RRI Tools

Fostering Responsible Research and Innovation

D1.2

Methodology for the collection and classification of RRI practices

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Executive summary

Aim of document

The aim of this document is to outline a methodology that enables the collection and classification of Responsible Research and Innovation (RRI) promising practices within the RRI Tools project. The methodology shall be used by the Hubs during the second half of the first year of the project to collect promising practices of RRI in various regions of Europe. This collection of RRI practices will be compiled in an extensive database that will be analysed by the Athena Institute – VU University – and University College London. The analysis will lead to a list of criteria that should be met in order for a promising practice to become considered a good, or even best, practice. A range of Good Practice Standards can be drawn from these criteria, which will be used to guide stakeholders in making good practices in RRI a reality. Also, these Good Practice Standards will lead to an evaluation methodology and RRI tools.

Working definition

Responsible Research and Innovation is a dynamic, iterative process by which all stakeholders involved in the R&I practice become mutually responsive to each other and share responsibility regarding the RRI outcomes and process requirements. In our conceptualization, the outcomes of RRI are divided in three categories:

- learning outcomes; engaged publics, responsible actors, and responsible institutions);
- outcomes that relate to (the system of) R&I itself (ethically acceptable, sustainable and socially desirable outcomes);
- outcomes that address societal challenges of RRI (referring to each of the Grand Challenges).

In order to achieve the outcomes as described above, the R&I process has to be conducted according to seven process requirements, which we adjusted in four clusters:

- diversity and inclusion;
- openness and transparency;
- anticipation and reflexivity;
- responsiveness and adaptive change.

RRI promising practices

To make the translation from the theoretical notions of RRI to practical RRI standards and tools, the RRI Tools project will look at existing practices that might already exert some key features of our RRI working definition. Future R&I practices can learn from steps that have already been made in cases that are specific and at the same time address general and real-world problems of RRI. It is probably too early to find evidence-based (or best) practices that could be transformed into RRI standards, as RRI is a diverse and relatively new concept. Therefore, we aim to gather 'promising practices'; practices that work in that particular context and have the potential to be effective in other contexts as well.

In our view promising RRI practices should be responsible, link to both research and innovation, and promote stakeholder involvement. Although some promising practices may not meet all process requirements and outcomes as formulated in our definition, they can still help us formulate good RRI practice standards for the aspects they excel in or provide us with examples of how the interplay between outcomes and process requirements takes place in practice. Furthermore, the policy agendas (ethics, governance, public engagement, open access, science education, and gender) may be used as a heuristic to find promising practices.

The six policy agendas each have their own RRI potential and as such will have their own R&I practices to look for. Practices could be tools, projects, programmes, or organisations, and could be found in one's local and regional surroundings but could also be of international proportion.

We purposefully keep the search for RRI promising practices as broad as possible, because we do not want to risk excluding possible valuable practices by putting up fixed frames beforehand. Still, we advise to look for practices of which information is detailed and easily accessible as it will enrich the results of the analysis.

Collection and classification methodology
We developed a methodology that enables the collection and classification of RRI promising practices in order to provide a catalogue of Good Practice Standards in RRI (D1.4 in DoW). To classify the promising RRI practices collected by the Hub members and stakeholders, the Hubs will gather as much information about promising RRI practices as possible. The method we developed consists of four steps and uses two instruments (months of the project in brackets).

Collection
1. Hubs desk study (M7-M10)
    During M7-M10, Hubs will search for promising practices. The Question sheet (Annex 2) was developed to assist Hubs in gathering and reporting these practices. For each found practice Hubs shall fill in both part A and part B.

2. Stakeholders Consultation Workshops (M9-M10)
    a. As preparation for the workshop, Hubs will send an Information Package to the participating stakeholders containing:
        - Brief RRI Information Sheet (Annex 3)
        - Part A of the Question Sheet (Annex 2, page 1)

    b. Hubs will conduct the M9-M10 Workshop using the workshop Manual[1], for which they received training in Copenhagen. The Manual includes:
        - the script of the workshop
        - the corresponding PowerPoint presentation
        - the promising practices Question Sheet part B (Annex 2, page 2)
        - a list of necessities
        Part B of the Question Sheet will be answered during this workshop and, when incomplete, finished by the Hubs.

Classification
3. Questionnaire for promising practices (M10-M11)
    Hubs will send all filled in Question Sheets (Annex 2) to Athena Institute and pre-select the 10 most promising practices. Together with the Athena Institute, Hubs wel select 5 to 8 practices for which they will fill in an online Questionnaire[2].

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[1] *As this section was a result of the feedback given by the Hub coordinators during the Copenhagen workshop (26-27th June 2014), it could not be added to the Annex section before the deliverable submission date.*

[2] *As this questionnaire has received important feedback by the Hub coordinators during the Copenhagen workshop (26-27th June 2014), it could not be completed before the deliverable submission date.*

Analysis

    4.   Analysis of data (M11-M12)

The Hub coordinators are asked to report all data regarding the collection and classification of promising practices to Athena Institute. The data will be analysed by Athena Institute in collaboration with University College London. The report consists of three different documents:

- Filled in Question Sheets (Annex 2) for each promising practice that has been put forward by the stakeholders or Hub members (translated into English).
- An extensive summary of the M9-M10 Workshop in English, following the reporting template (Annex 4).
- Filled in Online Questionnaires[2] for the 5 to 8 most promising practices.

1. Introduction

The aim of this document is to outline a methodology that enables the collection and classification of Responsible Research and Innovation (RRI) promising practices. The methodology is to be used in the second half of the first year of the RRI Tools project, resulting in the compilation and analysis of promising practices of RRI in various regions of Europe. This collection of RRI practices should lead to an extensive database that will be analysed and will serve as a foundation to design standards for best RRI practices. Furthermore, the data set will be used to sharpen the RRI working definition and to develop the tools for RRI in Work Package (WP) 3. Additionally, the data set will be a source for scientific publications with regards to conceptualizing and developing tools for RRI.

The data set will lead to a list of criteria that should be met in order for a promising practice to become considered a good, or even best, practice. Consequently, a range of Good Practice Standards (Deliverable D1.4 of the project) can be drawn from this in order to guide stakeholders in making good practice in RRI a reality. Also, these Good Practice Standards will lead to an evaluation methodology and RRI tools.

Alongside the collection of promising RRI practices, the Athena Institute, VU University, will gather all the comments on the working definition and the promising practices from the Hubs. This information will be in English and conveniently categorized. Together with experts from the consortium on the key components, the Athena Institute will have to run their own validation of the Good Practice Standards, and to work on the final working definition.

After the introduction, we present an updated version of the RRI working definition. Based on that definition, the third chapter will explain what an RRI practice is and provide a framework in searching for promising RRI practices by addressing questions such as: what is an RRI practice? And: when is an RRI practice promising? The fourth chapter introduces the methodology for collecting promising RRI practices and it explains the classification methodology. Chapter five concludes by recapitulating which tools will be used for collecting and classifying promising RRI practices and how these tools will be used by the Hubs. It also shows the Hubs how to report on the activities they undertake in collecting and classifying promising RRI practices.

2.   Working definition of RRI

Developing better research and innovation practices that reflect both excellent science and the incorporation of societal values and needs is increasingly framed as Responsible Research and Innovation. Research and Innovation (R&I) in Europe already aim to contribute directly to the level of prosperity, the well-being of individuals and society in general, and to establish the European Union as a leading knowledge-based economy. But within Horizon 2020 emphasis is also put on *responsible* R&I practices. The variety of concepts that could be labelled as responsible R&I practices is almost as wide as the variety of ideas about how R&I practices can become responsible. But what these notions have in common – more than anything – is their strong ethical component. They all strive to create responsible practices in research and innovation.

RRI can be described as activities aimed to align a wide range of actors and activities involved in research and innovation processes towards desirable and acceptable future outcomes. RRI is about envisioning the future and connecting research and innovation with that future by governing our R&I activities towards ethically acceptable, socially desirable and sustainable outcomes. It is a form of anticipatory governance (Barben et al., 2008; Guston, 2013; Sutcliffe, 2011) in the sense that it aims to ensure positive outcomes of research in the future.

The norms for these outcomes should be sensitive to the pluralistic society we live in and to possible changes in the interpretation of values over time due to either technological or cultural developments. This is an uncertain and unpredictable process that is value-based, allowing for the discussion of purposes and values. Responsibility is then not seen at the level of individuals but in terms of collective and distributed responsibility. Collective responsibility requires active participation of the diverse actors involved in integrated processes of anticipation, reflection and inclusive deliberation that are closely tied to processes of policy-making and decision-making (Owen et al., 2012).

As the focus is increasingly more on responsibility as acceptable outcomes *and* a responsible process (Stilgoe, et al., 2013; von Schomberg, 2007, 2011, 2013), we have developed a working definition of RRI that specifies both outcomes and process requirements. The working definition is the result of literature study and an iterative process with the project partners and experts involved in RRI Tools. Therefore, the working definition is still evolving and will be finalised after analysing the input we will receive from the second and third sphere of stakeholders in the coming months. For now, we propose the following definition:

Responsible Research and Innovation is a dynamic, iterative process by which all stakeholders involved in the R&I practice become mutually responsive to each other and share responsibility regarding the outcomes and process requirements, as defined below.

Outcomes
In the RRI literature, the conceptualization of outcomes of RRI processes has so far been underdeveloped. Apart from abstract notions such as 'sustainability', 'responsibility' and 'solution to grand challenges', little work has been made so far of defining what that means in the RRI context. Nevertheless, we have developed a preliminary thematic categorization of RRI outcomes. In our conceptualization, the outcomes of RRI are divided in three categories. We distinguish between the:

- learning outcomes of the actors and institutions involved,
- the outcomes that relate to (the system of) R&I itself, and
- the outcomes that address societal challenges of RRI.

1. Learning outcomes

Learning outcomes are composed of *engaged publics, responsible actors, and responsible institutions*. Firstly, citizens should be empowered with the appropriate skills to be involved in deliberative processes of anticipation and reflection, policy and decision making, which RRI demands. To facilitate the process towards scientific citizenship, it is equally important to actively engage citizens in science and to embed outcomes of this engagement in decision-making processes. Secondly, RRI should lead to responsible actors across the whole range of our socio-technical systems (e.g. scientists and policy makers, NGOs, CSOs, businesses and innovators). Responsibility needs to become a way of being that is reflexive –learning about routines, behavior, underlying values and assumptions (Schön & Rein, 1994) –, and that is responsive and adaptive – creating an open mind to the values and perspectives of others and the capacity for adaptive change. Thirdly, structures and organisations in which these actors function should create opportunity for and should provide support to actors to be responsible, ensuring that RRI becomes (and remains) a solid and continuous reality.

2. R&I outcomes

RRI practices should strive for *ethically acceptable, sustainable and socially desirable outcomes*. As for ethically acceptable outcomes, the Treaty on European Union provides us with commonly shared values within the European society that R&I practices need to comply with. Living in a pluralistic society, values and norms that are important for *responsible* research and innovation should be specified through deliberation and interaction between stakeholders. Sustainable development is explained as meeting the needs of present generations without jeopardizing the ability of generations to come to meet their own needs (The Council of the European Union, 2006). To do so, we need to find solutions for our current unsustainable way of living. Thirdly, science and innovation should become more responsive to real-felt social needs, concerns, ambitions and interests and strive for socially desirable outcomes. Solutions are found in opening up science through continuous meaningful deliberation with societal actors (Broerse et al., 2010). In the end, the incorporation of societal voices in R&I will lead to relevant applications of science.

3. Solutions to societal challenges

The European Commission has formulated seven 'Grand Challenges' and underlines the importance of these challenges by viewing them as one of the three main pillars of the Horizon 2020 programme. In order to be indicated as responsible, R&I endeavours should contribute to finding solutions for these societal challenges, which are:
- Health, demographic change and wellbeing;
- Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bio-economy;
- Secure, clean and efficient energy;
- Smart, green and integrated transport;
- Climate action, environment, resource efficiency and raw materials;
- Europe in a changing world - inclusive, innovative and reflective societies;
- Secure societies - protecting freedom and security of Europe and its citizens.

Process requirements
In order to achieve the outcomes as described above, the R&I process has to be conducted according to certain process requirements. The outcomes, when operationalised in objectives, can then function as a guiding vision. This in itself is an *anticipatory* approach, and should furthermore be *diverse* and *inclusive*, *open* and *transparent*, *reflexive*, *responsive* and *sensitive to adaptive change*. In the working definition we have described these aspects as process requirements. Based on this description and the input we received at the Barcelona workshop (April 2014), we adjusted the seven process requirements in four clusters. We briefly explain the process requirements and clusters.

1. Diversity & inclusion

Diverse and inclusive RRI processes should call for the involvement of a wide range of stakeholders in the early development of science and technology to broaden and diversify the sources of expertise and perspectives. In this respect, inclusive practices should ideally lead to diverse practices. In reverse, diverse practices are more likely to be inclusive. Therefore, diversity and inclusion can be considered two complementary ways to reach the same goal. But more importantly, RRI processes should be inclusive for normative reasons. We expect RRI promising practices to have continuous and ongoing process requirements that aim for diversity and inclusion.

2. Openness & transparency

Openness as a process requirement should lead to increased transparency and better science. Openness and transparency are conditions for accountability, liability and therefore for responsibility. More openness does not automatically lead to more trust. Openness should be meaningful, and enhance quality of the process and enrich the outcomes. In practice, the amount and level of openness depends on the context, situation and topic of the specific research or innovation practices. In addition, information needs to be tailored to the needs of stakeholders.

3. Anticipation & reflexivity

Anticipation and reflexivity are two other process requirements for RRI that complement each other. Anticipation is not only about envisioning the future, but also about understanding how present dynamics of promising science and technology practices shape the future (Borup et al., 2006). Reflexivity asks for first-order, second-order and third order learning. We could say that anticipation, a prospective activity, would be useless without reflexivity, a retrospective activity, as knowing or trying to grasp the future only make sense if you know the past. We expect RRI promising practices to have process requirements for anticipation and reflexivity implemented in the form of anticipatory and reflective instruments.

4. Responsiveness & adaptive change

Our system of science and innovation should be open to and enable transformative change by way of responsiveness. Responsiveness means responding to emerging knowledge, perspectives, views and norms. Responsiveness is a condition for adaptive change and this is where the two process requirements meet. RRI requires a capacity to change or shape direction in response to stakeholder and public values and changing circumstances (Stilgoe et al., 2013). We expect promising RRI practises to be responsive and receptive for adaptive change.

3. RRI practices

To make the translation from the theoretical notions of RRI to RRI in practice, the RRI Tools project should look at existing practices that might already exert some key features of our RRI working definition. Although these practices may not meet all process requirements and outcomes as formulated in our definition, much can be learned from steps that have already been made in order to move towards responsible practices. As these practices are embedded in real world context, they come across real world obstacles. Understanding these obstacles and finding solutions will add value to the theoretics of RRI and to the development of RRI Tools. Through the analysis of current practices, common relevant characteristics, weaknesses and strengths will be identified and subsequently used for the formulation of good standards for *responsible* research and innovation. By studying cases that are specific and unique and address general problems of RRI at the same time, these good standards will be usable to improve future R&I practices.

3.1. What is an RRI practice?

In order to collect RRI practices, we need to be able to recognize such practices, so the following paragraph will provide some guidance in this search.

3.1.1. An RRI practice is responsible

First of all, in the exploration for responsible R&I practices, one should look for practices that take their responsibility in aiming for responsible outcomes and process requirements as explained in our working definition for RRI (Box 1). This means that RRI practices should deploy activities that strive towards sustainable, desirable and ethically acceptable future outcomes and that aim to align a wide range of actors and activities involved in R&I processes. Being responsible in R&I includes all R&I activities undertaken from start to finish of the practice, including both processes and products. In short, RRI practices should strive for acceptable outcomes, but should meet specific requirements to reach these outcomes.

Box 1: Responsibility

Responsible research and innovation is a dynamic, iterative process by which all stakeholders involved in the research and innovation practice become mutually responsive to each other and share responsibility regarding the RRI outcomes and process requirements as defined below.

Outcomes:
1. Learning outcomes
2. R&I outcomes
3. Solutions to societal challenges

Process requirements:
1. Diversity & inclusion
2. Openness & transparency
3. Anticipation & reflexivity
4. Responsiveness & adaptive change

3.1.2.　An RRI practice includes both research and innovation

Secondly, when aiming to collect responsible R&I practices, one should look for practices with a strong link to research and innovation. Promising RRI practices should have a clear research component, but should also be innovative. Although it may seem self-evident what we mean by research and innovation, viewpoints may differ substantially with regards to what research and innovation actually entail in this context. So let us indicate how we frame research and innovation and how the two relate to each other and to RRI.

The term research describes a range of systematic efforts to increase the total amount of knowledge in an area. Depending on the objective of the research, a distinction is made between basic research and applied research (Box 2). Research is traditionally conducted by professionals that are specifically trained in (scientific) research. RRI opens up the research process by enabling other stakeholders to become 'co-researchers' (Collins & Evans, 2002), which may highlight relevant questions otherwise neglected by 'experts' (Fischer, 2000).

The term innovation can relate to very diverse areas, such as products, processes, production methods, services and organisation forms or marketing. Innovation is about finding better solutions and can be defined as something original, new, and important in whatever field that breaks in to a market or society (Frankelius, 2009; Wong, 2013). This is accomplished through more effective products, processes, services, technologies, or ideas that are readily available to markets, governments and society.

Innovation can be viewed as the application of better solutions that meet new requirements, in-articulated needs, or existing needs. Therefore, innovation processes and outcomes are increasingly established through stakeholder involvement. RRI opens up the innovation process by enabling stakeholders to articulate their needs and consequently enrich the end result of research and innovation practices.

Box 2: Research AND Innovation

RRI practices should contain both a research and an innovation component.

Basic research:
Characterised by experimental or theoretical work in order to acquire new knowledge in an area. At this stage, it does not yet encompass an application or concrete use of the research results.

Applied research:
As basic research, applied research aims to acquire new knowledge, but with a practical and concrete objective.

Innovation:
The translation of new knowledge and ideas into practical goods or services.

3.1.3.　An RRI practice promotes stakeholder involvement

Stakeholder involvement is an increasingly important component of R&I practices. Therefore, we find it important to highlight the different roles and levels of influence of stakeholder involvement in R&I practices. Based on the ladder of citizen participation of Arnstein (1969), different levels of involvement are distinguished. For application in the health domain, the

ladder – originally including eight 'sports' – has been condensed to the following four levels: consultation, advice, collaboration/partnership, and control (Arnstein, 1969; Pittens, 2013). We consider this as a useful approach to identify the level of stakeholder influence in R&I practices. Note that these levels do not imply a hierarchical order; different stakeholder approaches can be more appropriate in different contexts or phases of the R&I practice.

Box 3: Stakeholder involvement

Consultation:
Stakeholders are seen as information providers but have little power to influence decisions. It is up to the conventional decision makers whether the input of the stakeholders is included in the decision-making process. Examples of consultation methods are questionnaires, interviews or focus group discussions with homogenous groups.

Advice:
Stakeholders provide advice on decisions regarding the issue at hand, as members of an advisory or decision-making committee. Their influence in the decision-making process is, however, not guaranteed and depends much on the group dynamics.

Collaboration/partnership:
This involves the formation of partnerships between research professionals, policy-makers and stakeholders. Stakeholder inputs are included in decision-making processes; integration of knowledge occurs. For collaboration various deliberative methods could be employed, like dialogue meetings, working sessions, citizens juries, citizens panels, the Delphi process and the Nominal Group Technique.

Control:
Here a shift in decision-making power takes place; control is transferred from researchers and policy-makers to stakeholders.

(Based on: Pittens, C., 2013, p. 13-15)

3.2. Recognizing RRI Practices

Now that we have addressed the Responsible aspect of RRI practices and the Research and Innovation aspects, the question of "what is a practice?" needs to be answered. At least four types of RRI practices can be distinguished: tools, projects, programmes and organisations (Box 4). Furthermore, practices of RRI can for instance be found in your local and regional surroundings. You may read about them in the newspaper or hear about it on your local or national radio news channel. Or you might find examples of RRI through your professional life. These RRI practices might be described or documented in some way such as research proposals, agendas, calls, articles, or policy documents. The classification of RRI practices will become richer when information about the practice is detailed and easily accessible. We aim to find good examples of all four types of RRI practices. In the collection phase, we purposefully keep the search for RRI practices as broad as possible. We do not want to risk neglecting possible interesting practices by putting up fixed frames beforehand.

Thirdly, practices can be found within the six policy agendas (Box 5). The policy agendas may be used as a heuristic to find promising practices. The six policy agendas each have their own RRI potential; their own contribution to realizing responsible research and innovation and as such will have their own R&I practices to look for.

3.3. **When is an RRI practice promising?**

In the search for good standards for *responsible* research and innovation, 'best practices' are collected for classification and evaluation. Best practices are methods that have proved to reach better results than similar practices and are often used for the development of evidence-based practice standards because these methods can be reproduced in other contexts. RRI is a dynamic and diverse concept, and still relatively new. Therefore, it is probably too early to find evidence-based practices that could be transformed into RRI standards. Instead of searching for evidence-based practices, we aim to gather 'promising practices', a more modest level of 'best practice'; practices that work in that particular context and have the potential to be effective in other contexts as well. In the case of RRI such a practice may only exert a few of the specified process requirements and outcomes but still holds valuable information of RRI in practice. Lessons learned in these practices could help improve the translation of the rather abstract notions of RRI to practical standards and tools.

In short, promising RRI practices are practices that strive towards the indicated outcomes and meet a diversity of process requirements to a considerable extent. Important is the RRI potential these practices embody. Some practices might outstand in merely one or two aspects, possibly because these aspects are the practices' focus or because the practices are embedded in a larger process, platform or project in order to really contribute to RRI. These practices could help us formulate good RRI practice standards for the aspects they excel in. Other practices might address more process requirements and outcomes. Although these process requirements and outcomes might not be all addressed satisfyingly, they could provide us with examples of how the interplay between outcomes and process requirements takes place in practice. Both forms of RRI practices could be considered promising and could be highly valuable for extracting good practice standards and can teach us much about developing, implementing and evaluating future RRI practices.

4.   Collection and classification

In this section the method for collecting and classifying promising RRI practices will be described. Promising practices are interesting examples of how practices deal with RRI in practice. Based on their real-world experiences, good practice standards can be formulated and tools for RRI can be developed.

In order for Hubs to recognize promising RRI practices and describe them in terms of the RRI working definition, Hub coordinators received a preparatory training in Copenhagen at the end of June 2014. This training not only addressed the working definition, but also trained the Hubs in conducting the collection and classification methodology. As a preparation, the Hub coordinators were asked to choose a promising RRI practice and fill in the Hub preparation sheet Copenhagen workshop (Annex 1). The sheet was used as an assistance tool for the Hubs to get a feel for what a promising RRI practice is in terms of the RRI working definition by inquiring after the practice related to RRI outcomes, process requirements and policy agendas.
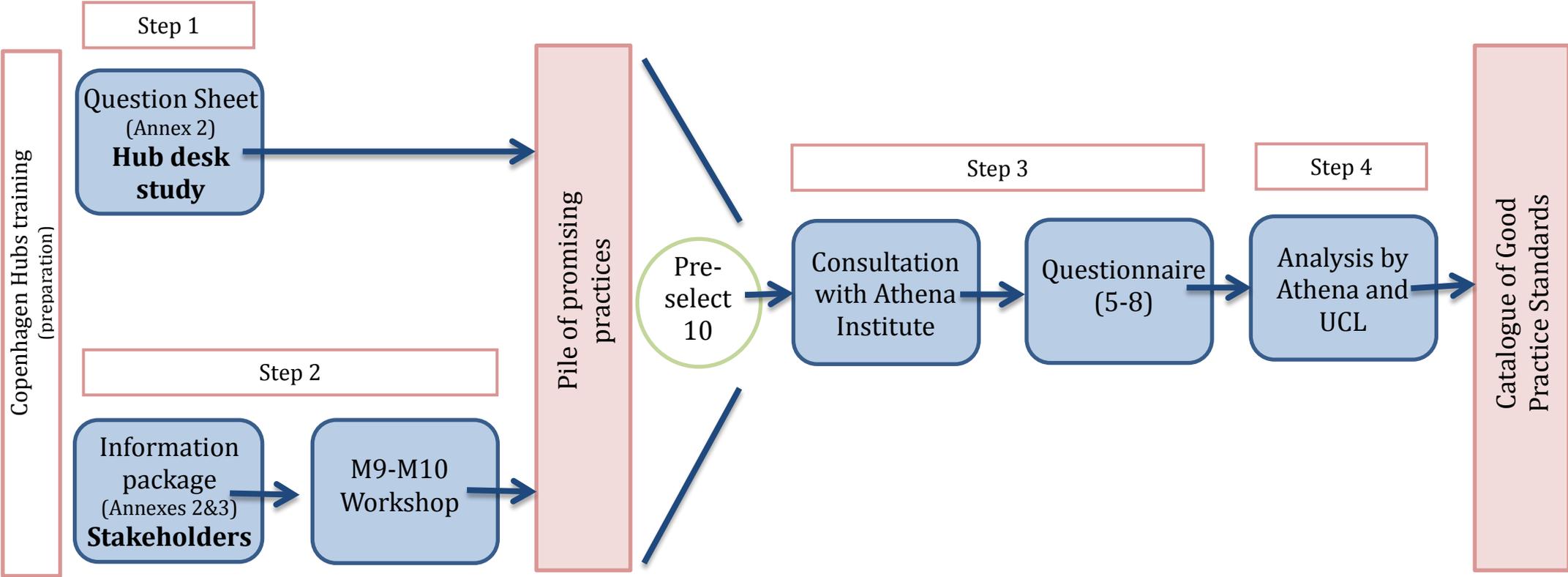
The collection and classification of promising practices will be done by the Hubs, assisted by stakeholders, in four steps (Figure 1).

1. Hub membes will collect promising practices in the coming months by filling in a two page Question Sheet (Annex 2) that inquires after basic information to describe the practice and assists in a first identification of its RRI potential.

2. The Hub coordinators will provide RRI stakeholders, whom they will meet in the Stakeholders Consultation Workshop (Months 9-10 of the project), with a Brief RRI Information Sheet (Annex 3) and invite them to also collect promising RRI practices by filling in *part A* of the Question Sheet (Annex 2, page 1) before the workshop. During the workshop the stakeholders will fill in *part B* of the Question Sheet (Annex 2, page 2). The Hubs were trained during the workshop in Copenhagen for the M9-M10 Workshops to meet the RRI stakeholders (Subtask T1.3.1 in DoW).

3. In this step data for the classification of the promising practices for RRI is collected. This will be done through a Questionnaire for promising RRI practices[3]. In consultation with Athena Institute, every Hub will choose 5 to 8 promising practices (from the list of promising practices collected in step 2) for which they will fill in the questionnaire. Data can be collected either using literature/documents on the promising practice, and/or by interviewing a key person from the promising practice (the questionnaire can then be used as an interview guide). At the end of step 3 we will have a database of promising RRI practices available (Task T1.3 in DoW).

4. The objective of this step (T1.4 in DoW) is to analyze the selected promising practices in order to identify common relevant characteristics, weaknesses and strengths based on the information of the questionnaires.

Below we will describe in more detail the different steps. Steps 1 and 2 are discussed in section 4.1 Collection methodology, steps 3 is elaborated in section 4.2 Classification methodology, and step 4 in section 4.3 Analysis

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[3] *As this section was a result of the feedback given by the Hub coordinators during the Copenhagen workshop (26-27th June 2014), it could not be added to the Annex section before the deliverable submission date.*

Figure 1. Flowchart: steps of the collection and classification methodology

Step 1

Copenhagen Hubs training (preparation)

Question Sheet
(Annex 2)
Hub desk study

Step 2

Information package
(Annexes 2&3)
Stakeholders

M9-M10 Workshop

Pile of promising practices

Pre-select 10

Step 3

Consultation with Athena Institute

Questionnaire (5-8)

Step 4

Analysis by Athena and UCL

Catalogue of Good Practice Standards

4.1. **Collection methodology**

The collection of a first list of possible promising practices consists of two steps; the collection of promising practices by Hub members and the collection of promising practices by the stakeholders. To assist in these two steps, we developed the *RRI Information Package*, wich will be used by both Hub members and stakeholders. As the package will be used by stakeholders, it may be translated in the local language. The RRI Information Package consists of:

1. The Brief RRI Information Sheet (Annex 3) concretely explaining the what and why of RRI (Annex 3, page 1) and providing an overview of examples of RRI in practice[4] (Annex 3, page 2).
2. The RRI practices Question Sheet (Annex 2, parts A and B) with questions that should be answered for all promising practices that Hubs or stakeholders think of. This question sheet will be the basis of the promising practices collection.

The whole package will be used during step 1 and step 2 of the collection and classification methodology. During the first step, Hub members will search for promising RRI practices and fill in both parts (A and B) of the Question Sheet (Annex 2) in English for every practice they find in the coming months. Part A consist of questions that refer to the organisations involved in the practice, a possible contact person and website, a short description of the practice and its aims, and a brief explanation of why the practice might be an example of RRI. Part B addresses the promising practice in light of the working definition of RRI. Hubs can start collecting promising practices by using these sheets in July, quickly after the Copenhagen workshop, and continue to do so until the M9-M10 Workshop.

In step 2, Hub members will distribute the Information Sheet (Annex 3) and part A of the Question Sheet (Annex 2, page 1) to stakeholders that will participate in the M9-M10 Workshop, with the request to think of a practice that could be an example of RRI. The stakeholders are asked to write down the name of the practice and answer some short additional questions on part A of the Question Sheet. Participants are asked to bring this information of their example of a promising practice to the M9-M10 Workshop. During the workshop the practices will be discussed and assessed in light of the RRI working definition, using part B of the Question Sheet as a basis. If this sheet is not sufficiently filled out during the workshop, the Hubs shall finish the answers afterwards. Furthermore, if the aswers are not in English, they should be translated into English by the Hubs, as they will be read and discussed by Athena Institute.

Both the results of the M9-M10 Workshop (*step 2*) and the desk study by the Hubs (*step 1*) will result in a collection of filled out Question Sheets of promising practices. Hubs will send these two page Question Sheets of all identified practices to Athena Institute a week after the M9-M10 Workshop. They will include a list of what they believe are the 10 most promising RRI practices. Athena Institute will discuss this list with each national Hub coordinator and together select 5 to 8 practices with the highest RRI potential per Hub using a preliminary version of the Questionnaire for promising RRI practices (see next section, Classification methodology).

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[4] *As this section was a result of the feedback given by the Hub coordinators during the Copenhagen workshop (26-27th June 2014), it could not be added to Annex 3 before the deliverable submission date.*

Besides the filled in Question Sheets, other data will be derived from the M9-M10 Workshops given by the 19 Hubs. The Hubs are asked to write an extensive report of the workshop, addressing the different topics of the workshop and covering all voices present in it. To guide the Hub coordinators in drawing up this part of the report and to ensure all Hubs provide similar data, a Report template of the summary (Annex 4) has been prepared with a topic list and assisting questions.

4.2.   **Classification methodology**

During *step 3* of the collection and classification methodology, the 5 to 8 selected practices will be classified using a self-developed questionnaire: the Questionnaire for promising RRI practices[5]. The questionnaires will be filled in by Hubs as soon as possible after the M9-M10 workshops.

The Questionnaire for promising practices is based on specific RRI indicators. Indicators are measurable elements of responsible research and innovation that give an indication of the amount and quality of responsible research and innovation delivered. An indicator is a signal function: it is not a direct measure of quality, but points to a particular aspect of performance and may lead to further investigation.

For the classification methodology, we chose to formulate indicators as questions, directly leading to the formation of a questionnaire[5]. A useful classification for these indicator questions is a division in process and outcome that we can relate precisely to the RRI working definition, as presented in section 2. Therefore, the working definition was used as the starting point of our search for RRI indicator questions. They elaborate on important aspects of the four clusters of process requirements and three clusters of outcomes. Together with some basic practical questions about the RRI practice, the questions of the questionnaire are meant to reveal the RRI potential of the practice and to gather in-depth information about RRI (a combination of process requirements and outcomes) put into practice. A few questions are formulated regarding the policy agendas (Box 5) the practice addresses or might address in the future.

We asked for the Hub coordinators' opinion regarding the practicality, content and formulation of the first draft of the questionnaire and received many comments. The feedback will lead to a revision of the Questionnaire. The revised version will be made available in the online tool SurveyMonkey® in the first half of July. Hubs will be asked to test the new online version in July and August and can send their comments to Athena Institute. The feedback will be used to finalize the Questionnaire in time for them to fill out the information about the promising RRI practices (Subtask T1.3.2 in DoW) after the M9-M10 Workshops.

In order to answer the questions of the Questionnaire in-depth, it is crucial that enough information about the 5 to 8 selected promising practices is available and accessible. Information can be found through literature search and/or interviews. Therefore, the Questionnaire will be drawn in its final form in such a way that it can be used as an interview guide as well.

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[5] *As this section was a result of the feedback given by the Hub coordinators during the Copenhagen workshop (26-27th June 2014), it could not be added to the Annex section before the deliverable submission date.*

So, the filled in Questionnaires will be the major source for the next step of promising RRI practices classification. Through the classification we aim to make a mapping of promising practices from which lessons can be drawn in order to formulate good practice standards, which are necessary to develop tools for the RRI Toolkit.

4.3.   **Analysis**

Step 4 of the collection and classification methodology entails the analysis of the data that will be collected by the Hubs in the months to come. This data consists of the filled in Question Sheets, the filled in Questionnaires and the Reports of the M9-M10 Workshops given by the Hubs. The analysis will be done by Athena Institute and University College London in November and December (M11-M12 of the project) 2014. The results of this analysis will be used for finalizing the working definition and for the development of the catalogue of good practice standards.

We expect to analyse around 100-150 promising practices (19 Hubs, each delivering about 5 to 8 questionnaires). By the analysis of the questionnaires, common relevant characteristics, weaknesses and strengths will be identified, leading to the development of good practice standards. From the 100-150 promising practices, Athena Institute and University College London will select the 10 'best' practices. These 10 best practices will be analysed deeper by extra literature search and interviews and will be used as show cases in the RRI Toolkit.

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6. Annexes

Annex 1. Hub preparation sheet Copenhagen workshop

Use this sheet to make a short description of one practice you find particularly promising or otherwise interesting with respect to Responsible Research and Innovation. For every section, we have added some guiding questions based on the Background Note to the Working Definition. Use these questions to formulate your practice description only if they apply. Not all questions will pertain to the practice you have selected.

<TITLE OF SELECTED PRACTICE>

Description of the practice
For this section, be guided by the following questions:

- At which level does the practice take place? The level of 1) regional, national or international research and innovation systems, 2) organizations and institutions or 3) local research and innovation projects and agendas?

- What is the aim of this practice?

- How are the members of the practice fulfilling the aims (methodology)?

- Why do you think it is a practice of responsible research and innovation?

Outcomes
For this section we refer to the outcomes as described in the Background Note (p. 11).
Be guided by the following questions:

- Is there any form of learning on the side of either the scientific or societal actors involved in this practice? Please explain.

- To what extent do you think the practice strives towards R&I processes and products that are ethically acceptable, socially desirable or sustainable? Please explain.

- To what extent does this R&I practice departs from a societal challenge? Please explain.

- Are there any other outcomes of this practice that you think are characteristic for RRI?

Process requirements
For this section we refer to the process requirements as described in the Background Note (p. 16).
Be guided by the following questions:

- Is there any form of inclusion of societal stakeholders? Does the practice strive for diversity?

- How does this practice address openness and transparency?

- How does the practice shape the anticipation of future consequences and/or reflection on underlying values and ideals?

- Does the practice contribute to adaptive change?

Relation to policy agendas
For this section we refer to the policy agendas as described in the Background Note (p. 21).
You can be guided by the following questions:

- Does this practice relate to one or more policy agendas?

- Do you think this is a cross-cutting practice?

Annex 2. Promising RRI practice Question Sheet

Part A

After reading the information sheet on Responsible Research and Innovation (RRI), can you think of an existing practice that might be an example of RRI? Could you please note down some information about that practice and bring it to the workshop?

Name / Title:	
Organisation(s) involved:	
Website of practice:	
Contact person:	
Aims to contribute to:	☐ Health, demographic change and wellbeing; ☐ Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bio-economy; ☐ Secure, clean and efficient energy; ☐ Smart, green and integrated transport; ☐ Climate action, environment, resource efficiency and raw materials; ☐ Europe in a changing world - inclusive, innovative and reflective societies; ☐ Secure societies - protecting freedom and security of Europe and its citizens.
General description: (aims, activities, etc.)	
What makes this practice an example of RRI?	

Part B
Additional questions about the promising practice that relate to the RRI working definition. This part is filled in by the national Hub coordinators to collect promising practices and by stakeholders during the workshop.

Which RRI policy agenda(s) is or are addressed by the practice? (more answers possible)	☐ Public engagement ☐ Ethics ☐ Science education ☐ Open access ☐ Gender ☐ Governance ☐ Other, namely….
What are the *strong* points of the practice in terms of process requirements?	
What are the *weak* points of the practice in terms of process requirements?	
To what extent are the RRI outcomes explicitly addressed/reached in the course of the practice?	☐ Engaged publics ☐ Responsible actors ☐ Responsible institutions ☐ Ethically acceptable outcomes ☐ Sustainable outcomes ☐ Socially desirable outcomes ☐ Solutions to societal challenges, namely…
Please explain	

Annex 3. Brief RRI Information Sheet

What is responsible research and innovation?

Research and innovation constantly change our world. From the Internet and mobile phones, to climate change and new cancer treatments, science and technology have the potential to transform our lives. These developments also create new risks and new ethical dilemmas. Responsible Research and Innovation (RRI) seeks to bring these issues into the open, anticipate the consequences and directions of research and innovation and involve society in discussing how science and technology can help create the kind of world and future we want.

Why responsible research and innovation?

Increasingly powerful science and technology have granted humans unprecedented scope to intervene in our surroundings, from altering ecosystems and the Earth's climate at the global scale to manipulating the minute building blocks of matter and life itself. In addition, as a society, we face great challenges – from healthy ageing to sustainability, from global health to resource security. Research and innovation have the power to tackle these challenges, but their success is not guaranteed.

Research and innovation will always be at least partly unpredictable, but this does not excuse irresponsibility. Understanding and taking responsibility for these developments goes well beyond just science and scientists. Such developments profoundly affect all our lives. The direction and purpose of research and innovation, the distribution of its outcomes (both positive and negative), the uses of new technologies and maintaining a focus on solving pressing problems are matters that we, as a society, need to discuss and choose together.

What should responsible research and innovation look like?

RRI is not one thing. It will vary across institutions, cultures and areas of science and technology. However, it will have one key, central feature: it will put the needs of ordinary citizens at its centre. Companies will still need to make profits in a market economy, but RRI will re-orientate research from "can this make money?" to "how can this fulfil the needs of society within the market?".

What about "fundamental" research?

Fundamental research is not aimed exclusively at meeting the immediate, material needs of society. The deep insights into the world in which we live – from sub-atomic to universal scales, from the micro-biotic to the global environment – are a vital part of human culture. RRI applies to all stages and aspects of research, including fundamental research. It demands that the knowledge gained be open and accessible to all, and that its starting point be engagement with as many of the world's citizens, who want to participate in creating that new knowledge, as possible.

Whose needs, whose challenges?

How, then, to uncover the needs of our fellow citizens? Over the last few decades, we have seen many experiments that foster involvement of the public in discussions and policy decisions regarding science, collaboration between scientists, ethicists and social scientists, open source and user-driven innovation, citizen science and more besides. We should encourage such experiments, join them up and encourage the institutions that fund, regulate and govern science and innovation to respond to them.

RRI means experimenting further and improving upon existing practice. It means paying close attention to current developments, be they positive efforts by scientists to take responsibility for emerging technologies, or institutional and cultural barriers that are stopping progress. RRI also encompasses research ethics, gender and other forms of inclusion, open access to scientific data and publications, and scientific education. Scientists and innovators should be encouraged to take responsibility for the futures they help shape. But the responsibility is not individual, nor is it theirs alone. The challenge is to find collective ways to take care of the future.

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Promising practice examples

As this section was a result of the feedback given by the Hub coordinators during the Copenhagen workshop (26-27th June 2014), it could not be added before the deliverable submission date.

Annex 4. M9-M10 Workshop Reporting Template

Session 2 (RRI working definition) template

Working definition	
Exercise 1: **The RRI working definition**	*Add photos of the visualizations* *Summarize (or translate) information below:* *Provide a small summary of the discussion:* *<Address the most relevant aspects of the working definition; aspects outside the four clusters that might be missing; other important questions or remarks>*
Exercise 2: **Experiences of participants**	*Add photos of the visualizations* *Summarize (or translate) information below:* *Provide a small summary of the discussion:* *<Elaborate on keywords from post-its>*

Session 3 (RRI promising practices collection) template

Collection and classification of promising RRI practices	
Exercise 3: **Collection and classification in small groups**	*Please attach translations of all of the filled-in 'three-questions' answer sheets.* *Add photos of the visualizations and provide translations of the lists of the most successful strategies made by participants.* *Add photos of the visualizations and provide translations of the lists of process requirements that are not fulfilled made by participants.*
Exercise 4: **Classification in whole group**	*Add photos of the visualization*
Exercise 5: **Ranking successful strategies**	*Provide translations of the successful strategies along with the amount of dots and their respective colours:* *Provide a small summary of the discussion:* *<Elaborate on keywords from post-its>*
Wrap-up and closing	*Summarize the most important questions or remarks that have been made at the end of Sessions 2 and 3*