	DITOs-D5.1-20161129.pdf
Security (distribution level)	Public
Contractual date of delivery	End of project month 6: 31.11.2016
Actual date of delivery	29.11.2016
Deliverable number	D5.1
Deliverable name	Terms of reference and evaluation templates
Type	Report
Status & version	Version 3
Number of pages	69
WP / Task (responsible)	WP5 / T1 (eutema)
Author(s)	eutema: Erich Prem and UCL: Cindy Regalado
Other contributors	UCL: Christian Nold and eutema: Jörg Irran
Project Officer	Colombe Warin
Abstract	*D5.1 Evaluation terms of reference and templates* contains the overall terms of reference and key performance indicators identified for DITOs, with templates and guidelines for recording and documenting activities and gathering public feedback.
Keywords	Public engagement in science, citizen science, DITOs, evaluation
Sent to peer reviewer	18.10.2016
Peer review completed	28.10.2016
Supervisory Board approval version 1.0	06.11.2016

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1 Version Log

Version	Date	Released by	Nature of Change
First Draft V1	18/10/2016	First draft issued by UCL (CR) and eutema (EP)	-
	28/10/2016	Simon Gmajner	Review by partner (KI)

2 Definitions and Acronyms

The basic definitions are here, but you need to add report-specific ones

Acronyms	Definitions
CSA	Communication and Support Action
DITOs	Doing It Together science
EC	European Commission
ECSA	European Citizen Science Association / Verein der Europäischen Bürgerwissenschaften
ERIO	European Research and Innovation Office at UCL
eutema	EUTEMA GMBH
H2020	Horizon 2020 Programme
KI	Kersnikova Institute
KPI	Key Performance Indicator
Meritum	Centrum Szkolen I Rozwoju Osobistego Meritum
MP	Medialab Prado, Madrid
RBINS	Institut Royal des Sciences Naturelles de Belgique
RRI	Responsible Research and Innovation
RTDI	Research Technology Development and Innovation
Tekiu	Tekiu Limited
UCL	University College London
UNIGE	Universite de Geneve
UPD	Universite Paris Descartes
WS	Waag Society

3 Executive summary

An evaluation serves as a systematic and objective assessment of a planned, ongoing or completed project or programme, its design, implementation and results. However, in the context of the DITOs project, the range and operation of public engagement activities planned by consortium partners falls outside of traditional organisational boundaries. These activities are highly contextualised in their socio-cultural environments, approaches to design, and objectives and therefore they pose a challenge to traditional forms of evaluation.

The DITOs evaluation work package therefore focuses on determining the relevance and fulfilment of project objectives but also seeks to understand impact and effectiveness of the project measures. The results of the evaluation serve to aid and guide knowledge sharing at public and policy levels and, through iterative learning design, the evaluation also serves as a way for consortium partners to build on, adapt, and replicate public engagement methods and strategies developed throughout the project.

This report presents the Terms of Reference, which outlines the requirements and expectations of the evaluation and defines how the evaluation will be conducted. It also presents the evaluation templates used in phase 1 of the project, namely the Events diary, the Satisfaction questionnaire, and the action research interview guide. To illustrate the use of the templates this report also presents a preliminary analysis pilot in two levels namely, evaluation of the project and evaluation of the evaluation.

4 Introduction

BOX 1.1

A ToR presents an overview of the requirements and expectations of the evaluation and defines all aspects of how an evaluation will be conducted. It provides an explicit statement of the objectives of the evaluation, roles and responsibilities of the evaluators and the consortium, and resources available for the evaluation.

A ToR provides clearly detailed parameters for—

1. Why and for whom the evaluation is being done
2. What it intends to accomplish
3. How it will be accomplished
4. Who will be in involved in the evaluation
5. When milestones will be reached and when the evaluation will be completed
6. What resources are available to conduct the evaluation

This report presents terms of reference (ToR) and key performance indicators identified for DITOs, with templates and guidelines for recording and documenting activities and gathering public feedback. In line with the objective of work package 5 (WP5), this report contributes to the development of a robust framework for evaluating the engagement of citizens, scientists, and decision-makers in DITOs activities. The specific objective of this deliverable are to present the initial ToR for DITOs evaluation as well as the tools to carry out this evaluation. This report is divided into four main sections, namely the ToR, the evaluation templates, and initial results from the use of the templates.

5 Terms of reference[1]

This ToR document specifies the evaluation process in terms of methodology, including methodological approach, evaluation procedures and allocation of resources.

5.1 Background and context

This section describes the background of the project activities to be evaluated and focuses on: an evaluation baseline, the logic of the intervention; the key actors and factors considered; and the state of the art in evaluation of public engagement in science and technology literature.

Evaluation is often defined as *the systematic and objective assessment* of a planned, ongoing or completed project or programme, its design, implementation and results.[2] In the context of the DITOs project, the evaluation work package focuses in particular on the determination of relevance and fulfilment of project objectives, but also seeks to understand impact and effectiveness of the project measures. It has been pointed out in the literature (Prem, 2014) that evaluation has two very different angles. The first one takes a rather objectivist perspective that emphasizes the instrumental nature of a project and thus seeks to assess degrees of fulfilment of such objectives. The

[1] This ToR section will be extracted from this document and simplified to serve as a handbook for consortium partners.

[2] cf. the OECD DAC glossary

second one, often used in RTDI policy making, systematically investigates an action from the point of view of worth (value), significance (importance) or merit (quality). In DITOs, we will address both perspectives, i.e. we will aim to analyse the project based on mainly counting events, participants etc., but we will also analyse its actions in a more qualitative fashion with participant observation and Action Research methodologies.

At proposal preparation time, the decision was taken to design the evaluation set-up in an iterative fashion. This means that the evaluation procedures themselves will develop throughout the project. Evaluation will start with a relatively straightforward approach to collecting relevant dimensions of the DITOs events. In parallel we will also analyse the state-of-play as regards evaluation by the different project partners. This should support the relatively quick choice of evaluation observables or indicators to be used by all partners in the first project period.

We will take another look at project evaluation procedures and critically examine the degree to which they deliver an understanding of quality and significance of the DITOs actions. This may then lead to changing the choice of indicators and procedures. The aim of the set-up is not just to evaluate the DITOs project, but to also provide recommendations for good practices for other citizen science endeavours including in particular recommendations for how to best evaluate them.

This deliverable, however, focuses on step 1, i.e. the relatively quick definition of a set of indicators to evaluate DITOs events in the project's first phase.

5.1.1 Logic model

A logic model provides a framework for the analysis and evaluation of programs. It provides concepts and relations in the frame of the theory of change (Funnell & Rogers, 2011). It is widely used in the evaluation of public interventions such as research programmes and other initiatives. It can also be used for projects, initiatives or general goal-oriented activities. Logic models support designers of interventions to logically think about what the programme (or project) is trying to achieve (the purpose), what things the project needs to do / produce to bring that about (the outputs) and what needs to be done to produce those outputs(the activities). It can be both used for design and evaluation (ex ante, interim and ex post).

The most used feature of logic models is the clear separation of inputs, outputs and impacts, i.e. the distinction of what kind of resources are used for the program, what are the immediate outputs and what are the longer-term impacts achieved (through the generated outputs). Often, there is a distinction of (tangible) outputs, short-term outcomes, and longer-term impacts. In addition to inputs sometimes activities are also described separately, i.e. what the program undertakes.

In the frame of DITOs, logic models were elaborated from the perspective of the whole consortium with the aim of developing a joint understanding of the project's objectives.

Please refer to Appendix 9.1 for more detailed information on the logic framework, indicators, etc.

The main **inputs** in DITOs consist of DITOs staff; immaterial assets such as existing networks, contacts, knowledge and experience in the team, access to media, citizens, researchers and public authorities; material assets including lab space, instruments, kits, materials (e.g. teaching material), guidelines, publications, and online courses. There are also certain technologies on the side of the inputs such as computer programs and applications, collaboration tools and online platforms as well as infrastructure for the involved organisations.

Due to the broad nature of the project, the **activities** of DITOs span over a very wide range. At a general level they include first and foremost planning, setting-up and running events including their evaluation (e.g. questionnaires). Activities also include communication, public relation and online activities. There are dissemination actions for sharing outcomes and actions targeting policy makers as well as targeting additional funding. (The annex contains more elaborate descriptions of the project activities including a categorisation in on- and offline activities, passive and more interactive activities.)

The project's **outputs** cover both offline and online results and have also been structured along the distinction of passive and more interactive outcomes and with respect to synchronicity (asynchronous or synchronous). Some important examples of outcomes are:

- exhibitions;
- prototypes;
- interactive exhibitions;
- twitter discussions;
- knowledge sharing platform;
- policy briefs;
- meetings etc.

Finally, at the level of **outcomes** we distinguish between short (1-3 years), medium (4-7) and long-term (>7 years) outcomes. Examples of short-term outcomes are engaging more citizens in science, improving the understanding of citizen science in academia and in the broad public, or increasing people participating in DIY clubs or museum memberships. Some medium-term outcomes are new calls for citizen science actions, understanding limits of citizen science, more informed public debates and more RTDI projects including citizens. Finally, in the long run, DITOs may result in the regular participation of citizens in science projects, the participation of citizens in the evaluation of science, or the improved integration of DIY-science in education.

5.1.2 Key stakeholders, elements, and factors to be considered

The key stakeholders of DITOs basically include all actors relevant to science, in particular also RTDI management. DITOs will directly communicate with scientists, researchers, innovators, and citizens but it also targets research agencies, funding bodies, RTDI policy makers in governments and public authorities. Important

stakeholders for DITO's communication actions include the press and other media, RTDI networks and professional associations or networks.

It will be important to distinguish these from the immediate stakeholders of the evaluation exercise and their interests:

- DITOs management - interested in measuring progress, evaluating the status quo and further impact of the project;
- DITOs partners- interested in measuring progress, evaluating the status quo and further impact of the project;
- European Commission services - interested in measuring progress, evaluating the status quo and further impact of the project;
- researchers involved in DITOs events - interested in practicalities, limits, good practices and recommendations regarding citizen involvement in science as well as new funding opportunities;
- broad audiences targeted in the DITOs events - interested in how science impacts their daily lives, if and how they can contribute; and
- DITOs reviewers - interested in measuring progress and assessing the extent to which DITOs reaches its objectives.

5.1.3 State of the art

Rationale

The focus of the evaluation of DITOs is on feedback from the project's activities for public engagement in science with a focus on citizen science. Literature on traditional citizen science studies to date identifies the need for: improved and targeted evaluation of participatory processes (including the process of facilitation and communication strategies); processes of creativity and learning in science; advice for evaluating the costs and benefits of citizen; and long-term impacts of engagement activities (including acceptability and relevance to a wider audience). However, literature on the larger field of Public Engagement in Science has offered more critical guidance on not only the evaluation of engagement exercises but more broadly, on the impact on science, governance, and policy.

As Stilgoe et al. (2014) note, the main critiques focus on the exercises of engagement themselves and tend to question legitimacy of their inputs - "what goes into engagement?" – and the scale of impact. Lövbrand et al. (2010) for example, draw on the European Commission's (EC) report "Taking the European Knowledge Society Seriously" to ask how legitimate efforts to "democratize" scientific expertise (such as citizen deliberation) really are; they note that these processes seem legitimate only for the people who are involved in them (Stilgoe et al., 2014, p. 5).

Additionally, while research on motivation on engagement in citizen science project is wide-ranging and growing (from online engagement (e.g. Oreg and Nov (2008) and Raddick et al. (2010)) to nature conservation (e.g. Phillips et al., (2014) and Roy et al., (2012)), there has been little research on the motivations of individuals to move from "informal settings such as pubs, festivals and cafes to effective lobbying on issues such as libel law and science funding". As Stilgoe et al. (2014) note, "such activities break down any clear distinction between informal, policy-free engagements and

politically motivated activities". The alleged impact of citizen science approaches have also been scrutinised in terms of their democratising power (e.g. Haklay (2013)) and in terms of their perpetuation of power relations between scientists and publics, and between scientific/technical practices and gender divides (e.g. Dunbar-Hester (2014)).

The DITOs project is unique in that not only does it cover a wide range of approaches to citizen engagement with science and technology but also aims to build a sustained bridge between scientists, citizens, and decision-makers. "There is much to understand here about these new spaces for engagement with science and technology and their impacts on scientific culture, politics and society" (Stilgoe et al., 2014, p. 9). Warning flags have been raised to not 'over-promise' on this impact while at the same time attention to how "the engagement of citizens with new technologies and how their use of the new media shapes, constrains and possibly widens the choices open for science and democracy" (Nowotny, 2014, p. 20).

One main issue that the DITOs evaluation aims to address is the lack of documented examples of factors affecting citizen-led or grassroots initiatives their contributions to various aspects including organisational capacity, relations between citizens and practitioners, and science practices. This is important because in the eyes of the authoritative validator, the lack of these documented examples often amounts to lack of evidence to 'prove' (and even legitimise) their contributions. However, Beebeejaun (2016) warns that 'good' examples of mobilisation "should not be confused with a significant movement of power towards citizens". She also adds that "[t]he quest for best practice has decontextualized accounts from the communities and places in which they are situated, seeking to deliver easily replicable toolkits of participation as if the solution was innovation and not the engaging with the stark evidence of deepening inequalities, with a diverse and multiple set of publics" (p.10). In fact, the *best practices* 'extracted' from success stories might be flawed if they are stripped of context. It is this context that reveals some of the preconditions needed for particular initiatives to be successful – and for whom. Likewise, Horst (2014) cautions that trying to institutionalise or 'tame' public engagement activities risks "ignoring or discounting places outside of the formally mandated engagement processes where publics do, or wish to, engage with science, technology and innovation" (Stilgoe et al., 2014, p.10).

Previous studies

In preparation for the ToR and definition of initial evaluation methods, we revised various logic models including the "Sciencewise Theory of Change for Strategic Planning" and the Cornell Lab "User's guide to evaluating learning outcomes from citizen science". We also reviewed the outcomes of the PLACES Toolkit and the FP7 Citizen Cyberlab project. We also reviewed the EC report on Indicators for promoting and monitoring Responsible Research and Innovation and received additional input from the DITOs Advisory Board (AB).

The Sciencewise report provided guidance on working with 'goals' as a starting point; employing a participatory approach with the DITOs team (acknowledging and drawing on their knowledge and experience as practitioners and facilitators of citizen engagement); probing project assumptions; and clarifying why each activity is being done (Sciencewise, 2014, p. 3). The Cornell Lab user's guide (Phillips et al., 2014) provided initial guidance on the design of the DITOs Logic Model, specifically from the

summative evaluation perspective (this is detailed in section 4.5.2). The 'PLACES Impact Assessment Toolkit' focuses on the area of science communication and scientific culture in general and therefore provided initial guidance on basic methodological considerations as well as indicators of impact evaluation of 'science events'. We also adopt the PLACES toolkit definition of 'scientific culture' as "the presence of science in public life, public affairs and public discourses" (de Semir et al., 2011, p. 16).

The 'PLACES Impact Assessment Toolkit' also provides important considerations for the definition of 'science events' (SE) in terms of their objectives. These include promoting dialogue between science and society and encouraging young people into science; promoting the communication and discussion of not only the results of scientific work but also the way science is carried out as a wider concept; and raising public awareness of science. The main point in which PLACES and DITOs differ in terms of the objective of SEs. The PLACES 'science events' "exist in order to market science positively" by increasing the status and attraction of scientific work and to recognise scientific results; "the principal idea is not to criticize or scrutinize the science itself, or to present alternative findings in other respects than as a counter-weight to the scientific results". For many grassroots organisations, the nature of DIY and grassroots science is to "question the state of things" (Public Laboratory, 2011), as evident in the Maker Manifesto: "if you can't open it, you don't own it" (makezine.com).

The project "Citizen Cyberlab: Technology enhanced creative learning in the field of Citizen Cyberscience" provided foundations for the formative evaluation of citizen-led engagement in science and technology (detailed in section 4.5.3). The project focused on the development of citizen science pilot projects that that employed the Web and computing platforms to enhance creativity and learning. This creativity and learning was evaluated using a mixed methodology. The pilot designed by UCL used an inclusive approach based on Participatory Action Research (PAR). This was the most suitable methodology as the pilot used Information and Communication Technology (ICT) as part of detailed, face-to-face and community focused approach. Specifically, the evaluation was embedded in the participatory and iterative methodology: using and developing research and data collection methodologies and tools, learning to work together, learning about the environment around them and their relationship with it, and working across boundaries through experimentation, active engagement, playful interactions, self-discovery, and reflection. The process of reflection grounds the learning, which is taken to the next series of activities. Their RRI criteria/indicators matrix intends to provide a set of indicators for the monitoring, promotion and development of RRI - to be adapted to particular policy contexts, objectives, and identified directions and constraints of EC sections and EU projects - especially within the 'Science with and for society' programme[3].

[3] The authors note that 'Science with and for society' programme should (and will) be evaluated and monitored also by standard criteria for any subprogramme of a European Union framework programme for R & I, to be broadly characterised as attempts at measuring the effectiveness and efficiency of the funded activities with respect to achieving their expected impact (Strand et al., 2015, p.42).

The report prioritizes both qualitative and quantitative indicators some of which are already in use in evaluative methodology while others require further development. Hence, they warn that some of the evaluation procedures may be "exploratory; data may be missing or hard to obtain, and methodologies may be immature" (Strand et al., 2015, p. 41). The also advise that users of these indicators and criteria to "devise their own process of deliberation in order to choose and tailor the indicators proposed [...] and add their own indicators according to their own needs, goals and concerns" (ibid). As part of our DITOs methodologies we co-produced a Logic Model (LM) at our project Kick-Off meeting in early June this year. Criteria and indicators for evaluation are take considerations from this LM and are described in section 4.6.1. Considerations for further indicators and criteria based on assessment of risk will be discussed at our first Formal Advisory board meeting in late October.

The RRI criteria/indicators matrix is divided into four sections: criteria, performance indicators, and perception indicators. The criteria level encompasses individual RRI criterion, which, based on the above considerations (objectives, context, constrains, etc.) are subject to their own policy development, policy action and concomitant monitoring. Their criteria include public engagement, gender equality, ethics, governance, and sustainability, among others. Their main recommendation for the selection of criteria is having a balance and complementarity between the different indicators at the intersecting levels of performance (process and outcome) and perception (Table 4.1) as well as addressing the main project issues identified (e.g. through LM or identification of risks).

Table 5.1 Indicator framework for Responsible Research and Innovation (Source: Strand et al., 2015).

Criteria	Performance indicators		Perception indicators	Key actors
	Process indicators	Outcome indicators		
Public engagement				
Gender equality				
Science learning				
Ethics				
Governance				
Sustainability				
Social justice / inclusion				

Considerations for their second section, performance indicators, include selecting indicators for all RRI criteria but in a way that provides beneficial information "that is helpful in collaborative modes of governance, developing trust, best practices and

mutual institutional change" as well as being "meaningful and informative to various research and innovation (R & I) actors and conducive to good processes that promote and develop RRI as a policy principle" (Strand et al., 2015, p. 41).

The third section, perception indicators, are considered in terms of two questions: are R & I actors and stakeholders knowledgeable of EU values and the needs and concerns of citizens, and are R & I actors and stakeholders sensitive to EU values and the needs and concerns of citizens? The authors note an interplay between process indicators and perceptions indicators as what is being monitored includes the "level of awareness and ability to adequately handle the tensions and discrepancies between official norms and actual practices, as well as the tensions between different norms and values" (Strand et al., 2015, p. 34). It also includes the extent to which members of the public visiting science environments or made use of such environments and found them useful (Ibid p.32).

The final section considered in this report, Key actors (within and linked to R & I), include policy institutions, universities and other institutional R & I actors at various levels of aggregation (e.g. research institutions, funding programmes, research areas, research projects, etc.), sections of the public, civil society organisations.

The authors of this report warn that contradictions and tensions between various objectives and desired outcomes guiding the selection of criteria and indicators may arise (e.g. in considerations between access, ethics, or gender equality and potential realisation of economic growth). They recommend that in these cases the legitimacy and justification for these guiding objectives should be weighed from both pragmatic and integrative perspectives. That is, taking into account the practical considerations and constraints as well as the effect on the whole and each of the parts making up the project (e.g. partner organisations and DITOs project).

5.2 Evaluation purpose and target audiences

This section addresses the main purpose of the evaluation and outlines the content of the ToR linked to this purpose (Box 1.2)

BOX 1.2

Purpose of evaluation and target audience

A ToR clearly outlines —

1. Why the evaluation is conducted
2. What the evaluation intends to accomplish
3. Who will use the evaluation results & how
4. Who will be in involved in the evaluation
5. How the evaluation will be fulfilled

5.2.1 Evaluation purpose

Why is the evaluation of DITOs being conducted?

The evaluation has an **internal** as well as an **external** purpose. Internally, it seeks to answer: "Are partners accomplishing what they *want* to accomplish?" Externally, the evaluation seeks to answer: "Is DITOs accomplishing what it *promised* to deliver?"

The **internal** purpose is contextualised by each partner's organisation and that organisation's goals and context: where do they want to get to? It is also linked to the personal goals of facilitators.

The **external** purpose is bound to the GA and the specific objectives outlined in it (see section 4.3 below).

However, the internal and external purposes are not mutually exclusive and in fact are linked because as stated in our GA, while all of our activities are designed and carried out in different contexts and languages, they all aim at the same goal: **co-creating and sharing actionable knowledge that helps raise awareness and builds personal and organisational capacities for engagement in science and technology**. Thus, the evaluation is carried out to:

- Determine how the co-creation and sharing of knowledge is carried out – and if it is measurable;
- Determine the impact our interventions through public engagement and capacity building;
- Help individual partners assess, improve and build on their activities; providing a basis for recommendations and facilitating continuous improvement;
- Provide content and insights for capacity building materials for distribution;
- Determine and assess the project's different levels of accomplishment ; (numerical data from science events, participant satisfaction, facilitator's satisfaction, organisational development, etc.) and thus,

- Track progress of project (management) to determine how well project objectives are reached at different stages of the project;
- Understand the trajectory of practice as a result of RRI discourse; and
- Aid preparation of policy briefs (identification of good practices).

5.2.2 Evaluation target audiences

Who will use the evaluation methodology?

Consortium partners directly. We also intend to develop the evaluation as an adaptable methodology to be shared beyond DITOs so that other groups or organisations seeking to assess different aspects of their initiatives in public engagement in science and technology can do so.

Who will use the results of the evaluation?

The evaluation results will be directly used by:

- Partner organisations and facilitators within partner organisations;
- EC reviewers – to assess project progress; and
- Participating public wishing to learn how to develop their own activities.

How will the evaluation be carried out?

As we show below in section 4.5, Approach and Methodology, this evaluation will employ a variety of complementary evaluation tools to understand and monitor various indicators corresponding to prioritised criteria. The focus is on iterative learning from the various types of activities of the project as well as the evaluation of the evaluation itself. The evaluation in Phase 1 consisted of several overlapping steps corresponding to baseline exploration (4.5.2), initial summative evaluation (4.5.3), and formative evaluation (4.5.4).

The first step in the evaluation was the baseline exploration – what evaluation practices/tools do partners currently have in place. We obtained evaluation templates currently in use by partners that guided the design the DITOs event evaluation template.

The second step involved gaining an initial understanding of the context within which the practices of each partner organisations unfold; through various one-on-one conversations, learnt about partners' operational context.

The third step involved the design of evaluation templates. These are detailed in section 6 of this document and include a tabulation tool (gathering information about

each of the DITOs activities/events), participant surveys, and facilitator interview guide.

Alongside these steps we reviewed the literature on evaluation and monitoring of public engagement activities, including citizen science (4.1.3). We also reviewed the DITOs Logic Model (4.1.1) and selected a wide range of indicators (4.6.1) to explore in Phase 2.

5.3 Evaluation objective and scope

This section addresses the objectives of the project, as dictated by our GA and the scope of the evaluation, including what is and is not within its scope.

5.3.1 Objectives of the evaluation

The objectives of the evaluation are clearly stated in our GA:

BOX 1.3

O5 To develop a robust framework for evaluating citizen science and gathering feedback on DITOs activities, including the engagement of citizens, scientists and decision-makers by

O5.1 Developing evaluation tools based on the core methodologies of DITOs that can be accessed, implemented, tested and adapted by the consortium over the duration of the project;

O5.2 Gathering internal and external feedback on the activities, processes and outcomes of the project;

O5.3 Delivering an impartial and objective evaluation and assessment of the DITOs project relative to project objectives and expected impacts

These objectives reflect our aim and outline the focus of the evaluation. The design of the evaluation methodology is iterative and adaptive in nature in order to fulfil the objectives internally for DITOs. The methodologies and results of the evaluation will go hand in hand with the development of activities and methodologies in WP1 and WP2 and will be tailored to consortium partners' operational context and needs. To create a methodology and final evaluation framework that can be employed beyond the project, we will take great consideration for Beebeejaun (2016) warning against 'decontextualized good practice'. The framework will be accompanied by the stories from which these methods emerged: the struggles, the gains, and the road ahead.

5.3.2 Scope of the evaluation

The evaluation focuses on the evaluation of DITOs activities for citizens' involvement in science through a citizen science approach. DITOs events in WP1 and WP2 are the central element of the project evaluation. Therefore, the evaluation of the policy briefs of WP4 is beyond the scope of WP5. In addition, this evaluation will not provide a comprehensive assessment of all project objectives, project risks or its management. The latter remains the responsibility of the management work package (WP6).

5.4 Evaluation questions and tasks

BOX 1.4 Project aim

DITOs will create a tangible 'Do-It-Together Science' method for

a) wider and deeper public participation in science and awareness of Responsible Research and Innovation (RRI);

b) raising governments' awareness of the benefits of the citizen science approach for both society and for science; and

c) guiding funding agencies to set up schemes that take into account the different levels of engagement and their impact.

This will be achieved by accelerating pan-European coordination and support for citizen science, including DIY science, through multiple avenues of engagement including exhibitions, science cafés, and workshops.

The evaluation questions flow from the objectives and tasks of the evaluation and correspond to a real need for knowledge, understanding or identification of solutions to project performance issues. The conclusions of the evaluation will provide answers these questions in a contextualised format. As mentioned above, this evaluation will not cover all aspects of the project and therefore will not answer all possible questions. Therefore, the questions posed here represent the issues of greatest concern to the project linked directly to the project aim (Box 1.4). In particular, our questions focus on performance and impact of the project's engagement efforts and "wider and deeper public participation in science and awareness of RRI".

5.4.1 Questions assessing performance of DITOs activities

Questions directly assessing the performance of the project fall into two categories: **summative** and **formative**.

Summative level (quantitative)

These are questions about outcome that aim at determining project effectiveness:

- Were project objectives met?
- Will aspects of the project need to be improved or modified?

- What is the overall impact of the project?
- Will additional resources be required to address the project's weaknesses?

Formative level (qualitative)

These are questions about people's experiences in DITOs and to explore the project's process:

- Is the project structured and implemented as planned?
- What is the quality of the activities and material produced?
- How do participants engage with the activities' environment, content, and materials?

Formative questions are addressed in more detail in section 4.5.4 and are directly linked to our main evaluation criteria of public engagement, capacity building, gender equality, and inclusion. The questions here cover all phases of the project; section 4.5.4 also details the respective questions to be explored in Phase 1.

5.4.2 Questions assessing impact of DITOs activities

Questions directly assessing the impact of the project:

- What change can be observed in relation to the objectives of the intervention? (e.g. is there increased public awareness of science and of RRI?)
- To what extent can observed changes be attributed to the intervention?
- Are there unintended impacts?
- What mechanisms delivered the impact? What are key contextual features for these mechanisms?

The next section presents the evaluation approach and methodology employed to answer these questions.

5.5 Approach and Methodology

This section outlines the methods selected and employed in this evaluation. It includes how the methods will be carried out and combined and what our initial considerations in Phase 1 are for Phase 2 of the project. We begin with a presentation of the evaluation approach as a whole, then present the evaluation baseline, the approach to the summative, formative, and ethnographic evaluation and considerations for each, we then present the limitations and challenges of our evaluation approach.

5.5.1 Approach as a whole

Data gathering, documentation, and analysis processes

Figure 4.1 illustrates the DITOs evaluation as a whole: the types of activities to be evaluated, the criteria for evaluation, and the tools used to monitor and gather data about DITOs activities. The evaluation The ToR and templates exist as 'living documents' (continuously documented, revised, and updated) to reflect the dynamic nature of the events and activities. This living document resides in our shared consortium Google drive and in addition to detailing the evaluation procedures, it also documents the results from the evaluation. Currently, these are our 'Event diary' table, our Action Research interview notes, and 'Satisfaction questionnaire' results table (Section 6). Data analysis of the data gathered in the evaluation is described in each other evaluation approaches below.

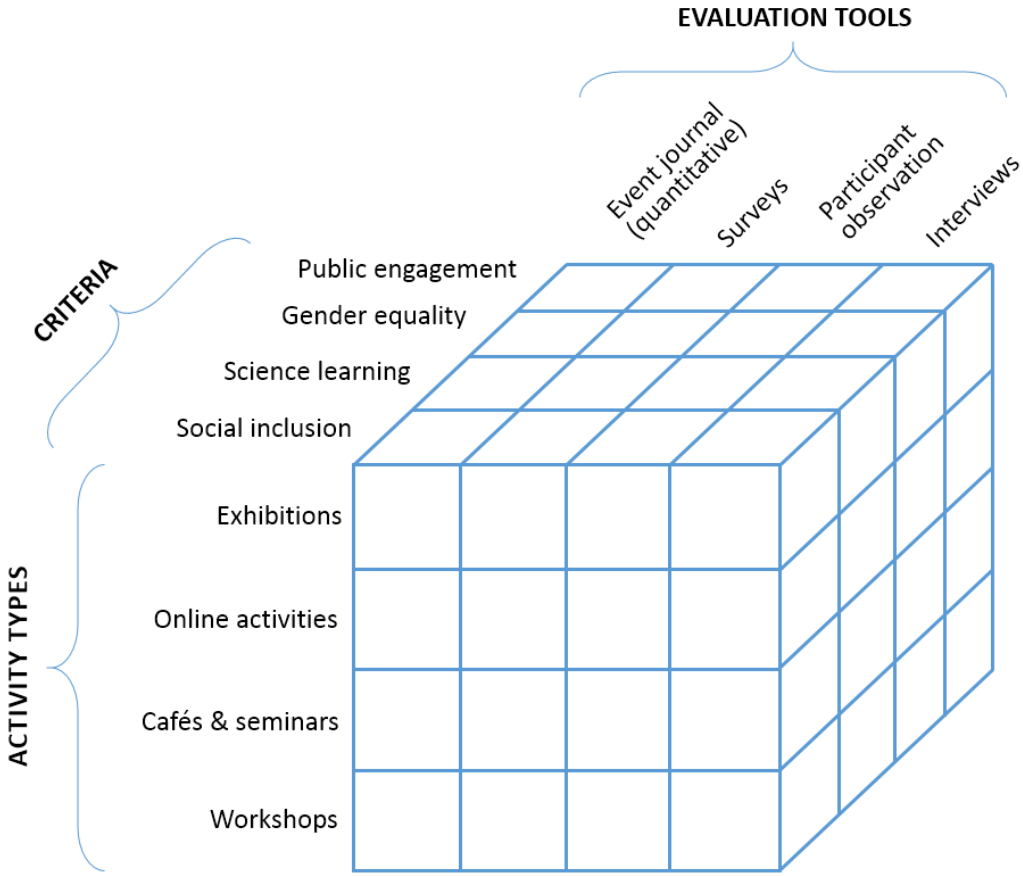


Figure 5.1 Evaluation as a whole: considerations for criteria and evaluation tools based on activity type to be evaluated

Evaluation approaches

Formative evaluation intends to foster development and improvement of partner activities. It encompasses the individual as well as the organisational level. Summative evaluation, in contrast, assesses whether the results of the evaluation show that the objectives of public engagement have been met. Ethnographic evaluation uncovers categories of evaluation beyond those of the summative evaluation.

Iterative learning design and emergent design flexibility strategy

The 'emergent design flexibility strategy' involves adapting evaluative enquiry and assessment through iterative feedback loops. Through these iterations we learn and adapt the design of templates and approaches to evaluation (Figure 4.2). As a reflective process, iterative learning design involves a three-way learning between participants, facilitators of activities, and evaluators.

The focus of evaluation in Phase 1 was on establishing iterative links of inquiry between partners to develop our ToR and evaluation templates. Contextualised feedback from facilitators (through one-on-one interviews) and event participants (through questionnaire responses) has led to tailored evaluation as well as reflections on facilitator's main challenges, good practice, sharing of good practice and replication of practices between partners. These reflections have taken into account and began to cross over contextual borders (language, culture, etc.). That is, through initial mutual understanding we have begun the process of organisational capacity building – as facilitators and participants (acting as individuals and groups) – building on and contributing to a growing body of knowledge. Knowledge on current practices is shared through D1.1 and D2.1. The results from the iterative learning are presented in section 6.

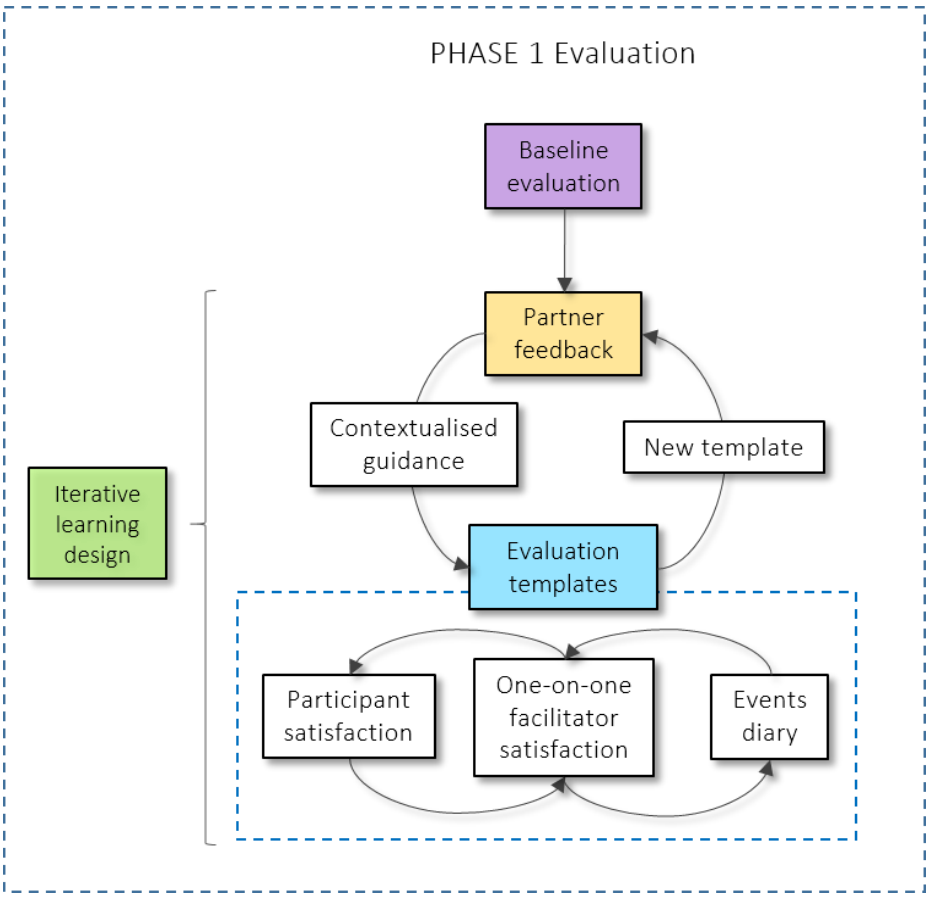


Figure 5.2 Phase 1 evaluation: iterative learning design involves acknowledgement of existing evaluation practices (Baseline evaluation); discussions with partners on evaluation practices and needs (Partner feedback); and development of evaluation templates based on iterative feedback.

5.5.2 Evaluation baseline

DITOs partners have many years of experience developing and delivering science events – from exhibitions to hands-on workshops and participatory projects. The starting point of the evaluation was seeking to understand partner's current formal and informal evaluation practices.

Partners shared the methods and templates for evaluation that they used before DITOs. Analysis of these revealed highly varied and contextualised approaches to evaluation ranging from reporting for government agencies supporting the organisation to targeted staff meetings to dedicated spaces for reflection/discussion with participants incorporated into the event format. Formal gathering of data in quantitative format presented some similarities in terms of measuring 'participant satisfaction' levels: usefulness of material presented, ease of understanding content, skills gained and relevant to their lives, etc. This initial information, combined with commitments from our GA led to the first iteration of evaluation templates (section 5).

5.5.3 Summative evaluation

Summative evaluation is also referred to as outcomes or impact evaluation. It makes use of the 'Events diary' and the 'Satisfaction questionnaire' to gather data.

Why the summative evaluation is conducted

It is used to describe project outcomes and determine a project's effectiveness. Summative evaluation questions focus on understanding the components of a project that are most effective, uncovering unintended outcomes, and highlighting aspects of the project that are replicable and transferable thereby informing good practice. Its findings help to determine if the project is accomplishing its stated goals and met its target outcomes.

What the summative evaluation intends to accomplish

With the aim of determining project effectiveness, summative evaluation focuses on answering:

Meta questions:	Specific questions:

• Were program objectives met?
• Will aspects of the project need to be improved or modified?
• What is the overall impact of the project?
• Will additional resources be required to address the project's weaknesses?
	• About the audience:
	  o How many people were reached through the project?
	  o What are their characteristics (gender, age, education, etc.)?
	  o Is there evidence of a change in knowledge/interest after, or as a result of, participation in the project?
	  o Is there evidence of an increase in skills (data collection, interpretation, etc.) after, or as a result of, participation in the project?
	• About the activities:
	  o What types of activities are delivered and how many?

- What is the reach of these activities? Locations, duration, span over project, etc.

Summative evaluation aids decision-making about activity planning and strategising the future direction of the project.

Who will use the summative evaluation results?

Summative evaluations will be provided to consortium partners (for internal organisation and reporting), the EC, and others with an interest in DITOs. Specific data points in the 'Events diary' directly feed into online interactive citizen science map produced by UNIGE. In the wider context results will be disseminated through formal and informal channels to reach other researchers interested in RRI and citizen science.

How the summative evaluation results will be used

Led by WP5, consortium partners will use summative evaluation results to raise further questions about process and move towards formative evaluation. The EC will use these results to determine the progress of the project.

Who will be in involved in the summative evaluation?

Summative evaluation is led by eutema and UCL. Individual consortium partners are in charge of providing data (as in the Events diary) or collecting data at their DITOs activities.

How the summative evaluation will be fulfilled

As the summative evaluation requires the active contribution from partners, to for example add their event information into the 'Events diary', consideration is given to how partners are to be reminded to carry out this task while at the same time be open to feedback from them. Here, summative evaluation is complemented by formative evaluation – e.g. to improve the 'Events diary' format (see section 6.1.3). As described below, formative evaluation also helps in avoiding gaps in the collection of summative data because it creates a communication pathway on a regular basis. Partners are also encouraged to raise issues about summative evaluation through our online weekly consortium meetings. When partners appear unresponsive (and this has not been the case) further measures include contacting the partner organisation directly or organising a personal visit.

5.5.4 Formative evaluation and considerations

Formative evaluation is also referred to as process or implementation evaluation. It makes use of one-to-one facilitators' interviews and responses from the 'Satisfaction questionnaire' to gather data.

Why the formative evaluation is conducted

Formative evaluation helps to understand the extent to which the project is functioning according to our expectations: it uncovers barriers to project outreach and participation, and highlights what works, what does not, and why. Thus, it provides direction for improving project implementation and operation. The main approach to formative evaluation in DITOs is through action research.

As an evaluation approach, action research aims to understand and solve a problem/issue as it arises. It is a problem-solving, learning-oriented, and context-sensitive process employing qualitative inquiry. It helps a group reflect on ways of improving what they are doing or to understand it from different perspectives (Patton, 2015). These reflective insights from practice inform future action. Through the evaluative process the people involved in the inquiry deepen their sensitivity to the perspectives and needs of others, thereby building their performative capacity. The learning that results from the iterative process of inquiry occurs on two levels: 1) inquiry can yield specific insights and findings that can change practice, and 2) those who participate in the inquiry learn to think more systematically about what they are doing and their relationship with those with whom they work (in the project and within their organisations). What results from Action research evaluation is of "process use" (the ongoing learning and improvement as a result of participating in the process of evaluation) and "findings use" (specific findings that aid summative evaluation and reporting). Both of these will be reported in our living documents.

While the action research evaluation takes shape during the course of the project (as needs/issues are identified), the scope of the evaluation will begin with the questions evaluation questions set in this ToR document (section 4.4) and specified below. These questions are based on experience and review of the literature including reflections from the PLACES project's Advisory Board as the project came to a close (Gerber, 2014).

What the formative evaluation intends to accomplish

With the aim of determining project process, formative evaluation focuses on answering:

Meta questions:	Specific questions:

• Is the project structured and implemented as planned?
• What is the quality of the activities and material produced?
• How do participants engage with the activities'
	• About the activities:
	  ○ How are activities planned and implemented?
	  ○ What links and collaborations are formed (to make the event happen)?
	  ○ What role does the facilitator play in shaping the activity (inspiration, motivation, and lessons learnt from their events and interaction with the public?
	  ○ What was the environment of the event, who was there, who was missing?
	  ○ What strategies are in place or are planned to improve the activities?
	• About the audience:
	  ○ Are relationships between citizens and facilitators/organisation formed through the activities of DITOs? If so, what type?
	  ○ How are relationships between citizens and facilitators/organisation formed and delivered through the activities of DITOs?

environment, content, and materials?	○ What are participant's experiences at the events – what attracts them to events, what interests/motivates them, what do they gain, etc. ○ Do the activities provide participants (incl. public, facilitators, practitioners, policy makers, etc.) with ways to guide and co-design future activities that reflect local needs, aspirations, and conditions? How are disadvantaged groups encouraged to participate?

In Phase 1 the aim of the formative evaluation was to gain an initial understanding of the context within which the practices of each partner organisations develop and are performed. It is an ongoing process and for the remainder of the project it will allow constant feedback that will be implemented during each Phase. The advantage of continuous iterative formative evaluation is that it facilitates examination and a changing of processes as they occur. Functioning as a needs assessment, it provides timely feedback about project activities and the dynamics between partners, facilitators, participants, and other key actors: what is needed (by whom), what is missing, and what might work to meet the need.

Who will use the formative evaluation results

In action research, all of those involved in the inquiry become co-inquirers. The findings are more likely to be used when those who must act on the findings collaborate in generating and interpreting them. To establish co-inquiring relationships mutually respectful inquiry relationships, agreements over goals and methods need to be established. The learning occurs from the group sharing the analysis process; they gain a deeper understanding and come to mutually constructed options, implementation processes, and solutions. As with summative evaluation, results will be provided to consortium partners, the EC, and others with an interest in DITOs.

How the formative evaluation results will be used

One-on-one interviews create a conversational space for partner/facilitators to reflect on activity practices. These reflections, which include discussion about results from summative evaluation, help to develop new strategies/adaptations to reach project and organisational goals. The process and results also aid in iterative discussions about consequences of activities and changes to those activities.

The key aspect of action research is that for findings to be useful, they must also be timely: observation, reporting, and discussion is to be continuous throughout the project. Over the course of DITOs, we hope the data gathered will also contribute to organisational memory for each of the partner organisations and the legacy of good practice in DITOs. Documentation of one-to-one interviews are stored as a living document on our Google drive and accessible to all partners. In Phase 2 these notes will be analysed to answer the above questions.

Who will be in involved in the formative evaluation

Led by UCL, the formative evaluation follows an action research approach in which all project partners participate in data gathering. In Phase 2 the action research approach also involves data gathering directly with event participants, where applicable, so that events are steered by the needs of the participants/communities.

How the formative evaluation will be fulfilled

As with summative evaluation, formative evaluation also requires the active contribution from partners. This contribution occurs at in three ways:

- Through the one-on-one interviews with UCL. Consideration is given to how much time partners can allocate to interviews and the impact of those interviews on their practices (relating their reflections back to other staff in their organisation, strategizing and agreeing to changes, etc.);
- Through visits partner organisation to carry out participant observation. This involves a member of the evaluation team participating in a partner activity, gathering; and
- Through the creation of reflective spaces in their activities. Considerations for the creation of spaces are ways in which the nuanced changes in practice are shared with other consortium partners. This is the next step in formative evaluation in Phase 2 and will include discussing the data gathered on current good practice in D1.1 and D2.1.

The duration of the action research observations depend on travel budget allocation and PM allocation. However, they also depend on the needs identified and time-pressures from those needs. The action researcher will participate part-time in partner activities (in person). While this affords some distance/detachment in reporting, the lack of immersion into the context will be supplemented by monthly one-on-one conversations with partners and the weekly consortium meeting updates.

5.5.5 Ethnographic evaluation and considerations

The ethnographic evaluation will make use of interviews as well as participant observations and will be guided by actions in partner activities as they unfold as well as the frameworks adopted by the project such as RRI and the ‘DITOs escalator model’. The ethnographic evaluation will begin with Phase 2 of the project and therefore we give a more detailed account here of what it entails.

Why the ethnographic evaluation is conducted

The ethnographic evaluation is an analytical tool for analysing the impact of DITOs that goes beyond the existing categories of the evaluation in order to analyse these categories themselves. It uses a post-actor-network theory approach (Law & Ruppert, 2013; Mol, 2002) to carry out ethnographic research on DITOs events and dynamics of the consortium. It will follow RRI concepts such as ‘inclusion’ throughout the different stages and sites of DITOs, to see what material practices and categories they generate. This allows the ethnographic evaluation to account for the fact that research methods are performative ways of enacting the world (Law & Ruppert, 2013). The goal

of the ethnographic component is to act as a self-reflective way of evaluating the ontological categorisation processes of DITOs itself.

What the ethnographic evaluation intends to accomplish

The ethnographic evaluation intends to provide critical insights about the material practices of participants and consortium partners that cannot be captured by other means. It will answer questions such as: How do accounting procedures transform the material practices of DIY science? It will provide empirical answers for any impacts of evaluating procedures such as the counting of numbers of participants in order to demonstrate engagement and public impact. The ethnography will also capture practices taking place that are currently not being recognised using the current categories of evaluation. In this way it will highlight unknown unrecognised outputs of public engagement and the citizen science approach.

Who will use the ethnographic evaluation results?

The beneficiaries will be event participants and the consortium partners who can improve the project while it is taking place. In addition the academic community, other RRI researcher, and the EC will be able to use the results of this ethnographic evaluation.

How the ethnographic evaluation results will be used

These insights are key to improving future projects supporting the citizen science approach by understanding the multiple and complex impacts of RRI categories and to suggest improved procedures.

Who will be in involved in the ethnographic evaluation?

The ethnographic work will be carried out by the UCL team and the entities engaged will be the participants, consortium partners as well as RRI stake-holders.

How the ethnographic evaluation will be fulfilled

The ethnographic work will analyse a sample proportion of workshops and consortium meetings as well as analyse textual documents within the consortium and will be documented in researcher field notes. The process will involve identifying ‘what is acting’ within DITOs and identify common patterns between workshop observations. In this way it will highlight ‘actors’ of the DITOs project that are not being accounted for and articulate ontological dynamics between them. The ethnographic work takes place and is reported in parallel to the summative and formative evaluation. This ensures the ethnographic work is carried out in a way that is suitable for the needs of the multiple stake-holders of the project.

5.5.6 Limitations and challenges

With 11 partner organisations, and 3-year project aiming to directly reach 290,000 individuals through 500 participatory events, the evaluation efforts need to be targeted and focused in order to be effective. With considerations for the allocation of staff and budget, the evaluation team will not be able to attend all events or enter into conversations about all events with their organisers. This would involve not only a lot of time but would also produce a vast amount of data requiring additional time and resources to analyse. However, to fulfil our evaluation, we will complement our in-person efforts with self-evaluation procedures to ensure proper bookkeeping of all events. This requires facilitation of reporting for the project participants as much as possible with easy to fill-in, easy to understand online reporting systems. This is one of the main goals of the first 6-months period of the project through the iterative learning design of templates.

Another challenge arises from the diversity in cultural context, partner organisation missions, ownership over practice, and local level of public engagement. In some cases, consortium partner accountability with respect to their own stakeholders may require them to use their own reporting and evaluation procedures. It is important to understand the state-of-play of evaluation as we cannot expect all partners to create entirely new reporting schemes for DITOs perhaps even in addition to already existing ones. This would be neither practical nor efficient; the intension of the evaluation is not to create further bureaucratic burdens, but to change/eliminate them where possible.

An additional challenge comes from the different formats of partner activities ranging from exhibitions (of which there too are several formats – travelling vs large scale) to hands-on workshops. To address this challenge, while acknowledging the influence of local factors in the design and delivery of each of these types of activities, we complement the use of the Events diary and the satisfaction questionnaires (which are tailored by each partner (see Appendix 9.3.2 for an example) with one-on-one interviews and dedicated group discussions that allow partners to share concerns and ideas to aid in the design of more effective evaluation templates. We will also seek guidance from members in our Advisory Boards who have experience with citizen science evaluation.

Specific challenges that have begun to manifest themselves in Phase 1 are finding a balance between conforming to DITOs requirements for evaluation and dissemination and translating those requirements into practice in contextualised environments for each partner organisation. This is explained in more detail in our initial results (section 6.3) below.

5.6 Evaluation procedures

This sections lists the indicators and criteria reviewed and in consideration for subselection in Phase 2 of the project. This section also presents the timing and deliverables as per our GA.

5.6.1 Indicators and criteria

The original considerations for criteria and indicators identified in our GA were *inclusion, accessibility, and equality*; science learning and creativity; and level of engagement. Initial review of the literature focused on monitoring and evaluation of public engagement in science and technology and RRI (section 4.1.3), including the EC report on RRI criteria and indicators, the White Paper on Citizen Science by the project Socientize, the PLACES toolkit, EU FP7 project Citizen Cyberscience, The User's Guide for Evaluating Citizen Science Learning Outcomes (2014), among others. This literature, combined with iterative feedback from partners, shaped the selection of criteria and indicators presented below in Table 4.2. As seen from Figure 4.1 above, we have narrowed in on four criteria with a strong focus on RRI as one of the aims of DITOs is to promote "wider and deeper public participation in science and awareness of RRI". The selected criteria are: **public engagement**, **gender equality**, **science learning**, and **social inclusion**.

Table 5.2 Selection of criteria and indicators for DITOs evaluation

Criteria	Dimensions of criteria	Performance indicators		Perception indicators	Key actors
		Process indicators	Outcome indicators		
Public engage-ment	Policies, regulations & frameworks	Commitments by institutions & organisations to PE*	Changes in agendas / organisational practices as a result from PE*	Public interest in impact of science & technology* Public expectations of engagement in decision-making processes*	Local authorities* Funding agencies* PE organisations / establishments** Educational & research institutions* Partner organisations Civil society organisations** Practitioners & their institutions/companies* Community groups & organisations* Individuals from the general public
	Science initiatives & events	Number & type of Initiatives Number & types of locations for science events	Number of visitors / participants at activities Types of visitors / participants Social media coverage	Perceived 'level' of participation/contribution** Attitude toward facilitator & organisaton*	
	Capacity building	Number of facilitators / science communicators Current experience & training opportunities for facilitators*	Number of collaborations & types* Number & type of participant-initiated/led activities* Number & types of skills developed by participants & facilitators*	Understanding of science & technology* Attitude towards science & technology* Attitude towards their own abilites**	

			Costs of (increased) organisational capacity**		
Gender equali-ty	Equal participation of males and females	Gender equality commitments / frameworks*	Percentage of women attending events Percentage of women in Advisory Boards Percentage of women facilitators & collaborators*	General perception of gender equality issues in science & technology Perception/awareness of gender equality efforts / initiatives in science & technology* Perception/awareness of gender equality issues in science & technology relevant to their own lives*	
	Gender perspective on science & technology content	Number & type of events discussing gender dimension in science & technology*	Percentage of women initiating/leading citizen initiatives* Percentage of women sharing feedback**		
Science learn-ing	Organisational scientific capacity	Capacity building initiatives at the organisational level*	Methods for science learning at the organisation level**	Level of ownership over science learning** Level of creativity in science activities**	
	Scientific capacity of the public	Strategies for science-learning outcomes at events**	Skills gained*		
Social inclu-sion	N/A	Considerations/strategies for: addressing access issues from disadvantaged social groups; ethical issues and values in the design, development and implementation of activities; benefits from activities; design of communication and outreach strategies* Number of stakeholders who actively review/show interest in research results that have an impact on social justice**	The percentage of activities: delivered in accessible locations**; modified to address issues of social justice and inclusion**; and that may have unintended negative effects on social justice* The percentage of participants attending events from disadvantaged groups**	Level of importance given to social justice/inclusion* Level of organisational importance & commitment given to development of methodology & implementation of social justice/inclusion strategies* Public belief on the positive & negative impact of activities*	

*For further development in Phase 2

** For further development in Phase 2 and currently have the methods to monitor these

Public engagement

The focus of PE has shifted from 'the need to educate for public acceptance of science' to public participation in shaping and gaining from science. In R&I at the EU level this

has translated into "deeper forms of engagement in science and technology, where citizens are peers in the knowledge production, assessment and governance processes". This criterion was selected for its relevance to the commitments by DITOs.

Process indicators

- **Commitments by institutions and organisations to PE**: These may be embedded in organisational' structure (e.g. mission statements and goals or their types of projects/programmes they hold or plan). This indicator also includes the type as well as the number of commitments and its source (e.g. linked to funding commitments, political environment, social pressures, etc.).

- **Number and type of initiatives**: These include those outlined in the DITOs GA as well as additional activities (not in GA) developed by partners or participants as the project progresses. The development of these (e.g. motivations, conditions, duration of a sample of these will also be captured using action research and ethnographies).

- **Number & types of locations for science events**: This captures where events are held and includes the kinds of environments where these take place and that these events create. The information on location is obtained from facilitators; the environment is obtained from both facilitators and participants through interviews.

- **Number of facilitators / science communicators**: These are the people - however, it is recognised that these people are also supported by others 'behind the scenes' (see next indicator).

- **Current experience & training opportunities for facilitators**: The DITOs proposal included team competence profiles, however, as the project progresses additional skills may be gained either through the iterative learning process or by purposefully receiving skill training. This indicator also includes the resources available to the facilitators incl. space, other staff helping 'behind the scenes' with administrative tasks, etc.

Outcome indicators

Many of these occur gradually and rea easy to 'take for granted' by organisations and individual facilitators. Keeping track of this does not only help to determine project progress but also builds organisational awareness and memory.

- **Changes in agendas / organisational practices as a result from PE**: This may be a medium-term outcome and/or brought on gradually, hence, a precise number and type might not easily obtained. However, organisational adjustments based on e.g. needs/opportunity assessment linked to public/participant input should be tracked to tell the trajectory of the organisation's development. As above, these will be captured using action research and ethnographies.

- **Number of visitors/participants at activities**: Tallied at events and reported through our 'events journal' tool.

- **Types of visitors / participants**: This includes education attainment level, age group, current level of engagement in science-related activities, main occupational group (see 'Participant satisfaction' template in section 5.2). Gender addressed in Gender criterion. DITOs has a commitment to engage with underrepresented sectors of society, hence the challenges faced and strategies developed by partner organisations to target and include these sectors (e.g. "Take the activities to their neighbourhoods") - along with what worked and did not work - should also be recorded as these feed directly into and guide good practice.

- **Social media coverage**: This includes the regular social media channels managed by consortium partners and should also include blog posts/articles/tweets/etc. written by participants.

- **Number of collaborations and types**: This includes existing and new collaborations over the course of the project. The collaboration type includes interdisciplinarity (e.g. partner collaboration with technologists, activists, artists, scientists, practitioners, policy-makers, etc.), extent of collaboration (e.g. consultation, co-design of activities, outsourcing, etc.), length of collaboration (e.g. one-off, long-term), result of collaboration (e.g. how-to manuals, articles, blog post, and longer term new projects, etc.).

- **Number and type of participant-initiated/led activities**: While these might vary in type and extent, they should be acknowledged and celebrated. Within their contexts, partner organisations should follow the cases of participant-initiated/led activities to encourage them by e.g. understanding their sources and needs (this can lead to further capacity development on the part of the participant, the facilitator, and the organisation). This indicator also aims to capture over time how these initiatives develop (are they temporary, goal-oriented, intended to be longer-terms, etc.).

- **Number and types of skills developed by participants & facilitators**: Linked to the above indicator, this includes tacit knowledge gained from practice. This is captured through iterative learning through action research. This indicator also includes the organisational changes carried out to support the new skills (e.g. group debriefs, increase in space to run events, application to new grants, etc.).

- **Costs of (increased organisational) capacity**: As these engagement activities are intended to be sustainable after the end of the project, information about the actual costs of developing and maintaining these is an important consideration. One way to explore this is by looking at budget allocation; another is by enquiring how much participants are willing to pay for such events - the difference between these can shed light on the needed cost to be covered by other means. This is useful information for funders and decision-makers.

Perception indicators

These can be indirectly obtained from surveys. However, we encourage partners to obtain a sense of both participants and facilitators' expectation through one-on-one or group discussions.

- **Public interest on impact of science & technology**: These are very general perceptions but point to the broader interests of the public - hopes, concerns, and aspirations from science and technology (range from intellectual curiosity to active engagement in activities (following news, attending events).

- **Public expectations of engagement in decision-making processes**: This involves various levels of decision-making - from organisational to governmental. However, the EC RRI report warns that "absence or declining public expectations of being involved might be an indicator of the acceptance of technocracy" (p.X).

- **Perceived 'level' of participation/contribution**: These can be juxtaposed to Arnstein's 'Ladder of Participation' (Figure X.X) and mostly be obtained in an atmosphere of trust, where participants feel able to free share how they engaged / got out of their experience. This also points to the local science culture within which the organisation and/or participant operate.

- **Attitude toward facilitator and organisation**: This will have an effect on the engagement of the participants (e.g. perception of facilitator's competence (even perceived charisma, enthusiasm, and commitment to science), adequacy of facilities, status of organisation, etc. As above, these perceptions will more likely be shared in an atmosphere of trust and when participants know how their answers will be used.

- **Understanding of science**: We base this directly on EC (2015) classical indicators for public understanding of science "knowledge of science in terms of textbook facts, methodological processes and awareness of and beliefs about institutional functioning" and it applied to both facilitators and participants. However, they also note that "knowledge is not a driver of positive attitudes but a cognitive component of public perceptions" (p.X).

- **Attitude towards science**: Includes the perception of science in broaders terms (e.g. social gains from science and technology - medicine, environmental protection, etc.), relevance or science to daily lives, etc.

- **Attitude towards their own abilities**: This is for participants, facilitators, and organisations as a whole - it points to a level of (self-)confidence and acknowledgement of abilities, aspirations, and limitations. Limitations can be technical but may also be attitudinal. This indicator also aims to capture facilitators' and participants' lessons learnt, openness to change, willingness to share thoughts on room for improvement, etc.

Gender equality

The EC literature on gender equality in the context of RRI policy identifies two dimensions: promoting the equal participation of men and women in research activities (the human capital dimension); and the inclusion and integration of gender perspectives in R & I content (Strand et al., 2015, p. 27).

The literature on RRI pinpoints several obstacles in advancing the gender equality agenda: decision-making processes that reinforce status quo ; formal and informal institutional practices and organisational culture (which often hide unconscious bias against women); unconscious gender bias in the assessment of issues and definition of problems/identification of solutions; lack of recognition of the LGBT perspectives in design, definition, and problem-solving in science and technology and public engagement.

The EC (Strand et al., 2015) report on RRI criteria/indicators recommends that the focus for gender equality should be on processes of institutional change to see whether general ambitions for equality and inclusion are translated into concrete forms of action.

Process indicators

- **Gender equality commitments/frameworks**: This includes formalised practices and specific actions towards recognising and minimising discrimination and advantage of one sex over another, or commitments towards change; documentation of good practice toward gender equality; training/support for gender equality actions.

- **Number and type of events discussing gender**: This includes events specifically designed to have a dedicated space to discuss gender issues/opportunities in science or that promote the discussion of the role of gender in science and technology.

Outcome indicators

- **Percentage of women attending events.**

- **Percentage of women in Advisory Boards.**

- **Percentage of women facilitators & collaborators.**

- **Percentage of women initiating/leading citizen initiatives**: This includes leading discussion, raising issues and actively taking part in shaping events, starting their own initiatives/events (as part of or outside of the project).

- **Percentage of women sharing feedback** (surveys & interviews): The female voice in understanding the performance of the events and project as a whole

should be captured through surveys and one-on-one exchanges - what is relevant to them, what is of interest, what is missing, etc. in terms of content.

Perception indicators

- **General perception of gender equality**: this includes perceptions at the social, organisational, group, and individual level.

- **Perception of opportunities for women in science**: for themselves, for youth and younger generations (tells about perception about the future trajectory of gender equality), in their lives (incl. work environment).

- **Perception of gender equality efforts**: in society, science-related organisations, at DITOs events.

- **General perception of gender equality issues in science & technology**: These are more likely to be shared if there are dedicated spaces to explore and discuss them during activities. Group discussions might raise awareness and invite sharing of ideas/concerns. Some of the issues that initially arise might be contentious and therefore good moderation is advised.

- **Perception/awareness of gender equality efforts/initiatives in science & technology:** These are efforts both at the social level as well as the organisational level - the event itself - did women feel they had an equal experience, where some gender biases debunked, etc. Answers to these can be obtained from one-on-one interviews following a group discussing, which 'breaks the ice' on gender issue discussions.

- **Perception/awareness of gender equality issues in science & technology relevant to their own lives**: Do participants feel that the gender question or role of gender equality in science and technology is relevant to their everyday life?

Science learning

Although there is an overlap between science learning and capacity building in PE (above), the latter is focused on planning and delivery of events, whereas the former is focused on providing participants, facilitators, and organisations with the capacity to engage in science and technology. These are the specific skills and techniques shared and (co)developed to engage in citizen science. For DITOs these are for the most part informal science education initiatives and the two dimension for this criterion are organisational scientific capacity (partner capacity to plan/deliver science learning) and scientific capacity of the public (the gains from science learning in the public sphere).

Process indicators

- **Capacity building initiatives at the organisational level**: How do facilitators prepare for their science activities (what training, sources, guidance do they use); how are they supported (infrastructurally (on and off-line), in terms of content and resources, etc.); what learning plans are in place (e.g. scientific procedures, philosophical orientations, technical issues, learning methodologies, etc.).

- **Strategies for science-learning outcomes at events**: What are the approaches/methodologies employed by partners to promote science learning during the event. How are existing skills/expertise of participants recognised/harnessed? A baseline of methodologies have been collected by leads from WPs 1 and 2 (see D1.1 and D2.1). Each partner organisation has over the years developed various engaging forms of informal science education. They have employed multiple tools and methods and lengths of time to enable skill development. In this evaluation we will gather these together with leads from WPs 1, 2, and 3 to create a collection of good practice in informal science learning initiatives.

Outcome indicators

- **Methods for science learning at the organisation level**: These are shareable methods as above, for DITOs partners and beyond.

- **Skills gained**: Type of skills gained by participants. These include both those expected (outlined in the event description) and unexpected learning. These can be obtained through surveys as well as through one-on-one interviews with participants over time to follow their journey - this allows time for the skills to be 'transferred' to their everyday lives/work.

Perception indicators

- **Level of ownership over science learning**: Do participants/facilitators feel they have gained skills? Do they feel these skills are relevant/transferable/replicable? In the long run do they feel they have gained (local) expertise, that they are able to engage with scientific experts, participate in the decisions about their local environment, etc.?

- **Level of creativity in science activities**: to what extent do participants/facilitators feel they were able to engage creatively (verbally, hands-on).

Social inclusion

Grassroots organisations such as the Public Laboratory for Open Technology and Science, whose values rest on inclusion and social justice consider successful initiatives those that engage the public not as consumers but as co-producers of shared, open-source knowledge and technologies. They also see that knowledge and those technologies applied to real world problems to create change (Public Lab, 2011). Issues of social justice and social inclusion require deep social and political

considerations and are at the root of our democratic values. However, as Haklay (2013) asks of claims to the democratising power of participatory technologies: "what is the nature of this democratisation and what are its limits? To what extent do the technologies that mediate the access to, and creation of [...] information allow and enable such democratisation? While DITOs activities aim to make science tools and techniques more accessible, address exclusion of marginalised groups, gain access to information and find ways to make positive changes in their lives, following how these aspirations translate into actual benefits and for who is a challenge. Ethnographies are particularly useful to capture the greater implications of these aspiration and their impacts.

Process indicators

- **Strategies for addressing access issues from disadvantaged social groups**: Number and type of strategies for e.g. the disabled, illiterate people, migrants, elderly people, single parents, etc.

- **Considerations/strategies of ethical issues and values in the design, development and implementation of activities**: This includes a tally of existing and development of strategies for the use of technologies/methodologies (are these affordable/accessible to the participating population), issues/topic discussed (are there multiple interpretations/perspectives, are these contentious (and how is it moderated), are there resolutions/follow ups?), suitable event times and locations (provisions such as day care or meals). As above, a baseline compendium of partner good practice and challenges was collected and is presented in D1.1 and D2.1.

- **Considerations/strategies of benefits from activities**: This includes a tally of mechanisms to determine/analyse who benefits, who does not, can there be a negative impact on individuals or groups? E.g. existing or building of links to local authorities and industry to address issues of long-term engagement and sustainability for those who do not have the luxury of 'free time'.

- **Considerations/strategies for the design of communication and outreach strategies**: These have been in part addressed in D6.4 Self-assessment plan. These include a tally of the existence of those stated in our GA such as links to existing groups and organisations that already engage with disadvantaged groups (and how those links are maintained), consideration for language/cultural barriers, etc. It also includes the measurement of new strategies and considerations developed throughout the project.

- **Number of stakeholders who actively review/show interest in research results that have an impact on social justice**: E.g. AB members, collaborators, external researchers, community leaders, etc.

Outcome indicators

- **The percentage of activities purposefully delivered in accessible locations**: e.g. at community centres.

- **The percentage of activities purposefully modified to address issues of social justice and inclusion**: e.g. translated methodologies and techniques, linked to the needs of a specific community, etc.

- **The percentage of participants attending events from disadvantaged groups**: This includes inquiring how these participants found out about the event.

- **The percentage of activities that may have unintended negative effects on social justice**: (e.g. activities that benefited for only small portion of the general population or created additional barriers).

Perception indicators

- **Level of importance given to social justice/inclusion by organisations, facilitators, the public**.

- **Level of organisational importance and commitment given to development of methodology and implementation of social justice/inclusion strategies**.

- **Public belief on the impact of activities** on (a) actively promote/contribute to achieving social justice/inclusion and (b) have a negative effect on social justice. These can help identification of good and bad practices. The EC (2015) notes that the indicators for social justice/inclusion require substantial resources to be monitored and thus need to be considered accordingly. Much research in this area of monitoring is still needed - one that also weighs claims against real impact.

5.6.2 Timing and deliverables

The timings for WP5 deliverables remain as outlined in our GA

Deliverable Number [14]	Deliverable Title	Lead beneficiary	Type [15]	Dissemination level [16]	Due Date (in months) [17]
D5.1	Evaluation terms of reference and templates	11 - eutema	Report	Public	6
D5.2	Phases 1 and 2 project evaluation	11 - eutema	Report	Public	15
D5.3	Final evaluation report	11 - eutema	Report	Public	36

The procedures and timings of the evaluation are outlined in D6.4 (Self-assessment plan) sections 5 and 6.

5.7 Resources and evaluation team composition

The evaluation team is led by eutema in collaboration with UCL. eutema carried out the initial planning and preparation of the discussions at the kick-off event with all partners. This included the joint design of logic charts (in close collaboration with the management work package). eutema also contributed a preliminary analysis of reporting requirements and a draft plan for the current approach to evaluation in different levels. A meeting of eutema and UCL in London served to clarify important components of the evaluation such as the role of participatory evaluation.

In Phase 1 UCL carried out one-on-one interviews with consortium partners who had DITOs activities planned and delivered in Phase 1 only. Together with eutema, UCL also designed satisfaction questionnaires and followed up with each partner on the contributions by each partner on the Events diary. The latter overlaps with WP6 management duties. In Phase 2 UCL will continue perform one-on-one interviews with partners (as part of the formative evaluation). However, these will move from bi-monthly to monthly intervals. UCL will also begin ethnographies in Phase 2. The main evaluation team in UCL are Cindy Regalado and Christian Nold. The main evaluation team at eutema included Erich Prem and Jörg Irran. Overall, eutema have 20 PM and UCL have 15 PM allocated to WP5, all other partners have 2 PMs for WP5.

6 Evaluation templates: tools and evaluation instruments

This section presents the characteristics of the evaluation templates used in Phase 1 of DITOs: the Events diary, the Satisfaction questionnaire, and the action research interview guide. Samples of templates are presented in Appendices 9.2 to 9.4.

6.1 Events diary

The Events diary is a tool to maintain a quick and concise overview of the DITOs outreach and engagement actions. It is a living document shared online between all partners (see Appendix 9.2 for a sample of the template). It lists the following fields for each event:

- Partner name;
- Name of event;
- Description in the contract (DoA description);
- Brief description (in particular for non-DoA described events);
- Status (planned / completed / cancelled);
- Start day, month, year;
- Event type;
- Audience number;

- Percentage female;
- Work package;
- Name of partner organisation and facilitator person;
- Participant age bracket;
- URL 1, 2 and 3;
- Total amount funding used;
- Event postcode, town;
- Duration of the event;
- Event ID;
- Reporting period; and
- Phase (for which the event was planned).

These categories were selected on the basis of reporting requirements from the EC and ERIO and were refined based on the literature and workshops with the evaluation and management teams. As mentioned above, some categories were also added as a request from partners to gather data for their own needs (e.g. the citizen science map by UNIGE).

6.2 Participant satisfaction questionnaire

Participant satisfaction questionnaire is used to gain insights in the impact of the DITOs events (see Appendix 9.3 for a sample template). As mentioned in previous sections, the design of the template in Phase 1 is based on review of event evaluation forms in use by consortium partners (past and present). One of the main criteria for inclusion of questionnaire questions is that they must include properties that are distinctive and comparable across partners (e.g. "Overall, how satisfied were you with the event" with a 1-5 scale.)

The quantitative categories used in the Phase 1 iteration of the template are:

- Event name and date;
- Overall satisfaction level;
- Level of interaction;
- Participant background (what group they represent);
- Highest level of education attained;
- Level of current engagement in science activities;
- Frequency of internet use;
- Gender; and
- Age group

The gathering of this numerical data also provides us with ‘number of responses’, which can aid in pinpointing initial issues with either specific survey questions and/or the way the evaluation is presented to/asked of participants. More on this in sections 6.3 below.

The qualitative questions for Phase 1 were selected on basis of simplicity; the general wall known formula “*what did you like the most, what did you like least, and what would you change*” was decided on in consultation with consortium partners.

An additional question “. Two additional questions were included to gain insight into participant experience: "*What is your take-home message from this event? (E.g. what topic(s) you found most interesting)*" and "*Comments / suggestions of themes for future event*". Some additional questions were added to tailor the evaluation to specific events (see Appendix 9.3.1).

As part of the design of the template, the evaluation team proposed experimenting with the satisfaction questionnaire as a way of creating an equal basis for evaluation: the template is to be filled out by participants and facilitators alike.

6.3 Action research interview guide

The interview guide focuses four main themes: relations with other organisations/groups; the event/activity in question; the facilitator; and the audience. Sample guiding questions include:

- What links and collaborations are formed?
- How are activities planned and implemented?
- What role does the facilitator play in shaping the activity (inspiration, lessons learnt, motivation, internal pressures, etc.)?
- What was the environment of the event, who was there, who was missing?
- What strategies are in place or are planned to improve the activities?

The one-on-one interview with partners aims to be more of a conversational exchange than an interrogation. However, the interview questions serve as a guide to 'keep on track' and thus respect partner's time. The complete guide can be found in Appendix 9.4.

7 Preliminary analysis pilot

This section presents the preliminary analysis framework from the evaluation – we show how we use the results from applying the templates and how we are going to present them. Level 1 results are from the use of the evaluation templates: numerical data from the Events diary, questionnaire data from the ‘Participant satisfaction’ template, and Action Research results. Level 2 are from evaluating the evaluation.

When interpreting the results, it is important to keep in mind that the first six months meant starting-up the project, although events were already organized in the first month of the project. Therefore, there are gaps in the tables documenting the first period as evens were organized before the terms-of-references for the evaluation (i.e. this document here) could be available. The main purpose of evaluating data at this point in time is to better understand evaluation procedures and their working in practice.

7.1 Level 1: evaluating the project

This section focuses purely on the results from applying the evaluation templates: initial results and considerations for future action in Phase 2.

7.1.1 Numerical data from events

The data as of October 17, 2016 from the events diary shows the following achievements of DITOs in the first project period:

- A total of 43 events have been completed.
- For 38 events audience numbers are available reaching a total of 2733 people.
- Completed event numbers are as follows per work package:
  - Bio/Policy: 2
  - Bio/Public: 31
  - Env/Policy: 1
  - Env/Public: 9
  - Dissemination 1

The data collected thus far can be presented in various formats. Here we present a few options. Classification per event type:

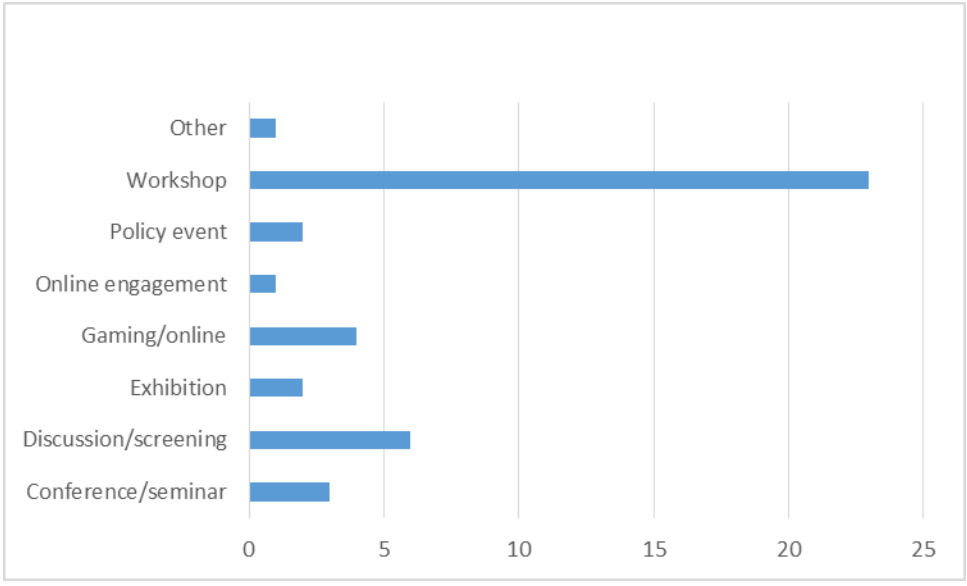


Figure 7.1 Presentation of evaluation results: event type as bar graph. Gives overview of how efforts are targeted.

Event types held (percent total):

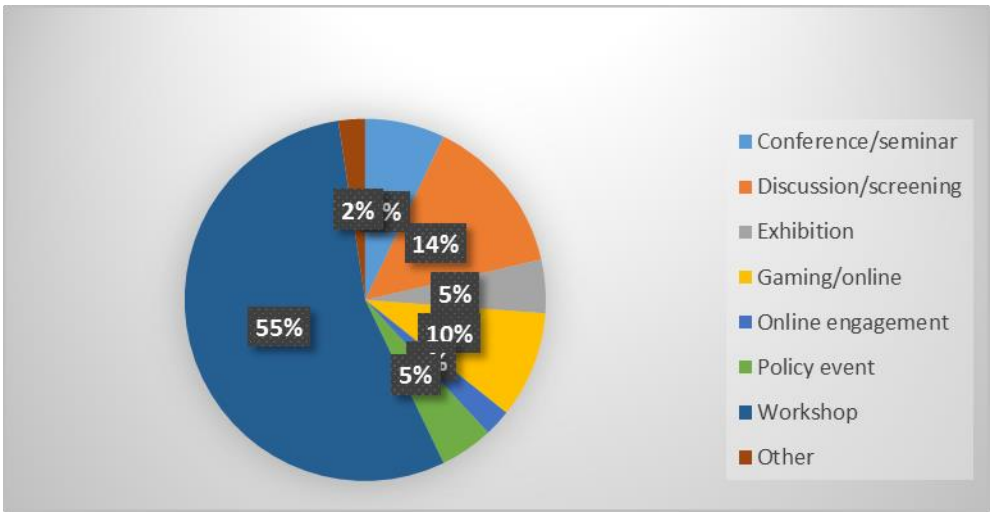


Figure 7.2 Presentation of evaluation results: event type as percentage. Can aid in targeting questions about partners' preferred mode of engagement.

Events held per location:

For 25 events, the event location is specified; distribution is as follows per town:

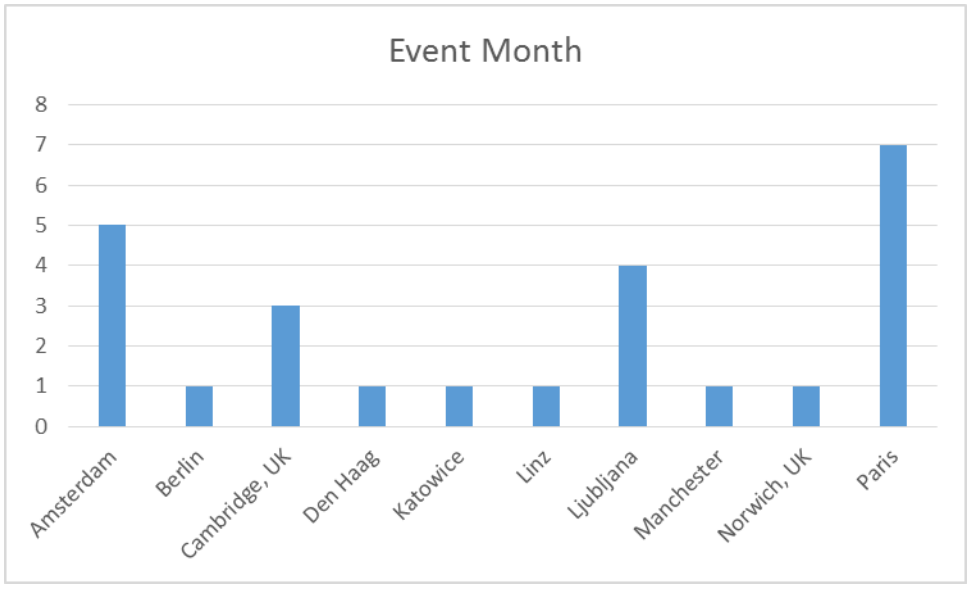


Figure 7.3 Presentation of evaluation results: geographical distribution – per city, as bar graph.

Distribution of events held per country:

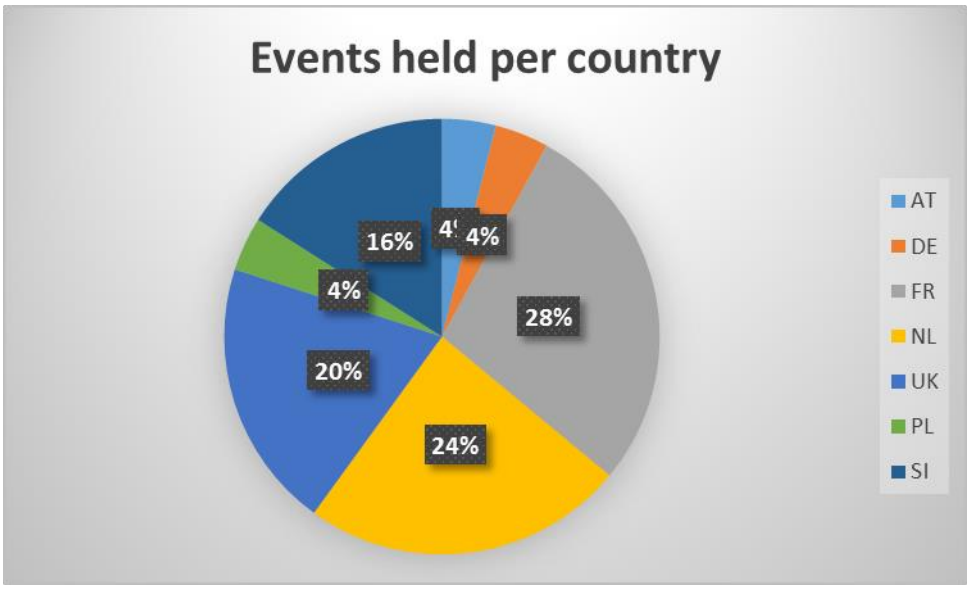


Figure 7.4 Presentation of evaluation results: geographical distribution – per country, as percentage in consortium. Can aid in the visualisation of distribution of efforts.

Events held per month:

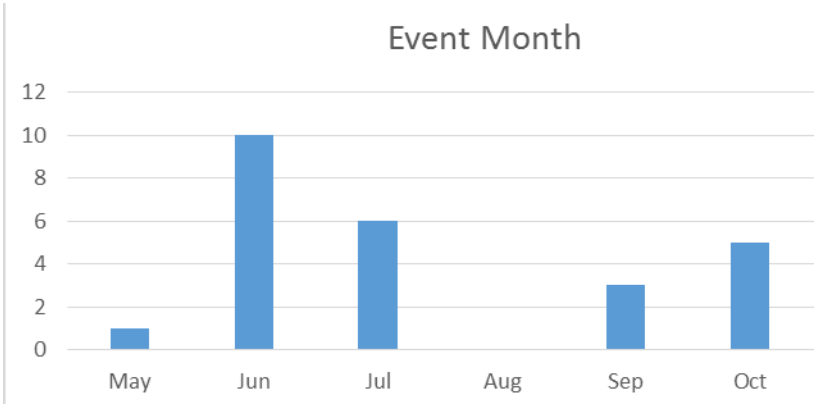
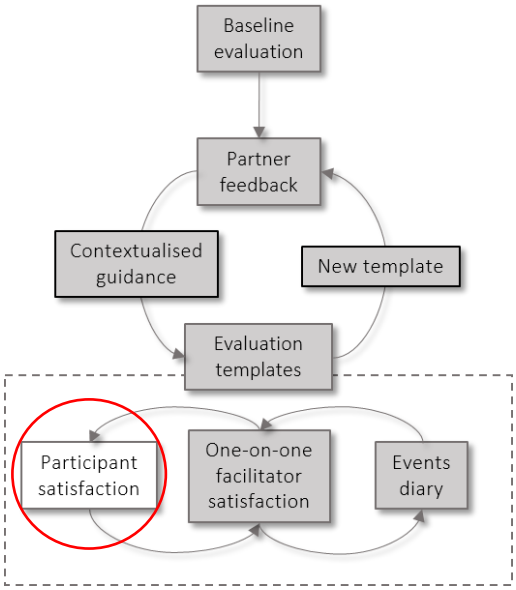


Figure 7.5 Presentation of evaluation results: temporal distribution of events as bar graph. This can aid in analysing the different factors affecting event numbers and/or patterns in event planning.

The 43 events held and 2733 people reached correspond to 8% of the total events planned and to 1% of the expected number of participants. In Phase we will discuss and revise the various approaches to collecting and visualising the project progress information; these will be key in allowing all partners to track their own progress (information pull) and make comparisons with other partners. Coupled with more candid exchanges (using Action Research) we hope these ways of communicating and presenting the project progress will aid in the more strategic planning of and

coordination of events to reach our targets in a way that the passion and quality of these are not compromised.

7.1.2 Questionnaire data



At the end of period one, a total 165 event participants responded to questionnaires distributed for 16 events. Due to the changes in the questionnaire in period 1, summary values are not available for all the questionnaires or all fields of the questionnaire (i.e. the questionnaires filled in by the partners were not comparable in all cases).

Overall, the following characteristics can be observed in the sample:

- The events participants are usually a younger crowd with about one third under the age of 26 and one third between 26 and 35.
- There is currently a good balance of male and female participants taking part in the events.
- About half of the participants have entry level certificates (UK) as their highest education level and quarter have a bachelor degree.
- Nearly half of the participants are students, 21 classify as “general public”.
- The typical interaction level is with “many exchanges” or “everyone got to say/talked to each other” which suggests very interactive events.
- The participants are nearly all very satisfied or satisfied.

For the cases with comparable questionnaires, the data can be presented as follows:

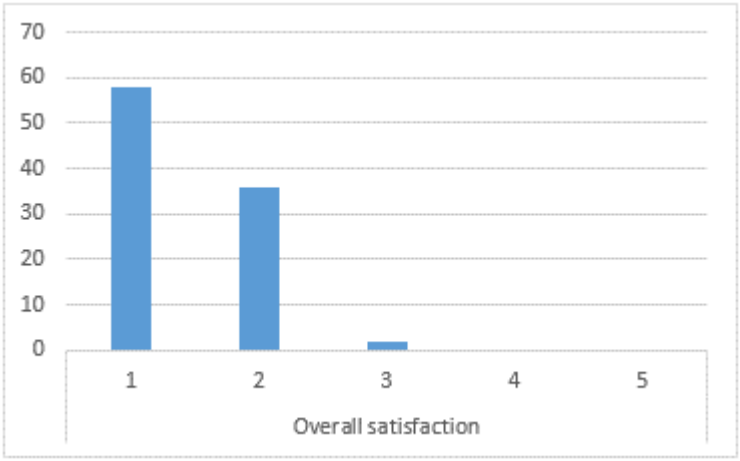


Figure 7.6 Presentation of evaluation results: participant satisfaction as bar graph - 8 events, 94 respondents

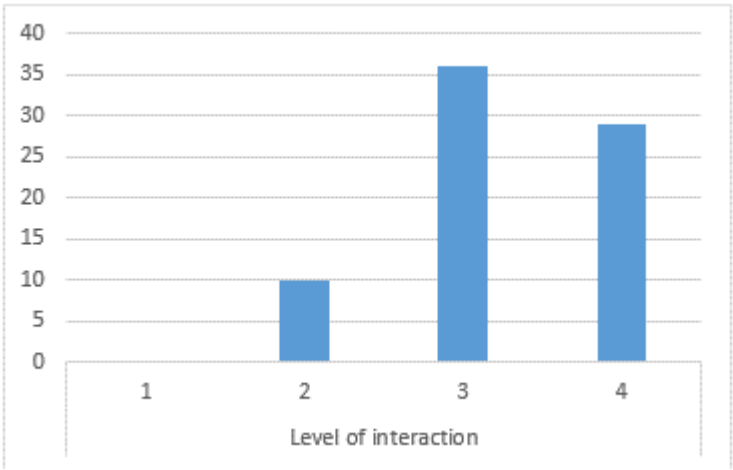


Figure 7.7 Presentation of evaluation results: level of interaction perceived by participants - 6 events, 77 respondents

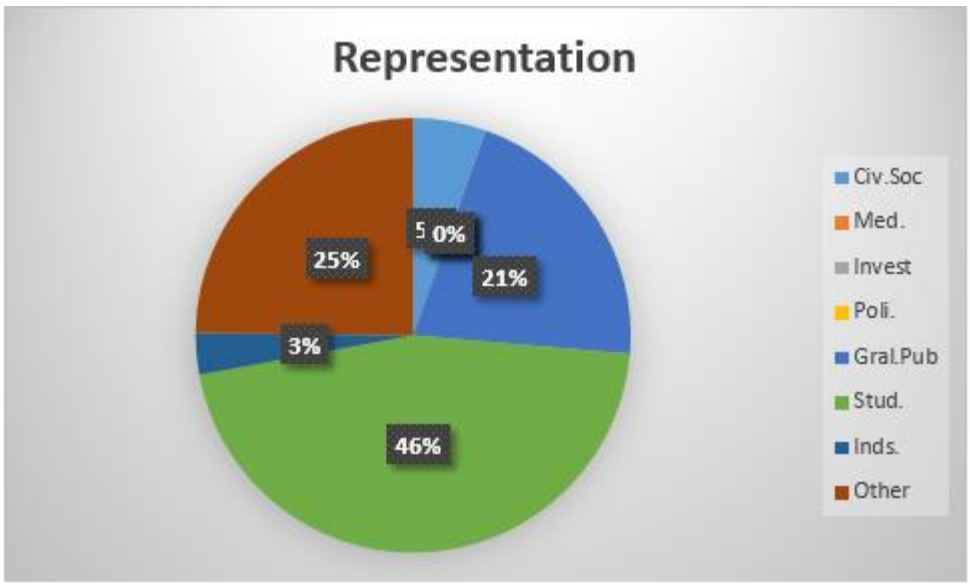


Figure 7.8 Presentation of evaluation results: participant background in occupation percentage of total. Here, the high percentage of 'Other' points to the revision of the question phrasing and answers choices available to choose from.

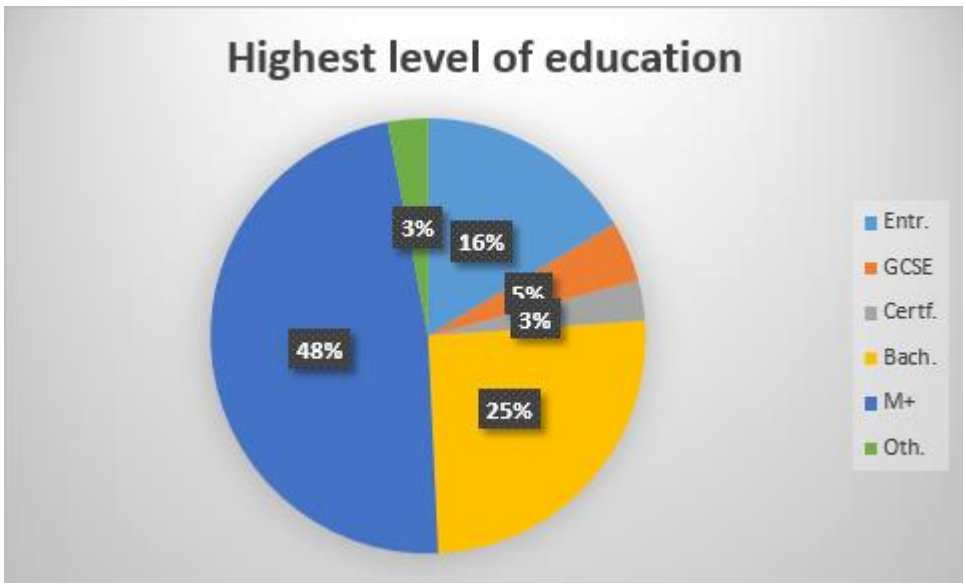


Figure 7.9 Presentation of evaluation results: participant background educational attainment as percentage of total. This visualisation aids readily in identification of population sectors we are yet to reach. This was for 6 events, 77 respondents.

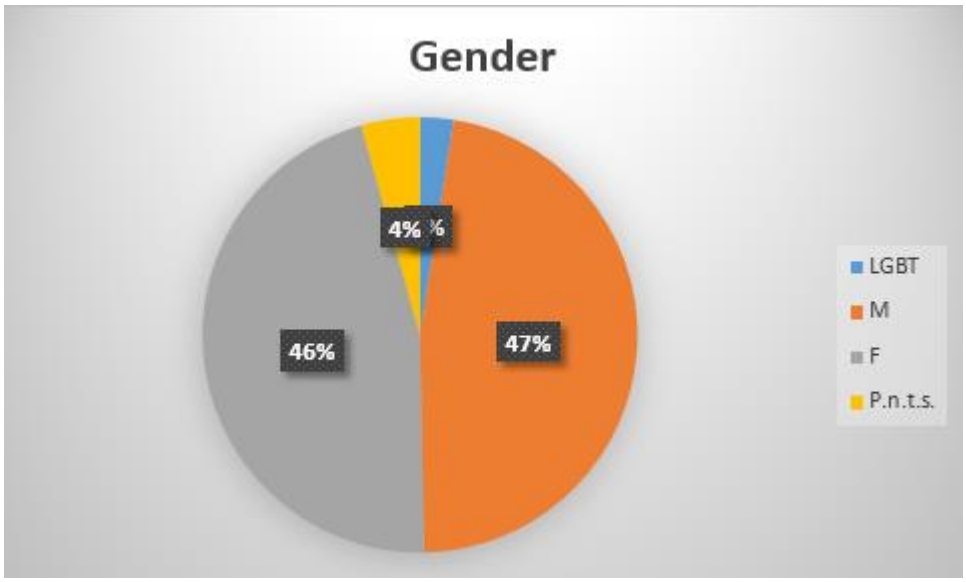


Figure 7.10 Presentation of evaluation results: participant background -gender as percentage of total. This visualisation aids readily in identification outreach to females. This was for 7 events, 104 respondents.

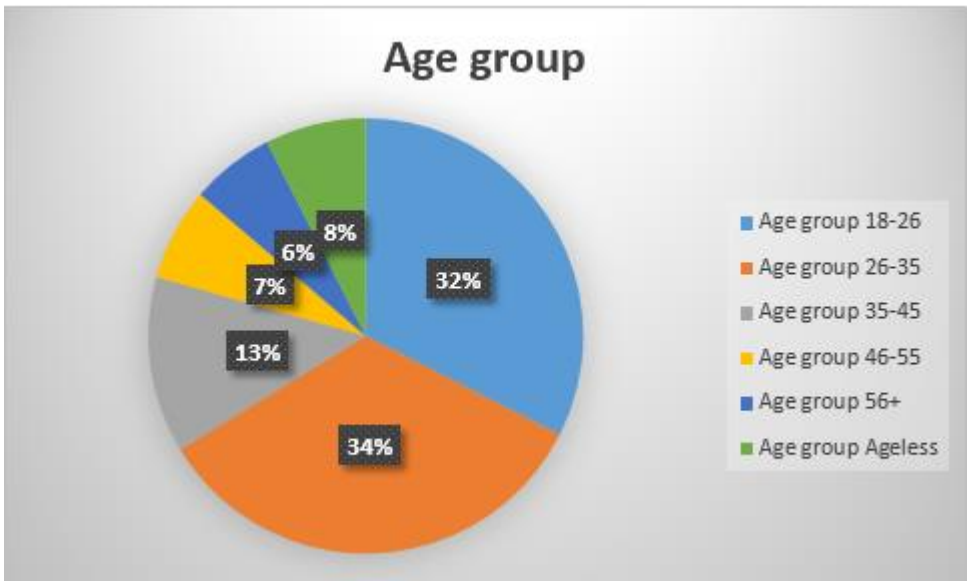
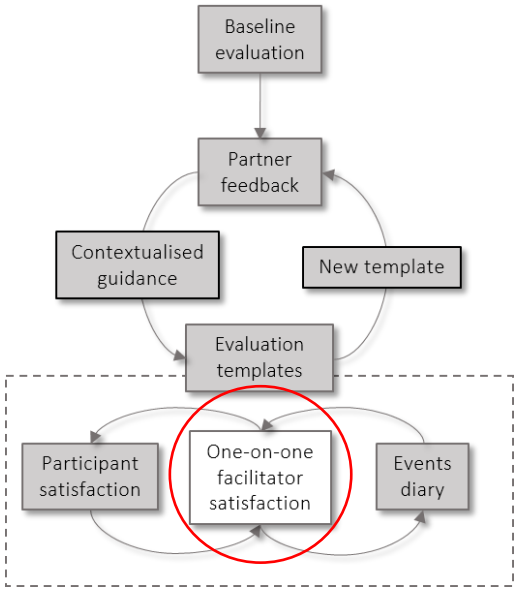


Figure 7.11 Presentation of evaluation results: participant background –age group as percentage of total. Aids in visualising the current participant turn out patterns and to ask questions about outreach and viability of our activities. This was for 12 events, 165 respondents.

As with the representation of the data from the Events diary, we recognise that the visual representation of the results is for the benefit of the consortium partners. We will seek ways in Phase 2 to analyse, cross analyse, and give visual representation to these results in a way that not blindly point to our 'misses' but rather sparks questions and conversations about practice, impact of practice, challenges, and good practices we can share between partners. We also recognise that the nuances in the data need to be openly and candidly discussed and that the data alone cannot speak for itself.

7.1.3 Action Research results

Initial results from interview data reveal various points of commonality between partners. The themes revolve around challenges, strategies for outreach and engagement, facilitators' traits, and issues of conformity.



Challenges faced by facilitators

A main challenge for all partners interviewed is reaching out disadvantaged groups, while most events are attended by highly educated individuals. Another challenge is managing participant expectation, an issue identified as linked to communication. Facilitators report that even when event descriptions detail what is and is not going to happen in an activity, participants will come with different ideas of what is and is not available (e.g. "facilitators will not carry out the experiments for you – rather, they'll give you the skills for you to do-it-yourself"). Facilitators gain experience in being prepared for situations as they arise and try to accommodate participants' needs while guiding them through the activity – to maximise learning and ownership over their experiences. Another notable challenge is working across discourses – between science and everyday life. That is, making scientific language accessible. Linked to this, another challenge is having a clear and easily understood definition of biodesign – one which does not reduce its meaning and potential in the process.

Strategies for outreach and engagement

All partners recognise the value in having various types of events (from exhibitions to cafes and workshops) as a way to reach different audience's expectations/level of interest. Partners adapt their activities to engage participants at various levels: from raising interest in a topic to providing a space for people to carry out their own experiments or talk about sensitive topics.

"Taking the science to them – rather than expecting them to come to us" is the next step various partners have identified to address the issue of outreach in their activities. This goes hand in hand with their ideas about trying out various strategies for communication including various platforms, formats, contexts, and locations.

An essential part of partner planning and scoping has been dedicated spaces for staff reflection on what worked and didn't work. They also point out that dedicated time one-on-one through interviews is a good way to verbalise challenges.

Facilitators' traits

Interviews reveal that various facilitator skills are essential for event planning and delivery. For example, ability to adapt and improvise because "things do not always go as planned". While facilitators are highly critical of their own performance, they also exhibit the ability to acknowledge and promote people's ideas and initiative taking. Being able to 'let go of the plan' enables facilitators to find creative ways to solve problems. For example, in getting people to use methods of science – e.g. fun ways to document experiments using large touchscreens. Facilitator knowledge and skills are currently tacit and there is an opportunity through DITOs to document and share these – which has already begun through D1.1 and D2.1.

Conformity

Partners continuously shared ideas and reflections about changes. One of these is the changes to their satisfaction questionnaire templates. Their suggestions were imbued with local knowledge that reflected the cultural landscape of each partner. For example, it is clear that partners recognise the benefits from obtaining a pan-European perspective – that is, results and methods generalizable across Europe. However, they also acknowledge that there needs to be a balance between conforming to standards and achieving organisational goals (of e.g. inclusion). The latter, it was observed, could jeopardise the initial stages of 'ambience' creation. Through the conversation with partners it was revealed that to be effective, templates for evaluation need more than language translation; they need to be adapted so as to be compatible with the context of the event – especially if the event environment is tailored specifically to enable the discussion of sensitive topics, as in a science café. Much work remains to be done to find ways to gather the data needed to asses events while not disrupting the event itself. Discussion has begun around questionnaire formats (online vs paper) and timeliness (at the event vs a few days after to allow the experience 'to sink in').

These are initial results and by no means comprehensive. Further analysis and follow up with each partner and as a group is needed to gain deeper understanding; through these discussions we will determining the next steps in evaluation and changes in practice / DITOs processes.

7.2 Level 2: evaluating the evaluation

The first phase of DITOs, i.e. the first six months, was an extremely active period for most project partners. It not only included kicking-off the project and starting up the relevant activities, but it also marked the setting up of important initial procedures such as organising the first events within the DITOs context (and 'wrapping our heads around it), and finding ways of collecting relevant background information and practices from all partners. For the evaluation work package this often provided the challenge of having to deal with 'moving targets', i.e. developing a clear understanding of the evaluation objectives while also understanding resources, constraints, practices and objectives of all partners. As mentioned previously, the challenge lies in the large numbers of events planned and the large number of participants, which concomitantly means partner focus is inward to meet targets, which can impact project cohesion.

Overall, the communication within the core evaluation team (UCL and eutema) was very good as was the communication with the consortium. The interviews in the frame of the action research and regarding questionnaires were time consuming, but extremely useful in order to gain insights into the needs of all participants. For the evaluation team it will remain important to develop evaluation procedures in close collaboration with the consortium to ensure moulding to and acceptance by all members of the project.

The end of phase 1 marks an important point for WP5, where a first set-up of evaluation standards is defined. However, it is also apparent that this can only be a first step as several questions are emerging including how to get more targeted qualitative feedback from events and learning from various contextualised partner practices. An example of the latter is learning from the experiences from partners' who struggle with finding a balance between conformity to rigid EU requirements (e.g. with branding and creating inviting and inclusive environments – especially for the Eurosceptic population. An important point that will deserve more attention and will also require dedicated workshops is the precise relation of the logic chart components to the indicators as the project progresses. This may lead to a streamlined version of the logic charts to be used for the evaluation and/or an expansion of observables or indicators. Although the logic charts were massively simplified after the kick-off, they may still involve further stratification.

In addition, the precise delineation of work between management (WP6) and evaluation (WP5) has not been a source of any problems so far. However, we will have to monitor the different demands and objectives of both work packages to avoid duplication or lop-sidedness of workload in the future. We have so far avoided any duplication of reporting from the side of the partners and need to be careful to keep reporting (and evaluation) procedures as simple as possible. It is expected that Phase 2 will result in a more mature and also more general version of the ToR for the evaluation based on experienced gained in the first year of the project. This means that the second six months (M7-M12) will be particularly important for monitoring and evaluating the evaluation.

8 Concluding remarks and further work

This document has summarized the ToR for the evaluation work in DITOs. It establishes a first set of tools for monitoring progress with respect to the DITOs objectives, but also for evaluating a set of indicators and for clarifying the DITOs intervention logic with the help of logic models.

Preliminary analysis and presentation of the evaluation results shows that the project has had a quick start with a first set of events already organised, representing 10% of events planned in total with only 60% of consortium partners contributing to number of events (the rest of the partners are due to begin their full efforts in Phase 2). Further

interpretation of the data will be a task of both the evaluation and management teams in full and open communication to avoid task ‘falling between the cracks’.

For the next project phase it will be important to clarify how to best use and share qualitative data from events (gathered using the participant questionnaire). Storing and summarising this kind of data remains a challenge due to the diverse nature of this information. The issue will have to be further discussed with partners with the aim of drawing good practice from the information collected in the questionnaires.

Perhaps most importantly, Phase 2 of the project will have to be used to improve the relation of reporting, indicators and logic charts so as to arrive at an evaluation model useful for DITOs but also beyond the project to public engagement and citizen science actions in general.

9 References

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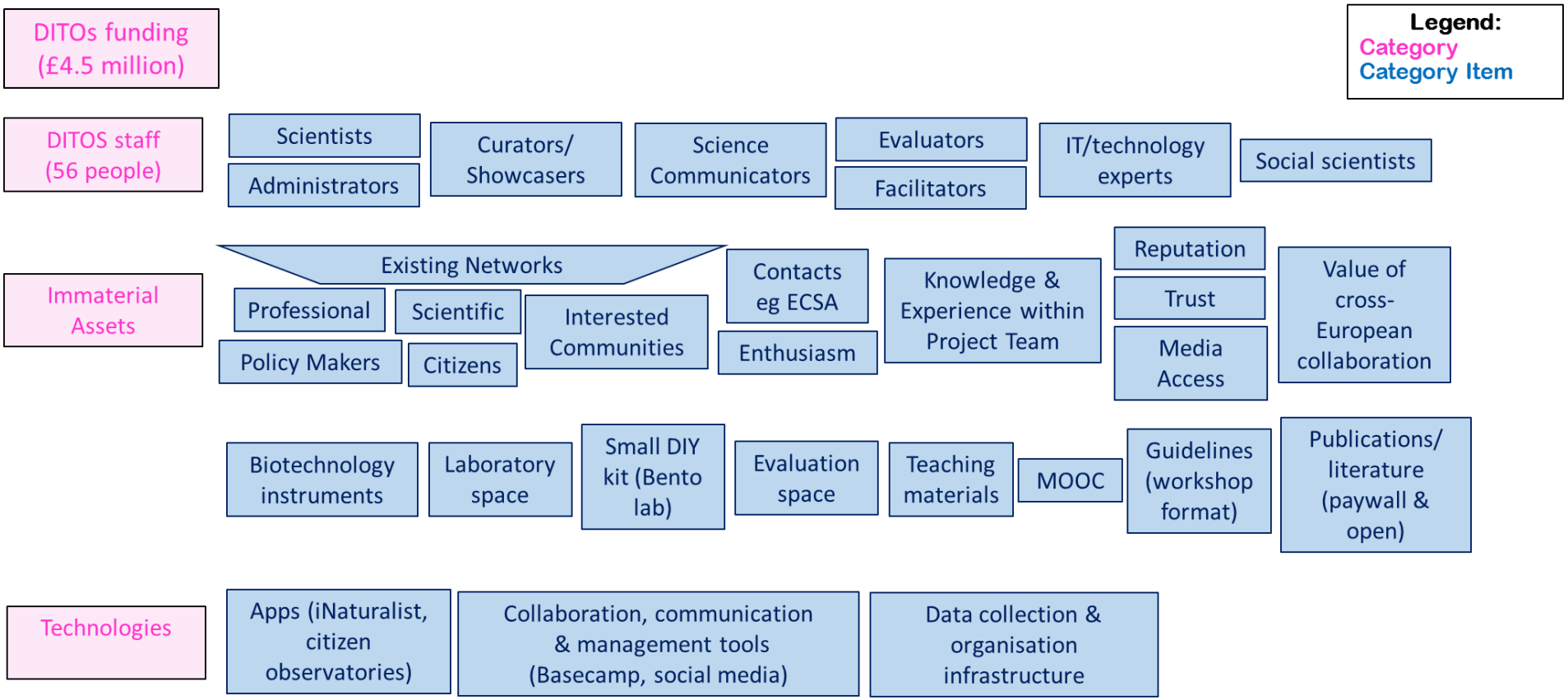
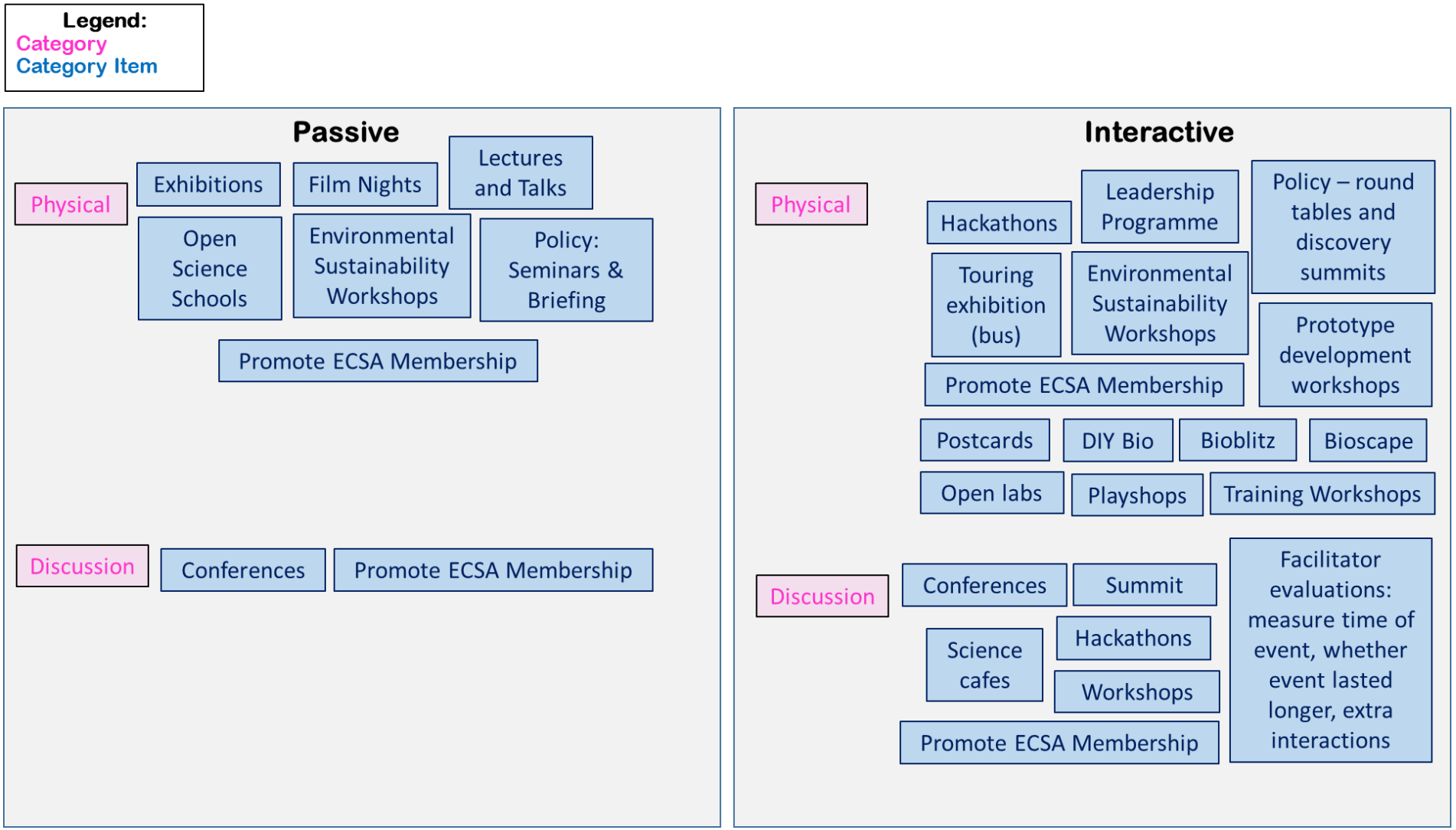
10 Appendix

10.1 Logic model

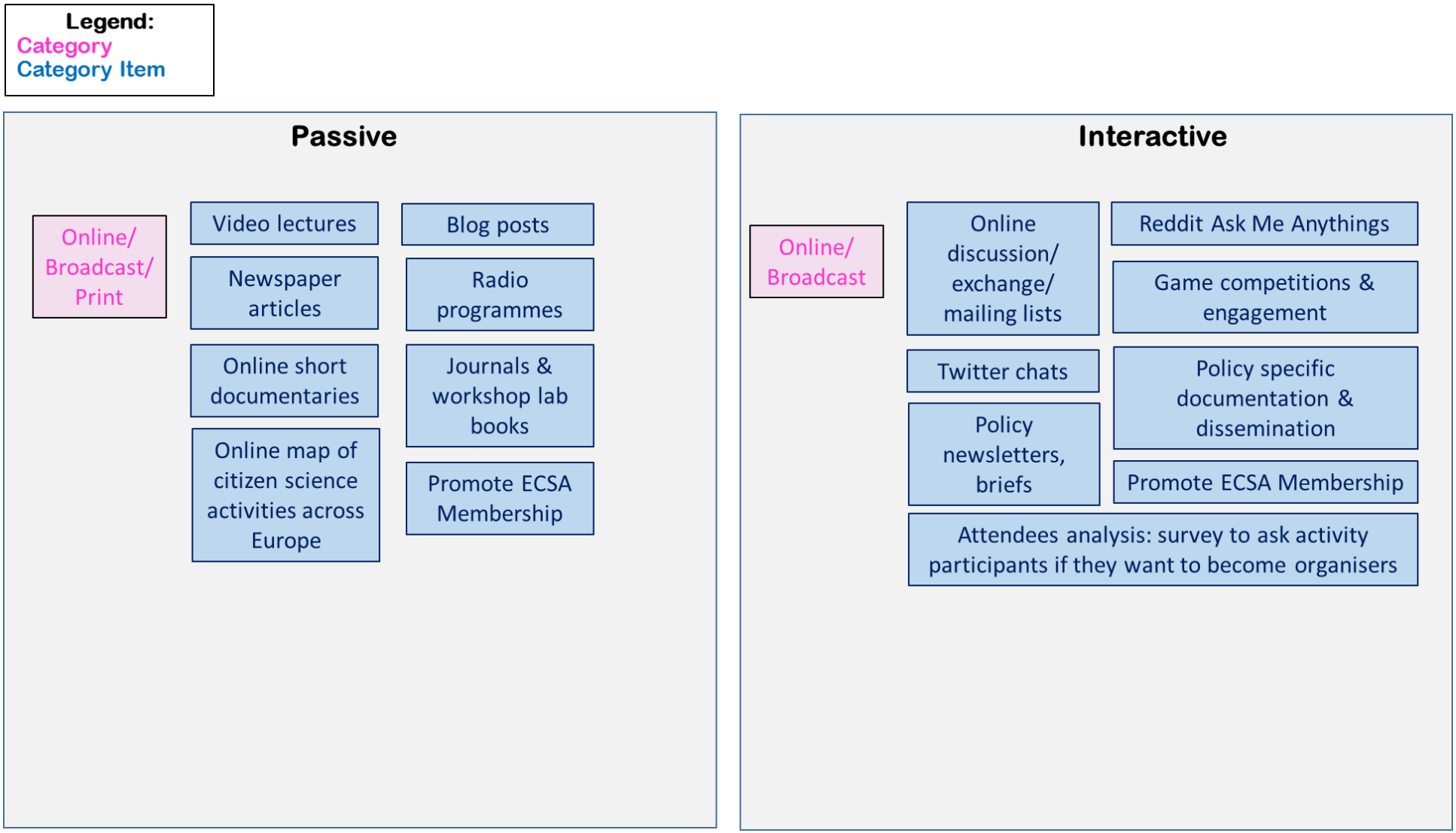
Inputs



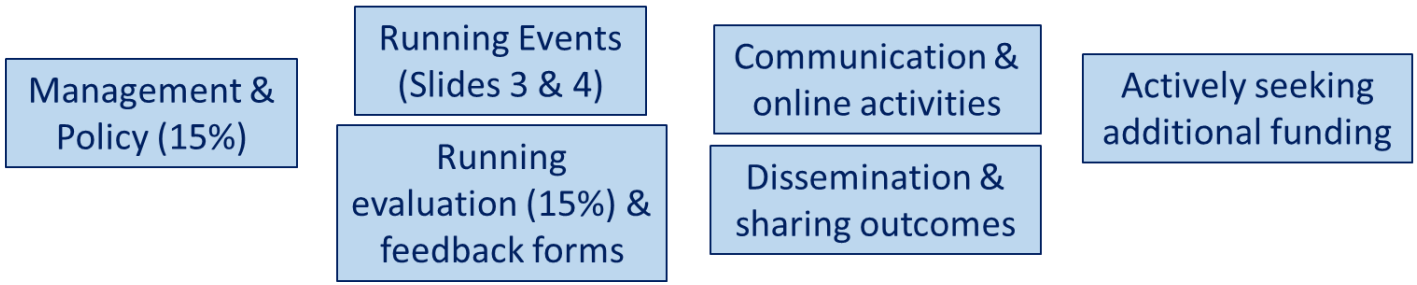
Activities (offline)



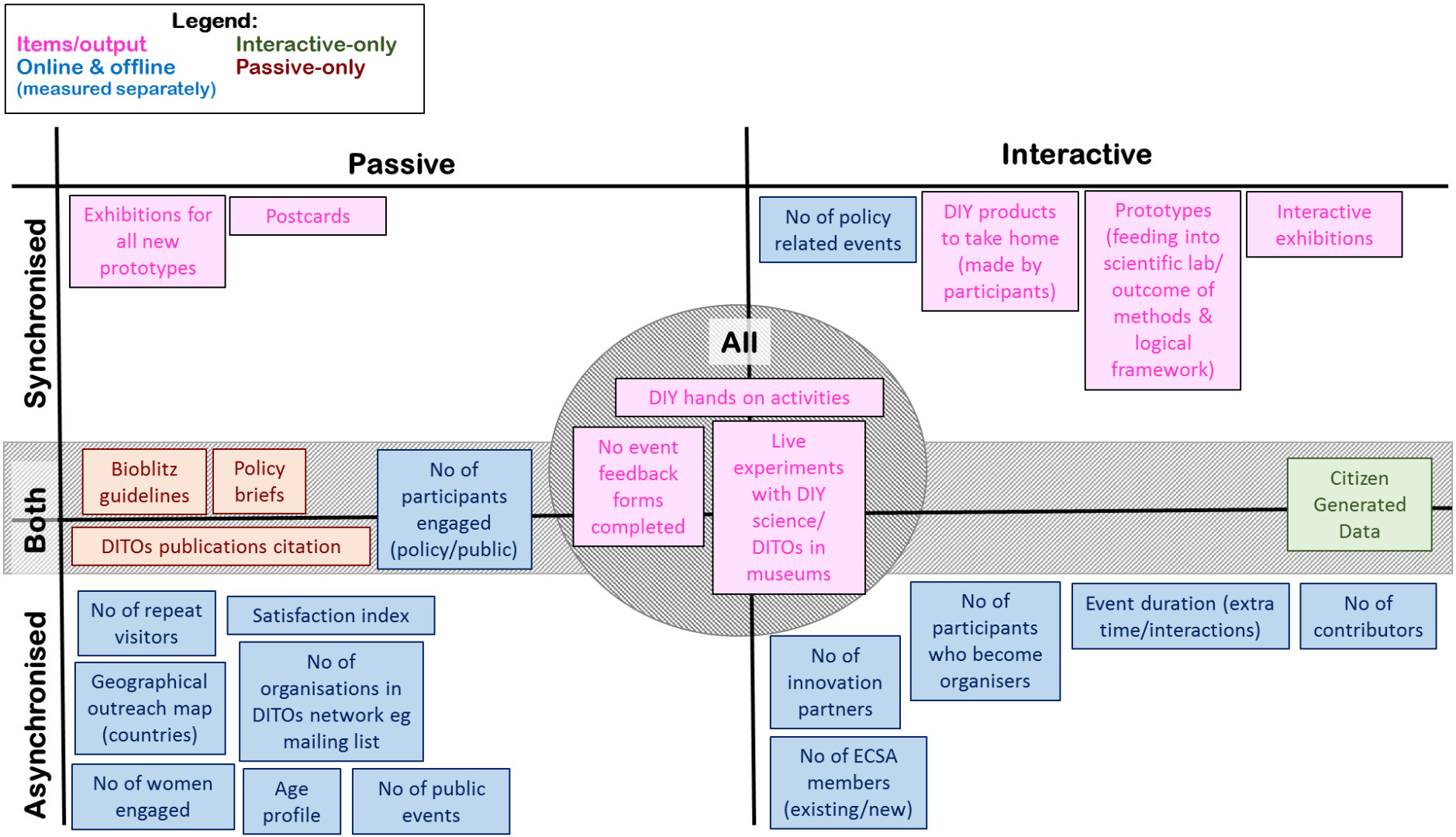
Activities (online)



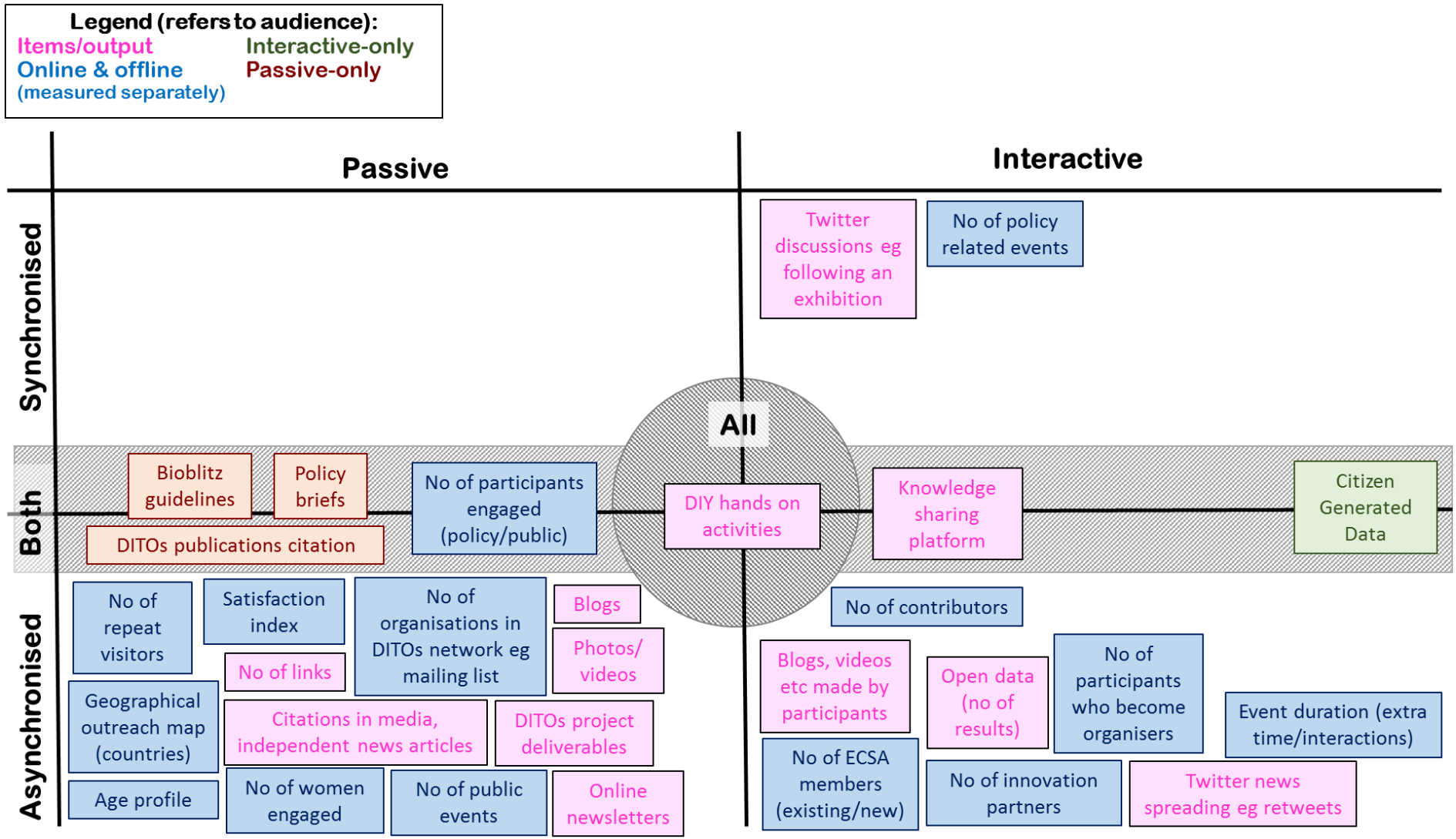
Broader level activities



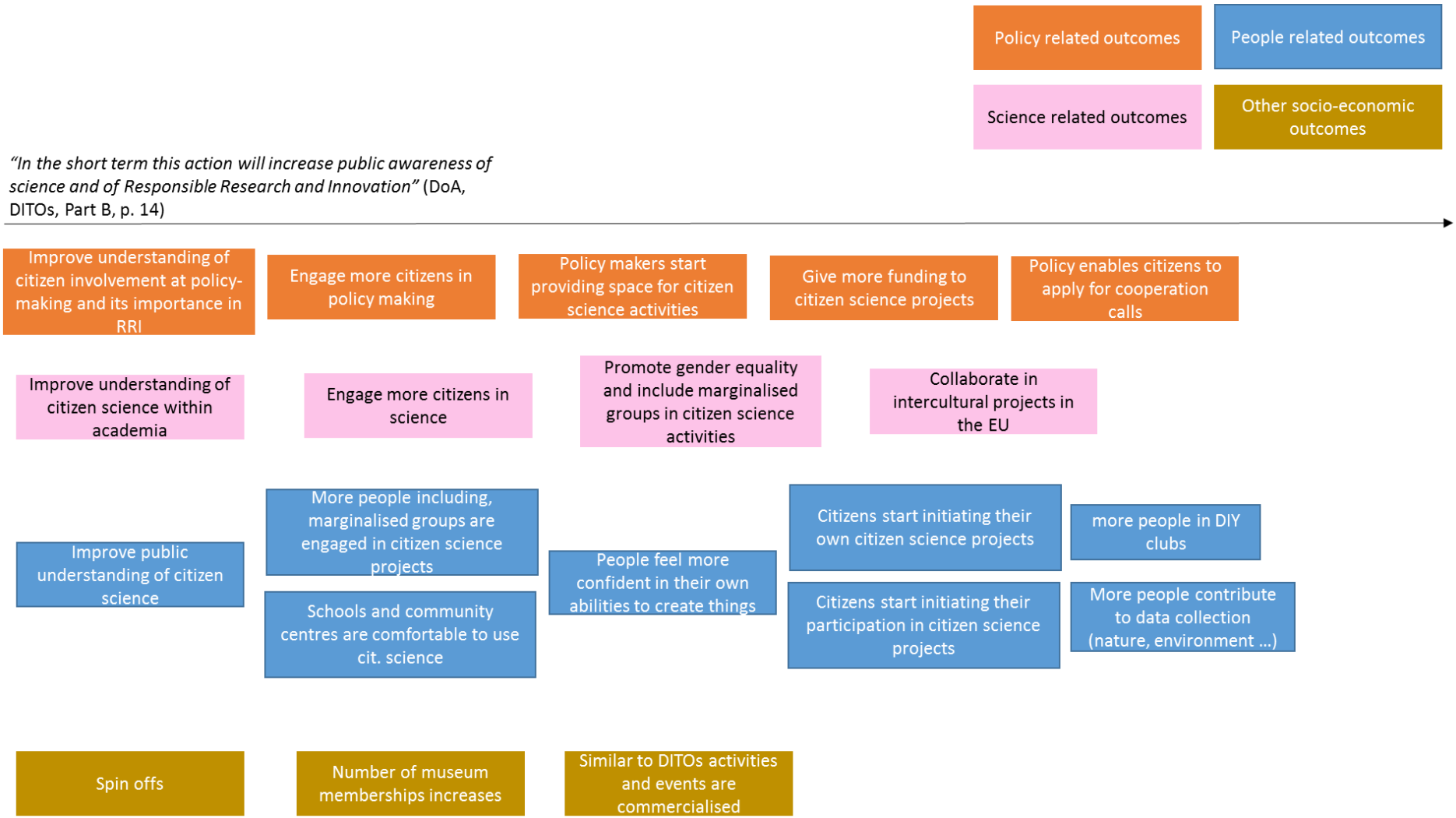
Outputs (offline)



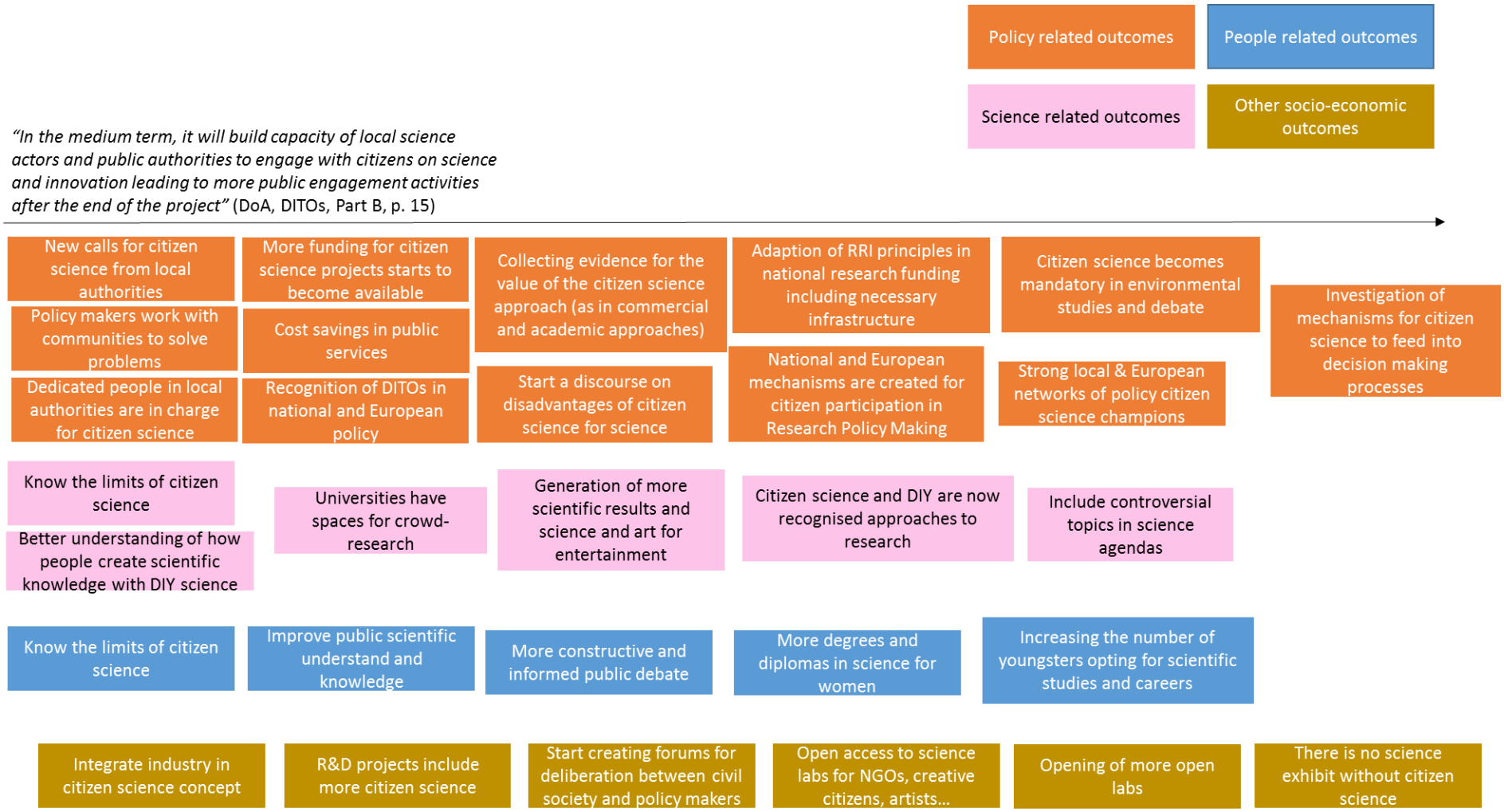
Outputs (online)



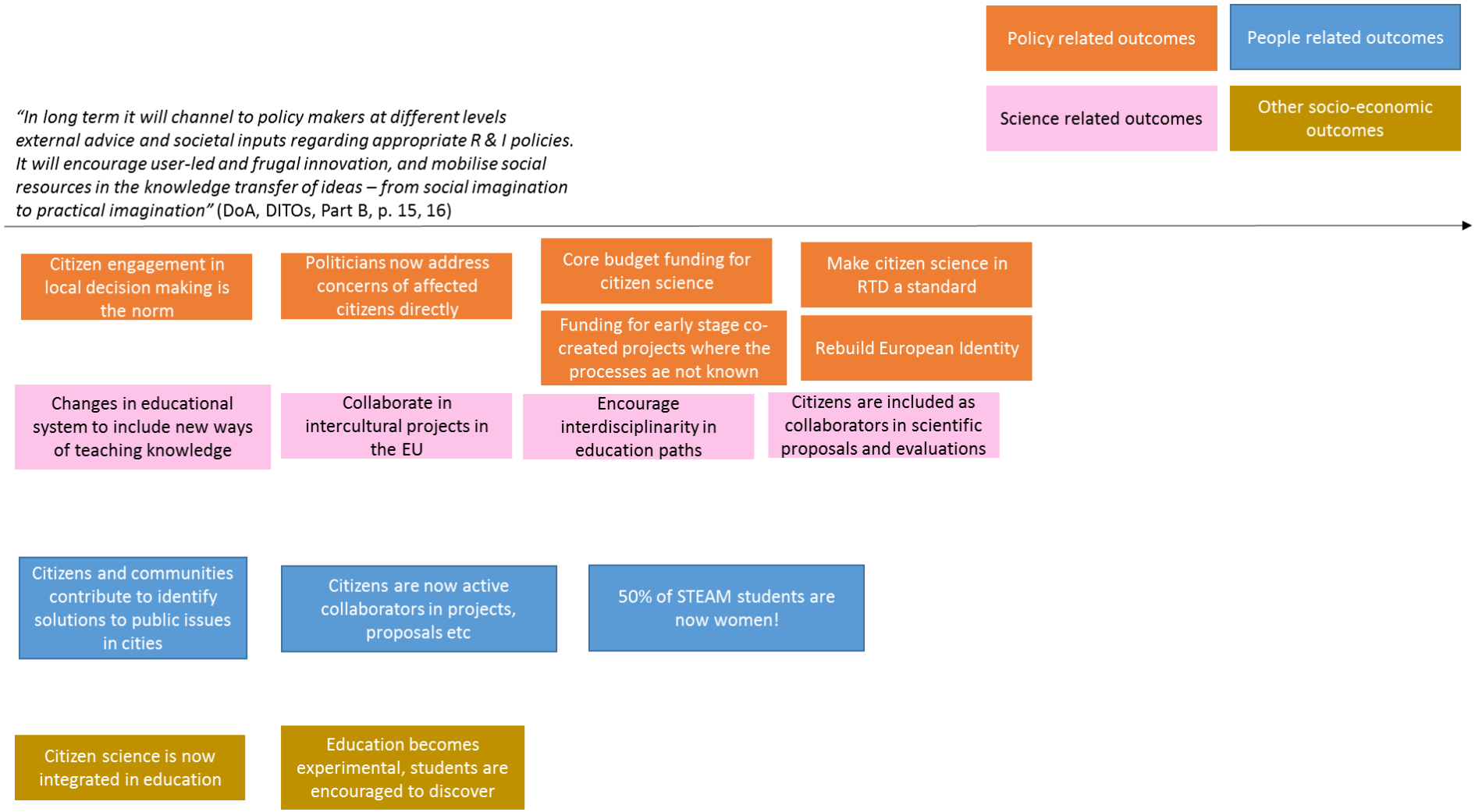
Short-term (1-3 years) outcomes



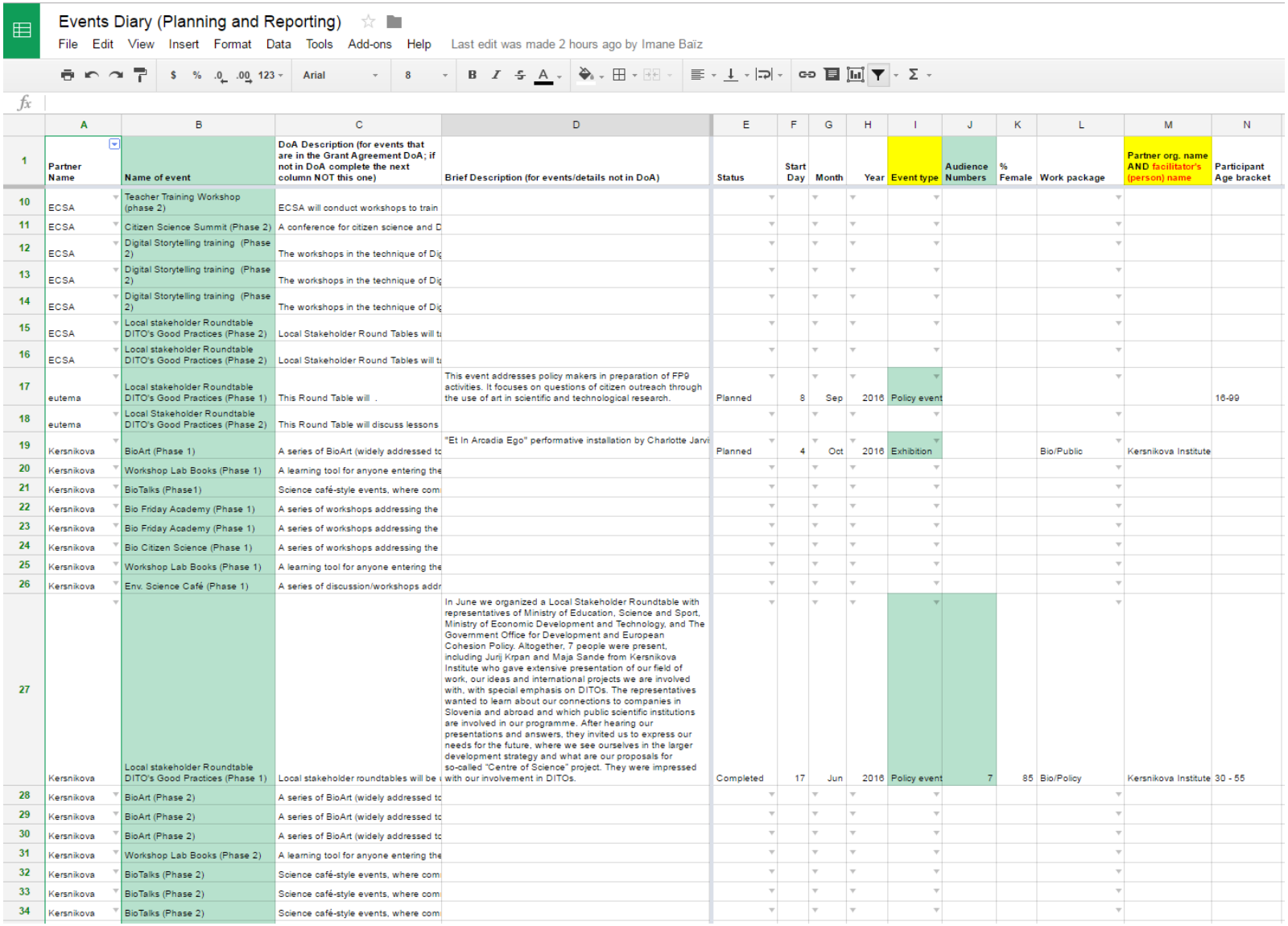
Medium-term (4-7 years) outcomes



Long-term (7+ years) outcomes



10.2 Appendix: Events diary sample



Events Diary (Planning and Reporting)

File Edit View Insert Format Data Tools Add-ons Help Last edit was made 2 hours ago by Imane Baïz

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Partner Name	Name of event	DoA Description (for events that are in the Grant Agreement DoA; if not in DoA complete the next column NOT this one)	Brief Description (for events/details not in DoA)	Status	Start Day	Month	Year	Event type	Audience Numbers	% Female	Work package	Partner org. name AND facilitator's (person) name	Participant Age bracket
10	ECSA	Teacher Training Workshop (phase 2)	ECSA will conduct workshops to train											
11	ECSA	Citizen Science Summit (Phase 2)	A conference for citizen science and D											
12	ECSA	Digital Storytelling training (Phase 2)	The workshops in the technique of Dig											
13	ECSA	Digital Storytelling training (Phase 2)	The workshops in the technique of Dig											
14	ECSA	Digital Storytelling training (Phase 2)	The workshops in the technique of Dig											
15	ECSA	Local stakeholder Roundtable DITO's Good Practices (Phase 2)	Local Stakeholder Round Tables will t											
16	ECSA	Local stakeholder Roundtable DITO's Good Practices (Phase 2)	Local Stakeholder Round Tables will t											
17	eutema	Local stakeholder Roundtable DITO's Good Practices (Phase 1)	This Round Table will .	This event addresses policy makers in preparation of FP9 activities. It focuses on questions of citizen outreach through the use of art in scientific and technological research.	Planned	8	Sep	2016	Policy event					16-99
18	eutema	Local Stakeholder Roundtable DITO's Good Practices (Phase 2)	This Round Table will discuss lessons											
19	Kersnikova	BioArt (Phase 1)	A series of BioArt (widely addressed to	"Et In Arcadia Ego" performative installation by Charlotte Jarv	Planned	4	Oct	2016	Exhibition			Bio/Public	Kersnikova Institute	
20	Kersnikova	Workshop Lab Books (Phase 1)	A learning tool for anyone entering the											
21	Kersnikova	BioTalks (Phase1)	Science café-style events, where com											
22	Kersnikova	Bio Friday Academy (Phase 1)	A series of workshops addressing the											
23	Kersnikova	Bio Friday Academy (Phase 1)	A series of workshops addressing the											
24	Kersnikova	Bio Citizen Science (Phase 1)	A series of workshops addressing the											
25	Kersnikova	Workshop Lab Books (Phase 1)	A learning tool for anyone entering the											
26	Kersnikova	Env. Science Café (Phase 1)	A series of discussion/workshops addr											
27	Kersnikova	Local stakeholder Roundtable DITO's Good Practices (Phase 1)	Local stakeholder roundtables will be	In June we organized a Local Stakeholder Roundtable with representatives of Ministry of Education, Science and Sport, Ministry of Economic Development and Technology, and The Government Office for Development and European Cohesion Policy. Altogether, 7 people were present, including Jurij Krpan and Maja Sande from Kersnikova Institute who gave extensive presentation of our field of work, our ideas and international projects we are involved with, with special emphasis on DITOs. The representatives wanted to learn about our connections to companies in Slovenia and abroad and which public scientific institutions are involved in our programme. After hearing our presentations and answers, they invited us to express our needs for the future, where we see ourselves in the larger development strategy and what are our proposals for so-called "Centre of Science" project. They were impressed with our involvement in DITOs.	Completed	17	Jun	2016	Policy event	7	85	Bio/Policy	Kersnikova Institute	30 - 55
28	Kersnikova	BioArt (Phase 2)	A series of BioArt (widely addressed to											
29	Kersnikova	BioArt (Phase 2)	A series of BioArt (widely addressed to											
30	Kersnikova	BioArt (Phase 2)	A series of BioArt (widely addressed to											
31	Kersnikova	Workshop Lab Books (Phase 2)	A learning tool for anyone entering the											
32	Kersnikova	BioTalks (Phase 2)	Science café-style events, where com											
33	Kersnikova	BioTalks (Phase 2)	Science café-style events, where com											
34	Kersnikova	BioTalks (Phase 2)	Science café-style events, where com											

10.3 Appendix: Satisfaction questionnaire

This template was provided to each partner, who had the freedom to add questions that would benefit data collection specific to their context. For example, highlighted in yellow in 9.3.1, are two questions specific to KI who are interested in *how* internet is accessed so that they can adapt their activities to fit their audiences' needs. They also have events with youth so, the age bracket was extended to reflect this. The history of each partners' changes are documented in our Google drive.

10.3.1 Final satisfaction questionnaire template – Phase 1

Doing It Together science (DITOs)

Evaluation - How did we do?

Event name: Date:

Overall how satisfied are you with this event?
○ 1. Very satisfied ○ 2. Satisfied ○ 3. Neutral ○ 4. Dissatisfied ○ 5. Very dissatisfied

How did you learn about the event?
○ Meetup ○ Mailing list ○ Friend ○ Web search ○ Other:_____

How would you rate the level of interaction at this event?
□ 1. One way interaction (one person talking) ○ 2. A few exchanges ○ 3. Many exchanges ○ 4. Everyone got a say / talked to each other

What is your take-home message from this event? (E.g. what topic(s) you found most interesting)

What is the one thing you liked the most?

What is the one thing you liked the least?

What would you change?

Comments / suggestions of themes for future event:

Want to keep updated about our upcoming events or plan your own? Stay in touch!
Full name:
E-mail address:

The following questions help us with our reporting for our funder, the European Commission – Thank you for completing!

I represent:

□ Civil society (e.g. NGOs, CBOs, trade unions, etc.) □ Media □ Investment/funding □ Policy-making
□ General public □ Student/academia □ Industry □ Other:_____

Which of the following have you done this year (all that apply)?
□ Attended science seminars/talks □ Visited a science museum □ Read scientific articles
□ Carried out my own experiments □ Watched science film / documentary □ Participated in on-/off-line science projects (e.g. Springwatch/Zooniverse)

Highest level of education attained?
□ GCSE/equivalent □ A-levels/equivalent □ BA/BSc/equivalent
□ Master's degree+ □ Other:_____

How often do you access the internet? □ Daily □ Weekly □ Monthly □ Less frequently

How do you mostly access the internet □ Mobile phone □ Laptop □ Other:_____

I'm a: □ Male □ Female □ Prefer not to say

Age group: □ under 16 □ 16 - 25 □ 26 -35 □ 36 - 45 □ 46 - 55 □ 56+

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 709443

10.3.2 Sample template previous versions:

Version 01

Event name :

Date:

Speaker(s):

Participant name:

Gender (male/female):

Age:

Email address:

Question 1 : What did you expect from the event ?

Question 2 : How would you define the notion of "Biodesign"?

Question 3: How do you feel about the event? Give us your opinion

Any remarks, suggestions?

10.3.3 Partner initiative for process tracking – checklist

REPORTING: step by step

At the beginning of the event:

1. Encourage the audience to disseminate through **social networks**:
   - Twitter hashtags: #DITscience #biodesign @criparis @TogetherSci
   - But also: Snapchat, Periscope, Facebook, Instagram, …

2. Make an announcement to the audience about taking pictures & filming - "Let us know if you would like to not be photographed" ⇒ cf. authorization to use image, voice and name

During the event:

3. Take **photos**: at least 20 per event

4. Take **videos**:
   - 1 short video (4 to 5 mn): interviews of the speaker(s) + participants feedback
   - 1 longer video: whole content of the conference/workshop which will be able to be used as a MOOC for instance.

At the end of the event:

5. Ask the participants to fill in a **questionnaire** to obtain their feedback on the event

6. Inform the participants about the **upcoming events** organised by UPD but also by the other partners in Europe (cf. agenda on DITOs website: togetherscience.eu + on the CRI website)

7. Report on the events diary:
   - **the audience numbers**
   - **% Female**
   - **participant age bracket**

8. Report on the dissemination form:
   - **dissemination & communication activities** occurred before/during/after the event
   - **number of posts on social media**
   - **main target audience(s) in order of importance** (e.g. students; local CBOs; industry)
   - **how many from civil society/general public/ media/ policy makers/ investors/ potential customers/ students/ industry/ other?**

9. Have a conversation with Cindy on those **questions for the evaluation**
[see interview guide]

10.4 Appendix: Formative evaluation interview guide

This list of questions below is used as a guide when carrying out conversational interviews with partners as part of the formative evaluation.

Relations with other groups/orgs
Was this event done in collaboration with other group(s)/individual(s)? Whom with?
What is the purpose of the collaboration? What is gained (on both sides? short and longer term)

The event itself
Where did the idea / inspiration for the event come from?
What was the main intended message of the event? (Broadly speaking - what did you want to convey to the audience through this event - about science, technology but also about your organisation, etc.)
What was the purpose of the event?
What came out from the event? (What were the outcomes?)

Event progress
Does the event still fit the description and justification from Annex II? in DoA p.128?
Overall, how satisfied are you with your events? 1 = not at all; 5 = extremely satisfied
Why this rating?

The facilitator
How would you define your role in the event?
What motivates you taking part in (organising) the event?
What did you learn from (organising) the event?
How does it reflect the goals of the organisation?
How does it link to DITOs?

The audience
What kind of people attended the event?
Who do you feel was missing?
What would they bring to the 'table'?
What do you plan to/would like to do to target these missing audiences?
What was your perception of the audience's general reaction to the event?
Did the audience contribute any comments/questions/remarks? If so what?
Where are attendees usually coming from? (What background - cultural, professional, social)
What generally brings people to the events?
Overall, does the event match what you expect?