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**SUPER MoRRI – Scientific understanding and provision of an enhanced and robust monitoring system for RRI**

## **D6.2 Self-assessment tool**

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## List of Acronyms and Abbreviation

|           |   |
|-----------|---|
| < KPI >   | < Key Performance Indicators >  |
| < MoRRI > | < Monitoring the Evolution and Benefits of Responsible Research and Innovation> |
| < RI >    | < Research Innovation >   |
| < RRI >   | < Responsible Research and Innovation >   |
| < SDGs >  | < Sustainable Development Goals>  |
| < SME >   | < Small or Medium-sized Enterprise >  |

# 1. EXECUTIVE SUMMARY

## 1.1. Description of work and task

**Task 6.2: Building a self-assessment tool for measuring, sharing, and communicating RRI within and across organizations (M6-M36; Lead: TUD, supported by Fraunhofer, SIMAVI)**

This task both designs ‘RRI readiness levels’ for all types of organizations and identifies levels of performance from minimum standard to best practice. To achieve each performance step (or level), an organization must meet a series of assessment criteria which include both quantitative and qualitative measurements. All stakeholders must achieve level one of each priority or have an action plan in place to ensure they do so within an agreed timescale. Such further development demonstrates growth or functionally increased performance in RRI. A tailor-made framework is developed to measure and monitor strategic benefits and performances achieved by RRI. This framework can subsequently be applied to all types of organizations. An online self-assessment tool is developed, where each organization monitor its performance against RRI indicators coined by the MoRRI project.

## 1.2. Work progress and achievements

**Task 6.2: Building a self-assessment tool for measuring, sharing, and communicating RRI within and across organizations (M6-M36; Lead: TUD, supported by Fraunhofer, SIMAVI)**

- <DONE> Identifying levels of assessment performance from minimum standard to best practice.
- <In Progress> Designing ‘RRI readiness levels’.
- <DONE> Achieving each performance step (or level) by providing a framework that an organization could meet a series of assessment criteria which include both quantitative and qualitative measurements.
- <DONE> Developing a tailor-made framework to measure and monitor strategic benefits and performances achieved by RRI.
- <DONE> An online self-assessment tool is developed, where each organization monitors its performance against RRI indicators coined by the MoRRI project.

## 1.3. Deliverable overview

| No.  | Deliverable Title    | Lead beneficiary | Type         | Diss. Level | Due/Delivery date |
|------|----------------------|------------------|--------------|-------------|-------------------|
| D6.2 | Self-assessment tool | TU Delft         | Demonstrator | Public      | M36               |

Table 1. Deliverable 6.2 overview

## 1.4. Deviations from the plan and problems encountered

<none>

## 2. OBJECTIVE AND SCOPE OF SELF-ASSESSMENT TOOL

The SUPER MoRRI Self-Assessment Tool (SAT) aims to provide a method of assistance to various types of stakeholder groups (primarily Research Performing Organizations (RPOs)) to measure/assess their performance in terms various RRI indicators.

While the aim is to serve RPOs, the assessment shall be carried out at the project level as the main unit of analysis (see below). To obtain a more complete picture at organizational level, a significant number of projects of that organization would have to be introduced in/assessed by the SAT.

The SAT can be of use to Research Funding Organizations (RFOs) as well, but rather indirectly. Such tool can inform RFO policies in terms of defining indicators of interest that can be monitored and targets established at the level of funded projects.

The SAT shall be based on prior work carried out in SUPER MoRRI (particularly WP2) and MoRRI projects. The indicators used by the SAT shall be developed mainly as adaptations of indicators developed previously at national level.

The SUPER MoRRI SAT builds on the idea and concerns of the inventory of RRI assessment toolbox in D6.1, particularly we are aware of the Societal Readiness Thinking Tool (<https://thinkingtool.eu/>). SAT and 'thinking tool' have a common interest with RRI and aim at stimulating thinking and interest in this field. However, the SAT will also be different from a thinking tool, including the one mentioned.

- The SAT aims to include and focus mainly (but not necessarily exclusively) on indicators with pre-defined scales of measurement, although some open answer questions may still be desirable. While this may involve some loss in terms of flexibility, there are also some gains (see below).
- Because of having pre-defined answers (measured at categorical/nominal, ordinal, interval or ratio scales), the SAT will allow to compute composite indicators and make comparisons:
  - Either within the same project
    - between different time points
    - between reported results and targets;
  - Or between one's project and others:
    - comparing with other projects within the same organization (with full access to other projects data);
    - comparing with outside projects (who have given their consent for sharing data, but under anonymous use: i.e. comparisons will be made with aggregates of other projects with a minimum number of projects needed in a category before aggregates become accessible).

### 3. METHODOLOGICAL STEPS

#### 3.1 Introduction

In this document, we clarify the methodological steps that we took so far, and the steps we will still take, in developing a self-assessment tool for research performing and research funding organizations. The explicit aim of this tool (as highlighted in the SUPER MoRRI project proposal) is to allow RFOs and RPOs to self-assess the current status of their implementation of RRI principles in running research and innovation projects, and monitor the development of this status over time. We follow a four-step approach based on the Design Council's Double Diamond (DD) approach, for the development of this tool. The priority at this stage lies firstly in figuring out how the tool should be used, and later will shift towards which indicators should be included, best linked to this use scenario.

The overview below (Figure 1) shows, as an example, the different stages of the DD approach. The next figure (Figure 2) shows our interpretation of the four consecutive steps. We are currently at the 'final brief' stage, halfway through the process. We will highlight the steps we took so far, below.

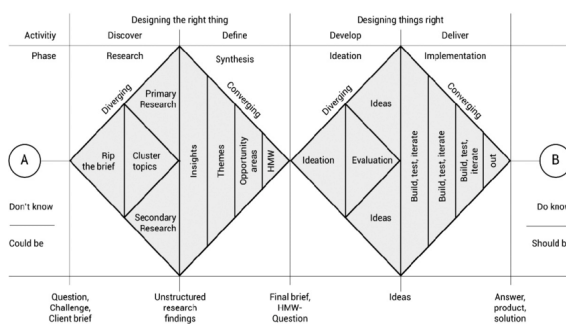


Figure 1: Example of Double Diamond Approach

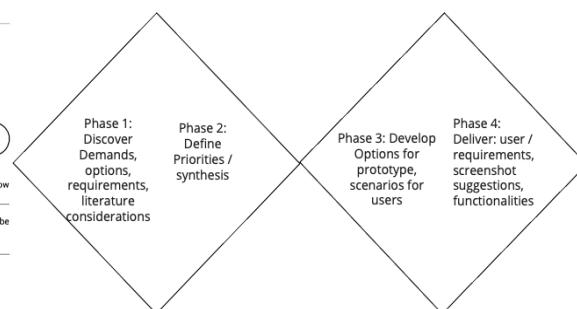


Figure 2: Our interpretation the four phases

#### 3.2 Phase 1: Designing the right thing

This first step is a divergent, research-based step. We collect and report on (without filtering these options based on any criterion) possibilities for self-assessment regarding RRI implementation and monitoring on the project level within RPOs and RFOs. The methods we use for this step include mainly literature search in academic and professional literature, as well as an investigation of earlier and current SwafS-project reports on RRI. The guiding questions for this phase are:

*Why would RFOs and RPOs require a RRI self-assessment tool?*

- We look explicitly at which instrumental/normative/substantive reasons may exist for RRI.

*What may be the aim of a self-assessment method on RRI on a project level for RPOs/RFOs?*

- We look explicitly at possibilities/opportunities and drawbacks/problems in RPOs/RFOs that a self-assessment tool on the project level might result in.
- Which practical features for self-assessment tools of projects are currently available?
- We look explicitly at methods and tools for self-assessment that have been developed within the (earlier and current) EU project context, including those reported on and developed in SwafS projects.

*What may be implementation options for RPO/RFO practice?*

- We highlight explicitly who should be involved in the implementation of an RRI self-assessment tool in RFOs/RPOs and which operational changes this might require in project-level activities within RFOs/RPOs.

### 3.3 Phase 2: Define priorities

In this phase we develop guiding principles that the tool should be based on. We share insights regarding the background of the tool against which it should be developed, develop various themes that the tool should contain, and highlight critical use-requirements. The methods we use for this step include (group) brainstorming, expert workshops and literature research.

Insights to develop the tool against:

- The tool should take into consideration the RPO/RFO's RRI maturity levels (stairway principle): more 'RRI-sensitive / RRI-ready' organizations can assess themselves against higher-level RRI elements. This requires some form of scalable performance, possibly a rubrics system.
- To assess projects, the tool should distinguish between RRI-relevant aspects on the levels of project processes and project products/outcomes.

Themes to be included:

- The tool should distinguish classical RRI elements Anticipation, Reflection, Inclusion and Responsiveness in a manner similar or based on the EU Thinking Tool.
- The tool should distinguish between instrumental, normative and substantive elements, related to the RPO/RFO's current interests / desires.

Critical use considerations:

- The tool should be usable in a clear, stepwise approach for its users. We consider something similar to the SDG compass, that includes 5 steps (1: understanding SDGs, 2: defining priorities, 3: setting goals, 4: integrating, 5: reporting & communicating).
- The tool should distinguish both personal (skills/abilities, willingness/motivations) and network (system tools, culture) based elements of RRI.

### 3.4 Final brief: Design requirements

Below we describe various Guiding Principles for the development of the tool, from the Why, Who, When, Where perspectives. The 'what' and 'how' are further specified in Phase 2.

- Why: Our first starting premise is that when RRI indicators are more explicitly considered and integrated in research / innovation projects in RFOs and RPOs, the outcomes of such projects will be both more societally relevant and of higher quality than without such explicit consideration and integration. Our second premise is that RFOs and RPOs currently lack the means to assess their on-going and future projects against RRI indicators that are project- and organization-relevant; this implies that they are currently not well-enough equipped to establish how they are performing with regard to such RRI indicators. Our third premise is that an online self-assessment tool provides the best means to enable RPOs and RFOs to carry out an analysis based on which they can further explicitly consider and integrate RRI indicators that are project- and organization-relevant.
  - Guiding principle (1): based on these three premises, we define the explicit aim of the tool (as highlighted in the SUPER MoRRI project proposal): to allow RFOs and RPOs to self-assess the

current status of their implementation of RRI principles in running research and innovation projects, and monitor the development of this status over time.

- Who: individuals who are working on research and innovation projects in RFOs and RPOs are the ones who are capable of integrating RRI principles in their practices. Ultimately, their (personal and group) decisions determine the direction of such projects. We explicitly consider project leaders and program managers, as well as project advisors, to be able to align research and innovation goals with RRI principles.
  - Guiding principle (2): the self-assessment tool should be used by those who know the guiding principles behind research and innovation projects, and are able to steer decisions in a direction that is in line with RRI principles.
- When: self-assessment of research and innovation projects requires that projects are advanced/matured to such an extent, that professionals can assess the quality of current processes and (early) outcomes and compare these processes and outcomes to other projects (within the organization). The anticipated aim of this tool (i.e. to monitor developments over time) also implies that repeated assessment is desirable, and also that the tool provides insights into possibilities for (positive) development based on RRI principles.
  - Guiding principles (3): the self-assessment tool should be used within on-going projects at multiple occasions, allowing for the possibility of development based on input from the self-assessment tool. 'Multiple occasions' need to be specified on the project-level, but we envision e.g. twice per year for longer projects, or bi-monthly for shorter projects.
  - Guiding principle (4): the self-assessment tool should provide insight into where possible improvements on the project-level may be found. Such projected improvements may be translated into targets, performance goals, etc.
- Where: the network within which research and innovation projects take place, more frequently than not includes multiple people (with multiple perspectives on RRI and project management) from different disciplines and multiple locations (even across countries). Such large, multi-national and multi-disciplinary projects require an accessible, preferably online system that catalogs and presents the self-assessment data.
  - Guiding principle (5): the self-assessment tool is accessible online.

### 3.5 Phase 3: Develop / ideation

Phase 3 results in various options (scenarios) for a self-assessment tool. These steps, in a nutshell:

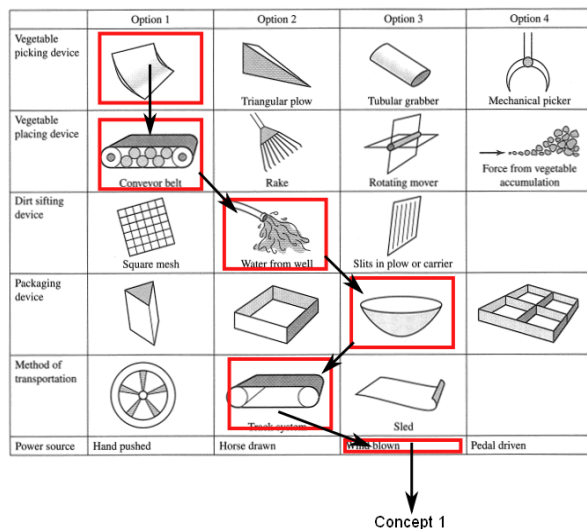
#### *(1) Morphological chart*

- Using a divergent thinking process (non-restrictive), we develop a morphological chart that lists all possible options/methods/ways to realise the guiding principles (functions) mentioned above. See Figure 3 for an example, and Figure 4 for an empty variant for this project. We use literature and an expert workshop with consortium members for this step.

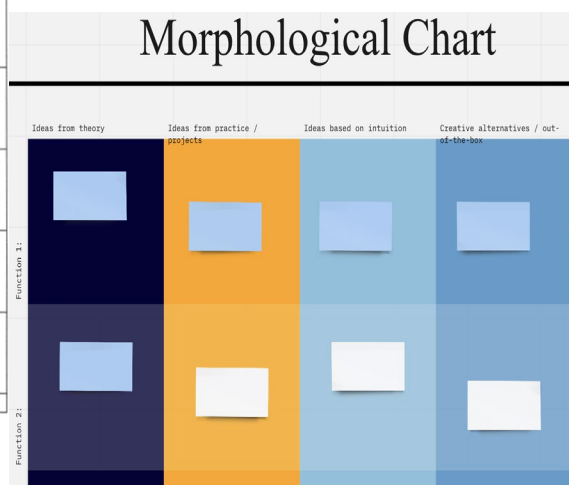
#### *(2) Scenario/concept development*

- We are aware that we cannot use all the ideas generated in the previous step in the development of various concepts/scenarios/options. This step is also divergent (non-restrictive), and we identified possible concepts that are worked out as starting principles for the prototype of the tool. This was done in collaboration with the consortium, led by SIMAVI.





**Figure 3:** Example of a morphological chart, leading to 'Concept 1'



**Figure 4:** Empty morphological chart to be used later

The functions that are part of this chart, for which the consortium members collectively found options, were:

- Which User Levels should we identify? Who are they? Which project roles? How many people should have simultaneous access?
- How much time may it take the users (per month?) to use the tool, all things included (opening tool, entering data, interpreting results, planning actions)
- How and who should select which (RRI) elements are important to consider for the use of the tool in their context?
- How frequently should the (content of the) tool be updated and who should do this?
- One function is 'reporting' on RRI / societal readiness. In which format should the tool export such reporting?
- Should users be able to add additional indicators? If so, how should they do this and at which stage (before the use of the tool)?
- To what extent is it important that users are able to prioritize actions based on the outcome of assessment (e.g. using an indicator-weight-system)?
- How frequently should users use the tool for data entering and interpretation (placing RRI / societal readiness on their agenda)?
- What kind of comparison should the tool allow for? E.g. between projects, individuals (opinions/assessments per person), moments in time, programmes within the organization, externally, international aggregate level, etc.)?
- What format for data protection should we use? e.g. No one else access, access for research purposes, anonymous results, etc.) and who should have access to data?
- How, how long and where should data be stored?
- Who, within the own organisation, can ask for access to which kinds of data? Individualised and recognisable?
- Should there be an aggregate level set of indicators that is always collected, to allow for comparison and prevent cherry picking by the organization / project team?

The outcome of this process, i.e. the morphological chart, is presented in APPENDIX A. In Section 5 we follow up on this, but first we indicate the process of identifying the relevant RRI indicators and performance levels

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## 4. RRI INDICATORS AND LEVELS

### 4.1 RRI indicators included in the tool

The self-assessment tool functions based on a number of RRI-related indicators that projects by research performing and funding organizations can be assessed on. To identify these indicators, we used the following approach. First, we identified a number of sources for these indicators from the inventory of RRI assessment toolbox in D6.1. We selected those sources from the toolbox that address a particular RRI policy agenda area or R&I process dimensions, they are current and in use, and they are applicable to research performing and funding organizations. These included the following tools:

- *SUPER MoRRI Deliverable 2.2 (Eurobarometer, She Figures, WoS, Unpaywall data)*: To synergize SUPER MoRRI activities, we closely looked at D2.2 and its selection of indicators.
- *MoRRI indicators*: We included the MoRRI indicators into our sources as MoRRI indicators are one of first and foremost set of indicators in the RRI space.
- *CWA 17796 Responsibility-by-design standard*: This standard uniquely provides guidelines to develop long-term strategies (roadmaps), that integrates considerations of technical, ethical, social, environmental, and economic aspects all along the research, development, and design process leading to an innovation. The CWA 17796 build on existing national, Europe, international standards and policies on corporate social responsibility, quality, risk, and innovation management, providing a management standard (Plan-Do-Check-Act cycle) focusing on research and innovation practices. CWA 17796 has a list of RRI key performance indicators.
- *British standard on Responsible Innovation – PAS 440*: Similar and aligned with CWA 17796, PAS 440 provides guidance to organizations on how to structure innovative thinking and processes responsibly. We selected both standards to cover RRI policy agenda aspects both in EU and UK.
- *Societal Readiness Thinking Tool*: Thinking tool is unique as the tool asks reflective questions to stimulate thinking about how to integrate ideas about RRI into research practice, at different stages in the project life.

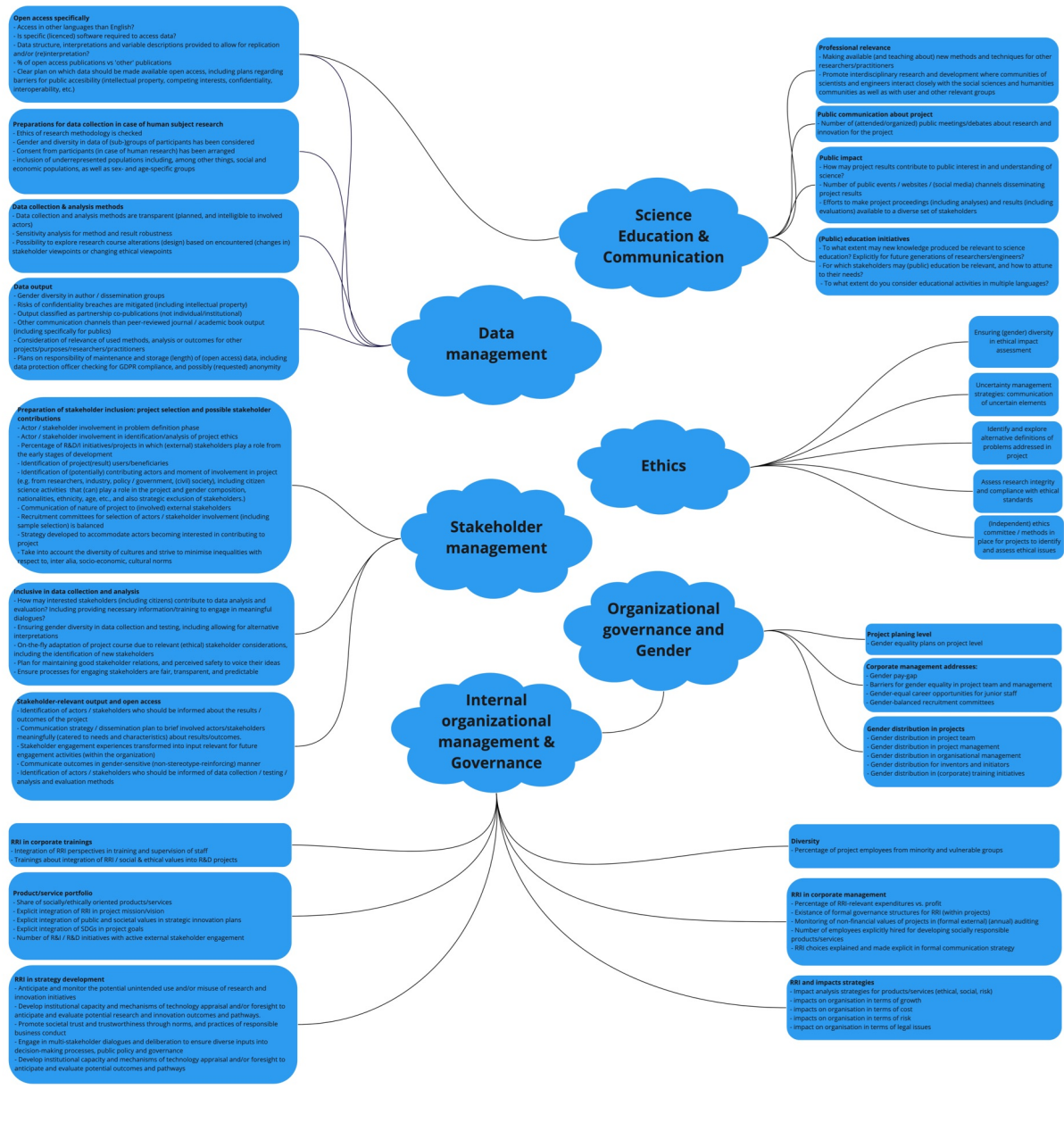


Figure 5: overview of identified clusters aggregate indicators and individual indicators.

The detailed list of identified clusters is presented in APPENDIX B.

## 4.2 Clusters, aggregate indicators and individual indicators

The consortium was explicitly asked to include elements of the Thinking Tool, i.e the practical outcome of the EU-funded NewHoRRizon project that offers practical guidance for researchers who wish to mature the societal readiness of their work.<sup>1</sup>

In total, 213 unique indicators were identified. After removal of duplicates, 174 indicators were intuitively clustered by the authors, using as guidelines the OECD Responsible Innovation Principles, and earlier clustering used in the Thinking Tool, the earlier MoRRI project and the PRISMA project. Here, six main clusters were identified, each with a number of aggregate indicators, with again a number of individual indicators that were used below in the tool development (section 5.6). Please note that some (aggregate) indicators could not be exclusively assigned to one cluster, and also clusters may overlap for various indicators. A mutually exclusive, collectively exhaustive (MECE) distribution, we feel, is impossible to develop.

The clusters include:

- Science Education & Communication
- General Ethics
- Internal organizational management & governance
- Organizational governance and Gender specifically
- Stakeholder management
- Data management

After reviewing the clusters and aggregate indicators, we felt that various indicators were predominantly relevant for different phases in projects in Research Performing Organizations. Below (Figure 6) we provide an overview of the distribution over project-relevant levels / phases.

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<sup>1</sup> The NewHoRRizon project website can be accessed at <https://newhorizon.eu/>, the Societal Readiness Thinking Tool is available at <https://thinkingtool.eu/>.

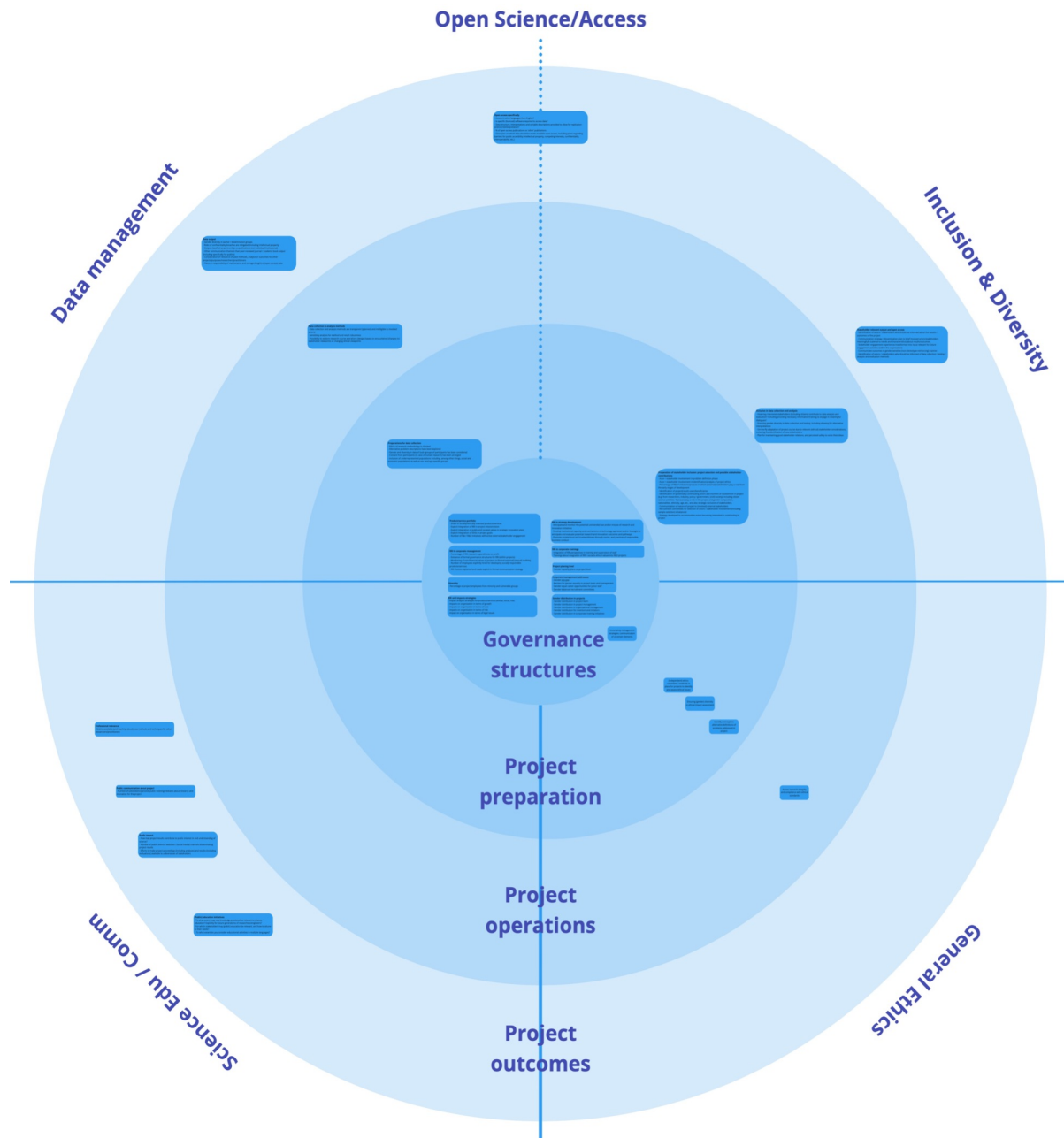


Figure 6: Distribution of aggregate indicators over clusters and project-relevant levels / phases.

## 5. PROTOTYPE DEVELOPMENT

### 5.1 Entities

Entities refer to “singular, identifiable and separate objects”

(<https://www.techopedia.com/definition/14360/entity-computing>). They may refer to various objects, e.g. individuals, organizations, assets, etc. to which attributes are associated. Understanding entities is essential for defining the data structures of an information system as well as the processes involving those entities.

Projects: the main unit of analysis

The main unit of analysis of the Self-Assessment Tool (SAT) is the project: i.e.:

“A project is a temporary endeavor undertaken to create a unique product, service or result” (PMBOK 2017).

More specifically the SAT will apply to research projects:

- the object of the assessment exercise (i.e. what is being assessed) will be the research project.
- The main and most RRI indicators to be collected will characterize (will be attributes of) the research project.

#### Justification

- Research is carried out in most organizations as projects – in other words the project is the main and basic unit of organization of research activities.
- Organizations are less appropriate units of analysis because:
  - Organizations usually are not entirely focused on research: many private entities that are involved in research have significant other activities. Collecting data at the level of the entire organization may mean collecting data that is not necessarily about research.
  - Identifying people/departments who have the perspective and access to data about research activities at the level of organization may be significantly more difficult than identifying people who have the knowledge and access to data about individual projects. For the later, the project manager can be the main person to initiate and coordinate the self-assessment process.
    - The person who may have the information may have not power or legitimacy to represent and assess the organization.

### 5.2 Attributes

All indicators will technically be considered as attributes of the research project under assessment. These indicators are described in the Section Indicators below. Aside from the indicators other attributes of projects are needed as general information describing the projects. These are described below.

**Table 2: Project attributes**

|    | Title                | Description  | Question  | Details   |
|----|----------------------|--|---|---|
| 1. | Project full title   | Provides the full title of the project   | Please provide the full name of the project           | Text  |
| 2. | Project Abbreviation | Abbreviation of project title  | Please provide the project title abbreviation if any. | Text  |
| 3. | Project ID           | Project ID Code  | Please provide the project ID Code                    | Text  |
| 4. | Consortium Project   | Provides information as to whether the project is implemented in a consortium or by a single organization. | Is the project implemented by a consortium of         | Binary; implementable as drop box or option button. |

|    |                               |   |   |   |
|----|-------------------------------|---|---|---|
|    |                               |   | organizations or by a single organization?                    | 1 – Single organization;<br>2 – Consortium            |
| 5. | Consortium list               | List of organizations members of consortium. This will be initially implemented as a text box with agreed separators between organization names. In the future if a different model of use is adopted where each member of consortium has a role in inputting data in the SAT this will need to change. | Please insert the list of consortium members.                 | Text; only if the answer to the above is "Consortium" |
| 6. | External funding              | Describes whether the project received external funding.  | Is the project financed externally by a funding organization? | Binary: yes/no  |
| 7. | External funding organization | Provides information as to which is the external funding organization   | Which external funding organization?                          |   |
| 8. | Thematic area of research     | TBD   |   |   |

### 5.3 Organizations

While one of the goals of the SAT is to serve stakeholder groups (primarily RPOs and groups of RPOs as well as individual researchers, managers and other project workers), it will not assess directly the organization (for reasons enumerated above). Therefore, the organization is not the unit of analysis. Nevertheless, it is an important entity considered by the SAT.

The organization shall be a unit of aggregation of project information. For example, the SAT can present aggregates of project indicators (e.g. averages, sums, etc.) by the lead organization, and (possibly, TBD) compare aggregates between organizations. To the extent that an organization includes/assesses using the SAT, a number of projects that are in some meaningful way "representative" of their wider set of projects or a totality of their projects, the aggregations by organization shall be representative of the organization's projects. Otherwise, it should be clear (and will be made transparent) that the aggregates are over the projects of that organization which happen to be in the SAT at that time.

Projects will need to be associated to organizations. However, the relationship between projects and organizations is complicated. Technically there is a many-to-many relation between projects and organizations:

- One or more projects may be implemented by a single organization.
- One or more projects may be implemented by a partnership/consortium of organizations.

This many-to-many relationship poses business and technical problems for the SAT, as related to indicators implementations. For example, many indicators about a project may need to be recorded, analyzed and presented separately per each organization partnering in a project – significantly complicating the process of using the SAT.

This level of complexity should be avoided, at least at the first iteration of implementing SAT, especially as we deal with other conceptual and practical difficulties at this moment.

To simplify the relationship between project and organization we think it is appropriate to consider only the "lead organization", i.e. the unique organization if the project is implemented by a single organization, or the "lead organization"/coordinator if the project is implemented in a consortium. The organization thus defined is in a one-to-one relationship with the project.

The organization shall be a unit of aggregation of project information. For example, the SAT can present aggregates of project indicators (e.g. averages, sums, etc.) by the lead organization, and (possibly, TBD) compare aggregates between organizations. While these aggregates may be somewhat telling it should be clear

that such aggregates do not represent all projects run by that organization but are a collection of projects that have been included in the SAT until that moment in which the said organization is the lead partner.

## Attributes

Table 3: Organization attributes

|    | Title             | Description                                     | Question  | Details   |
|----|-------------------|---|---|---|
| 1. | Organization name | The official name of the organization           | What is the official name of your organization? | Text  |
| 2. | Country           | Country name where the organization is located. | Country?  | Text  |
| 3. | Region/Province   | Region where organization is located            | Region where organization is located            | Text. If the country is in the EU, then the NUTS2 regions will be required. |
| 4. | Town/City         | Town/City where organization is located         | Town/City where organization is located         | Text  |
| 5. | Organization type |   |   | Private Enterprise<br>University<br>Research Institute<br>Public Authority  |
| 6. | Ownership         |   |   | Privately owned<br>Owned by governmental organization                       |

## 5.4 User Roles

Table 4: User Roles

| User Role         | Description  |
|-------------------|--|
| Project Manager   | <p>Manages all the information about the organization<sup>2</sup> and project . This person is ultimately responsible for the information filled in the SAT about their project and organization.</p> <ul style="list-style-type: none"> <li>Creates new projects in SAT;</li> <li>Fills in general information about project and organization.</li> <li>Can also input and view information about indicators.</li> <li>Can see self-assessment reports about their projects.</li> <li>Can add other users: Project Assistants, Project Workers.</li> <li>Can access/view the SAT Dashboard</li> </ul> |
| Project Assistant | <p>Person appointed/added by the Project Manager to operate input data.</p> <ul style="list-style-type: none"> <li>Fills in general information about project and organization.</li> <li>Can also input and view information about indicators.</li> <li>Can see self-assessment reports about their projects.</li> <li>Can add other users: Project Workers.</li> <li>Can access/view the SAT Dashboard</li> </ul>   |
| Project Worker    | <p>A project worker is any project worker that is added by the Project Manager or Project Assistant ;</p> <ul style="list-style-type: none"> <li>The project worker has viewing rights on information about the project.</li> <li>Can access/view the SAT Dashboard;</li> <li>If in the future some Self Assessment Information is asked in a survey format from project workers, the project workers will have input/editing access to such surveys.</li> <li>Can access/view the SAT Dashboard</li> </ul>  |
| Unassociated user | <p>User who has self-registered but has not (yet) been associated with a project and organization.</p> <ul style="list-style-type: none"> <li>Can access/view the SAT Dashboard</li> </ul>   |

<sup>2</sup> For a future version of this document we may consider another user role "Organization representative" who manages the entire account for the respective organization and the projects that belong to it. For the moment, however, it does not make sense to make the user role list too complex.



|                      |   |
|----------------------|---|
| Unregistered User    | Any visitor of SAT on the Internet. <ul style="list-style-type: none"><li>• Can access/view the SAT Dashboard</li></ul> |
| System Administrator | Representatives of the SUPER MoRRI implementation team who can manage the SAT.  |

## 5.5 FLEXIBILITY OF TOOL

We are considering flexibility of the tool under various aspects to accommodate different users/projects needs.

Flexibility may include the following aspects:

- choosing indicators
  - prescreening indicators
  - non-answers that exclude indicators
- weighing indicators
- add indicators
- Open answers

There may be a tradeoff between flexibility and adding features in general on the one hand, and usability on the other hand.

SAT will have two modes: target setting and reporting.

The initial version of the SAT will be less flexible: the set of indicators considered will be pre-defined; equal weights of indicators will be assumed; only one mode (that of reporting) of work will be added. Later versions will enhance flexibility.

## 5.6 INDICATORS

Indicators will be grouped in six categories/pillars as defined by the MoRRI Project:

1. Science Education & Communication;
2. Ethics;
3. Organizational Governance and Gender;
4. Data Management;
5. Stakeholder Participation;
6. International Organizational Management & Governance.

### Level of complexity:

Indicators can vary in levels of complexity:

- Simple indicators – obtained by direct input from users,
- Meso level indicators – obtained via a simple calculation based on simple indicators (e.g. a percentage of female researchers in the project obtained as number of women divided by the total number of researchers),
- Complex indicators – obtained through aggregations of, or complex calculations based on, simpler indicators.

## 5.7 Main User Requirements

### Functional Requirements

Table 5: Functional Requirements

| Code  | Title                                | Description  | User Roles  |
|-------|--------------------------------------|--|---|
| FR001 | Data introduction (self-reporting)   | Introduce and reintroduce data about status on RRI indicators regarding my/our organization's projects at different time moments or intervals  | Project manager; Project assistant                                      |
| FR002 | Target setting                       | Introduce data about targets to be achieved on RRI indicators regarding my organization's project  | Project manager; Project assistant                                      |
| FR003 | View data self-reported and targets  | See data introduced by user reporting back about RRI indicators. Viewing should allow for comparisons between data introduced at different times and/or comparisons between reported values and target values. | Project Manager; Project assistant; Project worker                      |
| FR004 | View dashboard                       | Provide data visualizations and on one's project and comparisons with data (confidential aggregates) about other projects.   | Project Manager; Project assistant; Project worker<br>Unregistered User |
| FR005 | Add organization                     | Add organization and associate account to organization   | Project Manager   |
| FR006 | Add users associated to organization | Add users associated to organization   | Project Manager<br>Project Assistant                                    |
| FR007 | Add project                          | Add new project  | Project Manager; Project Assistant                                      |

### Non-Functional Requirements

Table 6: Non-Functional Requirements

| Code   | Title                       | Description  |
|--------|-----------------------------|--|
| NFR001 | Data privacy                | Personal data shall be protected in accordance with GDPR   |
| NFR002 | Projectdata confidentiality | Specific data about projects may be protected. However (with the user acceptance) data from projects will be used to produce aggregates and those aggregates shall be public |

## 6. SAT FIRST (DEMO) VERSION

A first demo version of the SAT was implemented by SIMAVI in accordance with the DOA established deadline of 31 December 2021.

The demo SAT is hosted in a temporary test environment at: <http://195.82.130.213/>

The following test user accounts have been generated:

Table 7: Test User Accounts Credentials

| User Role            | User Name        | Password                 |
|----------------------|------------------|--------------------------|
| System administrator | admin            | to be given upon request |
| Project manager      | Projectmanager   | C89%d0m5                 |
| Project assistant    | Projectassistant | C93%d0m3                 |
| Project worker       | Projectworker    | C23%d0c6                 |

### 6.1 SAT Main Page

This is the main page of the SAT where the main functionalities and options are shown (Project Manager view).

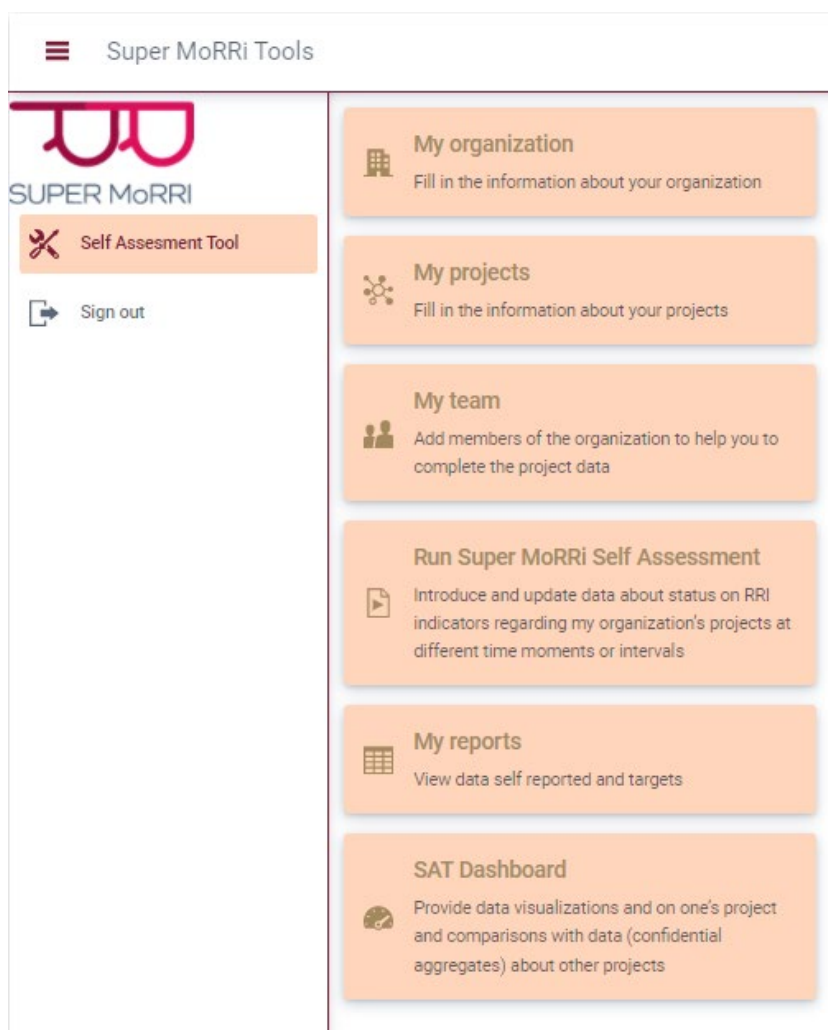


Figure 7: SAT Main Menu (Project Manager's view)

The System Administrator has additional administration options as shown below:

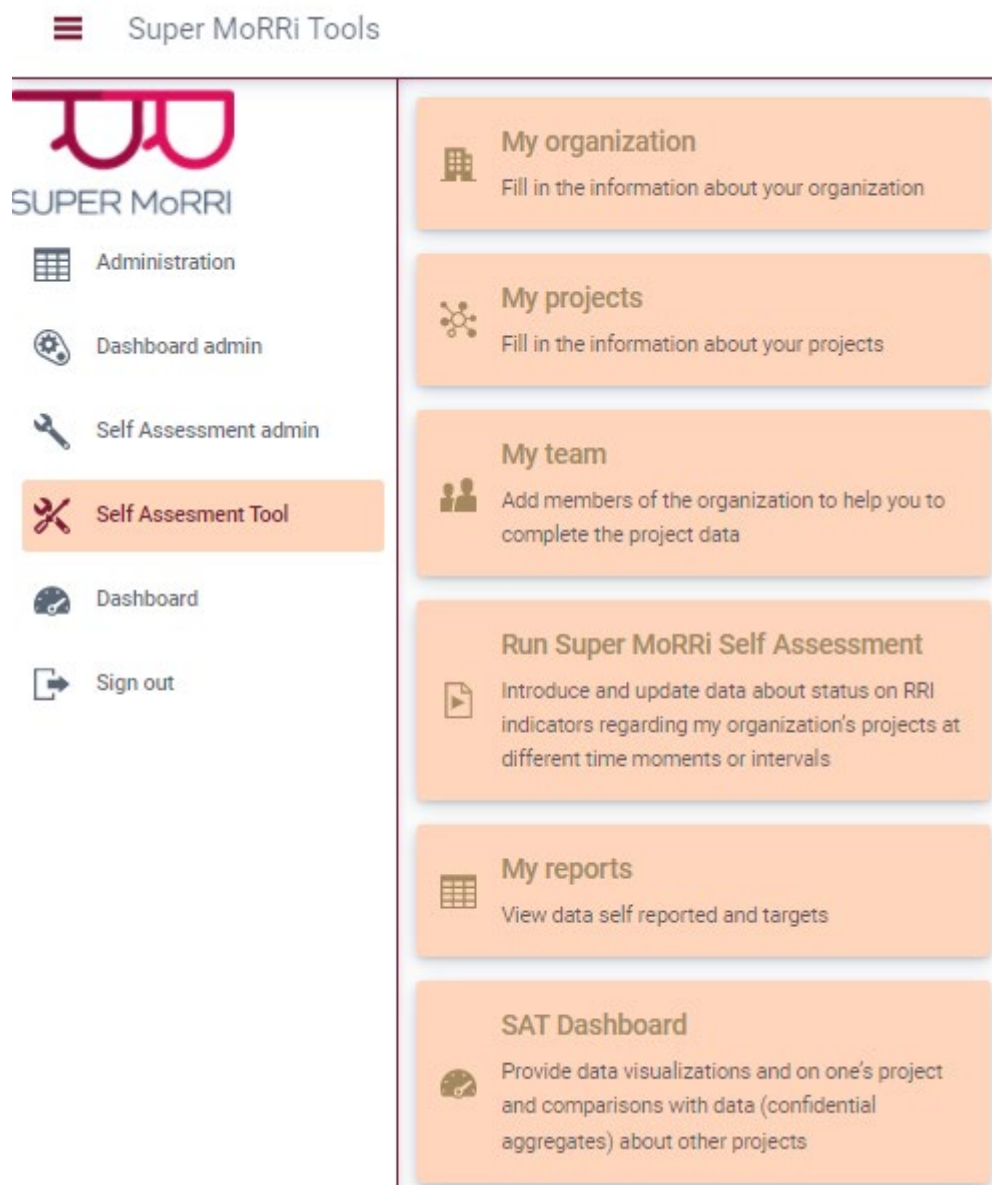


Figure 8: SAT Main Menu (System Administrator's View)

The project manager has the ability to edit his/her organization's data un an organization form shown below:

What is the official name of your organization? •

Country where organization is located? •

Region where organization is located?

Town/City where organization is located •

Organization type

Private Enterprise

Ownership

Privately owned

Save Discard Cancel

Figure 9: Organization Data Form

Also he/she can add projects into the SAT:

Filter by title

Add a project

| Title                    | Code     |
|--------------------------|----------|
| UM Ethics and Integrity  | 09GH%&   |
| UM Data Science Research | 56SHJK98 |

Please provide the full name of the project •

Please provide the project title abbreviation if any

Please provide the project ID Code •

The project is implemented in a consortium or by a single organization

Single organization

Please insert the list of consortium members

Is the project financed externally by a funding organization?

No

Save Cancel

Discard Delete

Page 1 from 1 Total records: 2

Figure 10: Project List Form

The project manager can also add users to the project team:

Filter by username, last name, first name
New team member

| Username         | First Name | Last Name | Email             | Project Mana... |
|------------------|------------|-----------|-------------------|-----------------|
| projectworker    | Allison    | Torres    | allison.torres... | Madeline Lewis  |
| projectassistant | Aria       | Bailey    | aria.bailey@co... | Madeline Lewis  |

Page 1 from 1
Total records: 2

Figure 11: User Management Page (Project Manager's view)

The Project Manager, Project Assistant and Project Worker can see the list of self assessment forms that have been filled related to their project.

From the list the users can choose to view the form. The Project Manager can also add new projects or delete projects from the list.

Select a project to see your progress
Select a navigation mode to scroll through the questions

UM Ethics and Integrity
Filter by category, class

| Creation date     | Created by     | Date of last modification | Modified by    | Completion degree | Action |
|-------------------|----------------|---------------------------|----------------|-------------------|--------|
| December 18, 2021 | Madeline Lewis | December 18, 2021         | Madeline Lewis | 28/28 - 100.0%    |        |

Create a new set of records

Figure 12: Self-Assessment Forms List

The self assessment form once opened looks as below. The user can choose the category and class of questions and then can view or edit the answers to the questions.

Category

Data Management

Class

Preparations for data

Back to main page

✓ Question1 - (Optional question)

Have the ethics of the research methodology been checked?

☒ Yes
 ☐ No

Save

✓ Question2 - (Optional question)

Have the gender and diversity in data of (sub-)groups of participants been considered?

☐ Not at all
 ☐ A little
 ☒ Somewhat
 ☐ Much
 ☐ Very much

Save

✓ Question3 - (Optional question)

Have you arranged and gathered consent from participants (in case of human research)?

☐ Yes
 ☒ No

Save

✓ Question4 - (Optional question) >

Figure 13: Self-Assessment Form

D6.2

24 | Page





|        |   |   |  |   |  |
|--------|---|---|--|---|--|
| Team 3 | To what extent is it important that users are able to prioritize actions based on the outcome of assessment (e.g. using an indicator-weight-system)?  | <p>It would be unusual for an assessment to prioritize actions?</p> <p>If it is a formative evaluation, not important</p> <p>Idea 3</p> <p>Idea 4</p>   | <p>Strategic review and planning of priorities</p> <p>Adjustment of plans/processes based on formative assessment</p> <p>Idea 1</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p>  | <p>Idea 1</p> <p>Why should they be able to prioritize? In which way would it support the user?</p> <p>What's the benefit / goal of priority setting anyways?</p> <p>If there is a prioritization possible, there is a need for a good, understandable definition of what is meant with the outcome assessment.</p> <p>Setting priorities should be linked to good practice experience in similar contexts.</p> <p>Idea 1</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p> | <p>Idea 1</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p>  |
|        | How frequently should users use the tool for data entering and interpretation (placing RRI / societal readiness on their agenda)?   | <p>Context dependent</p> <p>Idea 2</p> <p>Depending on the stage of the project.</p> <p>Users should be able to choose the frequency of data entry. They need to enter data from a specific stage of the project. The tool should not rely on users entering data multiple times (will not work).</p> <p>As often as they would like to do so / see a particular need as changes occurred</p>   | <p>Idea 1</p> <p>About the planning phase, in the beginning, mid and end of the project. Depending on how the project is planned and structured and which goals it has.</p> <p>Every time there is need for reflection</p> <p>The tool should not rely on users entering data multiple times (will not work)</p> <p>As often as they would like to do so / see a particular need as changes occurred</p>   | <p>Idea 1</p> <p>In reality, most (external) users won't use the tool more than once</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p>  | <p>Idea 1</p> <p>The data entry should be coupled with a moment of reflection within projects. Not static data entering, but engaging in conversations around what has been entered.</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p> |
|        | What kind of comparison should the tool allow for? E.g. between projects, individuals (opinions/assessments per person), moments in time, programmes within the organization, externally, international aggregate level, etc.)? | <p>Between past and present stages of implementation</p> <p>Between a set of comparable entities based on a portfolio of variables</p> <p>Between every project at a time and same project at different times, between two projects at the same time and project's progress, between two project data and aggregates of other projects.</p> <p>Idea 4</p>   | <p>As a tool for revising progress and recalling actions</p> <p>Between targets set in earlier stages</p> <p>Between progress in time in different parts of project</p> <p>Depending on the goal for the assessment, context and goal dependent</p> <p>To categorise</p> <p>To get insights and ideas from similar projects</p>  | <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p>   | <p>Mechanism to cluster projects based on certain indicators or variables</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p>  |
| Team 4 | What format for data protection should we use? e.g. No one else access, access for research purposes, anonymous results, etc.) and who should have access to data?  | <p>Open question is what this means for sharing of appropriate business information. Potentially through anonymization, but can be shared outside project? (Dependent on GDPR)</p> <p>Idea 1</p> <p>Use a data protection impact assessment template to go through the data processing. GDPR also comes from practical and theoretical experience with GDPR.</p> <p>Idea 2</p> <p>Ask user not to enter person identifiable data</p> <p>open to everyone</p> <p>Anonymised, but with capacity to view own organisation position</p> | <p>What does "anonymous" mean? Should still be able to get information on the project at interest</p> <p>Idea 1</p> <p>The idea is to capture an accurate picture of the state of a project. Non-anonymous data might give more to stakeholders. Otherwise fine for e.g. public trust.</p> <p>Idea 2</p> <p>Personal data need not be used for research. Data about organization and project may need to be anonymized and/or permission for sharing need to be asked.</p> <p>Idea 4</p> | <p>Idea 1</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p>   | <p>Idea 1</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p>  |
|        | As long as legally possible where it can be accessed for analysis, e.g. Euro open science cloud   | <p>Idea 1</p> <p>European Open Science Cloud</p> <p>Idea 2</p> <p>10 years after the end of a project</p> <p>Forever and ever</p> <p>In alignment with GDPR</p>   | <p>follow the default settings of the EOSC</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p>   | <p>Idea 1</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p>   | <p>Idea 1</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p>  |
|        | How, how long and where should data be stored?  | <p>Idea 1</p> <p>European Open Science Cloud</p> <p>Idea 2</p> <p>10 years after the end of a project</p> <p>Forever and ever</p> <p>In alignment with GDPR</p>   | <p>follow the default settings of the EOSC</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p>   | <p>Idea 1</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p>   | <p>Idea 1</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p>  |
|        | Who, within the own organisation, can ask for access to which kinds of data? Individualised and recognisable?   | <p>default should be that everyone has access, otherwise the data won't talk</p> <p>This may depend on the sensitivity of the inputs</p> <p>Personal data should only be used in</p> <p>Idea 4</p>  | <p>Idea 1</p> <p>If a data set is not anonymized only the person responsible for that procedure should have access, then it should be open</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p>   | <p>Idea 1</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p>   | <p>Idea 1</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p>  |
|        | Should there be an aggregate level set of indicators that is always collected, to allow for comparison and prevent cherry picking by the organization / project team?   | <p>no aggregate levels, always include the highest and lowest score in any comparison</p> <p>Selection of terms that might be suitable for quantitative indicators needs careful consideration</p> <p>Premature benchmarking type quantification discourages users</p> <p>Idea 4</p>  | <p>Best practice examples are usually more sought after by participants</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p>  | <p>Idea 1</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p>   | <p>Idea 1</p> <p>Idea 2</p> <p>Idea 3</p> <p>Idea 4</p>  |



## APPENDIX B

| Title   | Item type | Statement  |
|---|-----------|--|
| <b>Data management</b>  | Category  |  |
| <b>Preparations for data collection in case of human subject research</b> | Class     | <p>Ethics of research methodology is checked</p> <p>Gender and diversity in data of (sub-)groups of participants has been considered</p> <p>Consent from participants (in case of human research) has been arranged</p> <p>inclusion of underrepresented populations including, among other things, social and economic populations, as well as sex- and age-specific groups</p> |
| <b>Data collection &amp; analysis methods</b>                             | Class     | <p>Data collection and analysis methods are transparent (planned, and intelligible to involved actors)</p> <p>Sensitivity analysis for method and result robustness</p> <p>Possibility to explore research course alterations (design) based on encountered (changes in) stakeholder viewpoints or changing ethical viewpoints</p>   |
| <b>Data output</b>  | Class     | <p>Gender diversity in author / dissemination groups</p> <p>Risks of confidentiality breaches are mitigated (including intellectual property)</p>  |

|   |       |   |
|---|-------|---|
| <b>Open access specifically</b>             |       | Output classified as partnership co-publications (not individual/institutional)   |
|   |       | Other communication channels than peer-reviewed journal / academic book output (including specifically for publics)   |
|   |       | Consideration of relevance of used methods, analysis or outcomes for other projects/purposes/researchers/practitioners  |
|   |       | Plans on responsibility of maintenance and storage (length) of (open access) data, including data protection officer checking for GDPR compliance, and possibly (requested) anonymity                           |
|   | Class |   |
|   |       | Access in other languages than English?   |
|   |       | Is specific (licenced) software required to access data?  |
|   |       | Data structure, interpretations and variable descriptions provided to allow for replication and/or (re)interpretation?  |
|   |       | % of open access publications vs 'other' publications   |
|   |       | Clear plan on which data should be made available open access, including plans regarding barriers for public accesibility (intellectual property, competing interests, confidentiality, interoperability, etc.) |
| <b>Organizational governance and Gender</b> |       | Category  |
| <b>Project planing level</b>                | Class |   |
|   |       | Gender equality plans on project level  |
| <b>Corporate management addresses</b>       | Class |   |
|   |       | Gender pay-gap  |
|   |       | Barriers for gender equality in project team and management   |
|   |       | Gender-equal career opportunities for junior staff  |
| <b>Gender distribution in projects</b>      |       | Gender-balanced recruitment committees  |
|   | Class |   |

|   |  |
|---|--|
|   | Gender distribution in project team  |
|   | Gender distribution in project management  |
|   | Gender distribution in organisational management   |
|   | Gender distribution for inventors and initiators   |
|   | Gender distribution in (corporate) training initiatives  |
| <b>Stakeholder management</b>   | Category   |
| <b>Preparation of stakeholder inclusion: project selection and possible stakeholder contributions</b> | Class  |
|   | Actor / stakeholder involvement in problem definition phase  |
|   | Actor / stakeholder involvement in identification/analysis of project ethics   |
|   | Percentage of R&D/I initiatives/projects in which (external) stakeholders play a role from the early stages of development   |
|   | Identification of project(result) users/beneficiaries  |
|   | Identification of (potentially) contributing actors and moment of involvement in project (e.g. from researchers, industry, policy / government, (civil) society), including citizen science activities that (can) play a role in the project and gender composition, nationalities, ethnicity, age, etc., and also strategic exclusion of stakeholders.) |
|   | Communication of nature of project to (involved) external stakeholders   |
|   | Recruitment committees for selection of actors / stakeholder involvement (including sample selection) is balanced  |
|   | Strategy developed to accommodate actors becoming interested in contributing to project  |
|   | Take into account the diversity of cultures and strive to minimise inequalities with respect to, inter alia, socio-economic, cultural norms  |
| <b>Inclusive in data collection and analysis</b>  | Class  |

|   |          |   |
|---|----------|---|
| Stakeholder-relevant output and open access     | Class    | How may interested stakeholders (including citizens) contribute to data analysis and evaluation?<br>Including providing necessary information/training to engage in meaningful dialogues? |
|   |          | Ensuring gender diversity in data collection and testing, including allowing for alternative interpretations  |
|   |          | On-the-fly adaptation of project course due to relevant (ethical) stakeholder considerations, including the identification of new stakeholders  |
|   |          | Plan for maintaining good stakeholder relations, and perceived safety to voice their ideas  |
|   |          | Ensure processes for engaging stakeholders are fair, transparent, and predictable   |
| Internal organizational management & Governance | Category | Identification of actors / stakeholders who should be informed about the results / outcomes of the project  |
|   |          | Communication strategy / dissemination plan to brief involved actors/stakeholders meaningfully (catered to needs and characteristics) about results/outcomes.                             |
|   |          | Stakeholder engagement experiences transformed into input relevant for future engagement activities (within the organization)   |
|   |          | Communicate outcomes in gender-sensitive (non-stereotype-reinforcing) manner  |
|   |          | Identification of actors / stakeholders who should be informed of data collection / testing / analysis and evaluation methods   |
| RRI in corporate trainings                      | Class    | Integration of RRI perspectives in training and supervision of staff  |
|   |          | Trainings about integration of RRI / social & ethical values into R&D projects  |

|                                    |  |
|------------------------------------|--|
| <b>Product/service portfolio</b>   | Class  |
|                                    | Share of socially/ethically oriented products/services   |
|                                    | Explicit integration of RRI in project mission/vision  |
|                                    | Explicit integration of public and societal values in strategic innovation plans   |
|                                    | Explicit integration of SDGs in project goals  |
| <b>RRI in strategy development</b> | Class  |
|                                    | Anticipate and monitor the potential unintended use and/or misuse of research and innovation initiatives   |
|                                    | Develop institutional capacity and mechanisms of technology appraisal and/or foresight to anticipate and evaluate potential research and innovation outcomes and pathways. |
|                                    | Promote societal trust and trustworthiness through norms, and practices of responsible business conduct  |
|                                    | Develop institutional capacity and mechanisms of technology appraisal and/or foresight to anticipate and evaluate potential outcomes and pathways                          |
| <b>Diversity</b>                   | Class  |
|                                    | Percentage of project employees from minority and vulnerable groups  |
| <b>RRI in corporate management</b> | Class  |
|                                    | Percentage of RRI-relevant expenditures vs. Profit   |
|                                    | Existence of formal governance structures for RRI (within projects)  |
|                                    | Monitoring of non-financial values of projects in (formal external) (annual) auditing  |

|  |          |  |
|--|----------|--|
| <b>RRI and impacts strategies</b>            |          | Number of employees explicitly hired for developing socially responsible products/services   |
|  |          | RRI choices explained and made explicit in formal communication strategy   |
|  | Class    |  |
|  |          | Impact analysis strategies for products/services (ethical, social, risk)   |
|  |          | impacts on organisation in terms of growth<br>impacts on organisation in terms of cost<br>impacts on organisation in terms of risk<br>impact on organisation in terms of legal issues  |
| <b>Science Education &amp; Communication</b> | Category |  |
| <b>Professional relevance</b>                | Class    |  |
|  |          | Making available (and teaching about) new methods and techniques for other researchers/practitioners<br><br>Promote interdisciplinary research and development where communities of scientists and engineers interact closely with the social sciences and humanities communities as well as with user and other relevant groups |
| <b>Public communication about project</b>    | Class    |  |
|  |          | Number of (attended/organized) public meetings/debates about research and innovation for the project   |
| <b>Public impact</b>                         | Class    |  |
|  |          | How may project results contribute to public interest in and understanding of science?   |
|  |          | Number of public events / websites / (social media) channels disseminating project results   |
| <b>(Public) education initiatives</b>        |          | Efforts to make project proceedings (including analyses) and results (including evaluations) available to a diverse set of stakeholders  |
|  | Class    |  |

|        |          |  |
|--------|----------|--|
| Ethics |          | To what extent may new knowledge produced be relevant to science education? Explicitly for future generations of researchers/engineers?  |
|        |          | For which stakeholders may (public) education be relevant, and how to attune to their needs?   |
|        |          | To what extent do you consider educational activities in multiple languages?   |
|        | Category |  |
|        |          | <p>Ensuring (gender) diversity in ethical impact assessment</p> <p>Uncertainty management strategies: communication of uncertain elements</p> <p>Identify and explore alternative definitions of problems addressed in project</p> <p>Assess research integrity and compliance with ethical standards</p> <p>(Independent) ethics committee / methods in place for projects to identify and assess ethical issues</p> <p>Integrate ethical considerations and take into account public values and concerns at the planning stage and design phase of technological development</p> |





## **SUPER MoRRI**

Scientific Understanding and Provision of an Enhanced and Robust Monitoring system for RRI

**Horizon 2020, Science with and for Society Work Programme 2018-2020, Topic: SwafS-21-2018**

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