



**TRASYS International**

# **Business Vision document for Reportnet 3.0**

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## 1. EXECUTIVE SUMMARY

The European Environment Agency (EEA) developed an IT infrastructure for supporting and improving the environmental data and information flows, called Reportnet. Reportnet was initially developed (back in 2000) for the reporting in the EIONET and was designed to replace reporting by postal mail and email. However, Reportnet gradually started hosting some of the reporting tasks of DG Environment and other regional and international organisations (e.g. United Nations Economic Commission for Europe, UNECE) while the reporting needs changed. As a result, Reportnet has been modified for special-case exceptions so many times that its original scope and design were compromised.

As it was concluded by the Environmental Reporting Fitness Check<sup>1</sup>, current practices and processes of organising and exchanging reporting data/information flows are not as effective and efficient as they should be and EEA is now better placed to establish a harmonised business process and to support the delivery of high quality environmental reporting services and products.

The initial phase of the Scoping Study was to determine a new scope and architectural vision for Reportnet. During this phase all the relevant information necessary to guide the design and implementation phase of the project was collected and organized. A new approach was followed when moving forward to the new version of the Reportnet system, envisioning it as a one-stop-shop for all involved stakeholders which should effectively address the problems faced by the users so far and should employ modern approaches in software development (i.e. with regards to security, scalability, architecture, interoperability, etc.). Furthermore, another principle<sup>2</sup> which Reportnet 3.0 should address, is the “building blocks by design”, based on which it should consist of re-usable components which different DGs will use in order to develop new solutions derived from their specific needs.

Reportnet 3.0 is also envisioned as a centralized e-Reporting platform, aiming at simplifying and streamlining the data flow steps across all environmental domains. Reportnet 3.0 will act as a central hub through which all e-reporting activities will be performed and will address the most important needs and problems of the involved stakeholders.

Moreover, the users will be able to collaborate and communicate with each other to assure quicker design of data flows and prompt data reporting. During the data flow design process, a visual schema design functionality with reusable validations and data visualization possibilities will be provided aiming at reducing design time and complexity. Furthermore, a variety of delivery methods (i.e. user interface, file import, web-service or INSPIRE harvesting) will be available to the data providers to choose from; concerning the user interface, the platform will be user-friendly and will support auto-generated web forms resembling a spreadsheet with which users are familiar. Generally, the new platform will embrace flexibility and efficiency, while it will be configurable enough to serve almost all reporting purposes and needs with low-to-zero code. Since, the dissemination of the reported data is a fundamental step of the reporting process aiming at providing the right information to the right people at the right time, the new reporting era, foresees automated data collections and streamlined generation of European datasets.

In the new system, a workflow driven approach will be followed in the sense that the data provider will be able to spot pending data flows easily along with the reporting deadlines so as to manage workload more efficiently. Through inline support and collaboration possibility, the data provider will solve issues more quickly and share tasks with colleagues to accelerate reporting process. Finally, through prepopulated datasets, visualisations and dashboards, reporting will be facilitated and quality of the reported data will be of higher level.

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<sup>1</sup> 8 Final Report of Fitness Check without annexes

With regards to the data requester (including the data stewards – thematic experts on behalf of EEA – and data custodians – technical experts on behalf of the EEA responsible for the data flow creation), the new system will provide the means for a streamlined inline communication process through notifications and comments and for easier management and monitoring of the data flow progress through dashboards and visualizations. Furthermore, the overall control of the data flow concerning access rights and reported data quality are foreseen by the new proposed design.

In Reportnet 3.0, NFPs and helpdesk users will also be provided with functionalities with which they will be able to serve administrative, coordination and monitoring activities.

The aim of Reportnet 3.0 is to improve effectiveness, streamline the process to make it more efficient and to improve coherence and relevance of EU environmental reporting making better use of new technologies and complementary information sources.

The scoping study should result in a solid requirements list and a proposal for the new business and architectural vision for the environmental reporting, which will serve as guidance for the implementation period which is planned to start in the beginning of 2019. The proposed vision is designed to deliver the ambition and the strategic goals as set out by the Commission's Digital Strategy<sup>3</sup> and constitutes EEA's contribution to deliver on this long-term strategy.

The vision of the new system should also take into account and respect the European interoperability framework<sup>4</sup> and the new system proposed should be able to work seamlessly across organisations and respect interoperability and data exchange requirements; not only should Reportnet 3.0 collect data from various sources but should also make its data available through corresponding APIs to other systems. Additionally, at least at the dissemination phase, data reported by multiple sources could be combined and reused to avoid duplications and assure better data quality.

After the scope study delivers the new architectural vision, it will be evaluated by the stakeholders, and potentially will be modified to be less or more ambitious. The new system will be designed in further detail and the implementation phase will begin with the intention to get the new core functionality operational as early as possible.

## 2. INTRODUCTION

The Business Vision document of this Scoping study for the Reportnet 3.0 project, aims to outline the high-level vision of the project, describing the future business processes and the user requirements as collected and analysed within the lifecycle of this project.

The purpose of this document is to form the basis for a more detailed design and planning for the developments in the next phase of the implementation of Reportnet 3.0. The details of how the new platform will fulfil these needs are outlined in the features' list section.

In order to assist reporting parties in their data reporting tasks, EEA has developed an infrastructure for supporting and improving the environmental data and information flows referred to as Reportnet 2. Reportnet was initially used for reporting environmental data to the EEA, but now also hosts some of the reporting tasks of DG Environment and other regional and international organisations (e.g. UNECE).

To promote and modernise e-Reporting, EEA is working to develop Reportnet 3.0. This modern reporting infrastructure will integrate new ideas about reporting, will respect and apply European interoperability framework, will take into account national capabilities and will produce a platform that can support the new challenges of the reporting process for the years 2020 to 2040 and beyond. The vision of Reportnet 3.0 is designed to deliver the ambition and

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<sup>3</sup> 13 European Commission Digital Strategy: A digitally transformed, user-focused and data-driven Commission

<sup>4</sup> [https://ec.europa.eu/isa2/eif\\_en](https://ec.europa.eu/isa2/eif_en)

the strategic goals as set out by the Commission's Digital Strategy<sup>5</sup>. It is the EEA's contribution to deliver on this long-term strategy.

Intending to accomplish this task, EEA initiated this project where the scope had two aspects; on the one hand to study the big picture and learn across all different reporting processes and on the other hand, to identify the differences among the reporting processes and the challenges imposed and attempt to propose a harmonization across all business areas.

In parallel to this project, two feasibility studies are performed (INSPIRE feasibility study<sup>6</sup>, Reporting directly to a database feasibility study<sup>7</sup>), the results of which are gathered and taken into consideration in this Business Vision document.

Moreover, the key points and outcomes proposed in the document 'Actions to Streamline Environmental Reporting' were studied to reassure that the vision will attain the overall modernization and streamlining through application of the best practices for environmental reporting and will make the processes reliable and smooth, as well.

The overall scope of the vision document, in parallel to the Architecture Vision document, is to secure all the above mentioned points and propose an improved solution.

The scope is briefly outlined in the EEA Project Charter document<sup>8</sup> and the specific areas considered in or out of scope are described in the next subsections. More specifically:

- **“IN” Scope for Reportnet 3.0**
  - Modernisation
  - Support of the whole data flow lifecycle of e-reporting
  - Multi-community Eionet, ENV, CLIMA, Energy Union
  - Minimisation of the implementation costs of data flows
  - Quick response time
  - User friendliness
  - Business processes related to Reportnet
  - Guidelines and standards for output technologies (e.g. dashboard, country reports and map viewer technologies)
- **“OUT” Scope for Reportnet 3.0**
  - Data analysis e.g. LEAC
  - Country fiches
  - End-user oriented map viewers with interpreted data (such as air quality index viewer)
  - Information platforms such as BISE, FISE, WISE, PRTR, Climate-ADAPT
  - Language translation
  - Manually generated European datasets

The items defined as out of scope here refer only to what will be delivered by this specific project (Reportnet 3.0). Many of the items defined here will be integral to the platform in the future, but they will be delivered by other projects or initiatives once the platform is running.

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<sup>5</sup> 13 European Commission Digital Strategy: A digitally transformed, user-focused and data-driven Commission

<sup>6</sup> 7 Reportnet-feasibility-study-data-harvesting.docx

<sup>7</sup> 5 Reportnet 3.0 IT Feasibility studyV2.pptx

<sup>8</sup> 6 Project\_Charter\_Reportnet\_3\_v2.0.docx

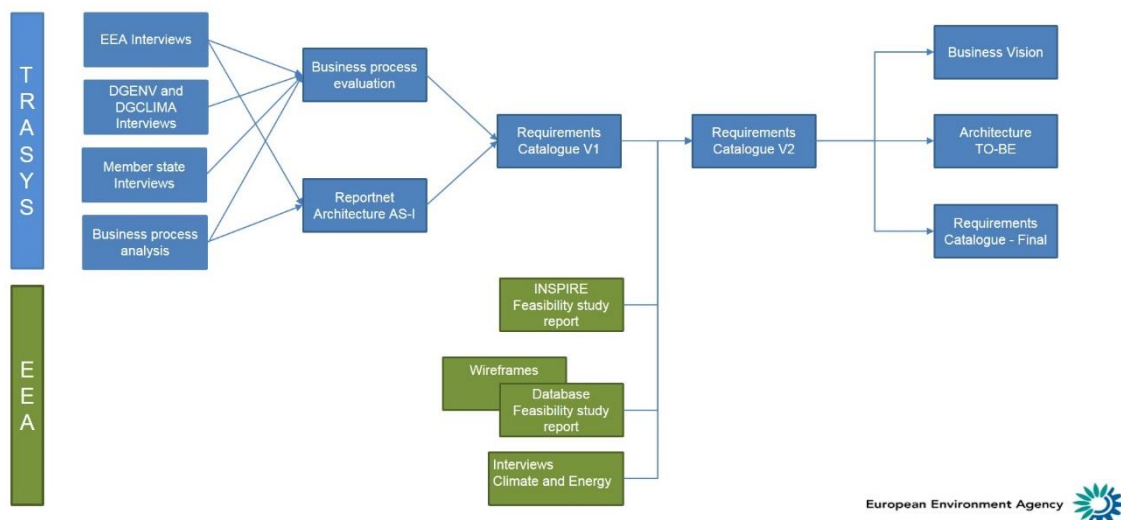
## 2.1. Scoping study background

The objectives of the scoping study were to collect and organize all the relevant information on Reportnet in order to guide the design phase, without having missed important aspects or requirements and to collect an initial feedback from stakeholders in order to support the definition of the future priorities for the Reportnet 3.0.

The project was organized in three phases (some activities of them overlapped) in order to produce the agreed deliverables:

- Phase 1: Analysis of 'AS-IS' situation of Reportnet:**  
 Phase 1 included the project launch, analysis and review of the existing body of information related to Reportnet and identification and description of the existing business processes together with description of the IT systems that supply or use Reportnet.  
 With regards to the first phase of the study, document analysis, interface analysis and interviews with process owners at DG ENV and EEA were conducted, in order to understand the existing business processes along with the relevant challenges and bottlenecks.  
 The output of this phase was a report describing the “as-is” situation of Reportnet (highlighting how the system is used today, and why it is used the way it is);
- Phase 2: Definition of high-level requirements**  
 Based on the outcomes of phase 1, main objective of the second phase was to discuss the high-level requirements and validate them with the BIG group, with proposed representation composed of representatives of EEA and relevant DGs.  
 An evaluation report of the stakeholder expectations and high-level user requirements was included in the Business Process Evaluation document<sup>9</sup> as a deliverable for this phase.
- Phase 3: Architectural Vision and design ('TO-BE')**  
 Based on the outcomes of phases 1 and 2, this solution vision document along with the corresponding “to-be” architectural design proposal for Reportnet 3 have been produced.

The deliverables of the project are outlined in the figure below, in parallel with two feasibility studies (Data harvesting using INSPIRE feasibility study<sup>6</sup>, Reporting directly to a database feasibility study<sup>7</sup>).



<sup>9</sup> 2 Business\_Process\_Evaluation\_Report.(Reportnet.3.0).(v3.0).docx



## 2.2. Document structure

The structure of the Business Vision document is as follows:

**Section 1:** Executive summary – summarizing the project vision while highlighting the key points of the document.

**Section 2:** Introduction - provides the background to Reportnet and to this document.

**Section 3:** Positioning Overview– brief outline of the problem to be solved by the project, description of the business opportunity addressed and summary of the solution proposed.

**Section 4:** Stakeholders and user descriptions – Project stakeholders and system users' description.

**Section 5:** Features – list and brief description of the features of the proposed solution organized per step of the 10-step model proposed by the EEA.

**Section 6:** Constraints – list of any design or external constraints, such as operational or regulatory requirements, or other dependencies.

**Section 7:** Quality ranges – definition of the quality ranges for robustness, fault tolerance, usability, and similar characteristics

**Sections I, II, III, IV:** Annexes for cost savings and benefits analysis regarding the new system, description of the snapshotting mechanism, document definitions, abbreviations and reference documents

## 3. POSITIONING OVERVIEW

### 3.1. Business opportunity

Based on the EEA Project Charter document for Reportnet 3.0<sup>8</sup>, as a result of the scoping study project, a new reporting system will be designed that will integrate new ideas about reporting, take into account national capabilities.

The following actions should be foreseen and the specific objectives should be fulfilled by the new system in order to streamline environmental reporting:

#### **Reportnet 3.0 - actions to streamline environmental reporting:**

- Getting the right information in the right form at the right time;
- Streamlining the reporting process;
- Promoting active dissemination of environmental information at European and national level;
- Exploiting other data sources and alternative approaches complementing environmental reporting;
- Improving coherence and cooperation.

#### **Reportnet 3.0 – specific objectives to streamline environmental reporting:**

1. Assist DG ENV in transforming the reporting obligations towards a more effective and efficient approach based on the best practices of the EEA (such as air quality or nature reporting) and thereby contributing to the future rounds of the Environmental Implementation Review (EIR).
2. Enable the extended use of EEA-Eionet suite of reporting tools (Reportnet) for a wider set of reporting obligations and streamline outsourcing activities.

3. Modernise IT infrastructure and processes to be in-line with the objectives set out in the Digital Single Market policies (such as eGovernment or EU interoperability) and the Communication for Data, Information and Knowledge Management in the Commission.
4. Facilitate the use of complementary information sources (in particular Copernicus or citizen science) for the purpose of EU environment policy.
5. Improve coherence in the reported data and the reporting activities.

## **3.2. Interoperability**

Reportnet 3.0 will be designed to work seamlessly across organizations and respect interoperability and data exchange requirements. Reportnet 3.0 will prioritize existing legal standards (e.g. INSPIRE) in design to assure reuse and interoperability of data and assure the best possible interoperability with third-party systems.

## **3.3. Problem statement**

Apart from the high-level business requirements, there are also various problems causing burden to the everyday interaction of the users with the system, which were collected during the analysis phase of the scoping study project and were captured in the Business Process Evaluation document<sup>9</sup>. The most relevant ones to the reporting process and system are outlined below:

### **Step 4 - Define reporting requirements & dataflow**

1. The process of defining the reporting requirements and the data design schema lasts too long (in some cases even 2 years) and in many cases wrong technical decisions are taken.
2. Reporters are not provided with a configurable reporting process where they could declare what can actually be reported under an agreement.

### **Step 5 - Help Member States prepare themselves for the reporting process**

1. The burden of the process of updating the access rights is very time consuming and complicated for the data stewards.
2. The guidance material for the reporting process is scattered across various locations rendering the reporting process more difficult.
3. The reporting process is not controlled by the system but lies in user interaction, introducing delays in cases where the next step in the process is not clear to all involved stakeholders.
4. Unarchived data complicate browsing in the system.
5. The data flow implementation through web forms solution proved to be costly, time consuming, non-user friendly and incorporates performance issues.
6. Data reporting through the web forms is also time consuming.
7. The duplication of Quality Controls in multiple reporting obligation requires extra effort for development and maintenance.
8. Reported data is distributed in different systems resulting in additional time and resources for collecting and analysing.
9. Required data quality is reassured by introducing manual validation and additional processing with the contribution of the FME process (supported by an EEA internal team).

### **Step 6 - Member State delivery process**

1. The same data are reported multiple times in terms of different reporting obligations / needs causing extra effort both in the data schema definition (data stewards) and in the data collection (by the reporters).

2. In case a reporting sequence defined by the legislative instrument among the obligations, this is not controlled by the system and lies to the users' actions causing inconsistencies in the reported data.
3. In case of update needed in reported data, the current process requires re-delivering of the full dataset and recheck by any involved stakeholder.
4. Web forms instead of facilitating the reporting process, introduce extra complexity to the reporters and the process itself is time consuming.

#### **Step 7 - Quality of reported data**

1. Quality data errors are explained in a very technical vocabulary causing delays and difficulties in the data correction.
2. System handles big size files (e.g. GML) inefficiently causing timeouts to the users and requiring sequential attempts in order to succeed in reporting.
3. Lack of visualizations of the reported data leads to prevent the data reporters from reviewing the data before final submission.

#### **Step 8 – Carrying out data processing and analysis**

1. Too much time between reporting deadline till release of data products, meaning that when a final data product is publicly available, information included could be outdated, providing less value to the interested stakeholders than it would.

#### **Step 9 – Presenting and disseminating results**

1. Reportnet 2.0 does not make any provisions to facilitate dissemination of reported data.

All the above high level problems reported by the users and the stakeholders of the system were taken into account during the "TO-BE" phase of this project.

### **3.4. Summary of capabilities**

The proposed approach for the Reportnet 3.0 aims at addressing the problems identified in the existing architecture and will employ the following characteristics:

- Collaboration platform in which the reported data sets are the outputs of the collaboration of potentially various stakeholders.
- Commenting mechanism to share feedback and comments quickly and to the point.
- User guiding platform where users will be directed through the process.
- User friendly and intuitive design to facilitate user interaction and navigation and minimize the need for training.
- Reduce duration of data schema definition phase which lasts up to two (2) years leaving limited time for the reporting process.
- Define and test validations during data flow design phase for quicker roll-out to production and higher quality of the reported data.
- Early reporting of data for quicker collection of feedback, allowing for more agility and adaptability.
- Flexibility on data submission providing a variety of submission methods.
- Minimize account management overhead (currently burdening data stewards) through self-registration and access rights' request and sharing.
- Develop and maintain data flows with minimum development effort.
- Support wider public information and audience and extend good practices for active dissemination.

### 3.5. Expected Benefits

The expected benefits and opportunities stemming from Reportnet 3.0 system for the EEA organisation, are described below:

#### Alternative reporting processes

- Enhanced alternative methods for reporting (e.g. spatial data for earth observation techniques) and new opportunities for data harvesting. Alternatives are including also harvesting from any EU source (e.g. citizen science).
- Changes in reporting obligations (e.g. increasing focus on KPIs for reporting) are considered to be collected in a very structured format and advocate in the Better Regulation Guidelines. Probably, few years from now, the increasing focus on KPIs will reduce the need for supporting documents.
- The platform requires the contribution at European and national level and promotes reporting best practices.
- Advances in reporting processes can support improved data verification which will, in general, help improve data quality.

#### Harmonisation of processes

- Continue the harmonization of dataflow design and data reporting processes not only horizontally but also strategically.
- Reporting of up-to-date information for more directives and not only for the Air Quality Directive, will lead to have regular alerts and inform the public about exceedance and actions that need to be taken.
- Enable the extension of DPSIR<sup>10</sup> category in more reporting obligations.

#### Collection of structured data

- Enhanced collaboration among stakeholders throughout the data reporting and reviewing processes.
- Collaborative focus in the design and delivery processes, formatted and validated reported data are eliminating the additional analysis or consultation which is undertaken by different stakeholders (e.g. ETCs, external consultants) and are expunging the administrative burden. The collaborative focus will lead to achieve common goals, share information and solve business problems more efficiently.
- Clear structure reporting results to clear repository and reduces the effort devoted to identify the reporting data in different folders (e.g. no "Other" folder in future).

#### Effective maintainability

- Maintain effectiveness of platform and keep the project scope intact even after the inclusion of many data flows.
- Streamlining the codes definition, the nomenclatures and the reporting requirements is enabling the simplification of the reporting process and minimize the conflicting definitions and data specifications.
- Improved reporting timeliness indications.

#### Strengthen public information

- Will gradually strengthen the public access information and increase the environmental information available to EU citizens. Reinforces the Aarhus Convention and EU legislation such as the Directive on public access to environmental information. In the

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<sup>10</sup> According to the Fitness check document (see 8 Final Report of Fitness Check without annexes), full implementation of the DPSIR framework is important for the legislator, both in terms of ensuring that the required steps to deliver environmental objectives are being carried out, and also in terms of ensuring that MS are treated equally under EU law. Therefore, DPSIR category extension is considered as a promising opportunity stemming from Reportnet 3.0 system.

next years the ease of access needs and more specific initiatives from citizens will be addressed.

- Continue support wider public information and audience.
- Extend further the attainment of good practices for active dissemination.

### Usability

- All involved in the reporting process stakeholders, will visit Reportnet 3.0 system to fulfil their reporting duties. The new system will constitute a “one-stop-shop” for them (data custodians, data requesters, data providers / reporters, public users, NFPs, etc.) which they will visit to perform their reporting activities.
- The new system will be user-friendly for all users accessing it, following proposed EU style-guides.

## 3.6. Success Criteria

In order to evaluate the success of the project’s revamp, some key success factors are defined which can be validated using the SMART goal setting technique. These factors were taken into account, in order to assure that the proposed solution would maximize the benefits for the stakeholders.

The acronym SMART is defined through the following:

S – Specific (it has been clearly defined what has to be accomplished)

M – Measurable (targets and milestones have been identified to track progress.)

A – Attainable (goal is realistic and manageable.)

R – Relevant (goal is relevant to the business objectives)

T – Time-based (goals should be limited by a period of time)

Indicator	How it will be measured?	S	M	A	R	T
User Satisfaction	User satisfaction can be measured through user testing, satisfaction scores (i.e. NPS) and surveys / questionnaires.	✓	✓	✓	✓	✗
Average reporting process duration	Indicator could be measured either through questionnaires to the reporters (which will measure their estimation and feeling for the new system and process) or, in order to assure objectiveness, employ analytics to measure the actual duration from data flow acceptance till final release to data collection.	✓	✓	✓	✓	✓
Average duration of data flow implementation	The system should lead to reduction of the duration of the process to design a data flow and make it available to the reporters. To measure this indicator, analytics could be used for the data flow creation action and the official reporting data sets creation.	✓	✓	✓	✓	✓
Cost of data flow creation	The system should lead to reduction of the cost to implement a new data flow, which is almost inevitable, since there will be no need of consultant development teams.  The duration of the creation of the data flows should be tracked in terms of person-days spent by the EEA team and be compared with the duration of the same activities in Reportnet 2.0 system.	✓	✓	✓	✓	✗
Resources allocated	Resources involved in the implementation of a dataflow should be reduced.  Similarly to the previous indicator, this one will be measured in terms of person-days spent by the EEA team and be compared with the corresponding	✓	✓	✓	✓	✗

	resources for the same activities in Reportnet 2.0 system.					
Reporting timeliness	Indicator refers to the length of time from reporting deadline to release of products and the goal is to reduce and finally eliminate this time in order to assure that reports are produced timely and conclusions are made in due time to take actions if needed.  Similarly to the previous indicator, this one will be measured through analytics as the difference between the release of the final data product and the reporting deadline.  <b>Note:</b> Since there are delays observed in the reporting process, maybe the reporting delays should also be monitored through an indicator aiming at eliminating them as well.	✓	✓	✓	✓	✓
Performance	Measure that the system maintains the threshold defined in the requirements where components must achieve response times with their 98 <sup>th</sup> percentile not exceeding 300ms as measured from the user interface.	✓	✓	✓	✓	✓
Availability	Measure that the system maintains the threshold defined in the requirements where the system should be available for use 24/7 and it must achieve 99% up time.	✓	✓	✓	✓	✓

**Table 1 - Success criteria to evaluate the outcome of the project**

Concerning the indicators, it is not in-scope of the vision document to specify numerically the goals that the system should reach, but to provide guidance to the consultants that will take responsibility to implement the new system about the direction towards the new system should head. Therefore, the indicators were specified only in terms of how they could be measured and not in terms of specific values to determine success.

Of course, apart from the measurable success criteria which are outlined above, the success of the new project will also address users' requirements, user needs and principles set forth by the EC for any digital solution<sup>2</sup>. More specifically the new system should take into account the following:

- Interoperability
  - data integration
  - data dissemination (through APIs)
- workflow management
- access rights management and delegation
- security
- privacy
- digitization
- one-stop-shop concept

### 3.7. Strategic time plan

An indicative planning is designed to support the strategic short and long term goals of EEA, having in mind the specific technology solution that is proposed in this document under the section 5 Features. The allocation of implementations in the short, mid and long term categories, was with the intention to get the new core functionality operational as early as possible in order to fulfil EEA's goals and time plan. In the beginning, the new system will be analysed in further detail and the implementation phase will start.

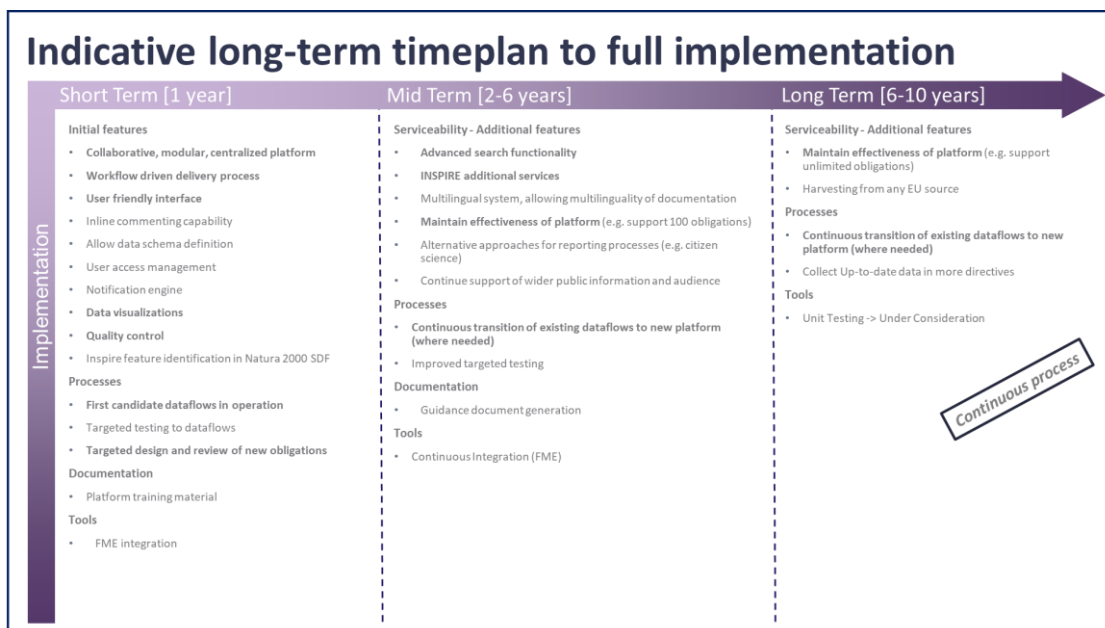


Figure 2 - Reportnet 3.0 long-term time plan

## 4. STAKEHOLDER AND USER DESCRIPTIONS

### 4.1. Stakeholder profiles

The stakeholders of the Reportnet 3.0 project are clustered in two groups; the core operational stakeholders and the consulting stakeholders.

Stakeholder	Description	Responsibilities
Reportnet 3.0 Steering Committee (EEA, Eionet, EC, Member Countries)	Made up of PO, SP, BM, PM and other optional roles.	<ul style="list-style-type: none"> <li>• Champion the project, raise awareness at senior level;</li> <li>• Guide and promote the successful execution of the project at a strategic level.</li> <li>• Provide high level monitoring and control of the project;</li> <li>• Authorise plan deviations, scope changes, with high project impact;</li> <li>• Negotiate solutions to important problems;</li> <li>• Ensure alignment with organisation policies and directions;</li> <li>• Endorse documents related to the users (documentation, requirements, etc.) with the help of the BIG;</li> </ul> <p>Approve all key management milestone artefacts (e.g. business case, project work plan, etc.).</p>
Business Implementation Group (EEA, Eionet, EC, Member Countries)	The BIG consists of representatives from the business and user groups.	<ul style="list-style-type: none"> <li>• Implement the business changes that need to be in place in order for the organisation to be able to effectively integrate into every day work the project deliverables.</li> </ul>
Project Core Team (EEA Data Stewards and Consultants on IT Infrastructure)	The Project Core Team consists of the specialist roles (EEA Data Stewards and Custodians and Consultants on IT Infrastructure) responsible for supporting and	<ul style="list-style-type: none"> <li>• Consultations on the relevant documents;</li> <li>• Execute the tasks according to the Work Plan;</li> <li>• Contribute to the scope of the project;</li> <li>• Supports the production of project deliverables.</li> </ul>

	consulting on the project deliverables.	
Project support team - Advisors to the Steering Committee (EEA)	Advisors to the Steering Committee is part of the Project Support Team and consists of lead and senior experts advising to the Reportnet 3.0 Steering Committee.	<ul style="list-style-type: none"> <li>• Provides administrative support to the project;</li> <li>• Advises on project management tools, guidance and administrative services;</li> <li>• Advises to the Reportnet 3.0 Steering Committee (RSC).</li> </ul>
Reporters	Consisting of reporting companies and/or EEA Member countries.	<ul style="list-style-type: none"> <li>• Reporting data in the system.</li> </ul>

**Table 2 – Core operational stakeholders’ responsibilities**

Stakeholder	Description	Responsibilities
National Focal Points (NFP)	NFPs are the primary link and contact between the country and EEA, other Eionet members and other relevant actors.	<ul style="list-style-type: none"> <li>• Informing their network on the activities and the requirements;</li> <li>• Consultations on the relevant documents;</li> <li>• The NFPs coordinate the national contribution to the implementation of the EEA Multi Annual Work Programme, the more detailed Annual Work Programmes and support relevant activities at country level.</li> </ul>
National Focal Point User Group on Eionet Information and Communication Technology Tools Developments (NFP ICT UG)	NFP ICT UG is formed to establish a coordination node between the NFP/Eionet, on the one side and the EEA IT team, on the other. Its aim is to define and interpret the needs of Eionet regarding ICT tools and mediate an agreement on proposed ICT solutions.	<ul style="list-style-type: none"> <li>• Support to define user requirements for each of new/renewed functionalities;</li> <li>• Test new or renewed tools and provide feedback to the EEA;</li> <li>• Consultations on the relevant documents.</li> </ul>
National Reference Centre on Environmental Information Systems (NRC EIS)	The NRC EIS support the monitoring, data and information related activities - mainly those related to system development and IT infrastructure for data collection, reporting, data and information dissemination.	<ul style="list-style-type: none"> <li>• Support to define user requirements for each of new/renewed functionalities;</li> <li>• Test new or renewed tools and provide feedback to the EEA;</li> <li>• Consultations on the relevant documents;</li> <li>• Contribution to the development and use of Reportnet 3.0.</li> </ul>
European Topic Centres (ETC)	ETCs are consortia of institutions across EEA member countries dealing with a specific environmental topic and contracted by the EEA to perform specific activities as	<ul style="list-style-type: none"> <li>• Support to define user requirements for each of new/renewed functionalities;</li> <li>• Test new or renewed tools and provide feedback to the EEA;</li> <li>• Consultations on the relevant documents;</li> <li>• Contribution to the development and use of Reportnet 3.0.</li> </ul>



	defined in the EEA Strategy and the Annual Management Plan.	
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**Table 3 – Consulting stakeholders’ responsibilities**

## 4.2. User profiles

The user profiles which will interact with the new system with regards to the new business processes, are briefly described below:

**Data requester** – data requesters are users with various different roles in the system who assist in defining, managing and supporting a dataflow. The data requester role might be shared among the data custodian, the data steward (thematic expert) and several consultants.

**Data custodian** – data custodian role is a data requester who creates the dataflow, links it with a submission agreement where needed and creates the design data set for it. A data custodian is also the responsible role for defining and managing the data requesters and data provider groups for the data flows that fall under his jurisdiction.

**Data steward** – data steward is able to easily define and manage legislative instruments, consult and monitor the tasks performed by the Data custodian in the dataflow design phase but even later during the reporting process.

**Data provider / reporter** – anyone reporting data for a submission agreement. Usually, these people are specific representatives of the MS or the reporting entities, in general, who are responsible for reporting their data (either by themselves or by sharing the reporting rights with other reporters).

**Observer user** – anyone visiting the system without being authorised. The system will provide some default views and visualisations for these users who will also be able to access publicly available, non-confidential information reported to the system.

**Helpdesk user** – assigned users, responsible to resolve any technical problems related to the reporting process.

**NFPs (National Focal Points)** – belong to the role of the data requesters but have read-only access in the system.

As it is defined in this document, the role of the data requester will be shared among the data requester, the data custodian and the data steward. In reference to the 10 step model, these users have specific tasks to perform which differ between them; therefore, an example follows in order to shed some light on the different duties:

### Step 1- 3: Preparing implementing acts on reporting

1. The data requester is designing the intervention logic around new reporting and is preparing the draft reporting obligation in legislation.
2. EEA is appointing a data steward and data custodian.
3. The data custodian is ordered (by the data requester) to initiate the process.

### Step 4: Explaining the reporting obligations in practice

1. The data custodian creates a new “data flow” and may share the new dataflow to all contributors.
2. The data steward enters the emails of the “data steward”, “data expert(s)” and “data consultants” of the new dataflow.
3. Data contributors get access to new dataflow and can login, see the same data flow in the system and upload existing documents.

4. The data expert calls for a meeting between the data providers and dataflow responsible.

#### **Step 5: Helping MS to prepare their reports**

1. The data custodian prepares the helpdesk infrastructure and adds the helpdesk mailing list.
2. The data expert sends the invitation out to all data providers using the corresponding mailing list.

#### **Step 6: Organising the data submission or harvesting**

1. The data custodian creates the working dataset to data providers.

#### **Step 7: Ensuring quality of the reported data**

1. The data steward ensures the quality of reported data in data collection and EU dataset (e.g. by dashboards, maps).

#### **Step 8: Carrying out data processing and analysis**

1. The data custodian/data steward can share the EU dataset to ETCs/EC to check the quality of data collection.
2. The data steward on completion of quality check period defines the EU dataset as the final one for the reporting period.
3. The data custodian can create from the data collection the EU dataset.

### **4.3. Key Stakeholder or User benefits**

The new Reportnet system foresees a new reporting era for the involved stakeholders, addressing their needs and the problems faced in the current system. In order to clarify how the core principles of the new system affect key stakeholders' reporting needs, the following tables have been created per stakeholder.

#### **4.3.1. Data provider / Reporter**

<b>Principle</b>	<b>Related actions</b>
Workflow driven	<ul style="list-style-type: none"> <li>• I can easily spot the assigned data flows (pending reporting) in my own personal workspace, when I log in to the system.</li> <li>• I am guided through the reporting process by the system.</li> </ul>
Managed access	<ul style="list-style-type: none"> <li>• I manage the access to a dataflow of other verified users belonging to the same reporting entity.</li> </ul>
Inline support	<ul style="list-style-type: none"> <li>• I find the supporting documentation for the reporting of a dataflow.</li> <li>• Through the integrated helpdesk tool I can solve any issues faced more easily.</li> </ul>
Optimized data delivery	<ul style="list-style-type: none"> <li>• I decide the data delivery format.</li> <li>• When applicable, data is pre-populated and cross-checked to facilitate and accelerate reporting.</li> <li>• I can visualize the data in charts and on maps.</li> <li>• I receive and see feedback for my reporting immediately and associated with the corresponding record.</li> <li>• I can update my dataset on a record level and resubmit it.</li> </ul>
Dashboard overviews	<ul style="list-style-type: none"> <li>• I have an integrated detailed overview of the status of my reporting for a dataflow.</li> </ul>
Collaborative	<ul style="list-style-type: none"> <li>• I can easily work with the my team, other agencies, ETC, EEA or helpdesk on the same data</li> </ul>

### 4.3.2. Data requester

Principle	Related actions
Workflow driven	<ul style="list-style-type: none"> <li>I can both design and assign a workflow to the data providers through the same platform.</li> </ul>
Managed access	<ul style="list-style-type: none"> <li>I can manage my dataflow design team and their access level.</li> <li>I am not bombarded by reporters' requests for access, since I am not responsible for it.</li> <li>I can monitor who has access to a dataflow.</li> </ul>
Inline support	<ul style="list-style-type: none"> <li>I can monitor the support requests.</li> </ul>
Optimized data delivery	<ul style="list-style-type: none"> <li>I have an overview of the number and types of issues to provide feedback and assistance to providers.</li> <li>I can more quickly and easily identify data issues.</li> <li>I can more quickly process reported data.</li> <li>I can visualize the reported data in charts and on maps.</li> </ul>
Dashboard overviews	<ul style="list-style-type: none"> <li>I have an overview of the status of the reporting by all providers in one place.</li> </ul>
Collaborative	<ul style="list-style-type: none"> <li>I can better coordinate data providers and support teams and can collaborate more easily with them.</li> </ul>

### 4.3.3. NFPs

Principle	Related actions
Workflow driven	<ul style="list-style-type: none"> <li>I can monitor all data flows and see the reporting stage of each one of them.</li> </ul>
Managed access	<ul style="list-style-type: none"> <li>I have an overview of my MS users' access level and dataflow access rights; I can view and manage my MS users' access rights.</li> </ul>
Inline support	<ul style="list-style-type: none"> <li>I can find answers to support requests and solve my issues.</li> <li>I can monitor the support requests.</li> </ul>
Optimized data delivery	<ul style="list-style-type: none"> <li>I can access the reported raw data.</li> <li>I can visualise the data in charts and on maps.</li> <li>I have an overview of the number and types of issues.</li> </ul>
Dashboard overviews	<ul style="list-style-type: none"> <li>I have an overview of the status of the obligations in one place.</li> </ul>
Collaborative	<ul style="list-style-type: none"> <li>I can better coordinate between the data providers and data requesters.</li> <li>I can better coordinate the reporters to meet the deadline.</li> </ul>

### 4.3.4. Helpdesk

Principle	Related actions
Workflow driven	<ul style="list-style-type: none"> <li>I can monitor all data flows and see the reporting stage of each one of them.</li> </ul>
Managed access	<ul style="list-style-type: none"> <li>I have an overview of users' access level and access rights; I can view and manage my MS users' access rights.</li> </ul>
Inline support	<ul style="list-style-type: none"> <li>I can monitor the support requests.</li> </ul>
Optimized data delivery	<ul style="list-style-type: none"> <li>I have an overview of the number and types of issues and proactively provide help and support.</li> <li>I have the means to access data sets more quickly and easily in order to identify issues and provide support to users when needed.</li> </ul>
Dashboard overviews	<ul style="list-style-type: none"> <li>I have an overview of the status of all obligations in one place.</li> </ul>
Collaborative	<ul style="list-style-type: none"> <li>I can better coordinate between the data providers and data requesters.</li> </ul>

### 4.3.5. Public user

Principle	Related actions
Workflow driven	
Managed access	
Inline support	
Optimized data delivery	<ul style="list-style-type: none"> <li>I can visualise the data in charts and on maps.</li> <li>I can access the reported data.</li> </ul>
Dashboard overviews	<ul style="list-style-type: none"> <li>I have an overview of the status of all in one place.</li> </ul>
Collaborative	

## 5. FEATURES

In this section, the product features are listed and briefly described. As features, we consider the high-level capabilities of the system that are required to deliver benefits to the users.

The reporting process in the current system is organised based on a commonly agreed reference model which serves itself as a guidance. The 10 step guidance model is outlined in the following figure.

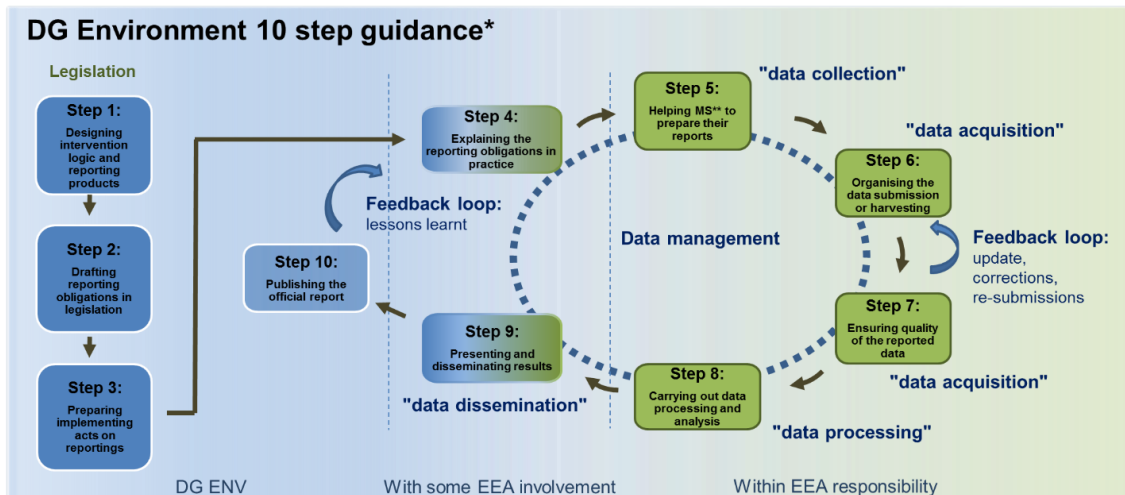


Figure 3 - 10 step guidance model

The new system, is designed in order to satisfy steps 4-9, while Steps 1, 2, 3 and 10 are considered out of scope of the project and no relevant functionality is proposed in the Business Vision document, since all relevant actions are performed outside of Reportnet.

The features related to the rest of the steps of the guidance model are outlined in this section.

The new proposed reporting process flow diagram for the Reportnet 3.0 system is displayed in the figure below.

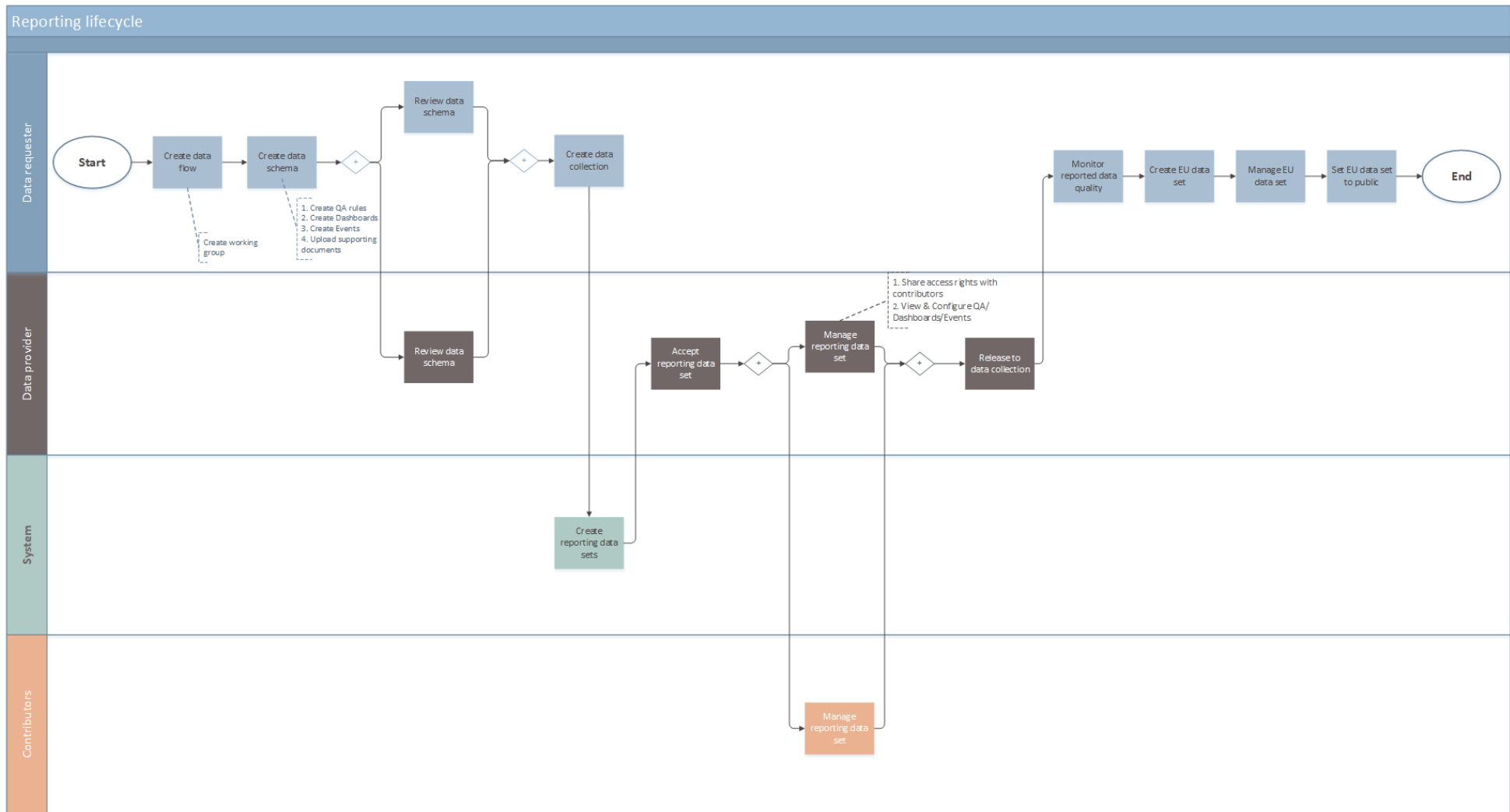


Figure 4 - Reportnet 3.0 general reporting process flow diagram

Each feature is assigned to the steps (one or more) of the 10 step guidance model and is briefly presented. Each feature's presentation, consists of the following sections:

- Title
- Actors involved
- Description of the feature
- List of the possible actions related to it

Since, the Scoping study is in line with the Database Feasibility study<sup>7</sup> for which mock-ups were designed to explain how the new system will serve reporting needs, mock-up page & action references were also added per feature, where available.

Actions that introduce complexity, require attention or affect the system in a way that cannot be foreseen, are handled in the document as new features and are presented accordingly (based on the sections mentioned above). In such features a reference to the corresponding section in the document is included.

### 5.1. Step 4 - Explaining the submission agreements in practice

Step 4 of the 10-step guidance model, constitutes the explanation of the submission agreement in practice, including the design of the submission agreement, the definition of the reporting requirements, the creation of the data flow and the design of the data schema.

The core interactions with the Reportnet 3.0 system in terms of step 4 are graphically represented in the following figure.

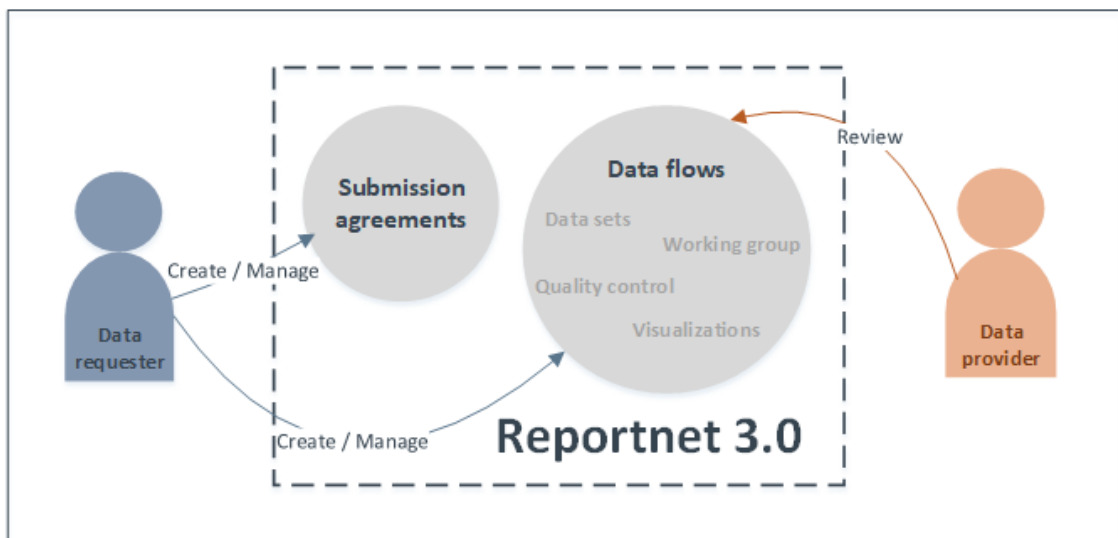


Figure 5 - Context diagram Step 4

According to the so far analysis and research, the ROD – Reporting Obligations Database - component of the Reportnet 2.0 system does not raise so many complaints or issues to the users. In general, this component suffers mainly from the fact that it is too-old fashioned and therefore needs a modernization and from the fact that the terminated obligations appear in the search similarly to the active ones and there is no obvious visual differentiation between them.

Regarding this component, the long-run vision is to replace the current ROD component with a new system which will serve as a submission agreements database, in which all legislative documents requiring reporting will be stored and will be accessible for search, view, management and creation of data flows. The data requester will be responsible for the creation and management of the submission agreements. It is also important to mention that the reporting obligations so far stored in current system version should be migrated to the new system at some point.

Since the process of re-implementing the ROD component is quite ambitious and requires a lot of effort, while it is not mandatory for the new system in the short-run and for the initial implementation of the Reportnet 3.0 system, the existing ROD system could be preserved.

Another intermediate option would be to develop the new submission agreements component without migrating old system's content; both systems should be operational at the same time.

**Note:** As submission agreements we consider both the Reporting obligations and the National deliveries' requirements. The Reportnet 3.0 system should store and allow reporting for both of them.

For each submission agreement the data requester creates a data flow in which the reporting for a specific deadline will take place. Upon creation (or update), the data requester will associate each data flow with a submission agreement and will specify the deadline for the reporting process. For each data flow two working groups will be specified consisting of the data requesters (including data custodian, data steward, data expert, etc.) and the data providers. Each group will be addressed through a mailing list, which will be maintained by the EEA through specific contact points which are responsible to report in terms of each obligation.

The data requester is also responsible for the data schema design for the reporting of this data flow. The data requesters will create a draft version of the data schema which will be further enhanced by the data providers. During this phase the data requesters will also configure the default dashboard, validations and events that should be available for the data providers during the reporting process to facilitate reporting and provide the means for achieving higher data quality. The related supporting documents for the reporting process will also be uploaded by the requesters.

The core features related to the previously mentioned components of Step 4 are briefly outlined in the following table:

Feature	Actor	Description	Possible actions
<b>Submission agreements</b>			
<b>Create submission agreements</b>	Data requester	The data requester creates a submission agreement in the system in terms of which a data flow will later be created for the data providers to report their data, setting up its metadata, as well.	<ul style="list-style-type: none"> <li>• Create submission agreement</li> </ul>
<b>Manage submission agreements</b>	Data requester	The data requester updates the content, the properties or the status (i.e. inactive, active, archived etc.) of the submission agreement.	<ul style="list-style-type: none"> <li>• Update the submission agreement</li> <li>• Update submission agreement status</li> </ul>
<b>Search submission agreements</b>	Data provider	The data provider is able to search for a submission agreement from within the agreements' list. The search results can be filtered i.e. deactivated submission agreements can be hidden.  <b>Note:</b> The search functionality is also available not only for submission agreements but also for other elements of the system (See Search functionality).	<ul style="list-style-type: none"> <li>• Search for a submission agreement</li> </ul>
<b>Monitor history of updates of submission agreements</b>	Data requester Data provider	The data requester and data provider monitor the history of the changes in the submission agreements which are tracked by the system.	<ul style="list-style-type: none"> <li>• Monitor history</li> </ul>
<b>Data flow creation &amp; management</b>			
<b>Create data flow</b>	Data requester	The data requester creates a data flow to serve the reporting of a specific submission agreement. Each data flow will be linked to this submission agreement and a specific set of contributors must be defined for it. Upon creation of a data flow, a document data set is created and the possibility to initiate a design data set is also provided to the data requester.  <b>Mock-up reference:</b> Empty personal space ( <b>Actions:</b> Create new data flow)	<ul style="list-style-type: none"> <li>• Create data flow</li> <li>• Setup contributors' mailing list</li> </ul>
<b>Manage data flow</b>	Data requester	The data requester accesses the data flow in order to update the details of it, monitor its properties, link it with a submission agreement, update the contributors' mailing lists (data requesters, data providers) or render a data flow as publicly available.  <b>Mock-up reference:</b> Data flow created ( <b>Actions:</b> [three dots button] > Manage roles / Properties)	<ul style="list-style-type: none"> <li>• Edit data flow</li> <li>• Monitor properties</li> <li>• Manage mailing list for data providers and data requesters – See Contributors' mailing lists creation (handled outside the Reportnet system)</li> <li>• Make data flow publicly available</li> <li>• Monitor data flow history</li> <li>• Duplicate data flow</li> </ul>



<p><b>Create working group for data flow</b></p>	<p>Data requester</p>	<p>The data requester creates a working group for a data flow in order to give access to involved stakeholders to work on it by entering the emails of the contributors (data steward, data custodian (allowing them to edit the design data set), data experts, data consultants and data providers (allowing them to submit their data)) and assigning them with specific roles. The system will address these users through two mailing lists (one for data requesters and one for data providers) (See Contributors' mailing lists creation (handled outside the Reportnet system)).</p> <p><b>Note:</b> Upon data schema design, the working group will consist of the people who will have access to the design data set and will contribute to the data schema.</p> <p><b>Mock-up reference:</b> Data flow created (<b>Actions:</b> [three dots button] &gt; Manage roles)</p>	<ul style="list-style-type: none"> <li>• Add contributors</li> </ul>
<p><b>Manage working group for data flow</b></p>	<p>Data requester</p>	<p>The data requester adds, replaces or removes contributors from the working group.</p> <p><b>Note:</b> Removing a data provider from the contributors list, will not remove the reporting data set from the system and the provider will still have access to it. However, this data provider will not be able to release the reporting data set to a data collection.</p> <p>When the data schema has been designed and the reporting process should start, the working group has to be updated to include the reporters of all reporting entities.</p> <p><b>Mock-up reference:</b> Data flow created (<b>Actions:</b> [three dots button] &gt; Manage roles)</p>	<ul style="list-style-type: none"> <li>• Add contributors</li> <li>• Remove contributors</li> </ul>
<p><b>Design data schema</b></p>			

<p><b>Create data schema and design data set</b></p>	<p>Data requester</p>	<p>The data requester starts designing the data schema of the data flow, by creating and formulating tables for a design data set which will serve as a template for the reporting. To initiate a design data set, any of the following options might be followed:</p> <ul style="list-style-type: none"> <li>• Create empty design data set</li> <li>• Create empty design data set based on an existing data schema</li> <li>• Create design data set from a data collection, prefilled with the data of the data collection</li> <li>• Create design data set from an EU data set, prefilled with the data of the EU data set</li> </ul> <p>This design data set is shared among the involved stakeholders (data requesters and providers) of the working groups in order to contribute to it and finalize the data schema of the data flow.</p> <p><b>Note:</b> Data schema creation will be facilitated if the data requesters have data visualisations in mind, since they will be able to test them instantly and they will also gain faster insights on reported data even at the initial steps of the reporting process.</p> <p><b>Mock-up reference:</b> Empty dataset edit window</p>	<ul style="list-style-type: none"> <li>• Create design data set</li> </ul>
<p><b>Design dashboards</b></p>	<p>Data requester</p>	<p>The data requester creates dashboards for each design data set which will be provided to the data providers when reporting their data for data visualization.</p> <p><b>Note:</b> The dashboards designed by the data requesters will serve as a default view for the data providers, but they will be able to configure them according to their needs in order to monitor information which is valuable for them. Data providers will gain a powerful new means of quickly visualising what they have reported so far, making it easier to detect gaps or anomalies in their reports.</p> <p><b>Mock-up reference:</b> Empty dataset edit window (<b>Actions:</b> Dashboards &gt; No dashboards &gt; + New dashboard), New dashboard (<b>Actions:</b> + Create a new chart), Config new chart1, Config new chart2</p>	<ul style="list-style-type: none"> <li>• Create dashboards</li> <li>• Create charts</li> </ul>
<p><b>Design quality control rules</b></p>	<p>Data requester</p>	<p>The data requester designs the quality control rules for a design data set (i.e. cross link validations between different tables).</p> <p><b>Mock-up reference:</b> Empty dataset edit window (<b>Actions:</b> Validations &gt; Create rule)</p>	

<p><b>Upload &amp; manage supporting documents for the data flow</b></p>	<p>Data requester</p>	<p>The data requester can upload supporting documents such as definitions, details guidance etc. in order to assist the data providers in the reporting process. The supporting documents will be publicly available and anyone will be able to download them. The data requester might also delete the documents uploaded.</p> <p><b>Note:</b> The file types of the supporting documents might be anything.</p> <p><b>Mock-up reference:</b> Documentation dataset details</p>	<ul style="list-style-type: none"> <li>• Add documents</li> <li>• Delete documents</li> </ul>
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**Table 4 - Features related to Step 4**

Actions mentioned in the sections: Manage submission agreements, Search submission agreements, Monitor history of updates of submission agreements, Manage data flow and Manage working group for data flow can also be performed in terms of other steps of the 10-step model served through the Reportnet 3.0 system.

## 5.2. Step 5 - Helping MS to prepare their reports

During step 5, all the activities aiming at supporting the MS during their reporting preparation are included. Most of them will take place outside Reportnet 3.0 system, but they are briefly outlined below for consistency reasons.

The core interactions with the Reportnet 3.0 system in terms of step 5 are graphically represented in the following figure.

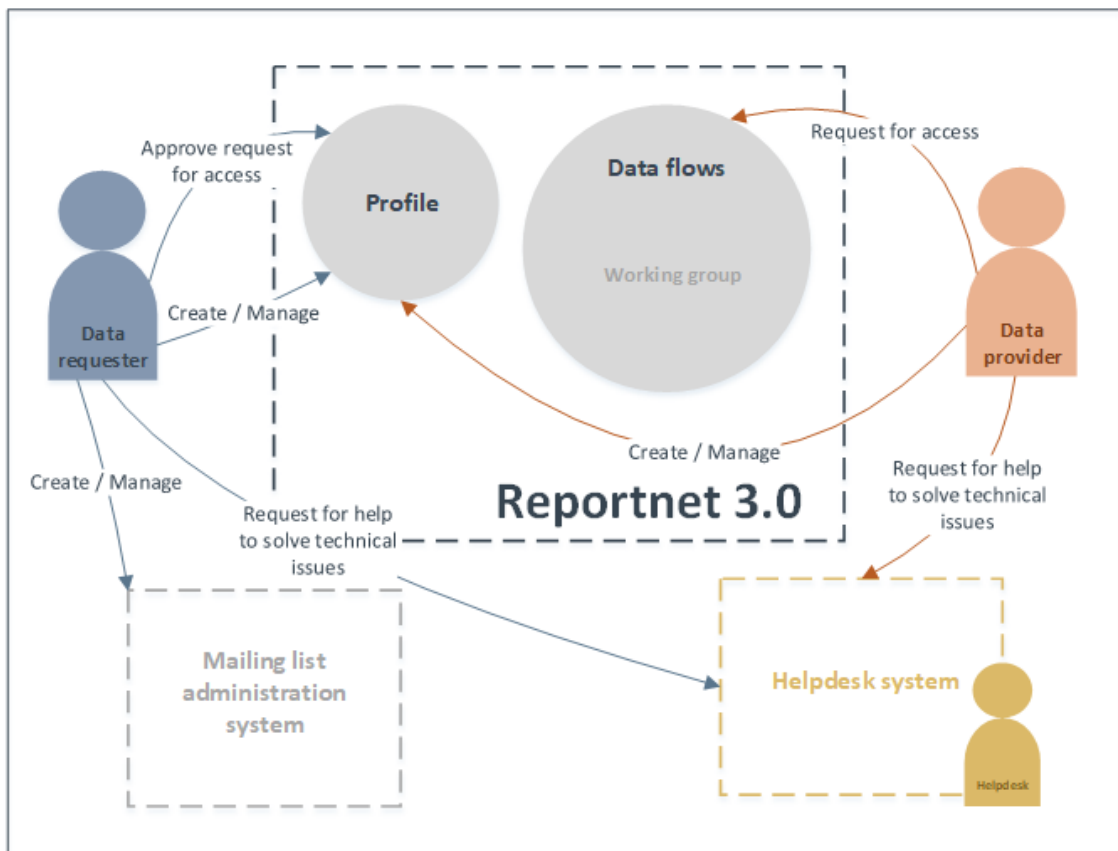


Figure 6 - Context diagram Step 5

### 5.2.1. Contributors' mailing lists creation (handled outside the Reportnet system)

The data requester is responsible to create two mailing lists per data flow; one for the data requesters and one for the data providers. These mailing lists will be created outside of the Reportnet 3.0 system and the members of it will be set up and configured in the Reportnet 3.0 system. These mailing lists will be used for data flow assignment, notifications, etc. (see Create working group for data flow).

### 5.2.2. Helpdesk (handling from external system)

The Helpdesk process constitutes an important part of Step 5 in the reporting process. The related functionalities are served outside of the to-be-analyzed system, but will be briefly mentioned here for consistency reasons, in order to clarify how the helpdesk processes will be incorporated to the new system.

When the users of the new system experience a technical problem related to the reporting process, they will address the helpdesk team for resolution. Incoming requests (either via email or through the ticketing system) will be classified based on their topic and will be assigned to specific email addresses responsible to handle them. The whole process will be conducted via a ticketing system, allowing for:

- Capturing all communications and information.
- Organizing and managing tasks more easily.
- Enabling statistics.
- Keeping track of the issues' resolution progress.

### **5.2.3. Access management**

The access management will be handled through the Reportnet 3.0 system. Both data providers and data requesters will be able to login to the system using either their Eionet account or EU login account. The data providers will be able to request for access to reporting to a data flow by the data requesters.

Feature	Actor	Description	Possible actions
<b>Account management</b>			
<b>Access to the platform &amp; profile management</b>	Data requester	The data requester or the data provider authenticate to the system using the EU login or Eionet account credentials.	<ul style="list-style-type: none"> <li>• Login / access the platform</li> <li>• Manage profile</li> </ul>
	Data provider	<b>Mock-up reference:</b> Start requester page ( <b>Actions:</b> Sign in > EIONET Login / EU Login > Login), Start reporter page ( <b>Actions:</b> Sign in > EIONET Login / EU Login > Login)	
<b>Request for access to a data flow</b>	Data provider	The data provider can subscribe to a data flow in order to report data. However, in order to be granted with access, the data requester should approve the request for access first. <b>Mock-up reference:</b> Pending task ( <b>Actions:</b> +Subscribe to a data flow > [Select one of the active open data flows] > Join)	<ul style="list-style-type: none"> <li>• Self-subscribe to data flow</li> </ul>
<b>Approve request for access to a data flow</b>	Data requester	The data requester reviews the self-subscription requests of the data providers and grants access to the ones who should report to each data flow by accepting the request. Upon approval, a new reporting data set will be created for this provider and the data provider will be included in the contributors' mailing list automatically by the system.	<ul style="list-style-type: none"> <li>• Accept request for access to a data flow</li> <li>• Reject request for access to a data flow - In case the data provider should not have access to the data flow, the data requester rejects the request and access is restricted.</li> </ul>
<b>Supporting documentation creation</b>	System	The system will produce automatically supporting documentation per data flow to provide guidance throughout the reporting process to the data providers. The format of the produced documentation will be standardized and consistent between different data flows.	<ul style="list-style-type: none"> <li>• Automatic supporting documentation creation</li> </ul>

**Table 5 - Features related to Step 5**

### 5.3. Step 6 - Organising the data submission or harvesting

Step 6 foresees the data submission and harvesting processes for the reporting, including the resubmission of the data and the monitoring of the reporting, as well.

The core interactions with the Reportnet 3.0 system in terms of step 6 are graphically represented in the following figure.

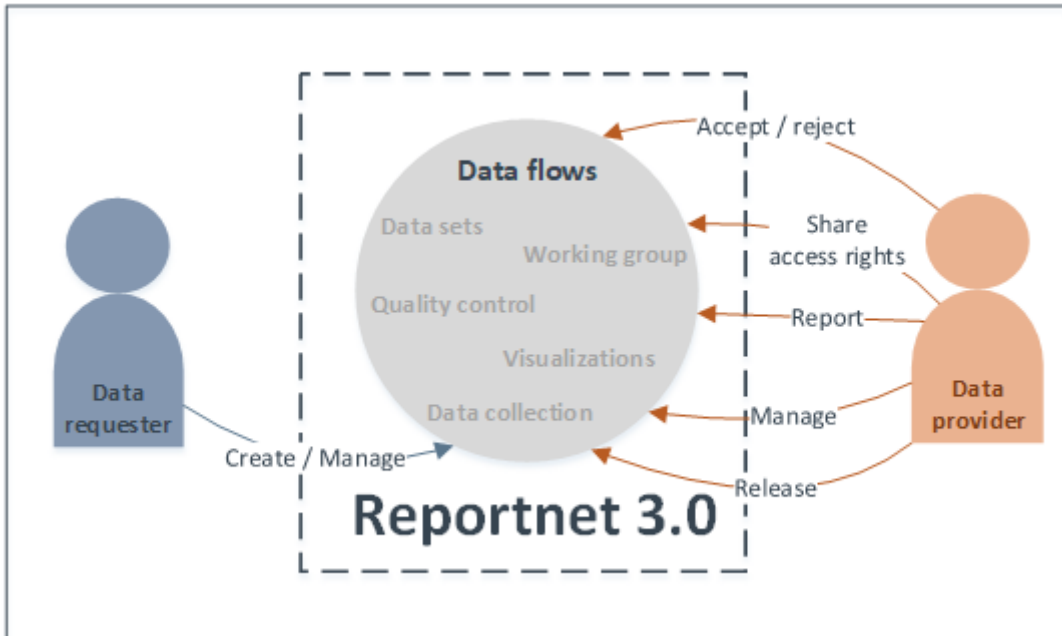


Figure 7 - Context diagram Step 6

The data requesters will create and manage a data collection for the data flow. The system will automatically create a reporting data set for each data provider, who will receive a data flow request for acceptance to submit their data. The data providers will be able to share a data set with their colleagues in order to contribute or review the data submitted and will also be able to monitor the reporting through dashboards, validations and events' log.

Feature	Actor	Description	Possible actions
<b>Prepare data collection</b>			
<b>Create data collection</b>	Data requester	<p>The data requester accesses a data flow and selects to create a data collection for it. The system automatically creates reporting data sets per data provider (see Create reporting data sets).</p> <p>The data collection will be publicly available unless an EU data set has been rendered publicly available instead, including all reporting data sets which have been released to a data collection and have not been set to confidential. The data schema of a data collection cannot be updated. In case a change in the schema needs to take place, a new data collection will be created and the existing one will be deleted or abandoned.</p> <p>When selecting to create a data collection for up-to-date data, the data requester should configure how often the up-to-date data should be reported and how often the system should create an EU data set for the data flow.</p> <p><b>Mock-up reference:</b> Data flow with Dataset (<b>Actions:</b> [arrow of Template new dataset] &gt; Create data collection &gt; [Enter data collection title] &gt; Create)</p>	<ul style="list-style-type: none"> <li>• Create data collection</li> <li>• Without data - empty data collection</li> <li>• With prefilled data by an EU data set of the selected data flow.</li> <li>• With prefilled data by another data collection of the selected data flow – Select data collection from which to prefill the data.</li> <li>• For up-to-date data.</li> </ul>
<b>Create reporting data sets</b>	System	<p>When the data requester creates a data collection, a reporting data set will be created automatically by the system for each data provider belonging to the working group of the data flow in order to report their data. The data schema of a data collection is fixed and cannot be updated.</p> <p><b>Note:</b> As soon as a new data provider is set for a data flow (see Manage working group for data flow), a reporting data set will be created to report their data.</p> <p><b>Mock-up reference:</b> Data flow created (<b>Actions:</b> New item &gt; New item &gt; New empty dataset &gt; [Enter new dataset title] &gt; Create)</p>	<ul style="list-style-type: none"> <li>• Reporting data set creation per data provider</li> </ul>
<b>Reporting process</b>			
<b>Accept or reject data flow</b>	Data provider	<p>When a data requester includes a data provider in the working group of a data flow, a request for acceptance of it by the data provider is created automatically by the system. When logged in to the system, a request to accept or reject the data flow is available to the data provider who is able either to accept or reject it. In case of acceptance, the provider is able to access the data flow, manage its working group (see Manage working group for data flow) or manage the reporting data set (see Manage reporting data set).</p> <p><b>Mock-up reference:</b> Pending task (<b>Actions:</b> Accept)</p>	



<b>Share access rights with other contributors for a data flow</b>	Data provider	<p>The data provider shares the data flow with others and configures their rights (read only or read/write access rights). The data provider can also remove them from the data flow, depriving them of the access to the data flow.</p> <p><b>Mock-up reference:</b> Dataflow for reporting (<b>Actions:</b> [three dots button] &gt; Manage roles)</p>	
<b>Manage data collection</b>	Data requester	<p>The data requester accesses the properties of the data collection in order to view or update them or rename the collection. The data requester is also able to delete a collection.</p> <p><b>Mock-up reference:</b> Data collection from Requester (<b>Actions:</b> [arrow of DC New data collection] &gt; Open collection / Delivery status, [three dots button] &gt; Properties)</p>	<ul style="list-style-type: none"> <li>• Access data collection properties</li> <li>• Update data collection properties</li> <li>• Rename data collection</li> <li>• Delete data collection</li> </ul>
<b>Manage reporting data set</b>	Data provider	<p>The data provider accesses the reporting data set in order to see, review or delete the already reported data or submit new ones and save the changes performed. The data provider might also select either to import the data set through a file or export the data or the data schema to manage it offline. The import &amp; export functionalities will be available to the data provider if the data requester has enabled them during the data schema design phase (see Create data schema and design data set). The reporting data set is released to a data collection (through a snapshotting mechanism) and when needed a certain snapshot can be restored in order to continue working on it. The data provider has also access to the properties of the reporting data set in order to view or update them. Through the properties of it, the data provider is also able to set a data set to confidential in order not to allow its publication.</p> <p>The data provider sets the reporting data set to confidential in case it should not be published within a data collection.</p> <p><b>Mock-up reference:</b> Dataflow for reporting (<b>Actions:</b> New dataset, Import from file, [three dots button] &gt; Properties), Dataprovider edit dataset (<b>Actions:</b> Export/Import, Snapshots &gt; Create new snapshot / [select snapshot date])</p>	<ul style="list-style-type: none"> <li>• Access / View reporting data set</li> <li>• Delete data from data set</li> <li>• Import data set</li> <li>• Export data set / schema</li> <li>• Save data set</li> <li>• Rename reporting data set</li> <li>• Access / View reporting data set properties</li> <li>• Update reporting data set properties</li> <li>• Release data set to data collection (create snapshots) –Release data set to data collection</li> <li>• Restore snapshots</li> </ul>

<b>Import data</b>	Data provider	<p>Apart from using the UI provided by the system, the data provider, might report their data alternatively using the system's import mechanism:</p> <ol style="list-style-type: none"> <li>1 Importing files (spreadsheet, package)</li> <li>2 Setup service for spatial data</li> <li>3 Importing XML files or JSON files</li> <li>4 Importing tables from an Access database or map the XML schema used in Reportnet 2 in the new system</li> <li>5 Add data through the web forms</li> <li>6 Geojson, Geopackage.</li> </ol> <p>The importing mechanism can also be used for reporting real time data selecting to import as an XML or JSON file through a web service.</p> <p><b>Note:</b> The supported file types that can be imported to the system can be found in the section Supported file types when importing files for the reporting section.</p>	<ul style="list-style-type: none"> <li>• Import files</li> <li>• Setup services</li> <li>• Set up reporting frequency</li> </ul>
<b>View and configure dashboards</b>	Data provider	<p>The data provider monitors the data reported to the system through dashboards and views designed by the data requester during the design data schema phase. The data provider is able to configure the default dashboards according to their needs in order to monitor information which is valuable for them (see Design dashboards).</p> <p><b>Mock-up reference:</b> Dataprovider edit dataset (<b>Actions:</b> Dashboards)</p>	<ul style="list-style-type: none"> <li>• View dashboards</li> <li>• Configure dashboards (add charts, update charts, etc.)</li> </ul>
<b>View events and monitor events' logs</b>	Data provider	<p>The data provider accesses the events' list, in order to see the active events for the data flow and monitors their execution through the events log.</p> <p><b>Mock-up reference:</b> Dataprovider edit dataset (<b>Actions:</b> Events)</p>	<ul style="list-style-type: none"> <li>• See active events</li> <li>• Monitor event logs</li> </ul>
<b>View validations per record or data set</b>	Data provider	<p>The data provider monitors the validation errors received per record or dataset.</p>	<ul style="list-style-type: none"> <li>• Monitor validation errors per record</li> <li>• Monitors validation errors per dataset</li> </ul>

<p><b>Release data set to data collection</b></p>	<p>Data provider</p>	<p>The data provider selects to release to a data collection the data already reported. The system automatically produces a snapshot of the current data set (back up) and links the snapshot to the data collection.</p> <p><b>Note:</b> The data provider is able to release the reporting data set to a data collection unlimited times as long as the data collection is open for reporting.</p> <p><b>Note:</b> The people to whom read / write access rights on a data flow have been shared by the data provider, will not be able to release to data collection.</p> <p><b>Mock-up reference:</b> Dataflow for reporting (<b>Actions:</b> [arrow of New dataset] &gt; Release to data collection)</p>	<ul style="list-style-type: none"> <li>• Release to data collection</li> </ul>
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**Table 6 - Features related to Step 6**

Actions mentioned in the sections: Create data collection, Create reporting data sets, Share access rights with other contributors for a data flow, Manage data collection and Manage reporting data set can also be performed in terms of other steps of the 10-step model served through the Reportnet 3.0 system.

#### 5.4. Step 7 - Ensuring quality of the reported data

An important step in the 10-step model for the reporting process is to ensure the quality of the data collection through manual and automatic data quality review.

Automatic quality control rules might be either implicit constraints (table links, selection, number fields and comparisons with earlier trends and past data reported) or explicit ones defined as additional constraints on a table during schema design (i.e. required fields, non-empty fields, unique fields, expected regex patterns on textual fields, etc.). More complex business validations are expected to be custom-developed outside of the system as part of the dataflow implementation in external systems (i.e. FME) with the sole responsibility of Reportnet 3.0 being to allow the seamless and uniform integration of all external validation plug-ins with the rest of the platform.

Concerning, the manual quality control, the data requesters will review manually the data released to a data collection providing the data providers with their feedback as comments. It is important to mention that, EU level checking is most commonly undertaken by the EEA and there is no clear evidence that having a third party quality review will lead to better quality evidence.

The core interactions with the Reportnet 3.0 system in terms of step 7 are graphically represented in the following figure.

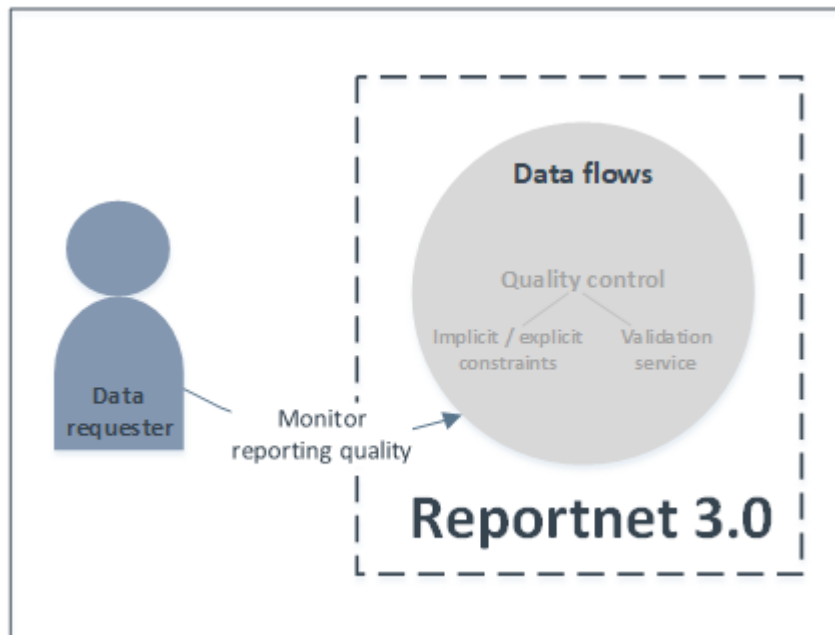


Figure 8 - Context diagram Step 7

Feature	Actor	Description	Possible actions
<b>Validations</b>			
<b>Monitor reporting quality</b>	Data requester	The data requester will be able to manually monitor the quality of the released to a data collection data. <b>Mock-up reference:</b> Data collection edit dataset	<ul style="list-style-type: none"> <li>• Monitor data quality</li> <li>• Reject reported data providing comments</li> </ul>
<b>Reject reported data providing comments</b>	Data requester	The data requester rejects the reported data from a data collection providing the data provider with comments explaining the reason of the rejection. This way, the snapshot of the reporting dataset which was released to the data collection will be removed from it and the data provider will have to resubmit the data set after applying corrections.	

**Table 7 - Features related to Step 7**

## 5.5. Step 8 - Carrying out data processing and analysis

In step 8, a European data set is created from the reported data collection which aims at conducting further processing and analysis. A data cleansing process might also take place in the European data set.

The core interactions with the Reportnet 3.0 system in terms of step 8 are graphically represented in the following figure.

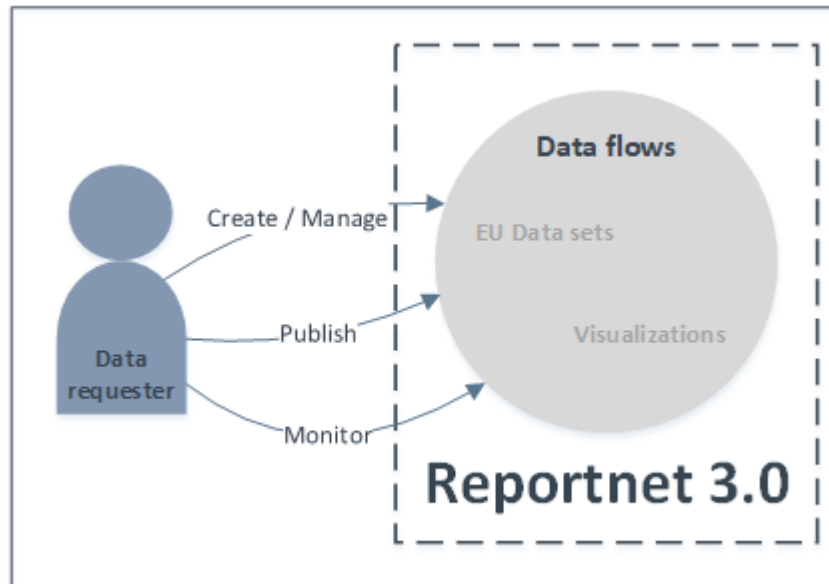


Figure 9 - Context diagram Step 8

Feature	Actor	Description	Possible actions
<b>EU data set</b>			
<b>Create EU data set from data collection</b>	Data requester	The data requester selects to create an EU data set from a data collection to produce a harmonized EU data set (See Snapshotting in reporting flow). The data requester might select to make the EU data set publicly available instead of the data collection for this data flow. <b>Note:</b> The data request is able to create an EU data set unlimited times. <b>Mock-up reference:</b> Data collection from Requester ( <b>Actions:</b> [arrow of DC New data collection] > Generate dataset > [Enter title of dataset] > Create)	<ul style="list-style-type: none"> <li>• Create EU data set</li> <li>• Make EU data set publicly available</li> </ul>
<b>Manage EU data set from data collection</b>	Data requester	The data requester reviews the EU data set which serves as a snapshot of a data collection at some time which can be used as a backup and is able either by himself / herself or after sharing the data set with the ETCs or EC consultants to cleanse, gap fill or update the data included, to assure a Quality checked and corrected EU data set.	<ul style="list-style-type: none"> <li>• Edit data</li> <li>• Duplicate EU data set</li> </ul>
<b>Set EU data to final</b>	Data requester	When the data requester has created more than one EU data sets and wishes to highlight the one which should be used for dissemination, marks this EU data set as final. <b>Note:</b> When setting an EU data set to be final, the system will automatically consider this as a source for dissemination, etc. compared to other data sets.	<ul style="list-style-type: none"> <li>• Set EU data set to final</li> </ul>
<b>Define EU data set as publicly available</b>	Data requester	The data requester will be able to decide on whether the EU data set (after its creation) will be set to publicly available.	<ul style="list-style-type: none"> <li>• Make EU data set publicly available</li> </ul>
<b>View visualization dashboards</b>	Data requester	The data, which are publicly available per data flow, are presented in visualizations provided by the system to allow an easier data monitoring to anyone visiting the system, either logged in or not.	<ul style="list-style-type: none"> <li>• View visualization dashboards</li> </ul>

**Table 8 - Features related to Step 8**

## 5.6. Step 9 – Presenting and disseminating results

As it is analyzed in the Architecture TO-BE document<sup>11</sup>, the European (EU) Dataset is essentially a branch out of a data collection's snapshot which can be further modified (excluding its schema) by data custodians or data experts for cleansing purposes, who will eventually create additional snapshots as the cleansing process advances. Data visualizations on EU datasets are copied from their originating data collection dataset but they can be edited in order to come up with the final "public" visualizations. Another important aspect of EU datasets is that they are publicly visible in Reportnet 3.0 and together with their public-facing data visualization dashboards, they constitute the primary auto-disseminated product of each dataflow.

The current situation of Reportnet validate that even though it is important to collect the data from all sources, most of the times the raw data do not provide sufficient information to the stakeholders or people who are interested in without further processing. However, even the new system will allow the users to access the raw data and search for them through the metadata catalogue.

However, the dissemination of the reported data is a fundamental step of the reporting process that reinforces the European interoperability framework within this digital solution adopted by EEA, aiming at providing the right information to the right people at the right time. It is used to track, manipulate and distribute the information from gathered data to wider audience regularly.

The main benefits of collecting and showing the reported data through a dissemination solution are any of the following, but are not limited only to them.

- Present how the outcomes are relevant to environment information.
- Allow results be accessible and meaningful (e.g. understood and utilized).
- Ensure that the public receives sufficient information to remain properly informed
- Help communicate the results in multiple ways (e.g. maps, graphs, pdf) and render them open and available to audience 24x7.

Active dissemination can increase the efficiency of monitoring and reporting, but more by increasing benefits than reducing costs. Therefore, apart from the auto-disseminated product of each dataflow from the platform, additional products are expected to be created from an EU dataset and totally diverse products will be required for each dataflow, but the processes which will create such bespoke products are considered to be external to Reportnet 3.0. However, it is important to mention that apart from the fact that reporting the same data multiple times will be avoided in the future (see 5.8 Data harvesting (incl. INSPIRE compliant data)) for efficiency and effectiveness, in case of collecting the same data from different sources (see for example 5.9 - Citizen science and 5.10 - Copernicus) at the dissemination phase, the possibility to combine them will be offered in order to increase data quality and produce better reporting results.

The cleansed EU dataset will be stored in Reportnet 3.0 database and will be accessible to the EEA directly through the database and to public users through the system. It will also be accessible through the system's API (the technical details of the interface are analyzed in the Architecture TO-BE document) as an aspect of Reportnet 3.0's interoperability. Any public user will be able to get the data through the public API and consume them to produce dissemination products.

**Note:** In case of confidential data, access to the dataset will have only logged in users with the corresponding access rights both through the system and through the API.

The reported data must be considered to be disseminated to the people who are interested in different formats:

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<sup>11</sup> 10 Reportnet\_3\_Scope\_Study\_Architecture\_TO\_BE.(15-11-2018).(v1.0)



- Country fiche report templates
- Visualized results (e.g. maps, graphs)
- Enhanced search results using Key Indicators
- Other reports, data in table format.

A wide variety of dissemination portals (i.e. EU Open Data Portal, Energy Union Portal, Air Quality portal, etc.) are and will be available, through which the data presented in an accessible and understandable format. Based on the Fitness Check report<sup>1</sup>, due to the dissemination portals there have been significant improvements in the ability of EU citizens to be kept properly informed about the state of the environment.

Nevertheless, as soon as any additional data product becomes available, the data custodian will have the option of publishing it in Reportnet 3.0 by including the relevant URL link inside the dataflow.

It is important, however, to mention that the data presented in the dissemination portals will be the publicly available (unless confidential), quality checked, processed data included in the final publicly available EU dataset.

## **5.7. Other features**

Apart from the features directly related to the Steps of the 10-step model (which are served through the system) there are also some features not limited to a specific step of the model but cross-cutting between different steps and very important for the new Reportnet system and the business processes that should be implemented in it.

Feature	Actor	Description	Possible actions
<b>Other features</b>			
<b>Supported file types when importing files for the reporting</b>	System	<p>The data providers will be able to deliver to the system their data of various types, based on the reporting needs for the submission agreements. More specifically the following options will be available to the users for their reporting:</p> <ul style="list-style-type: none"> <li>• Spreadsheet data (.csv, .tab, .xlsx)</li> <li>• .doc, .pdf</li> <li>• .json</li> <li>• .xml</li> <li>• Geographic &amp; Geospatial data (of various types, i.e. GML, Shapefiles, OGC, GeoPackage, geojson etc.)</li> <li>• Package (.zip)</li> <li>• RDF</li> </ul> <p>When selecting to import a file or setup a service a corresponding quality control process will be integrated into the new system, checking the reported data and assuring a standard level of quality of the data.</p> <p><b>Note:</b> The data providers will also be able to upload to the system guidance documents for the data flows in binary files.</p> <p><b>Mock-up reference:</b> Data provider edit dataset (<b>Actions:</b> Export/Import &gt; [Tabs: File / Service / ETL])</p>	<ul style="list-style-type: none"> <li>• Import files (once)</li> <li>• Import tables (once)</li> <li>• Setup service</li> </ul>
<b>Translated UI &amp; supporting documentation</b>	Data provider Data requester	<p>In the future, the system will provide the possibility to select the language in which the UI will be displayed, in order to facilitate the reporting process and the interaction of the users with the platform. Another nice to have functionality, will be to allow translations of the supporting documents uploaded by the data requesters in order to provide guidance to the data providers throughout the process.</p> <p><b>Mock-up reference:</b> Dataflow for reporting (<b>Actions:</b> Documents)</p>	<ul style="list-style-type: none"> <li>• Select language in the UI</li> <li>• Select to download documents in a specific language</li> </ul>
<b>Automatic generation of supporting documentation</b>	System	<p>In the future, the system will produce automatically supporting documentation per data flow to provide guidance throughout the reporting process to the data providers. The documentation should be stored in the Documents data set per data flow where the providers will be able to find and download them. The format of the produced documentation will be standardized and consistent between different data flows.</p>	

<p><b>Search functionality</b></p>	<p>Data provider Data requester Non-logged in user</p>	<p>The system will provide the users with the functionality to search for the following:</p> <ul style="list-style-type: none"> <li>• Submission agreements</li> <li>• Data flows</li> <li>• Data collection</li> <li>• EU data sets</li> <li>• Registered users</li> <li>• Roles</li> <li>• Organization</li> </ul> <p>based on specific search criteria. The search criteria will be based on the metadata of each of the previously mentioned entities</p>	
<p><b>Notification system</b></p>	<p>Data provider Data requester</p>	<p>In the Reportnet 3.0 system, a notification mechanism should be available, through which reminders and notifications will be generated (triggered by specific actions) and sent to the responsible users in order to motivate them to act accordingly and guide them through the reporting process. Notifications will be sent to each logged in user involved through email and the user will be able to subscribe to specific notifications and configure notification preferences through the system. Examples of notifications created by the system will be:</p> <ul style="list-style-type: none"> <li>• Notifications for new reporting deadlines created</li> <li>• Notifications for upcoming reporting deadlines approaching</li> <li>• Notifications for comments on a data schema</li> <li>• Notifications for updates in the data schema</li> <li>• Notifications for comments on reported data</li> <li>• Notifications for requests for access to a data flow</li> </ul>	<ul style="list-style-type: none"> <li>• Subscribe to notifications</li> <li>• Configure notification preferences</li> </ul>

<b>Dashboards</b>	System	<p>The Reportnet 3.0 system will be employed with Dashboards, through which various purposes will be served per user (authorized or not, requester or provider, etc.). The following dashboard types will be provided:</p> <ul style="list-style-type: none"> <li>• Dashboard to monitor data collection status and reporting progress (available to data requesters)</li> <li>• Dashboard to monitor EU data set status (available to data requesters)</li> <li>• Dashboard to monitor reporting data set errors &amp; status (available to data providers and data requesters)</li> <li>• Dashboard to visualize data reported (either from data collection or from EU data set) (available to data requesters, data providers, public users)</li> <li>• Dashboard to monitor pending data flows (available to data providers)</li> <li>• Dashboard to monitor pending tasks for access request approval (available to data providers)</li> </ul> <p>The dashboards provided will include tables, visualizations, charts and any other type. It would be nice to allow the authorized users to configure the dashboard based on their preferences and save them to be displayed by default each time they log in to the system.</p>	<ul style="list-style-type: none"> <li>• Configure dashboards</li> </ul>
<b>Public visualization of EU data sets – Accessibility from public users</b>		<p>As soon as the reported data are released to a data collection, the data included will become publicly available (even to non-registered users), unless the data provider selected during reporting to mark the data as confidential. In such cases, the data will not be accessible by non-registered users. When an EU data set is created by a data collection, the data requester will be able to decide whether this EU data set or the data collection will be publicly available for this data flow.</p>	
<b>View data collections for a specific submission agreement</b>	Data provider Data requester Non-logged in user	<p>When visiting the app (either logged in or not), the users will be able to access the submission agreements and through them easily access the data collections for it. <b>Note:</b> Confidential data will not be accessible by the users (either logged in or not).</p>	<ul style="list-style-type: none"> <li>• Access data collection delivered</li> </ul>
<b>Monitor data flow properties</b>	Data provider	<p>The data provider accesses the data flow to monitor the data flow properties and the data flow history as it has been logged by the system.</p>	<ul style="list-style-type: none"> <li>• View properties</li> <li>• View data flow history</li> <li>• Generate API-key</li> </ul>

**Table 9 – Other Features**

## 5.8. Data harvesting (incl. INSPIRE compliant data)

In the context of environmental reporting, data harvesting is a process through which an EU hub database collects data automatically from multiple entities' databases, typically via the internet. The EU hub database subsequently hosts the data, making it available for use (internally by EU institutions or externally by other stakeholders e.g. the Commission, the public, etc.). As such, data harvesting represents an 'automatic', alternative approach, to the 'manual' approach to reporting most commonly used for EU reporting obligations. The process of data harvesting may be set up between a private database and the EU hub or a public database and the EU hub. In the latter case, data harvesting is closely related to the process of 'active dissemination'.

Key benefits of data harvesting over current processes are that it can provide access to large volumes of information, including raw data, which could enable more powerful / in-depth analysis and greater potential for multipurpose use of the data; and enable more frequent, in particular real-time, reporting. Where data is put online for harvesting, and that resource is made publicly available, there may be co-benefits in terms of improving public access to information. This has not, however, replaced the need for traditional reporting of air quality data and compliance by Member States via Reportnet. The data harvesting provides real time data, but it is raw, non-validated data. Member States still need to perform detailed quality checks and report to the EEA validated air quality information. Further evolution and use of the data harvesting aspect of reporting is expected and is hoped to bring further benefits.

Apart from the benefits, though, a number of potential limitations and challenges have been raised by the stakeholders that both diminish the potential benefit of data harvesting and indicate the continued relevance of the current reporting processes for some type of reporting obligations:

- Data harvesting is generally more appropriate for quantitative information, but can be used for textual information.
- Potential divergences in end-user needs could lead to conflict over how data is accessed.
- Reported data must provide an appropriate basis for legal actions.
- The costs and benefits of data harvesting need to be carefully considered.

INSPIRE provides a key route for addressing some of the challenges posed by data harvesting and its implementation will erode the relevance of the current process of reporting for relevant types of reporting obligations and promote opportunities for data harvesting. However, further effort is required before INSPIRE will be fully operational which is not anticipated to happen until 2020.

The technical issues in the design of Reportnet 3.0 builds heavily on the data harvesting potential through providing the possibility to populate data sets through services (either INSPIRE compliant or not) which can be setup by the data providers in the system but can only be achieved with legal and thematic alignment.

It is foreseen in the new system that the reporters will be provided with the possibility to use INSPIRE compliant data sets as an alternative reporting method and potentially save time from reporting the same data set multiple times, promoting the standardization of reporting process.

Reportnet 3.0 will allow harvesting the information related to a specific obligation and not the whole data set and the system will be responsible to transform the INSPIRE data to tabular format. Moreover, the system should also test the services' availability, the compliance of the responses with the expected schema and the references between different data sets (i.e. spatial & non-spatial data). In case of discrepancies between the INSPIRE data sets and data in the reporting obligation, the system should highlight them to the corresponding data provider. To overcome the impediment of the lack of quality control of the harvested data (burdening heavily the current system and preventing from fully exploiting the data), the established quality control processes of the Reportnet 3.0 will be applied to the data when imported, as usual, assuring a standard level of reporting quality.

An additional capability, in the long future, could be to facilitate the selection of INSPIRE services by providing a search functionality of the INSPIRE geoportal and allow the reporters to identify the service relevant for them.

At this point, it should be mentioned, that for the INSPIRE data sets, a standardization of the INSPIRE id should be investigated in order to allow for correct matching between INSPIRE data set information and the data sets of other reporting obligations.

## 5.9. Citizen science

Environmental citizen science connects citizens, scientists and public authorities (such as EPAs) by engaging members of the public in environmental science and protection. Citizen science is the involvement of the public in scientific research – whether community-driven research or global investigations -, motivating them to participate in the scientific process to address problems, which may include identifying research questions, collecting and analysing data, making new discoveries, and developing technologies and applications. While citizen science is not a new concept, EPAs and other public authorities are increasingly making use of citizen science to assist them in the achievement of environmental protection, especially due to the increased availability of innovative mobile sensors and applications.

As it is mentioned in the Final Report of the Fitness Check<sup>1</sup>, potential benefits of citizen science stem from:

- reduced costs of data collection;
- access to real time data (e.g. drawing on technological development such as mobile-phone based data collection tools);
- direct access to the opinions of those impacted by environmental problems;
- large sample sizes and datasets.

On the other hand, potential challenges of citizen science, include concerns regarding:

- quality assurance (QA);
- resource requirements for cleaning and handling large datasets;
- maintaining citizen volunteer engagement over the course of the data collection period and over time.

While there remain challenges regarding harvesting of data from citizen science activities, there is also an opportunity for citizen science to support greater collection of state and pressure indicators to complement traditional environmental monitoring and reporting, providing higher density and spatio-temporal coverage with relatively minimal effect on administrative burdens. Future development of the monitoring and reporting system needs to be alert to this and ensure that this future role for citizen science is supported. It is also possible that in the future, a certain submission agreement may require / allow / accept citizen science data as a reporting stream. Registered citizen science associations might then report data that their volunteers have previously collected (and curated/QC/etc.) following an established methodology or protocol. The Reportnet 3.0 system should foresee the need to allow integration with citizen science applications from which data will be harvested and will later be processed inside the system and where applicable, corresponding QC rules will be implemented. The system might also provide the possibility to configured data sources for the harvesting.

However, the following considerations should be taken into account in the future:

- Although citizen scientists want their data to be used, they should be evaluated and validated since the data will be officially used for legal reporting; in case of insufficient quality or invalidity, they will receive a negative feedback for their submission which might eventually demotivate citizen scientists and their organizations from reporting.

- In most cases, citizen science data will be collected at national level and then collated together with other data sources prior to their submission; therefore, whether the data stem from citizen science or not should be transparent for the system (i.e. we should be able to run the same quality control on the data regardless their origin).

## 5.10. Copernicus

Future capabilities of the new system can be explored in other projects' outputs. Such an example is the Copernicus programme.

Copernicus, previously known as GMES (Global Monitoring for Environment and Security), is the European Programme for the establishment of a European capacity for Earth Observation, which produces environmental data based on earth observation satellites and in situ sensors. Vast amounts of global data from satellites and from ground-based, airborne and seaborne measurement systems are being used to provide information to help service providers, public authorities and other international organisations improve the quality of life for the citizens of Europe. The information services provided are freely and openly accessible to its users.

Copernicus represents the advances in earth-observation techniques but remains largely unexploited in the reporting process. The 3<sup>rd</sup> Stakeholder Workshop on the Fitness Check on Environmental Monitoring and Reporting revealed that Copernicus could provide new ways of collecting data, thus potentially reducing the burden of reporting, while the 4<sup>th</sup> Stakeholder Workshop on the Fitness Check on Environmental Monitoring and Reporting suggested that Copernicus could act principally to complement rather than directly replace reporting. The workshop participants agreed that further development and testing of Copernicus would be needed for it to be widely accepted, and for its role in contributing to reporting to increase. Specific suggestions received from stakeholders in responses to this study included that satellite data could:

- be used to track land use change as part of monitoring of Natura 2000 sites;
- be combined with other forms of data collection to enhance information (and improve efficiency) for air quality reporting;
- replace reporting for monitoring of marine waters;
- form a data source to support validation of results from modelling.

Exploiting the data collected with regards to Copernicus project, offers the potential to replace some aspects of the current reporting system. However, Copernicus data should be delivered combined with INSPIRE data to assure that potential benefits can be realised.

**Note:** Data harvesting from different sources like INSPIRE compliant services, Citizen Science or Copernicus will fulfil interoperability principle within Reportnet 3.0. All this data stemming from different sources could be combined at some point within Reportnet's sandbox in order to produce fruitful reports and consolidated results through this mash-up. As it can be easily understood, each source will provide data of different quality. This fact should be considered at some point to find a solution.

## 6. CONSTRAINTS

Within the main objective of modernization, there are constraints that may influence the ability to provide the described capabilities.

### Scope

- Requirements characterized as M (Must have) during the MoSCoW prioritization process cannot be left out when producing the solution without proper elaboration and discussion with the project stakeholders.
- In case of scope creep, implementation time, cost and resources will increase, and potentially quality will decrease. And thus increased risk on delivery.

- System-to-system reporting (data provider) and collection (data requester) must become possible.
- A transition phase from Reportnet 2 to Reportnet 3.0 is required and must be included in the time plan.
- The requirements of the INSPIRE directive must be incorporated or it must be justified where it would be considered out of scope.
- The solution must integrate with possible dissemination platforms.

#### **Effort**

- Reporting burden must be lowered for all roles involved in the reporting process.
- The process steps from definition of datasets, through quality control procedures, data processing and dataflow products must be more closely integrated and reduced in cost.

#### **Schedule**

- The first day of implementation cannot exceed 1 January of 2021.

#### **Resources**

- Adequate project team in the EEA must be available during the implementation of the system to continuously provide feedback and support in the project execution team.
- If project team finds that the quality of a deliverable is going bad, more resources may be required. This increases the cost—for additional resources—and effort to fix the faulty deliverable. This may also increase the time to deliver.
- If necessary resources are not available, time to deliver will increase. This may also increase project cost, because alternate resources, if available, may be more expensive than planned.

#### **Budget**

- The budget cannot exceed what was defined in the framework contract.

#### **Management Process**

- Depending on the management process that will be followed in the execution phase, corresponding constraints will be defined to re-assure and control the proper time, effort and project resources to minimize the project risks.

## **7. QUALITY RANGES**

This section defines the quality ranges for performance, robustness, fault tolerance, usability, and similar characteristics for the Reportnet 3.0 system.

### **7.1. Usability**

The new system must follow EU style-guides in order to be user-friendly, easy-to-use, modern and output-oriented. Furthermore, it should foresee search functionality and centrally stored documentation to support reporting process.

### **7.2. Availability**

The system must be available for use 24/7 and it must achieve 99% up-time. Maintenance breaks must be scheduled outside working hours and appropriate notifications shall be presented to the users well in advance before the system becomes unavailable.



### **7.3. Performance**

The system's user facing components must achieve response times with their 98<sup>th</sup> percentile not exceeding 300ms as measured from the user interface.

The system must be able to sustain its performance characteristics during usage peaks resulting from external factors such as approaching deadlines. For that purpose, it shall be possible to increase the system's load capacity horizontally without disrupting its' operation (zero downtime).

### **7.4. Business continuity**

The system must continue operating properly in the event of the failure of some (one or more) of its components. Details on the system components can be found in the Architecture TO-BE document<sup>11</sup>.

### **7.5. Maintainability**

The new system must be broken into micro services to allow for easier management and extendibility. Modularity will enable the new system to be upgraded per component (e.g. add or remove any component) with the minimum impact to the rest of the system.

The new system must be developed following a behavior-driven development approach (BDD) where the expected software behaviors (scenarios) will be specified in a logical language that everyone can understand and will be verified during the software delivery process by automated acceptance tests.

The system's components must expose measurable behavior indicators (metrics) which shall be managed (collected, stored, parsed and visualized) centrally and monitored by the technical support personnel.

### **7.6. Security**

The system must be developed following the OWASP secure coding practices and the system's security mechanisms shall be verified regularly through a well-established security testing process. Furthermore, Reportnet 3.0 system will comply with the relevant requirements of the COMMISSION DECISION 2017/46 on the security of communication and information systems in the EC. The security plan shall be documented and accessible to the users.

Reportnet 3.0 system's components must produce all the necessary audit trails of actions performed by its users following uniform logging patterns and all produced logs shall be managed (collected, stored, parsed and visualized) centrally; the logs shall be in line with standards already used at the EEA.

## ANNEX I: POTENTIAL COST SAVINGS IN REPORTNET 3.0

### Background on analysis of costs in “Support to the Fitness Check of monitoring and reporting obligations arising from EU environmental legislation”<sup>11</sup>

To support the European Commission’s Fitness Check of monitoring and reporting obligations arising from EU environmental legislation, a study was conducted with regards to which an analysis was undertaken on the costs and benefits of each reporting obligation identified in the inventory, following the Standard Cost Model<sup>12</sup> set out in the Better Regulation Guidelines<sup>13</sup>. The study developed an inventory of 181 EU reporting obligations across 58 items of legislation. The initial assessment involved a desk review, followed by further evidence gathering, including interviews with EC, EEA and MS officials, focusing on areas of legislation which appear to have the greatest and/or more uncertain costs and benefits (namely, air and noise, industrial emissions, waste and water).

#### Types of costs recognised in Fitness Check

Reporting obligations impose a range of costs on MS authorities, the EC and the EEA, and, in some cases, on businesses. These costs include:

- The costs of **time** taken to **fulfil reporting requirements** – including the collation, processing, quality checking and transmission of data, and the preparation of reports by Member States, the EEA and EC;
- The costs of **developing** and **maintaining** systems for reporting, at both EU and Member State level;
- **Outsourcing** costs, such as the costs of **consultants’** time in processing and synthesising reports at EU level.

In order to quantify all of these costs in monetary terms many thousands of data points should be collected, given the large numbers of reporting obligations (today around 100, estimated to reach 300 by 2020), multitude of actors involved (including the 28 Member States, numerous devolved administrations and varying administrative structures for different legislation, and in some cases businesses), and range of cost parameters.

Overall, the annual costs of monitoring and reporting obligations in EU environmental legislation are estimated at:

- EUR 13 million for Member States authorities;
- EUR 4.9 million for the EC (outsourcing costs only);
- EUR 4.5 million for the EEA.

These amount to an overall cost of approximately EUR 22.4 million per annum.

The estimates include mainly the costs of time (and in some cases consultancy fees) incurred in reporting. They do not include costs of monitoring equipment or time incurred in monitoring of emissions or environmental quality. They indicate that the Agency incurs annual costs in the region of reporting activities and additional costs in the maintenance and development of the system annually.

The evidence suggests that, in overall terms, the costs of monitoring and reporting as required by EU legislation are moderate, and represent a small proportion of the costs of environmental legislation in total.

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<sup>12</sup> 11 International Standard Cost Model Manual - Measuring and reducing administrative burdens for businesses

<sup>13</sup> 12 Better regulation: guidelines & toolbox

## Potential cost savings in Reportnet 3.0

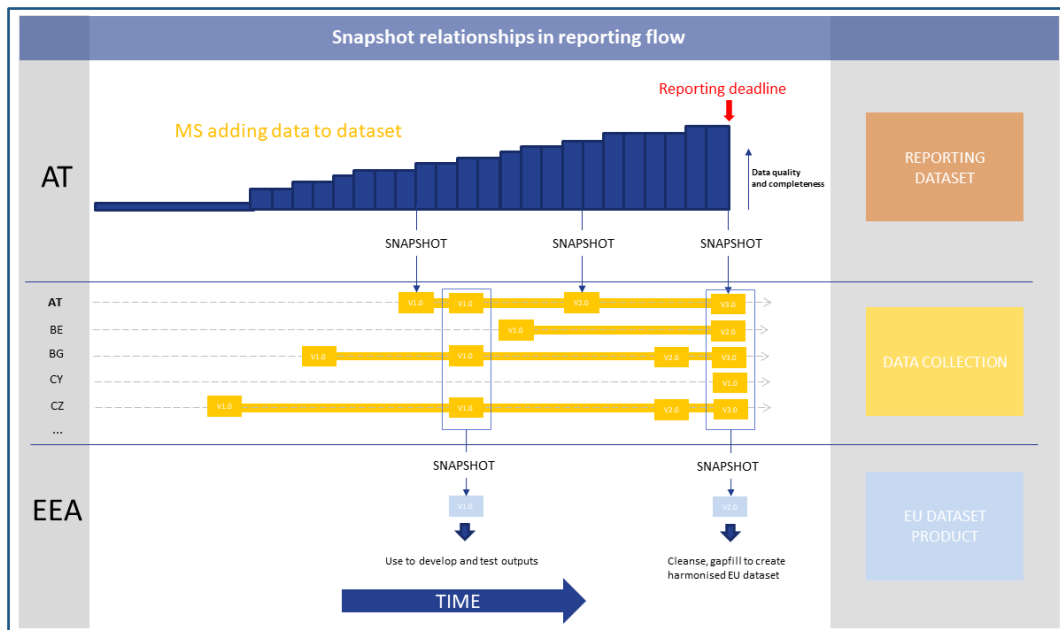
In order to effectively reduce the costs of reporting, potential solutions were considered for the investments in reporting infrastructure. It is important to note that investments in reporting infrastructure aim mostly at the administrative burdens' reduction rather than to the benefits of timeliness in information provision.

- **Low-to-zero code solution:** The system costs (annually maintenance and development) may be expected to decline over time as the system becomes less dependent to development teams and less time will be needed to invest on new dataflows development.
- **Collaborative platform:** The potential for cost reduction may lie in the use of the collaborative platform minimising the development effort, time and resources needed in the new design and implementation phase of a dataflow.
- **Flexibility on data submission methods:** Potential benefits of citizen science and INSPIRE stem from reduced costs of data collection, access to real time data (e.g. drawing on technological development such as mobile-phone based data collection tools), and direct access to the opinions of those -impacted by environmental problems and large sample sizes and datasets.
- **User friendly and intuitive design:** A user friendly system might enable any user to interact easily without the dependant of external consultant support within the reporting process and minimise the need for trainings.
- **Account management:** There is also a potential to minimize account management overhead through self-registration and access rights' request features available in the future system.
- **Reusable quality control validations:** The duplication of Quality Controls in multiple reporting obligations has been pointed out in phase 1 of this project (during the interview sessions) requires extra effort for development and maintenance in the current system. The Reportnet 3.0 will offer the capability of reusing the same set of validations among the dataflows, resulting in reducing the time and resources needed for this step of the design of a new dataflow.
- **Timing of reporting – Reduce reporting frequency:** There are significant differences in the timing of reporting under EU environmental legislation which are explained by the differences in the purpose and content of different reporting obligations, even though the range of reporting cycles is too wide. Reducing the frequency of reporting might lead to costs' and administrative burdens' reduction, but might also put in risk the benefits of timely information provision. Therefore, the potential to enhance efficiency by streamlining the timing of reporting needs to be examined carefully on a case by case basis, taking into account the frequency needed to ensure that reporting is fit for purpose and delivers the benefits envisaged.

The aforementioned subjects identified so far as possible actions to alleviate the challenges and the problems of Reportnet 2.0 are only the first step of the continuous exercise to bring current reporting costs down in Reportnet 3.0 and will require more work to follow up on the actions in the implementation phase of the future system and constant vigilance to address issues as they arise in the future.

## ANNEX II: SNAPSHOTTING IN REPORTING FLOW

From steps 6 to 9, namely from reporting by Member States or the companies to the production of European data set, the process is outlined in the figure below.



**Figure 10 - Snapshotting in reporting flow**

The data provider reports data in the assigned reporting data set available. Whenever the data provider considers that the reporting data should be available to the public, creates a snapshot of it which is released to the dataflow data collection and the data become publicly available. In the same data collection, the data providers of all the reporting entities release their reporting data sets. The data collection is a data set consisting of the latest versions of all the snapshots created by the data providers. Those data cannot be edited by the data providers. To do so, the data requester must request for an update reporting from the data provider. In such a scenario the data provider must update the reporting data set and release a new snapshot to the data collection. In case the data collection is completed, the data requester selects to create a snapshot of the data collection in order to create an EU data set. This snapshot consists of the latest versions of all the snapshots created by the data providers from the reporting data sets.

## ANNEX III: DEFINITIONS

The definitions of the fundamental terms extensively used throughout the Business Vision document are described in this section.

Term	Definition
Data collection	A data collection is a special data set designated to gather all data as they get submitted by the data flow's data providers. A data collection data set shares the same schema, validation rules and visualizations as the design dataset from which it was originated, however its schema is not allowed to change throughout the collection process.
Data flow	The translation of a legal obligation of an entity (country or company) for reporting environmental information at either European or National / International level to the EEA's reporting system. The data flows' concept covers the "who will report" and the "by when" part of a legal obligation.
Data schema	The data schema defines the expected format that the data to be reported should follow. The data schema describes the "what" of the legal obligations.
Data set	The purpose of a dataset is to store reported data as records in a tabular form. Not everybody is allowed to act on datasets but specific user permissions are defined in the dataset's list of contributors and depending on a user's role, one might be allowed to

	perform specific actions on a given dataset (i.e. view, edit, create snapshot, comment on data or change data structures).
Design data set	A sandbox dataset created by the data custodian serving itself as a test data set used prior to the actual data collection with its main purpose to help in designing, testing, validating and finalizing the data schema of the dataflow. Data providers report data to a design data set either in order to contribute to the data schema design or to experiment and familiarize themselves with the system.
Documents data set	A set of supporting guidance documents uploaded by the data requesters / data stewards, in order to facilitate their reporting.
European dataset	A European (EU) Dataset is a branch out of a data collection's snapshot which can be further modified for cleansing purposes.
Reporting data set	The data set consisting of the data officially delivered by the reporters with regards to a submission agreement. One reporting data set will be created for each data provider as soon as a data collection is created for a data flow and the data provider is allowed to share it with other contributors.
Submission agreements	As submission agreements either the Reporting Obligations or the National / International reporting legal documents are considered. They refer to the legal obligation of an entity (country or company) to report on environmental information, defining what needs to be reported, by whom and when.

**Table 10 - Definitions**

## ANNEX IV: ABBREVIATIONS

Abbreviation	Explanation
AQD	Air Quality Directive
BIG	Business Implementation Group
DB	Database
DG	Directorate-General
EC	European Commission
EEA	European Environment Agency
EPA	Environmental Protection Agency
FME	Feature Manipulation Engine
MS	Member States
QCs	Quality Controls
ROD	Reporting Obligations Database
UNECE	United Nations Economic Commission for Europe
WFD	Water Framework Directive

**Table 11 – Abbreviations**

## ANNEX V: REFERENCES

Reference document	Date	Source / Link
1. EEA_Reportnet_Kick off meeting_20180613_v4.3.pptx		<a href="https://projects.eionet.europa.eu/reportnet-3.0/library/02-planning/2018-06-13-project-steering-committee/scope-study-presentation-trasys">https://projects.eionet.europa.eu/reportnet-3.0/library/02-planning/2018-06-13-project-steering-committee/scope-study-presentation-trasys</a>
2. Business_Process_Evaluation_Report.(Reportnet.3.0).(v3.0).docx		<a href="https://projects.eionet.europa.eu/reportnet-3.0/library/03-executing/02-projects/01-scope-study/scoping-study-deliverables/business-process-evaluation-report">https://projects.eionet.europa.eu/reportnet-3.0/library/03-executing/02-projects/01-scope-study/scoping-study-deliverables/business-process-evaluation-report</a>

3.	Reportnet_3_Scope_Study_Consolidated interview report_4.0		
4.	Requirements Catalogue V2		<a href="https://projects.eionet.europa.eu/reportnet-3.0/library/03-executing/02-projects/01-scope-study/scoping-study-deliverables/requirements-catalogue-v.2-map-reference-model-idea-2">https://projects.eionet.europa.eu/reportnet-3.0/library/03-executing/02-projects/01-scope-study/scoping-study-deliverables/requirements-catalogue-v.2-map-reference-model-idea-2</a>
5.	Reportnet 3.0 IT Feasibility studyV2.pptx		<a href="https://projects.eionet.europa.eu/reportnet-3.0/library/02-planning/2018-06-13-project-steering-committee/feasibility-study-reporting-directly-database">https://projects.eionet.europa.eu/reportnet-3.0/library/02-planning/2018-06-13-project-steering-committee/feasibility-study-reporting-directly-database</a>
6.	Project_Charter_Reportnet_3_v2.0.docx	28/02/2018	<a href="https://projects.eionet.europa.eu/reportnet-3.0/library/01-initiating/project-charter">https://projects.eionet.europa.eu/reportnet-3.0/library/01-initiating/project-charter</a>
7.	Reportnet-feasibility-study-data-harvesting.docx	13/07/2018	<a href="https://projects.eionet.europa.eu/reportnet-3.0/library/02-planning/2018-06-13-project-steering-committee/reportnet-feasibility-study-data-harvesting">https://projects.eionet.europa.eu/reportnet-3.0/library/02-planning/2018-06-13-project-steering-committee/reportnet-feasibility-study-data-harvesting</a>
8.	Final Report of Fitness Check without annexes		<a href="http://ec.europa.eu/environment/legal/reporting/fc_overview_en.htm">http://ec.europa.eu/environment/legal/reporting/fc_overview_en.htm</a>
9.	Actions to Streamline Environmental Reporting		<a href="http://ec.europa.eu/environment/legal/reporting/fc_overview_en.htm">http://ec.europa.eu/environment/legal/reporting/fc_overview_en.htm</a>
10.	Reportnet_3_Scope_Study_Architecture_TO_BE.(15-11-2018).(v1.0)		
11.	International Standard Cost Model Manual - Measuring and reducing administrative burdens for businesses		<a href="https://www.oecd.org/gov/regulatory-policy/34227698.pdf">https://www.oecd.org/gov/regulatory-policy/34227698.pdf</a>
12.	Better regulation: guidelines & toolbox		<a href="https://ec.europa.eu/info/law/law-making-process/planning-and-proposing-law/better-regulation-why-and-how/better-regulation-guidelines-and-toolbox_en">https://ec.europa.eu/info/law/law-making-process/planning-and-proposing-law/better-regulation-why-and-how/better-regulation-guidelines-and-toolbox_en</a>
13.	European Commission Digital Strategy: A digitally transformed, user-focused and data-driven Commission	21/11/2018	<a href="https://ec.europa.eu/info/sites/info/files/file_import/digitally-transformed_user-focused_data-driven_commission_en.pdf">https://ec.europa.eu/info/sites/info/files/file_import/digitally-transformed_user-focused_data-driven_commission_en.pdf</a>

**Table 12 – References**