DG DIGIT
Unit.D.2 (ISA Unit)

European Commission - ISA Unit

REUSABILITY QUICK ASSESSMENT TOOLKIT V1.2.0

Guidelines for Solution Owners

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Document History

The following table shows the development of this document.

Version	Date	Description
1.0.0	June 2018	First release of the document coherently with the release of the RQAT v1.0.0
1.1.0	March 2019	Second release of the document coherently with the release of the RQAT v1.1.0
1.2.0	May 2020	Second release of the document coherently with the release of the RQAT v1.2.0

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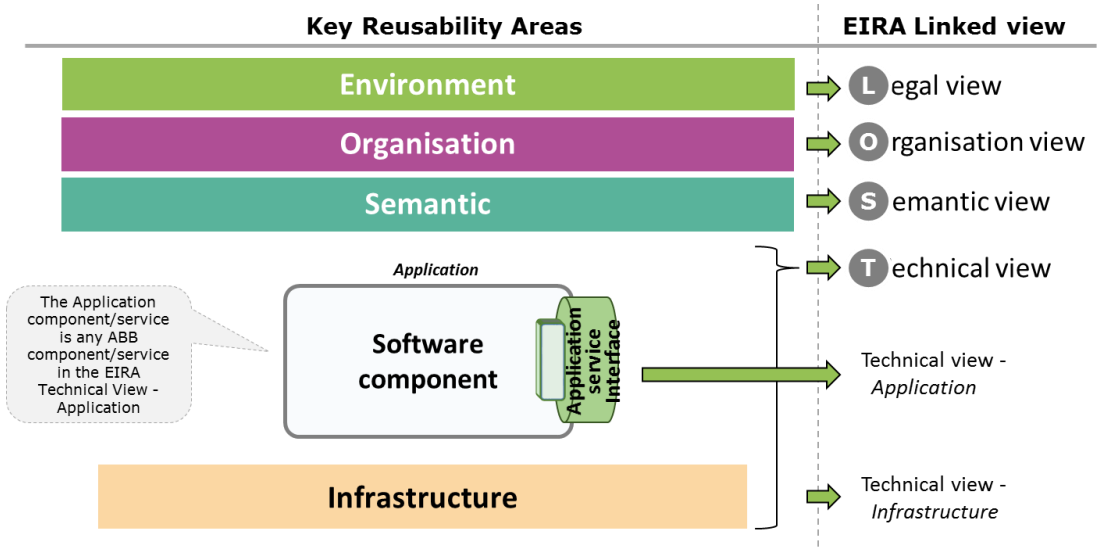
1. INTRODUCTION

This document is intended to be a guide for the use of the Reusability Quick Assessment Toolkit (RQAT) by the Solution Owners of any organisation (both European Commission and Public Administration / Institution at European, National and Local level) who decide to assess the Reusability (RUS) of their software solution.

The Reusability Quick Assessment Toolkit, developed in the context of the Action "*Assessment of Trans-European solutions supporting EU policies*" of the ISA^2 Programme, is based on explicitly differentiating between **Application Components** and **Application Services**. We will use the term Reusability for both Application Components and Application Services although in the literature *Service Reusability* is also referred to as *Service Consumption* or simply *Service Use*.

The Reusability Quick Assessment Toolkit is based on the following **Conceptual Model for the Reusability Quick Assessment of** Application Components and Application Services:



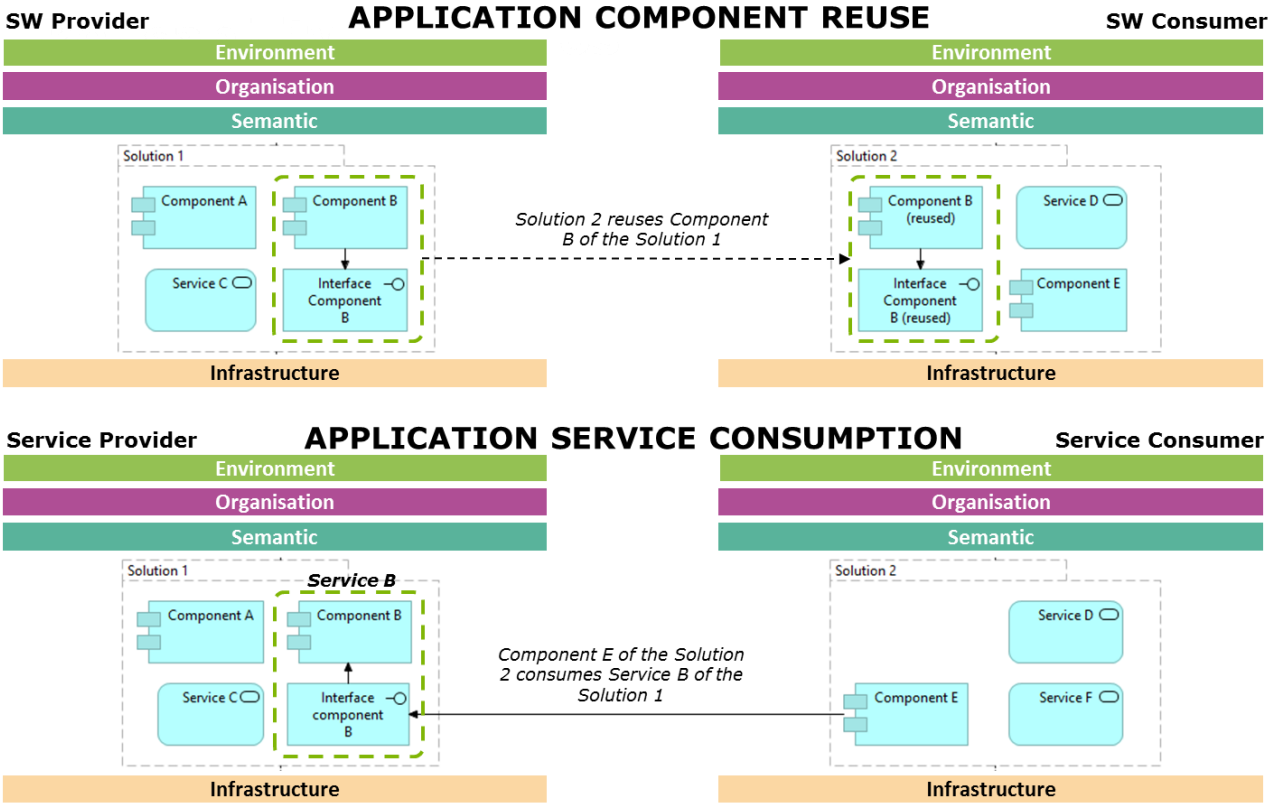
This Reusability Conceptual Model comprises the following **four Reusability Areas** to be assessed through the toolkit:

- **Environment**: this area assesses the influence on reusability of the economic, political, legal environment where the organisation providing Application component/service is operating. It is mapped to EIRA's Legal view.
- **Organisation**: this area assesses the influence on reusability of the organisation that developed and maintains an Application component/service. It is mapped to EIRA's Organisation view.
- **Semantic**: this area assesses the influence on reusability of the semantic aspects of an Application component/service. It is mapped to EIRA's Semantic view.
- **Technical**: this area assesses the influence on reusability of Application component/service *in a vacuum* (Technical-Application) as well as the influence on reusability of the infrastructure

where an Application component/service is hosted when in operation (Technical-Infrastructure).

It is obvious that these areas map clearly in the relevant EIRA Linked views (Legal, Organisational, Semantic, and Technical).

As anticipated, the model is based on explicitly differentiating between Components and Services. The following picture helps to understand the difference between the reuse of a software component (e.g., the reuse of the source code) and the consumption/use of a service.



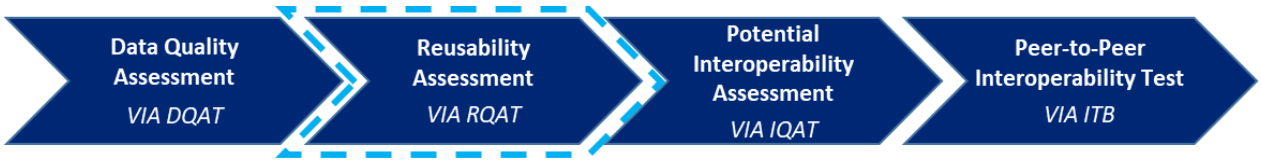
The Reusability Quick Assessment Toolkit comprises the following three components described in detail in the next chapters:

- **RUS QUICK ASSESSMENT METHODOLOGY** that describes the high-level steps to be followed by solution owners for assessing the reusability of a solution and the related expected benefits;
- **RUS QUICK ASSESSMENT TOOL** (Excel File) to be used to calculate the solution's Reusability Score;
- **GUIDELINES FOR SOLUTION OWNERS** that guide solution owners on how to use the Excel tool and how to interpret the RUS Score results.

The latest release of the Reusability Quick Assessment Toolkit is available in Joinup.

2. RUS QUICK ASSESSMENT METHODOLOGY

The RUS Quick Assessment Methodology has the aim to assess the Reusability of an Application component/service. This is expected to be followed by an Interoperability assessment using the Interoperability Quick Assessment Toolkit (IQAT) for Application components/services found to be sufficiently reusable. Actually, RQAT and IQAT were designed to be aligned thus avoiding unnecessary repetition.



The expected benefits of the RUS Quick Assessment Toolkit are the following:

- ✓ It spots areas for improving the RUS in a given solution
- ✓ It supports portfolio management decisions,
  - by suggesting solutions that could be published in the European Interoperability Cartography (EIC)
  - by clustering solutions with regard to RUS Maturity
  - by identifying solutions that should be improved in term of reusability
- ✓ It is applicable to any software solution (not only TES)
- ✓ It forms a first step before assessing the interoperability of an Application component/service.
- ✓ It supports end-users of the EIC in verifying the Overall RUS Score of any published solution.

The RUS Quick Assessment Methodology advocates the execution of the following steps.

1. **Prepare for assessment**: in this step, the solution owner puts together the resources needed for performing the RUS Quick Assessment. This may include guaranteeing the availability of different team members for a short time period.

This step should include:

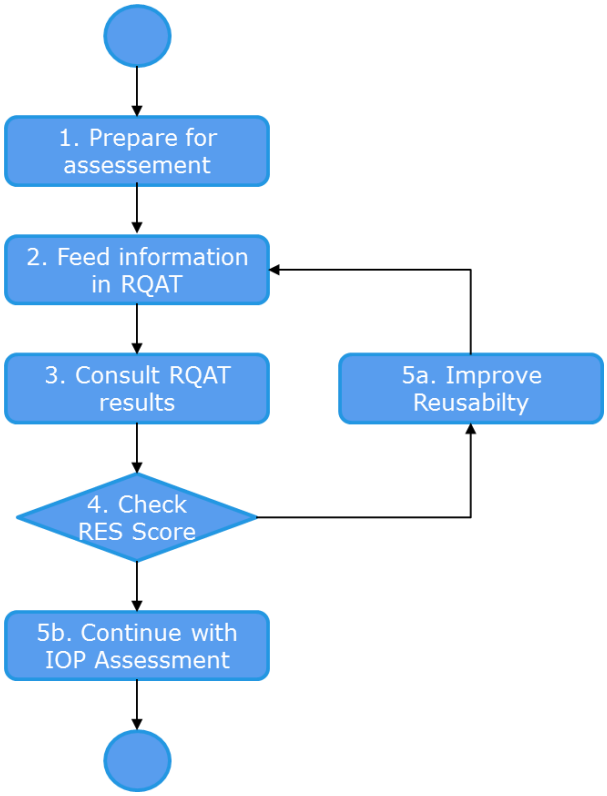
- **qualification for the solution**: gathering of high-level information about the solution (e.g. compliance with regulatory framework, existence of reusability processes etc.);
- **data gathering on the solution**: collection of the information required to perform the RUS Quick Assessment. The solution owner should check the tool in advance to identify the requested information.

Performing the RUS Quick Assessment requires **good understanding of the relevant solution** by the solution owner who performs the assessment but also of the relevant legal and organisational landscape.

It is also required that the solution owner provides consistent, complete and accurate information. Therefore it is strongly recommended that the solution owner **compiles all the information requested**.

2. Feed information in RUS Quick Assessment Tool: in this step, the solution owner provides information about the solution in the RUS Quick Assessment Tool. This consists of providing answers to a number of closed questions/statements about the solution in an interactive Microsoft Excel file. This step is expected to last no more than one hour.

The solution owner can feed the information incrementally in the Excel tool saving the file locally on his workstation anytime.



3. Consult RUS Quick Assessment Tool results: in this step, the solution owner consults the part of the tool that provides the RUS Quick Assessment scores. This enables the solution owners to better understand the potential RUS pitfalls of their solutions.

4. Check RUS score: here, the RUS score and maturity level of the solution is examined by the solution owner.

5a. Improve Reusability: based on the calculated RUS Score and RUS maturity level, the solution owner can activate technical improvements aimed to increase the reusability of the Application component/service. Strictly speaking, this step is not part of the RUS Quick Assessment, but is particularly important if the RUS maturity level is not satisfactory. After improvements, the RUS Quick Assessment of the solution can be resumed from Step 2 using the new information.

5b. Continue with IOP Assessment: solutions having a RUS score above a predefined threshold should proceed with Interoperability assessment, e.g. using the Interoperability Quick Assessment Toolkit (IQAT) available here. In order to perform the IOP Quick Assessment, the solution owner is expected to the IOP Quick Assessment EU Survey page from the following link.

Specific guidelines for the use of the Excel tool and for the interpretation of the resulting RUS score and maturity level are given in chapter "*Guidelines for Solution Owners*".

The next chapter describes in detail the Reusability Quick Assessment Excel tool.

3. RUS QUICK ASSESSMENT TOOL

The RUS Quick Assessment Excel tool supports a short and comprehensive **questionnaire** to collect information on the solution from the solution owner, in order to automatically calculate its **Reusability Score**. The Excel tool includes one section per RUS Area and one or two questions per RUS Criterion with closed answers, and implements the defined Reusability Scoring Model.

Different RUS Criteria exist for Application Components and Application Services due to their distinct nature.

The tool is implemented in ***Microsoft Excel*** without macros in order to be easily used by any solution owner and consists of three **front-end worksheets and two back-end worksheets**:

- **Front-end**: the worksheets "Cover", "Registration", "RQAT - component", "RQAT - service" and "RUS Final Scores" are visible to the solution owner and **only the cells to be filled-in are unlocked**.
- **Back-end**: the worksheets "RUS Parameters Dashboard" and "RUS Calculation Dashboard" are not visible to the solution owner. They are only for ISA internal use and for easy maintenance and sustainability of the tool. In fact, all the RUS parameters (weights, thresholds, etc.) are fully configurable.

The front-end worksheets are outlined below.

"Cover" worksheet

This is the cover worksheet containing only introductory information.

The Solution Owner can start the RUS Quick Assessment of a solution by clicking on the button "Start".

"Registration" worksheet

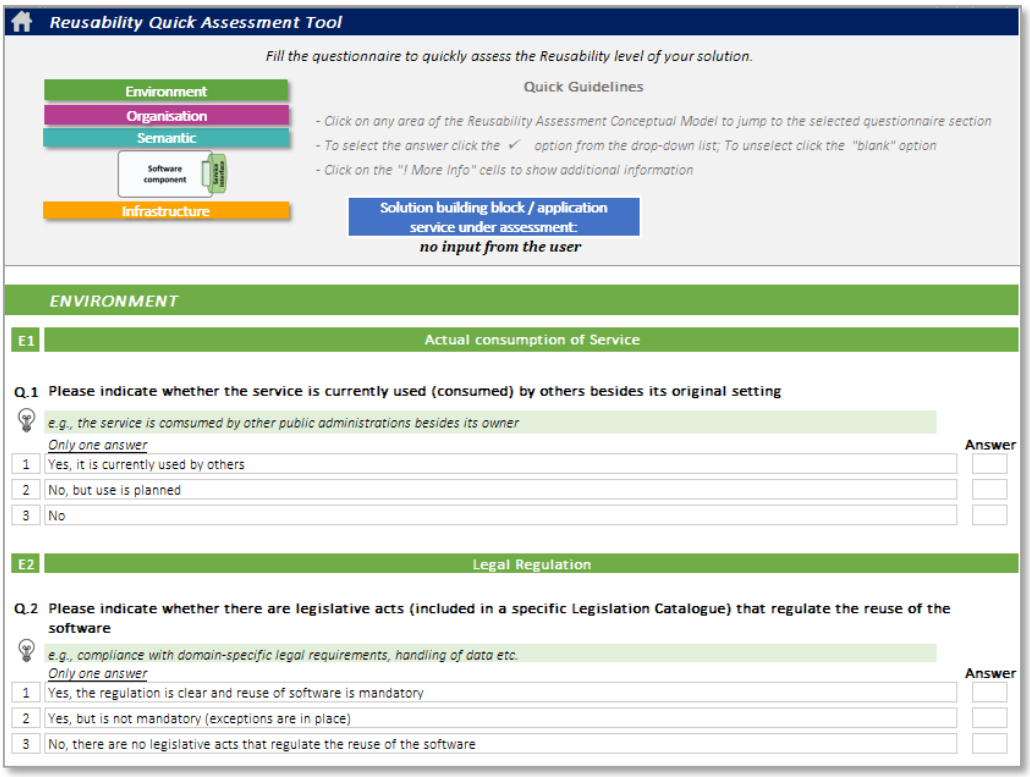
This is the worksheet where solution owners can register their solution to be assessed with RQAT:

Selecting one of the four reuse scenarios, the RQAT will guide the solution owners to the "RQAT – service" or to the "RQAT – component" worksheet.

"RQAT – component" and "RQAT – service" worksheets

These are the two worksheets that contains the questionnaire to be fulfilled by the solution owner for the case of application component and application service. Both worksheets present a similar

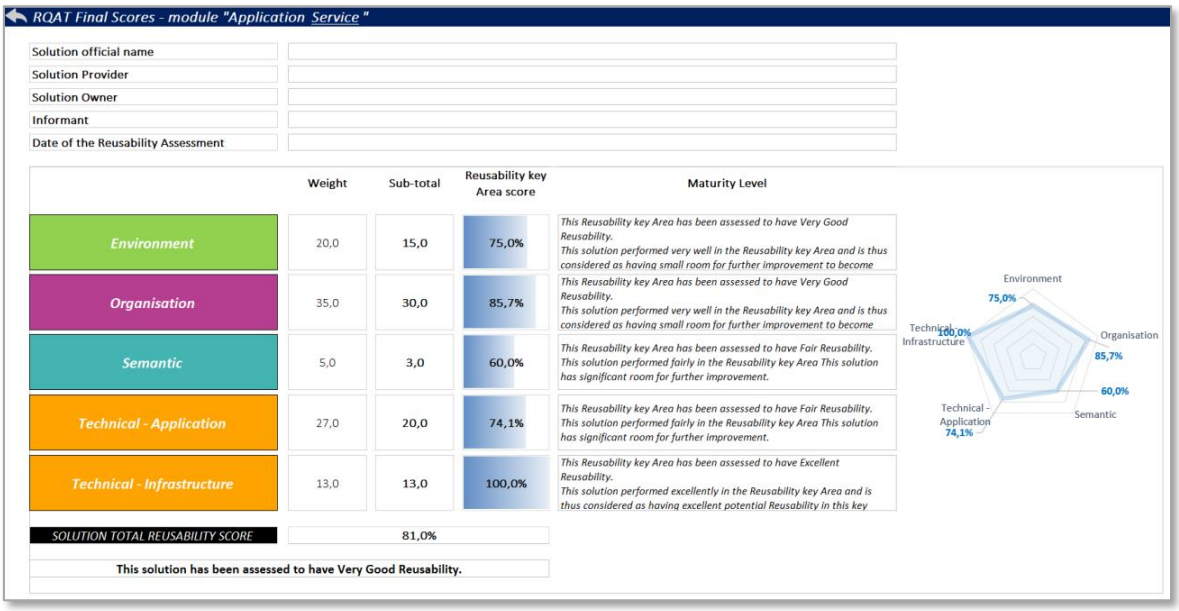
structure with different statements / questions and related possible **closed answers** for each RUS criterion.



"RUS Final Scores" worksheet

While the assessment responses are completed by the solution owner, the "RUS Final Scores" worksheet **calculates automatically the RUS Assessment score**.

This worksheet summarises the RUS score for each RUS Area and the overall Reusability score of the Application Component/Service (including a graphical radar chart), including the resulting RUS maturity level.



4. GUIDELINES FOR SOLUTION OWNERS

This chapter provides useful guidelines on how to use the RUS Quick Assessment Excel tool and how to interpret the RUS Score results.

4.1 RUS QUICK ASSESSMENT TOOL USER GUIDELINES

Step 1 – Download the RUS Quick Assessment Excel Tool

In order to perform the RUS Quick Assessment, the solution owner is expected to download the RUS Quick Assessment Excel Tool from the following link. Then, the solution owner can open the Excel file.

Step 2 – Start the RUS Quick Assessment

When opening the Excel file, the solution owner will see the Cover worksheet, which contains some general information.

This worksheet offers the solution owner the possibility to gather any additional information on the Tool by clicking on the "**Send an email**" button. Additional information on the tool can also be obtained by sending an email directly to the TES Project Officer Raul Abrìl at Raul-Mario.ABRIL-JIMENEZ@ec.europa.eu.

The Solution Owner can start the RUS Quick Assessment of a solution by clicking on the button "Start". This will open the next worksheet.

Step 3 – Register the solution in the "Registration" worksheet

This is the worksheet where solution owners have to:

1. **insert some register information** related to the solution to be assessed with the RQAT (official name of the solution, the Solution Provider, his/her name, the Informant - i.e. who

provided the information for the RUS Assessment, and the date of the Reusability Assessment);

2. **choose the reuse scenario** that better fit the assessment purpose (guidelines and examples are described directly in the RQAT and in the screenshot below).

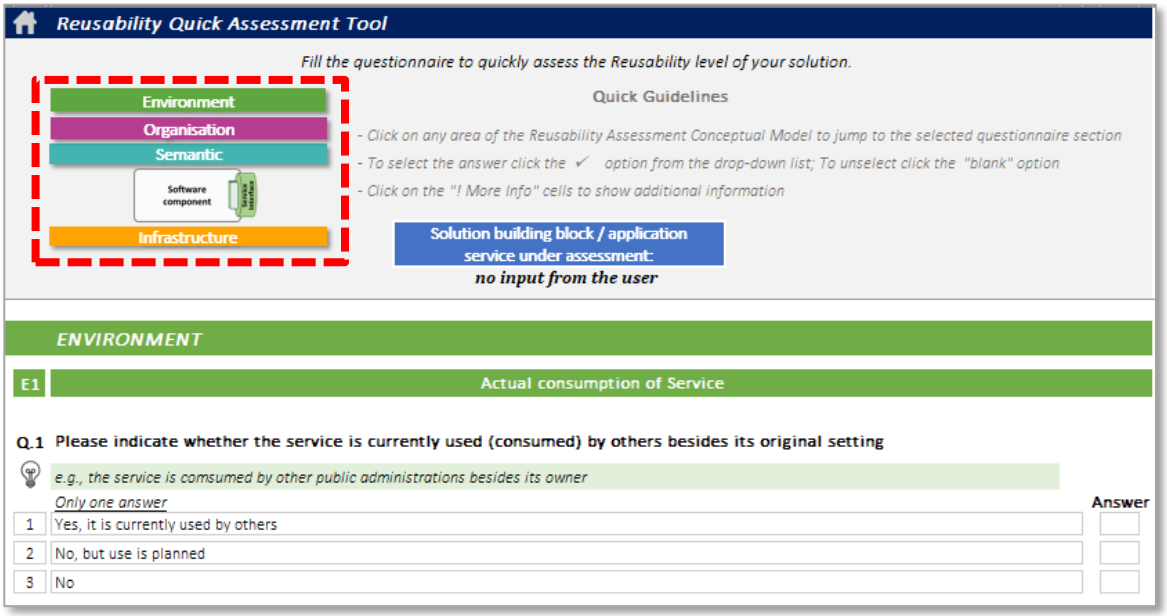
The solution owner can select the following scenarios:

1. If the Solution Owner selects reuse scenarios 1, the RQAT will guide the user to the "RQAT – component" worksheet to assess the source code of the whole IT system;
2. If the Solution Owner selects reuse scenarios 2, the RQAT will guide the user to the "RQAT – component" worksheet to assess a specific application component / solution building block;
3. If the Solution Owner selects reuse scenarios 3, the RQAT will guide the user to the "RQAT – service" worksheet to assess a specific application service.

<u>Step 4</u> – Fill-in the questionnaire in the "RQAT – component/service" worksheet

This worksheet contains the questionnaire to be answered by the solution owner, with questions and possible **closed answers** for each RUS criterion.

Fixed at the top of the worksheet there is a "**navigation tab**" that allows the solution owner to easily navigate through the four RUS areas to be assessed (Environment, Organisation, Semantic, and Technical).



The navigation is possible by clicking on each RUS Area box on the tab.

Each question of the assessment can be easily answered through **clicking the "✓" symbol from the drop-down list** associated to each response option. It can be unchecked by clicking again on the cell and choosing the "*blank*" option or pressing the "*del/canc*" button on the keyboard.

Excel embedded and seamless "data validation rules" help the solution owner avoiding incorrect answering. In this example, when an option is ticked, the others are disabled.

The questions can be answered in any order. As some Criteria can be not applicable the score will not consider the following criteria (more on scoring are provided in the next section):

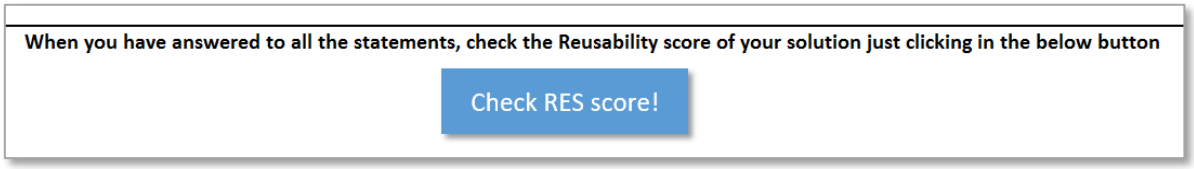
- Case "Application Component" - in Criteria S1, S2 and TI2 of the Application components assessment, an answer "*Not applicable*" is possible.
- Case "Application Service" - in Criteria S2 and TI3 of the Application services assessment, an answer "*Not applicable*" is possible.

The RUS Quick Assessment distinguishes between the following two types of questions:

- **Single answer questions**: the question must be answered by selecting only one response option.
- **Multiple answer questions**: this type of question allows multiple selections of response options. All the applicable answers must be selected.

If the solution owner does not answer a question, the RUS Assessment Tool automatically assigns the score *0%* to the relevant criterion.

After answering all questions, the solution owner should click the button "Check RUS Score!" at the end of the worksheet, in order to visualise the RUS Score and maturity level of the solution.



<u>Step 5</u> – Consult results in "RUS Final Scores" worksheet

While the assessment responses are completed by the solution owner, the "RUS Final Scores" worksheet **automatically calculates the Application Component/Service RUS Assessment Score**. It summarises the RUS Score for each RUS Area, the overall Reusability Score (accompanying data with a graphical radar chart to visualise results), and the interpretation of each score.

4.2 RUS SCORING INTERPRETATION GUIDELINES

It is important to remember that the RUS scoring model follows a **simple linear weighted model.** As a result, the score of each RUS Criterion is always between 0% and 100%, the score of each RUS Area is always between 0% and 100%, and the Total RUS Score is always between 0% and 100%.

The **maturity level of the solution** is provided based on a **four stage model** to indicate the **Reusability maturity of a specific solution**. The stages are:

- **Excellent Reusability (90% to 100%)**: this stage includes solutions that, on average, performed excellently in the relevant criteria and are thus considered as having excellent reusability;
- **Very Good Reusability (75% to 89.9%)**: this stage includes solutions that, on average, performed very well in the relevant criteria. These solutions have small room for further improvement to become excellent;
- **Fair Reusability (50% to 74.9%)**: this stage includes solutions that, on average, performed fairly in the relevant criteria. These solutions have significant room for further improvement;
- **Poor Reusability (0% to 49.9%)**: this stage includes solutions that, on average, performed poor in the relevant criteria. The potential reusability of these solutions is considered as having substantial room for improvement.

Based on these four stages, it is suggested that every solution **assessed as having "Very Good Reusability"** (or above) should be considered as **candidate for performing Interoperability Assessment.**

5. GLOSSARY

The following Table provides a glossary of the most common terms and acronyms used throughout this document.

TERM (ACRONYM)	DEFINITION
European Interoperability cartography (EIC)	The European Interoperability cartography (EIC) is based on EIRA; it documents European interoperability services and tools and intends to facilitate reuse.
European Interoperability Reference Architecture (EIRA)	The European Interoperability Reference Architecture (EIRA) is a reference architecture for designing and describing digital public services across borders and sectors. The EIRA is aligned with the European Interoperability Framework (EIF) and complies with the context given in the European Interoperability Strategy (EIS). A common EIRA facilitates interoperability between public administrations and the reuse of solutions when developing European Public Services at the various levels of the administration.
European Library of Interoperability Specifications (ELIS)	The EIRA Library of Interoperability Specifications is a library containing the standards and specifications defining the interoperability requirements of the architectural building blocks (ABBs) contained in the European Interoperability Reference Architecture (EIRA). The aim of this library is supporting solutions architects when modelling using EIRA.
Interoperability	"Interoperability" means the ability of disparate and diverse organisations to interact towards mutually beneficial and agreed common goals, involving the sharing of information and knowledge between the organisations, through the business processes they support, by means of the exchange of data between their respective ICT systems.
Interoperability (IOP) Quick Assessment	The Interoperability (IOP) Quick Assessment determines solution potential IOP by applying the proposed quick assessment methodology.
PURI	A URI is a compact sequence of characters that identifies an abstract or physical resource. A URI can be classified as a locator, a name, or both. Using persistent, well-formed URIs can help Member States overcome conflicts of semantic interoperability, enabling them to provide cross-border public services and supporting the Single Market.
Reusability	The degree to which IT solutions, information and data are used in contexts other than its original, intended or main purpose.
Reusability Assessment	The Reusability Assessment determines if a solution is considered as reusable. The current version of the methodology for solution Reusability Assessment includes seven reusability criteria. The main objective of these reusability criteria is to identify a number of solutions which could be reused in the framework of other projects and EU initiatives.
Reusability (RUS) Quick Assessment	The Reusability (RUS) Quick Assessment determines Application component/service RUS by applying the proposed quick assessment methodology.
Trans European Solution (TES)	An operational Interoperable European Solution developed by the European Commission or other bodies (in some cases co-funded by Member States) in support to the implementation and advancement of EU policies.