



INTEROPERABILITY SOLUTIONS FOR
EUROPEAN PUBLIC ADMINISTRATIONS
MONITORING AND EVALUATION

D03.05 PERCEIVED QUALITY MONITORING REPORT

ISA ACTION 2.1 EUROPEAN INTEROPERABILITY ARCHITECTURE
(EIA)

Framework Contract n° DI/07173-00

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EXECUTIVE SUMMARY

The purpose of this section is to provide an overview of the key findings of the Perceived Quality monitoring of **the ISA Action 2.1 – Support for the European Interoperability Architecture (EIA)**. The objective of the survey is to measure the Perceived Quality which is defined as the extent to which the outputs of an ISA action are meeting its direct beneficiaries' expectations¹.

The survey of the Action 2.1 included the evaluation of the European Interoperability Reference Architecture (EIRA) documentation. The survey was designed in the EUSurvey tool and distributed by e-mail to 31 contacts. Over the duration of one month², 11 stakeholders have responded.

Table 1 gives an overview of the main results of the survey. The detailed score calculation process is described in section 5.4.4.

TABLE 1 – ACTION 2.1 SURVEY MAIN RESULTS

	Score	Explanation of the score scale
Usefulness Score	5.20	Average value on a scale from 1 (Not useful at All) to 7 (Very Useful).
Value Score	3.49	Average value of all the statement means in the range from 1 (Disagree) to 5 (Agree).
User Satisfaction Score	56.61	User Satisfaction Score from 0 (none of the respondents are satisfied) to 100 (all respondents are satisfied with the work performed by the Action).
Net Promoter Score	-9	Net Promoter Score from -100 (every customer is a Detractor) to 100 (every customer is a Promoter).
OVERALL PERCEIVED QUALITY SCORE	3.34	The Overall Perceived Quality Score is the average value of the Usefulness Score, the Value Score, the User Satisfaction Score, and the Net Promoter Score reduced to a five point scale in range from 1 – the lowest score to 5 – the highest score.

It is important to take into account that only 11 out of 31 respondents participated in the survey, from whom only one respondent uses EIS regularly, meaning that the results of this action perform more like indicators of the Perceived Quality without fully representing the opinion of all the users.

Main findings:

- The survey results demonstrate that, in general, users of EIA consider that the Perceived Quality is rather positive, meaning that there are some aspects requiring improvement;
- **The weakest points of EIA are that the documentation is not complete and needs regular updates and that it is not easy to understand;**
- **The strongest aspect of EIA is its Accuracy;**

¹ DG BUDG (2004), "Evaluating EU activities, a practical guide for the Commission services"

² The survey was launched on the 10th of February 2016 and was active until the 11th of March 2016.

- According to the respondents' recommendations, EIA should be expressed in an interoperable format instead of a proprietary format. It should also preferably be a core model, being less restrictive than it is today.

REVISION HISTORY

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11/05/2016	0.10	Initial version	CGI - Accenture	
15/06/2016	1.00	Final version	CGI - Accenture	
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1 INTRODUCTION

CGI-Accenture has been requested to deliver Perceived Quality and Perceived Utility Monitoring and Evaluation Reports as part of the execution of the ISA programme monitoring (Technical Annex for Specific Contract SC 193 under Framework contract n° DI/07173-00).

Based on the scope of the Specific Contract, the Perceived Quality is to be measured for 15 actions and the Perceived Utility is to be measured for 17 actions. This report covers the Perceived Quality measurement for the Action 2.1 – European Interoperability Architecture (EIA).

This document is divided into the following sections:

- **Section 1:** provides an overview of the structure of the report;
- **Section 2:** provides an overview of the action and its objectives;
- **Section 3:** explains the methodology used to measure the Perceived Quality;
- **Section 4:** summarises the collected data;
- **Section 5:** focuses on the survey results and the data analysis:
 - The demographic profile of respondents;
 - Usage frequency of the action's outputs;
 - Usefulness Score;
 - Perceived Quality measurements;
 - Actions strengths, weaknesses, opportunities and threats;
 - Respondent recommendations and opinions;
- **Section 6:** provides the survey conclusion and recommendations;
- **Section 7:** appendix includes:
 - Raw data export;
 - Glossary.

2 ACTION 2.1 – EUROPEAN INTEROPERABILITY ARCHITECTURE (EIA)

The European Commission is determined to intensify coordination between Public Administrations in the EU institutions and/or Member States on ICT solutions to avoid the risk of creating new digital barriers for Public Administrations, businesses, and citizens. To serve the above purpose a European Interoperability Strategy (EIS) and a European Interoperability Framework (EIF) are in place.

Action 2.1 is about the European Interoperability Reference Architecture (EIRA) an instrument that plays a crucial role in the realisation of the EIS/EIF.

Today, one of the most important topics in the implementation of digital European public services is to have them described in a common way in order to make possible to properly analyse, interlink and potentially reuse them. At the EU level, there is an obvious need for digital solutions to be organised in accordance with a reference model and in such a way that makes them easily searchable and potentially shared and reused.

The EIRA is a reference model defining the most important architectural building blocks needed to develop interoperable digital public services. It provides a common terminology that can be used by architects, portfolio managers and business analysts when performing the following tasks:

- Design solutions: the EIRA provides architects with a common terminology and structure to design interoperable e-Government solutions that support the delivery of digital public services across borders and sectors;
- Assess solutions: the EIRA provides e-Government portfolio managers with a common terminology and structure for comparing existing architectures in different policy domains and thematic areas, and to identify focal points for convergence and reuse;
- Share solutions: the EIRA provides solution providers with a common terminology and structure to document the most salient interoperability elements of their solutions so that they can be more easily shared; and
- Discover solutions: the EIRA provides the terminology and structure to the European Interoperability Cartography (EIC) needed to facilitate the discovery and reuse of interoperability solutions.

The EIRA is developed and maintained using an open and inclusive change management process. It applies the principles of Service-Oriented Architecture (SOA) as an architectural style. It is defined as an extension of the ArchiMate language, with a focus on interoperability for digital public services.

Action's objectives:

- On a higher level, it should give an overview of what solutions exist and what type of solutions still need to be developed. This will then be reflected in the priorities for the ISA programme and the European Commission.
- On a lower level, it aims to help developers working on the creation of public services, by helping them find reusable solutions that they can incorporate into the systems they are developing. They can map their solution architectures towards the conceptual reference architecture and through the cartography discover solutions that they can reuse in their systems.

Action's benefits:

- ICT systems supporting European Public services.

3 SURVEY METHODOLOGY

A common methodology was developed by the CGI-Accenture team for all the surveys included in the Perceived Quality and Perceived Utility Monitoring and Evaluation Reports. The common methodology enables a comparison between the different action results. The first section explains how the Perceived Quality is measured and what dimensions are covered. The next section gives an overview of the main survey measurements. The last section describes the architecture of the survey.

3.1 PERCEIVED QUALITY

Perceived Quality is defined as the extent to which the outputs of an ISA action are meeting its direct beneficiaries' expectations¹.

Four dimensions are used to measure the Perceived Quality criterion. These dimensions are derived from the main objectives of the ISA programme and are as follows:

- **Accuracy (A):** the freedom from mistake or error; a synonym is “correctness”³;
- **Completeness (C):** the possession of all necessary parts, elements or steps³;
- **Usability (U):** the capability, convenience of using the document(s)³;
- **Expandability (Ex):** the ability to apply in broader/other context (for example to cross-sector, or from local to regional, national level)³.

The survey statements for the dimensions listed above are developed according to the information presented in the framework specification document³.

3.2 SURVEY MEASUREMENTS

In the data analysis, the core types of measurements which are performed include the Usefulness Score, the Value Score, the User Satisfaction Score, the Net Promoter Score and the Overall Score for Perceived Quality. The survey measurements are divided into two groups: action level measurement and Perceived Quality level measurements.

Action level measurement:

- The Usefulness Score indicates the respondents' evaluation of how useful the action is. The Usefulness Score is calculated taking into account the mean value from a single question: *“Overall, how useful is the European Interoperability Reference Architecture (EIRA) documentation (common terminology and structure) to your work?”*

³ Arthur J. D, Stevens K. T (1990), “Document Quality Indicators: A Framework for Assessing Documentation Adequacy”

- Action strengths, weaknesses, opportunities and threats: Statements are located in quadrants, based on the dimensions' conformity and dimensions' importance calculated mean values. The quadrants highlight the weak and strong aspects of the action, as well as threats and opportunities.

Perceived Quality level measurements:

- The Value Score shows the action's compliance to the dimensions. Two aspects are considered for each dimension. On one side, the importance of the dimension for the users is assessed. On the other side we measure if the action is compliant with the dimension. This section includes the analysis of specific statements, statement mapping to dimensions, dimensions conformity results, criterion score aggregation and strengths and weaknesses of the action.
- The User Satisfaction Score shows how satisfied the respondents are with the action. The User Satisfaction Score is assessed with the reference to the results of the dimensions' importance and conformity evaluation. The User Satisfaction Score is measured at the individual level for each of the survey respondents via the identification of the important dimensions for that particular respondent.
- The Net Promoter Score® (NPS) is a widely used management tool that helps evaluate the loyalty of a customer relationship. In order to evaluate the NPS, the question *"how likely the respondent would recommend the particular action's output to others"* is asked.
- The Overall Score is used to get a single score that would describe the overall Perceived Quality of the action. In order to determine the Overall Score, the average value of the Usefulness Score, the Value Score, the User Satisfaction Score and the Net Promoter Score is calculated. To calculate the Overall Score, all measurements are reduced to a five point scale.

3.3 SURVEY ARCHITECTURE

The survey is divided into several sections which are outlined below:

- The demographic profile: for the purpose of identifying the respondents' demographic profile, respondents are asked to answer several questions. The demographic profile illustrates the diversity of the respondents who have participated in the survey.
- Usage of the action outputs: for the purpose of identifying the usage rate of the action outputs, the respondents are asked to answer several questions regarding the usage of every action output. These questions also work as filters, selecting respondents who should evaluate the statements regarding the specific action output.

- The action's Usefulness: for the measurement of the action's usefulness, the respondents are asked to evaluate a single question using a 7-point Likert grading scale⁴.
- The Perceived Quality Measurement: in order to measure the Perceived Quality, the respondents are asked to grade dimensions and statements based on their level of importance and agreement. A 5-point Likert scale⁴ is used as a grading scale. Responses to these questions are used to determine the Value Score, action strengths and weaknesses, and User Satisfaction Score.
- The Net Promoter Score: there is a single question that measures the Net Promoter Score. By answering this question, the respondents indicate their likelihood of recommending the action's outputs to colleagues or other Public Administrations.
- The recommendations: the last section includes three open questions for recommendations and opinions regarding the action and the survey.

⁴ A Likert Scale is a widely used scaling method developed by Rensis Likert. Likert scale refers to the use of an ordinal 4- or 5-point rating scale with each point anchored or labeled.

4 SURVEY DATA SUMMARY

This section aims to provide detailed information about the data gathering fieldwork. Table 2 gives an overview of the survey start and end dates, the number of respondents the survey was proposed to, the amount of responses collected, as well as the survey launching method.

TABLE 2 – ACTION 2.1 SURVEY TECHNICAL INFORMATION ABOUT THE FIELDWORK

Start date:	10/02/2016
End date:	11/03/2016
The survey launch method:	E-mail notification
Reminders:	E-mail reminders sent out on 18/02/2016, 29/02/2016, and 07/03/2016
Target population:	31
Total number of respondents:	11
Number of suitable respondents for the survey:	11

5 SURVEY RESULTS AND ANALYSIS

This section aims to provide the detailed survey analysis and to present the results.

5.1 DEMOGRAPHIC PROFILE OF RESPONDENTS

The respondents' demographic profiles tend to describe the action respondents from the demographic point of view. It illustrates the diversity of the respondents. Table 3 gives an overview of the demographic profile of the respondents. **It is important to take into account that only 11 respondents participated in this survey, thus the percentage value of one respondent is 9.1%.**

TABLE 3 – ACTION 2.1 DEMOGRAPHIC PROFILE OF RESPONDENTS

RESPONDENT PROFILE			
		Amount	Col %
ALL RESPONDENTS		11	100.0
RESPONDENT GROUP	Architect	7	63.6
	IT head of unit	1	9.1
	Other (Mentioned 1 time: business analyst, business program leader, business and IT project manager; Chair of CEN/TC 440; Researcher)	3	27.3
ORGANISATION	EU institution	4	36.4
	Other organisation from the private sector	2	18.2
	Public administration at national level of an EU Member State	2	18.2
	International organisation for standardisation	1	9.1
	Academic	1	9.1
	Other (Mentioned 1 time: EU citizen)	1	9.1
LOCATION	Belgium	4	36.4
	Denmark	1	9.1
	Finland	1	9.1
	France	1	9.1
	Italy	1	9.1
	Slovakia	1	9.1
	Other (Mentioned 2 times: Norway)	2	18.2
POSITION LEVEL	Management level	5	45.5
	Technical level	4	36.4
	Other (Mentioned 1 time: citizen; no answer)	2	18.2

Base: all respondents, n=11

5.2 USAGE OF THE ACTION

The usage profile provides an overview of the usage rate of the action. Table 4 illustrates the diversity of the action's output usage and the frequency of using EIS. **It is important to take into account that only 11 respondents participated in this survey, thus the percentage value of one respondent is 9.1%.**

TABLE 4 – ACTION 2.1 USAGE OF EIA

USAGE PROFILE			
		Amount	Col %
ALL RESPONDENTS		11	100.0
PURPOSE OF USE*	Design solutions: to design interoperable e-Government solutions that support the delivery of digital public services across borders and sectors	5	45.5
	Assess solutions: to compare existing architectures in different policy domains and thematic areas, and to identify focal points for convergence and reuse	4	36.4
	Share solutions: to document the most salient interoperability elements of their solutions in order to share them easily	4	36.4
	Discover solutions: to facilitate the discovery and reuse of interoperability solutions via European Interoperability Cartography (EIC)	4	36.4
	Other (Mentioned 1 time: Don't use EIRA.; Currently none, however via plan to evaluate and use EIRA for at least design, assessment and sharing; just professionally interested in)	3	27.3
USAGE	Use it regularly	1	9.1
	Have used it occasionally	3	27.3
	Have tried it once	2	18.2
	Just heard, but don't use/work with it	4	36.4
	Other (Mentioned 1 time: CEN/TC 440 has decided to align its deliverables to the terminology and structures in EIRA to the extent possible.)	1	9.1

Base: all respondents, n=11

**There were multiple choices possible for these questions. This explains why the percentage of responses can exceed 100%.*

5.3 USEFULNESS SCORE

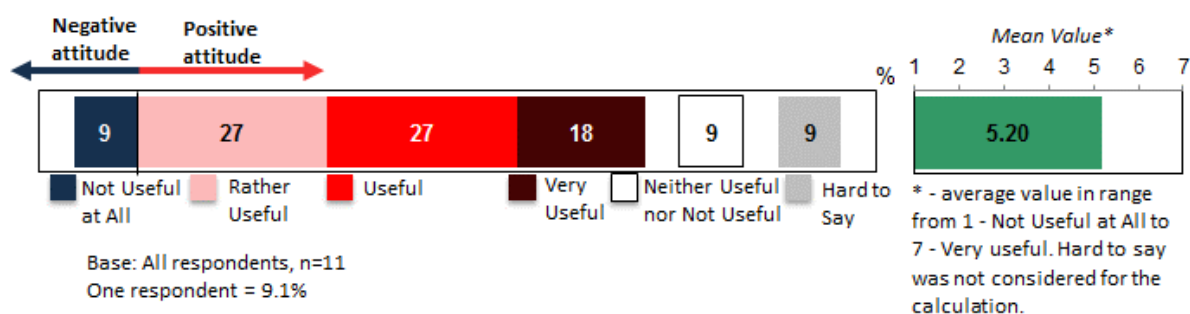
The Usefulness Score is calculated taking into account a single question: “Overall, how useful is the European Interoperability Reference Architecture (EIRA) documentation (common terminology and structure) to your work?”

The survey respondent is asked to provide his/her opinion using the 7-point Likert grading scale. For evaluation of the Usefulness, a grading scale is used with values ranging from “Very Useful” to “Not Useful at All”. An additional “Hard to Say” option is provided, however this choice is excluded from the score calculations. Before performing the survey data calculations, the 7-point Likert scale values are interpreted as numeric values:

- 7 – Very Useful;
- 6 – Useful;
- 5 – Rather Useful;
- 4 – Neither Useful nor Not Useful;
- 3 – Rather Not Useful;
- 2 – Not Useful;
- 1 – Not Useful at All;
- 0 – Hard to Say (is not considered for the calculation).

In order to have an overview of the positive (Rather Useful, Useful and Very Useful) and negative (Rather Not Useful, Not Useful and Not Useful at All) attitude proportions, the bar in blue represent the negative attitude, whereas the bars in pink and red represent the positive one. In addition, a neutral opinion (the bar in white) and no opinion (the bar in grey) are presented separately on the right. An explanatory legend with colour codes represents the data which is available. The average mean value is presented on the right side of the figure.

FIGURE 1 – ACTION 2.1 USEFULNESS SCORE



The survey results show that EIA seems useful to almost all of the respondents; only one respondent out of eleven provided a very negative response. The mean value is **5.20**, and it is between 5 - 'Rather Useful' and 6 -

'Useful' values, however, due to the fact that only 11 respondents participated in this survey out of which one respondent uses EIA regularly, the data should be reviewed with caution.

5.4 PERCEIVED QUALITY MEASUREMENTS

This section aims to provide a detailed Perceived Quality measurement analysis and to present the results.

5.4.1 Perceived Quality Value Score

This section includes the analysis and results of Perceived Quality Value Score. They are structured into two main sections: the dimensions' importance and conformity via statements.

5.4.1.1 PERCEIVED QUALITY DIMENSIONS IMPORTANCE

Prior to the evaluation of the dimensions' conformity to the outputs of the action, it is essential to initially ascertain whether these dimensions are important to the respondents while working with the action. If a specific dimension is important to respondents, then it is essential that its conformity assessment is positive. However, if a dimension is not important to respondents, it should not be considered as the action's weakness because of non-compliance with the outputs of the action.

Four Perceived Quality dimensions are evaluated in the survey: Accuracy, Usability, Completeness and Expandability. This section describes the respondents' answers regarding the importance of the dimensions.

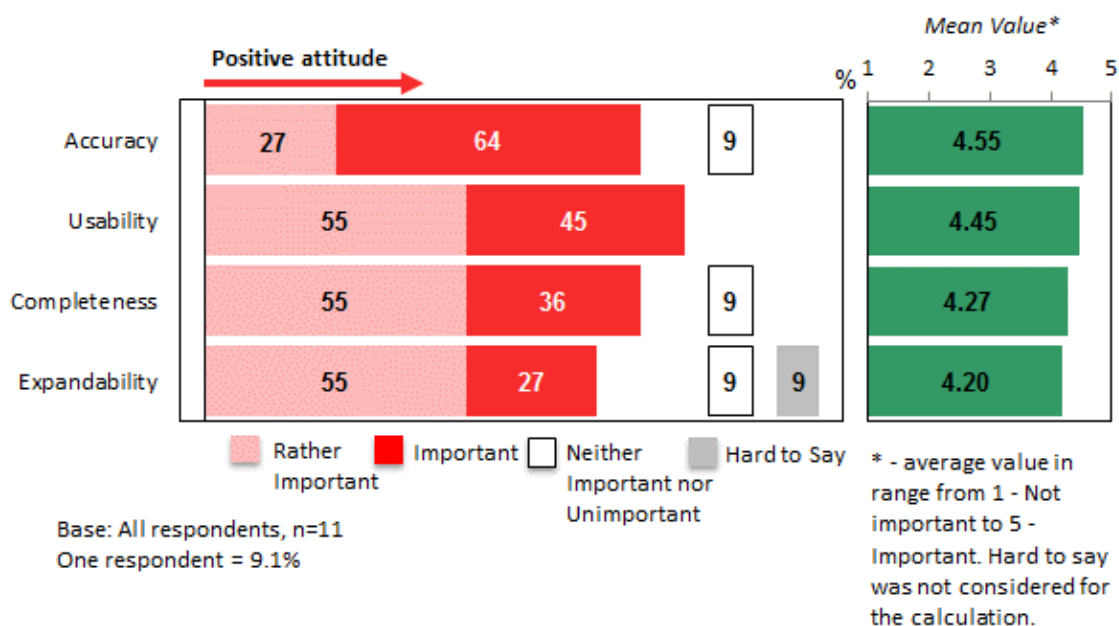
Each respondent is requested to provide his/her opinion using the 5-point Likert grading scale. For the dimension importance evaluation, a grading scale with values ranging from 'Important' to 'Not important' is used. An additional 'Hard to Say/Not Applicable' option is provided, however this score is excluded from the score calculations. Before performing the survey data calculations, the 5-point Likert scale values are interpreted as numeric values:

- 5 – Important;
- 4 – Rather Important;
- 3 – Neither Important nor Unimportant;
- 2 – Rather not Important;
- 1 – Not Important;
- 0 – Hard to Say/Not Applicable (*is not considered for the calculation*).

The bars in pink/red represent the positive one (answers 'Rather important' and 'Important'). In addition, a neutral opinion (the bars in white) and no opinion (the bar in grey) are presented separately on the right. An explanatory legend with colour codes represents the available data. The average mean value for each of the dimensions is presented on the right side of the figure.

FIGURE 2 – ACTION 2.1 PERCEIVED QUALITY DIMENSIONS IMPORTANCE RESULTS

"How important to you are these factors when using the European Interoperability Reference Architecture (EIRA) documentation, taking into consideration the project as a whole with all its outputs (common terminology and structure)?"



The survey results indicate that the most important Perceived Quality dimensions for Action 2.1 - EIA are Accuracy and Usability. Seven out of eleven respondents evaluated the Accuracy dimension as 'Important' while for one respondent it was 'Neither Important nor Unimportant'. The mean value is 4.55. All of the respondents evaluated the Usability dimension as 'Important' or 'Rather Important'. The mean value is 4.45. The Completeness and the Expandability dimensions follow next with the mean value of 4.27 and 4.20. All of the dimensions were evaluated with a mean value that is higher than 4 which is between the following values: 4 – 'Rather Important' and 5 – 'Important'.

5.4.1.2 PERCEIVED QUALITY DIMENSIONS CONFORMITY

In order to measure the Perceived Quality dimensions' conformity to the action (Accuracy, Usability, Completeness, and Expandability), a set of descriptive statements was developed for each dimension. By evaluating the statement conformity to the action, the extent to which the dimensions correspond to the ISA programme's objectives is measured.

This section provides an analysis of the statements. It starts with the statement mapping to the dimensions, which is followed by the analysis of the Perceived Quality dimensions' conformity statements. Finally, the last section provides an overview of the statement conformity scores, which are summarised in groups according to the dimensions.

5.4.1.2.1 PERCEIVED QUALITY STATEMENT MAPPING TO DIMENSIONS

In total, Action 2.1 has 10 statements regarding the dimensions’ conformity. Table 5 gives an overview of the statements representing each dimension. The Accuracy and the Usability dimensions are represented by three statements each, while the Completeness and the Expandability dimensions are represented by two statements each.

TABLE 5 – ACTION 2.1 STATEMENT MAPPING TO PERCEIVED QUALITY DIMENSIONS

	Statement	Dimension
1	The documentation is accurate	Accuracy
2	The sources of documentation listed are verifiable	Accuracy
3	The documentation is free from grammar/style errors	Accuracy
4	The reference links work and are accessible	Completeness
5	The documentation is complete and does not require additions	Completeness
6	The documentation is appropriate/applicable to my business needs	Usability
7	The guidelines are easy to understand	Usability
8	The structure of the documentation is clear and the systematic design remains consistent	Usability
9	The documentation is applicable to other sectors	Expandability
10	The documentation format is transferrable to other applications	Expandability

5.4.1.2.2 PERCEIVED QUALITY DIMENSIONS CONFORMITY RESULTS

For the purpose of describing the dimensions’ conformity to the action, 10 Perceived Quality statements are designed for this survey. The respondents are asked to evaluate the extent to which these statements conform to the particular action.

Each respondent is requested to provide his/her opinion using the 5-point Likert grading scale. For the dimensions’ conformity evaluation, a grading scale with values ranging from ‘Agree’ to ‘Disagree’ is applied. An additional ‘Hard to Say/Not Applicable’ option is provided, however this score is excluded from the score calculations. Before performing the survey data calculations, the 5-point Likert scale values are interpreted as numeric values:

- 5 – Agree;
- 4 – Rather Agree;
- 3 – Neither Agree nor Disagree;
- 2 – Rather Disagree;
- 1 – Disagree;
- 0 – Hard to Say/Not Applicable (*is not considered for the calculation*).

In order to have an overview of the positive and negative attitude proportions, the bars in blue represent the negative attitude (answers ‘Disagree’ and ‘Rather Disagree’), whereas the bars in pink/red represent the positive one (answers ‘Agree’ and ‘Rather Agree’). In addition, a neutral opinion (the bars in white) and no

opinion (the bars in grey) are presented separately on the right. An explanatory legend with colour codes represents the available data. The average mean value for each of the dimensions is presented on the right side of the figure.

FIGURE 3 – ACTION 2.1 PERCEIVED QUALITY DIMENSIONS CONFORMITY RESULTS

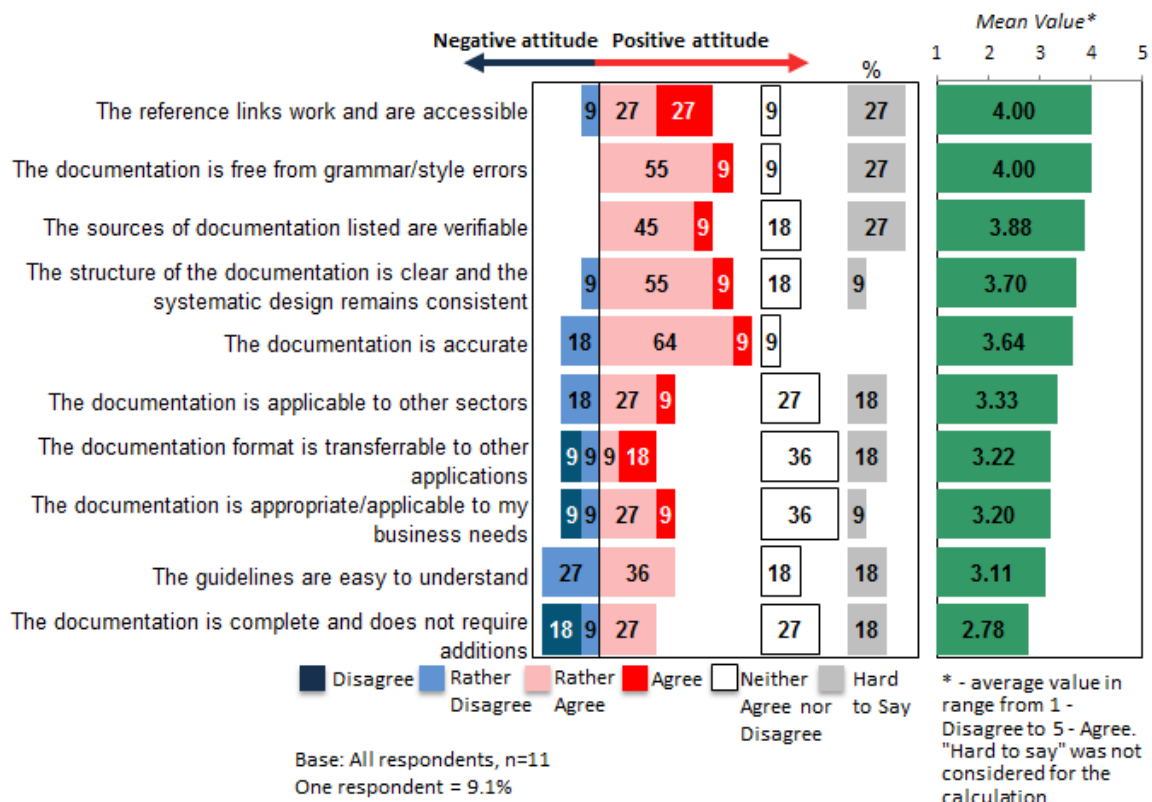


Figure 3 shows that nine out of ten statements are evaluated as relevant to EIA; the average value is higher than a neutral value (3 - 'Neither Agree nor Disagree'). However, because of the high standard error the four statements with the lowest mean value are close to the neutral value. One statement has an average value below the neutral value. This particular statement is not relevant to EIA. Also, for many statements, a non-negligible amount of respondents chose the answer 'Hard to say', meaning that they couldn't evaluate them or simply haven't had enough experience working with EIA. The most relevant statements regarding the evaluation of EIA according to the respondents are:

- 'The reference links work and are accessible' (mean value 4.00);
- 'The documentation is free from grammar/style errors' (mean value 4.00) and
- 'The sources of documentation listed are verifiable' (mean value 3.88).

Table 6 provides an overview of the statement conformity scores, which are summarised per dimension. To calculate these scores, the average values of all the conformable dimension statements are taken into account.

TABLE 6 – ACTION 2.1 AVERAGE RATING PER PERCEIVED QUALITY DIMENSION

	Dimension	MEAN
Per dimension	Accuracy	3.81
	Completeness	3.35
	Usability	3.34
	Expandability	3.28
Total Criterion Score		3.45

The survey results show that the respondents evaluated the Accuracy statements as the most relevant to EIA (mean value 3.81). The Completeness statements (mean value 3.35) and the Usability statements (mean value 3.34) are evaluated as the next most relevant to EIA. The respondents evaluated the Expandability statements (mean value 3.28) as the least relevant (but not as irrelevant, since the value is higher than the neutral value of 3 - 'Neither agree nor disagree'). However, the fact that only 11 respondents evaluated each statement should be taken into account. With a reference to the theory used in business research methods⁵, it is concluded that for statistically meaningful calculations, the minimum respondent number must be equal to or greater than ten per statement. However, seven out of ten statements were evaluated with an answer 'Hard to say' by at least two respondents meaning that the additional statistical calculations⁶ of mode, standard deviation and standard error could not be performed.

⁵ Cooper D. R., Schindler P. S. (2013), Business Research Methods, 12th Edition

⁶ Dictionary of statistics & methodology: a nontechnical guide for the social sciences (page 226).

5.4.1.2.3 PERCEIVED QUALITY CRITERION SCORE AGGREGATION

Figure 4 provides a visual overview of the dimension conformity scores.

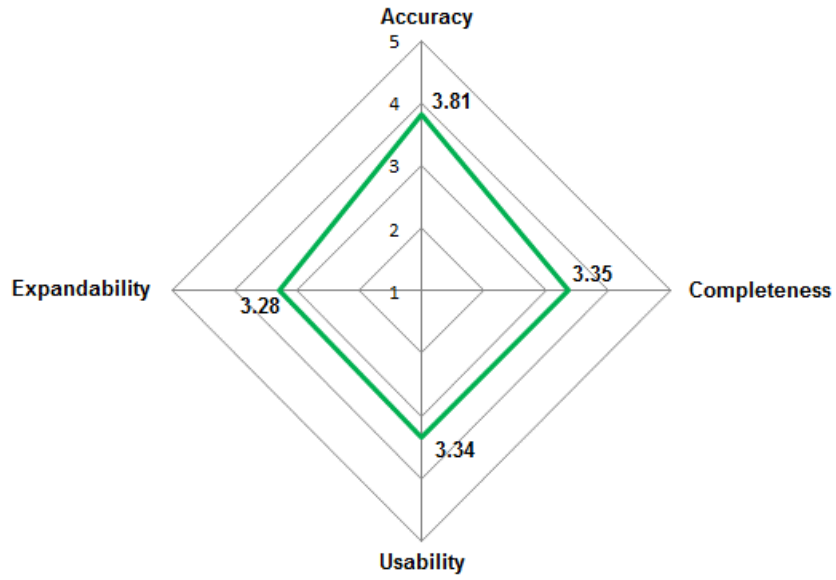


FIGURE 4 – ACTION 2.1 PERCEIVED QUALITY CRITERION SCORE AGGREGATION

5.4.2 Perceived Quality User Satisfaction Score

The User Satisfaction Score shows how satisfied and happy the respondents are with the performance of a specific action. The User Satisfaction Score is expressed as a percentage from 0 to 100, where 0 signifies that there are no satisfied and happy respondents, whereas 100 signifies all respondents are satisfied and happy with the work performed by the action.

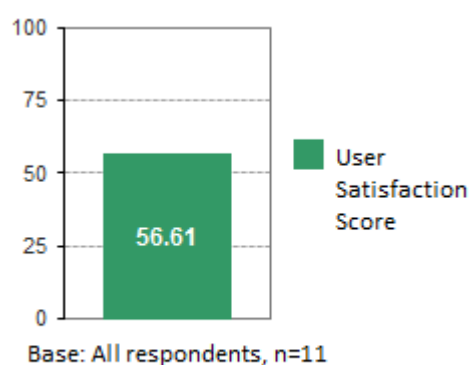
The User Satisfaction Score is assessed with reference to the results of the dimensions’ importance and dimensions’ conformity evaluation. The User Satisfaction Score is measured at the individual level for each of the survey respondents via identification of the important dimensions for that particular respondent.

To increase the accuracy of the calculation, a specific weight coefficient is applied to the dimensions. To those dimensions which respondents evaluated as “Important” a weight coefficient of 1 is applied, while a coefficient of 0.5 is applied to the dimensions which respondents evaluated as “Rather Important”. A coefficient of 0 is applied to all the other dimensions. Finally, all the individual values are summed.

As the next step, an analysis of the statements which represent these identified dimensions is performed. If a respondent claimed that a particular statement fully corresponded to the specific dimension (value 5 – ‘Agree’), then a coefficient of 100 (100% eligibility) is assigned. If evaluated with 4 – ‘Rather Agree’, a coefficient of 75 applies, if evaluated with 3 – ‘Neither Agree nor Disagree’, a coefficient of 50 applies, if evaluated with 2 – ‘Rather Disagree’, a coefficient of 25 applies, and in the case it was evaluated with 1 – ‘Disagree’, the coefficient is 0.

FIGURE 5 – ACTION 2.1 USER SATISFACTION SCORE

Figure 5 shows that the **User Satisfaction Score is 56.61**. The result indicates an average level of respondent satisfaction with EIA. However this value is only indicative due to the low number of respondents, who participated in this survey.



5.4.3 Perceived Quality Net Promoter Score

The Net Promoter Score® (NPS) is a widely used management tool that helps evaluate the loyalty of a customer relationship⁷. This management tool has been adapted to suit the ISA programmes’ Evaluation and Monitoring activities and measures the overall respondents’/stakeholders’ experience and loyalty to a specific ISA action.

In order to evaluate the NPS, the question “how likely the respondent would recommend the particular action’s output to others” is asked. The assessment is done on a scale from 0 to 10, where 0 represents the answer “Not likely at all” and 10 – “Extremely likely”⁸. After the data analysis, the respondents are classified as follows:

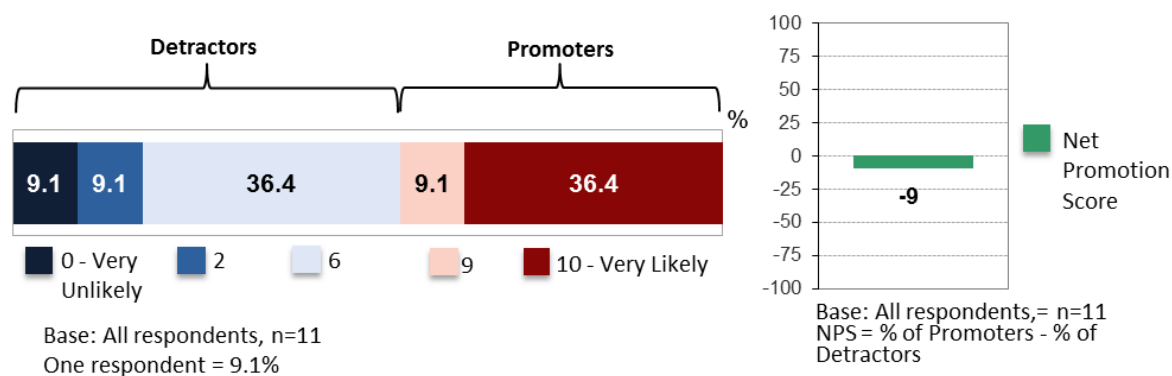
- **Promoters** (numeric values from 9 - 10) - loyal users who will keep using the action’s final outcome and refer others, promoting the usage of the action's outcomes;
- **Passives** (numeric values from 7 - 8) - satisfied but unenthusiastic users who will most probably not recommend the action's outcomes to others;
- **Detractors** (numeric values from 0 - 6) - unhappy users who can damage the image and decrease the usage of the action's outcomes.

The NPS final score calculation is done based on the following formula:

$$\text{NPS} = \% \text{ of Promoters} - \% \text{ of Detractors}^8$$

The result can range from a low of -100 (every customer is a Detractor) to a high of +100 (every customer is a Promoter).

FIGURE 6 – ACTION 2.1 PERCEIVED QUALITY NET PROMOTER SCORE



⁷ Official webpage of Net Promoter Score® community <http://www.netpromoter.com/home>.

⁸ Markey, R. and Reichheld, F. (2011), “The Ultimate Question 2.0: How Net Promoter Companies Thrive in a Customer-Driven World”

Figure 6 shows that 45.5% of the respondents (five out of eleven) are Promoters of EIA and would recommend it to colleagues or other Public Administrations. A slightly higher proportion of the respondents, 54.5% (six out of eleven), are Detractors of EIA and would not recommend it to colleagues or other Public Administrations. The Net Promoter Score is -9, meaning that more respondents would not recommend EIA, yet because of the low number of respondents who participated in this survey. The difference between Promoters and Detractors is only one respondent, so the NPS should be considered as an indicator that there are respondents who are loyal users of EIA and that at the same time there are unhappy users.

5.4.4 Overall Perceived Quality Score

Referring to the performed measurements described earlier, namely the Value Score, the User Satisfaction Score, the Usefulness Score and the NPS, an Overall Perceived Quality Score is calculated.

To calculate the Overall Perceived Quality Score, all measurements are reduced to a five point scale (the statements used to calculate the Value Score are already expressed using a scale from 1 to 5, the Usefulness Score had values from 1 to 7, NPS - from -100 to +100, and the User Satisfaction Score - from 0 to 100). In order to determine the Overall Perceived Quality score, the average value of these four measurements is calculated. To reduce any linear scale to a different linear scale the following formula⁹ is used:

$$Y = (B - A) * (x - a) / (b - a) + A$$

- Y = Value after reducing to a five point scale
- x = Value in the initial scale
- B = The highest value of the new scale (in this case it is 5, as we are reducing other scales to a five point scale)
- A = The lowest value of the new scale (in this case it is 1, as we are reducing other scales to a five point scale)
- b = The highest value of the original scale (for Net Promoter Score and User Satisfaction Score it is +100, for Usefulness Score it is 7)
- a = The lowest value of the original scale (for the Net Promoter Score it is -100, for the User Satisfaction Score it is 0 and for the Usefulness Score it is 1)

Example of reducing Net Promoter Score to a five point scale:

$$(5-1) * ((-9) - (-100)) / (100 - (-100)) + 1 = 4 * 91 / 200 + 1 = 364 / 200 + 1 = 1.82 + 1 = 2.82$$

⁹ Transforming different Likert scales to a common scale. IBM. Retrieved February 04. 2016., from <http://www-01.ibm.com/support/docview.wss?uid=swg21482329>

TABLE 7 – ACTION 2.1 OVERALL PERCEIVED QUALITY SCORE CALCULATION

NAME OF THE SCORE	ORIGINAL VALUE	VALUE AFTER REDUCING TO A FIVE POINT SCALE
Usefulness Score	5.20	3.80
Value Score	3.49	3.49
User Satisfaction Score	56.61	3.26
Net Promoter Score	-9	2.82
OVERALL PERCEIVED QUALITY SCORE		3.34

The survey results show that on a 5-point scale the Usefulness Score has the highest score (3.80), which indicates that the strongest aspect of this action is its Usefulness. The Value Score (3.49) and the User Satisfaction Score (3.26) are the next most highest scores. The Net Promoter Score (2.82) is the only score that is below the average value of 3, however, due to the low number of respondents who participated in this survey and the high standard error in cases when the response rate is so low, the values are only indicators of the real situation.

5.5 ACTION STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS

When analysing the data results of the dimensions' conformity versus the dimensions' importance, the action's strengths, weaknesses, opportunities and threats can be identified.

Statements are located in quadrants, based on the dimensions' conformity statements and dimensions' importance calculated mean values. The quadrants highlight the weak and strong aspects of the action, as well as threats and opportunities.

In general, all the statements that are attributed to the action can be grouped into four categories:

- Strengths – Essential to respondents and relevant to the action (1st quadrant);
- Weaknesses – Essential to respondents but not relevant to the action (2nd quadrant);
- Threats – Not essential to respondents and not relevant to the action (3rd quadrant);
- Opportunities – Not essential to respondents but relevant to the action (4th quadrant).

Four colours are used to identify Perceived Quality dimensions:

- Dark blue: Accuracy;
- Red: Completeness;
- Brown: Usability;
- Purple: Expandability.

As seen in Figure 7, nine statements are evaluated as essential to respondents and relevant to the action - all of them are placed in the 1st quadrant and are identified as strengths of EIA. While one statement is in the 2nd quadrant and is identified as a weakness of the action.

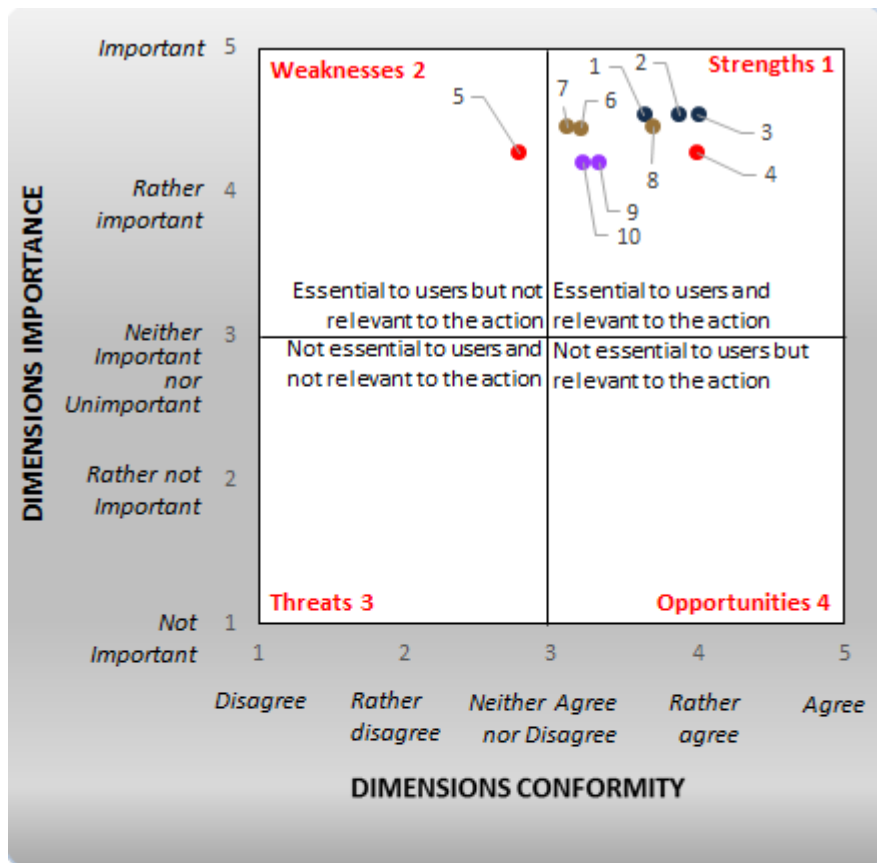
When comparing different statements, it is evident that the following statement is important for the respondents, but is less relevant to this action:

- *'The documentation is complete and does not require additions'* (statement 5).

The following three statements are the action's most important strengths (the most relevant to the action and important to the respondents):

- *'The documentation is free from grammar/style errors'* (statement 3);
- *'The reference links work and are accessible'* (statement 4) and
- *'The sources of documentation listed are verifiable'* (statement 2).

FIGURE 7 – ACTION 2.1 PERCEIVED QUALITY ACTION STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS



I. Accuracy:

- 1 - The documentation is accurate
- 2 - The sources of documentation listed are verifiable
- 3 - The documentation is free from grammar/style errors

II. Completeness:

- 4 - The reference links work and are accessible
- 5 - The documentation is complete and does not require additions

III. Usability:

- 6 - The documentation is appropriate/applicable to my business needs
- 7 - The guidelines are easy to understand
- 8 - The structure of the documentation is clear and the systematic design remains

IV. Expandability:

- 9 - The documentation is applicable to other sectors
- 10 - The documentation format is transferrable to other applications

5.6 RESPONDENT RECOMMENDATIONS AND OPINIONS

This section provides an overview of the recommendations and main benefits received about EIA. It should be noted that each response is given by a single survey respondent, which means that the number of different answers to each question is the same as the number of respondents who had an opinion or a recommendation to the specific question.

TABLE 8 – ACTION 2.1 RECOMMENDATIONS

Do you have any recommendations to improve the European Interoperability Reference Architecture (EIRA), taking into consideration the project as a whole with all its outputs (common terminology and structure)?

The EIRA is too much "stand-alone" and too limited in scope. It should provide a skeleton architecture for an "any business" IT system offering existing reference solutions/modules for the many IT functions that are always needed but not business specific. EIRA should deliver effective support to development teams, by offering a complete development environment supporting the team from start to finish of a project, and later during the maintenance phase. This environment should integrate tools such as (only examples) enterprise architect, github, SVN, JIRA ... This could guarantee the uptake of EIRA.

Consolidate it! Must be available as open data.

The descriptions of the building blocks are sometimes too superficial.

Despite the laudable intentions, the way this document accounts for the legal and (especially) the organization level makes it almost unusable to address the interoperability needs of European public services. In short, the main problems are the following one

1. The definition of public services is extremely problematic.
2. The structure of public services is very poorly modeled.
3. The way semantic interoperability would be enforced by the EIRA is not clear at all.
4. The organizational view presents several technical problems.

To be actually interoperable, which would mean at least have all artefacts follow the RDF model. This would also make it in line with the SEMIC action of ISA.

The EIRA, itself to be interoperable, should be expressed in an interoperable format. Not in a proprietary format. It should also preferably be a core model, not as restrictive as today.

Should recognize that semantics may be expressed independent of its technical representation and be and align with the work in ISA Core Vocabularies. In some areas, such as public procurement, EIRA can be seen to have too much focus on PUBLIC service. A number of services are likely to be offered by private entities.

"Do you have any other recommendations to share with us?"

Please don't try to impose EIRA, but make a service that good that it becomes a no-brainer to use it
Cartography tool is difficult to use

Develop your own ontology instead of using Archimate. If member states adopt EIRA and want to be interoperable with their partners from the private sector, all private companies would be required to pay a fee just to use a notation, and to an US organization. That is unacceptable (morally, legally, etc)

We transformed EIRA early version into an ontology, supporting EIRA in an interoperable format thus and found it useful in that format.

Keep up the good work. Add more usecases. Promotion of the EIRA.

TABLE 9 – ACTION 2.1 MAIN BENEFITS

<p><i>What are the main benefits or the most valuable things about the European Interoperability Reference Architecture (EIRA)?</i></p>
<p>The opportunity to:</p> <ul style="list-style-type: none"> - reduce the scope and cost of "specific business sector" related IT projects by selecting proven software modules for common IT functions (such as user management, activity logging, document storage, report producing ...) elsewhere. - improve project success rates by allowing the development to concentrate all resources on the business specific aspects
<p>That it drives the conversation linking "interoperability" with "architecture", and Enterprise Architecture is mainly about interoperability.</p>
<p>That it exists, that it has been thought of, that it could be made interoperable itself.</p>
<p>Facilitate re-use of building blocks/components across application areas.</p>
<p>With respect to the Conceptual Model for Public Services developed as part of the EIF initiative, and reported in Fig. 10, this EIRA draft document makes an important step forward, by making explicit how the various EIRA building blocks belong to the different levels of the EIF interoperability hierarchy (reported in Fig. 3). In particular, a very important clarification introduced by the EIRA is that public services (differently than, say, Web services) are not software solutions, but they are business level entities that are realized with the help of software solutions. A further important clarification is the relationship between public services and public policies: public services are described as implementations of public policies. So, the explicit account for an organizational level and a legal level is in our opinion the most relevant contribution of this document.</p>
<p>Alignment with the EIF, easier to reuse building block and infrastructures at the EU and national level. Communication.</p>

6 SURVEY CONCLUSION AND RECOMMENDATIONS

The objective of this survey was to evaluate the Perceived Quality of Action 2.1 – EIA. It is important to take into account that only 11 respondents have participated in the survey, meaning that the results of this action are more like indicators of the Perceived Quality and do not fully represent the opinions of all the users. The following conclusions have been drawn based on the analysis performed:

- The ISA Action 2.1 - EIA received a **rather positive Perceived Quality assessment with an Overall Perceived Quality Score of - 3.34 out of 5. Usefulness is the strongest aspect of EIA**, as the Usefulness Value Score has the highest value between measurements included in the calculation of the Overall Perceived Quality Score. The Net Promoter Score has the lowest value, yet the data shows that there is only a one respondent difference between those who would recommend EIA to colleagues or other Public Administrations and those who wouldn't.
- The results show that EIA is perceived as **more beneficial in terms of Accuracy than in Expandability, Usability and Completeness**.
- The findings indicate that respondents think that Action 2.1 – EIA **documentation is not complete and needs additions**, meaning that it requires regular updates. The overall Usability of the EIA is important to the respondents.

Based on the conclusions drawn, CGI-Accenture advises the following recommendations:

- Additional work on the EIA guidelines and documentation is needed to make it more clear and easy to understand. Also, it should be regularly updated.
- As accuracy is the strongest aspect of the EIA, this high quality performance must be a priority.
- According to the respondents' recommendation EIA should be expressed in an interoperable format instead of a proprietary format. It should also preferably be a core model being less restrictive than it is today. It would increase the usage of EIA and the willingness of users to recommend it to colleagues or other Public Administrations.

7 APPENDIX

7.1 RAW DATA EXPORT

The attached file contains the survey result export.



Raw data.xls

7.2 GLOSSARY

- A Likert Scale is a widely used scaling method developed by Rensis Likert. Likert scale refers to the use of an ordinal 4- or 5- point rating scale with each point anchored or labelled.
- The mean⁶ (average) is the most popular measure of location or central tendency; has the desirable mathematical property of minimizing the variance. To get the mean, you add up the values for each case and divide that sum by the total number of cases;
- Mode⁶ refers to the most frequent, repeated or common value in the quantitative or qualitative data. In some cases it is possible that there are several modes or none;
- The Net Promoter Score® (NPS) is a widely used management tool that helps evaluate the loyalty of a customer relationship. Customers are classified as Promoters, Passive and Detractors.
- 'Perceived Quality' is defined as the extent to which the outputs of an ISA action are meeting its direct beneficiaries' expectations;
- Standard deviation⁶ shows the spread, variability or dispersion of scores in a distribution of scores. It is a measure of the average amount the scores in a distribution deviate from the mean. The more widely the scores are spread out, the larger the standard deviation;
- Standard error⁶ is the standard deviation of the sampling distribution of a statistic. It is a measure of sampling error; it refers to error in estimates due to random fluctuations in samples. It goes down as the number of cases goes up. The smaller the standard error, the better the sample statistic is as an estimate of the population parameter – at least under most conditions;
- 'Perceived Utility' is defined as the extent to which the effects (impact) of an ISA action correspond with the needs, problems and issues to be addressed by the ISA programme;

INTEROPERABILITY SOLUTIONS FOR
EUROPEAN PUBLIC ADMINISTRATIONS
MONITORING AND EVALUATION
D03.05 ACTION 2.1 UTILITY MONITORING REPORT

Framework Contract n° DI/07173

31st July 2015

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EXECUTIVE SUMMARY

The purpose of this section is to provide an overview of the key findings of the Utility monitoring and evaluation activity.

The goal of the Utility survey for Action 2.1 – European Interoperability Architecture (EIA) was to evaluate the European Interoperability Reference Architecture (EIRA) and the Cartography Tool (CarTool) in the context of the pilots conducted with the public administrations in Member States (MS) and the Directorates-General (DG) of the European Commission.

The survey was launched at the end of a prototype phase of Action 2.1, and a limited number of respondents is linked to the number of participants of the prototype phase. The information presented in this report has an informative purpose and due to the small sample size the results do not present statistically valid overview of the whole Action 2.1 Utility.

The survey was designed in the EUSurvey tool and opened for submissions during the conference call with the related pilot representatives on the 27th of May 2015.

The survey result analysis (see The respondents' demographic profiles tend to describe the action respondents from the demographic point of view. It illustrates the diversity of the respondents. Table 3 gives an overview of the demographic profile of the respondents. **It is important to take into account that only 11 respondents participated in this survey, thus the percentage value of one respondent is 9.1%.**

TABLE 3 – ACTION 2.1 DEMOGRAPHIC PROFILE OF RESPONDENTS

RESPONDENT PROFILE			
		Amount	Col %
ALL RESPONDENTS		11	100.0
RESPONDENT GROUP	Architect	7	63.6
	IT head of unit	1	9.1
	Other (Mentioned 1 time: business analyst, business program leader, business and IT project manager; Chair of CEN/TC 440; Researcher)	3	27.3
ORGANISATION	EU institution	4	36.4
	Other organisation from the private sector	2	18.2
	Public administration at national level of an EU Member State	2	18.2
	International organisation for standardisation	1	9.1
	Academic	1	9.1
	Other (Mentioned 1 time: EU citizen)	1	9.1
LOCATION	Belgium	4	36.4

	Denmark	1	9.1
	Finland	1	9.1
	France	1	9.1
	Italy	1	9.1
	Slovakia	1	9.1
	Other (Mentioned 2 times: Norway)	2	18.2
POSITION LEVEL	Management level	5	45.5
	Technical level	4	36.4
	Other (Mentioned 1 time: citizen; no answer)	2	18.2

Base: all respondents, n=11

) shows the Action 2.1 Utility scores. The **Utility score** is **4.34** (scale: 1...5).

The detailed score calculation process is described in Section 4.4.

TABLE 10 – ACTION 2.1 PILOT PHASE UTILITY SURVEY RESULTS

Evaluation criteria	Mean ¹⁰	Mode ¹⁰	StDev ¹⁰	StErr ¹⁰
Action 2.1 Utility	4.34	5	0.90	0.12

The following conclusions and recommendation relate directly to the conducted pilots and are only interpretation that can be biased by the small sample size and are to be treated with caution.

Overall, the respondents from the Directorates-General of the European Commission valued the Utility of EIRA and CarTool slightly higher than the respondents from the Member State public administrations.

All pilot phase participants agreed that EIRA has the potential to support interoperability, however the Member State representatives did not fully agree that it has value to contribute to cost and time saving.

All respondents from the Directorates-General strongly agreed the CarTool has potential value for supporting interoperability and contributing to cost and time saving. However, the pilot participants from the Member States did not fully agree that the CarTool has this potential.

It is recommended to carry out informative seminars and workshops with the interested parties from the Member States that would promote and demonstrate the EIRA and CarTool’s potential value for supporting interoperability and contributing to cost and time saving.

¹⁰ See Glossary (Section 7.2)

REVISION HISTORY

Date	Version	Description	Authors	Approved by
31-July-2015	1.00	For QA purpose, the accepted draft version is changed into the final version. No other changes are implemented.	CGI-Accenture	
16-June-2015	0.20	Updated version	CGI-Accenture	
09-June-2015	0.10	Initial version	CGI-Accenture	

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1. INTRODUCTION

CGI-Accenture has been requested to deliver a Utility Monitoring and Evaluation Report as part of the execution of the ISA programme monitoring (Technical Annex for Specific Contract N° 52 under Framework contract N°DI/07173).

Based on the scope of the Specific Contract, the Utility is to be measured for 13 actions. This report covers the Utility survey result analysis for the EIRA and CarTool of the ISA Action 2.1 in the context of the pilots conducted with three public administrations in MS and three DGs.

The survey was launched at the end of a prototype phase of Action 2.1, and the small number of respondents is linked to the number of participants of the prototype phase. The results relate directly to the conducted pilots and the conclusions and recommendations presented in this report are only the interpretation that can be biased by the small sample size.

This document is divided into the following sections:

- **Section 1** provides an overview of the structure of the report;
- **Section 3** provides an overview of the methodology used for the Utility measurements;
- **Section 3** summarises the collected data;
- **Section 4** focuses on the survey result overview and data analysis;
- **Section 5** provides the survey conclusions and recommendations;
- **Section 6** appendix includes:
 - o Statement mapping per dimensions;
 - o Raw data export;
 - o Glossary.

2. SURVEY METHODOLOGY

A common methodology was developed for all surveys that enables the comparison between the different survey results. This section explains how the Utility is measured and what dimensions Action 2.1 survey covered. The last part of this section describes the architecture of the survey.

2.1. UTILITY

'Utility' is defined as the **extent to which the effects (impact) of an ISA action correspond with the needs, problems and issues to be addressed by the ISA programme**¹¹.

Utility is measured using an adaptation of the VAST (Value Assessment Tool) methodology¹², considering an additional dimension related to the Global and Intermediate objectives of the ISA programme.

The assessment is based on the following dimensions:

- **Value for the European Union:** Looks at the assessment of the external value of an information system or an IT project. External value of a project is considered to be any benefit which is delivered outside the Commission itself. This external aspect is divided into two parts: society (Social Value) and individuals (External Users' Value);
- **Value for the European Commission:** Encompasses criteria through which the internal value of an IT project can be assessed. All factors that can contribute to the improvement of the EC performance should be considered as delivering an internal value;
- **Value for cross-border and cross-sector interoperability:** Covers all aspects of how information system or IT project can support the efficient and effective cross-border and cross-sector interaction between the European Public Administrations.

The ISA Programme is mainly focusing on the value for the cross-border and cross-sector interoperability dimension. In this context, the value for EC is considered to have a lower weight than other dimensions. Consequently, less focus is put on this dimension.

2.2. SURVEY ARCHITECTURE

In order to measure the Utility, a respondent is supposed to grade the statements based on his/her level of agreement.

The survey was initially designed using 7-point Likert scale. To maintain consistency with all other ISA M&E surveys, this scale was adapted to fit the 5-point Likert rating scale that has been used for all other ISA program M&E surveys. To overcome this difference, the "Disagree" and "Somewhat Disagree" options were merged to one value – "Disagree" that is used in the 5-point Likert scale. The same merge was applied to the "Somewhat Agree" and "Agree" options that in the 5-point Likert scale have the "Agree" value.

¹¹ DG BUDG (2004), "Evaluating EU activities, a practical guide for the Commission services"

¹² More information can be found on: <http://ec.europa.eu/dgs/informatics/vast/>

The 5-point Likert scale¹³ has values ranging from ‘Strongly Agree’ to ‘Strongly Disagree’ with an additional ‘No Opinion/Not Applicable’ option.

For each presented statement the user is able to provide his/her opinion and suggestions for improvement in a free text field in case he/she rated the statement with ‘Disagree’ or ‘Strongly Disagree’.

3. ACTION 2.1 SURVEY DATA SUMMARY

Table 11 gives an overview on the survey start date, end date, the amount of responses collected and the survey launching method.

TABLE 11 – ACTION 2.1 PILOT PHASE SURVEY DATA SUMMARY

Action 2.1 - EIA	
Start date:	27/05/2015
End date:	27/05/2015
Amount of responses:	6
The survey launching method:	Announcement during a conference call with the stakeholders

4. ACTION 2.1 SURVEY RESULTS AND ANALYSIS

This section aims to provide a detailed overview and survey result analysis on the survey response range at the following levels:

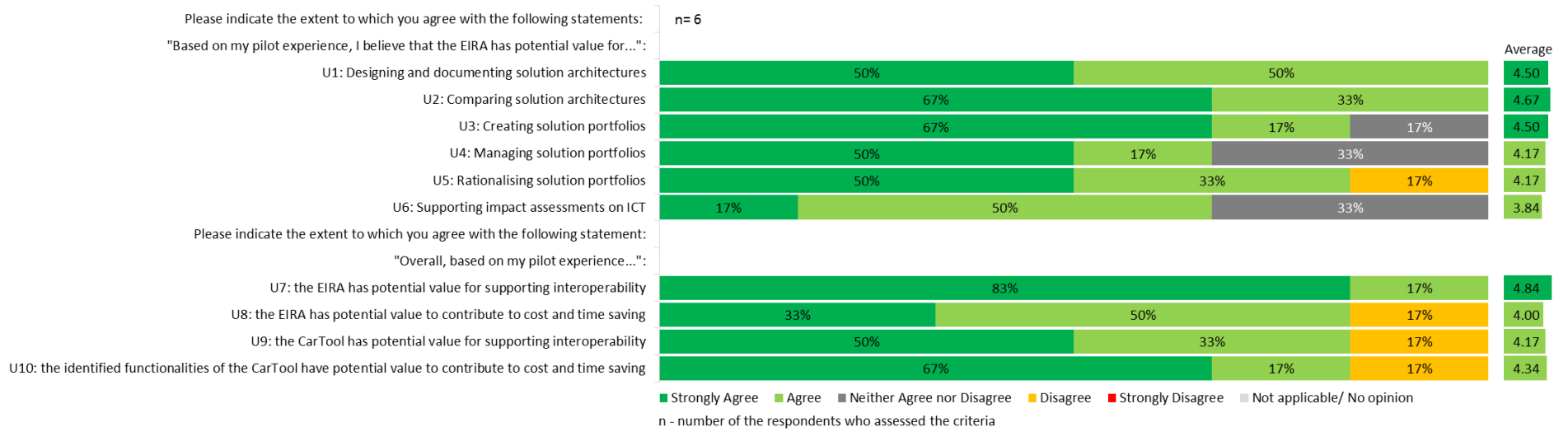
- **Overall Survey Response** shows a complete survey response range collection covered by the Action 2.1 Utility survey;
- **Result Analysis According to Respondent Organisation Type** provides a score calculation by the organisation type and the overall evaluation criteria score;
- **Result Analysis According to the Evaluation Criteria** provides a score calculation by evaluation criteria dimensions and the overall evaluation criteria score.

4.1. OVERALL SURVEY RESPONSE OVERVIEW

Figure 1 gives an overview of the overall survey results. The graphic presents the distribution of answers for each survey statement, as well as each statement’s average score.

¹³ A Likert Scale is a widely used scaling method developed by Rensis Likert. Likert scale refers to the use of an ordinal 4- or 5-point rating scale with each point anchored or labeled.

FIGURE 8 – OVERALL ACTION 2.1 SURVEY RESULT OVERVIEW



4.2. RESULT ANALYSIS ACCORDING TO THE RESPONDENT ORGANISATION TYPE

Figure 9~~Error! Reference source not found.~~ presents the survey results that were received from three respondents of the Member State (MS) public administrations. Figure 10~~Error! Reference source not found.~~ gives an overview of the survey responses from three different Directorates-General of the European Commission (DG). The graphics present the distribution of answers for each survey statement, as well as the average score of each statement.

FIGURE 9 – RESULT OVERVIEW FROM MS RESPONDENTS

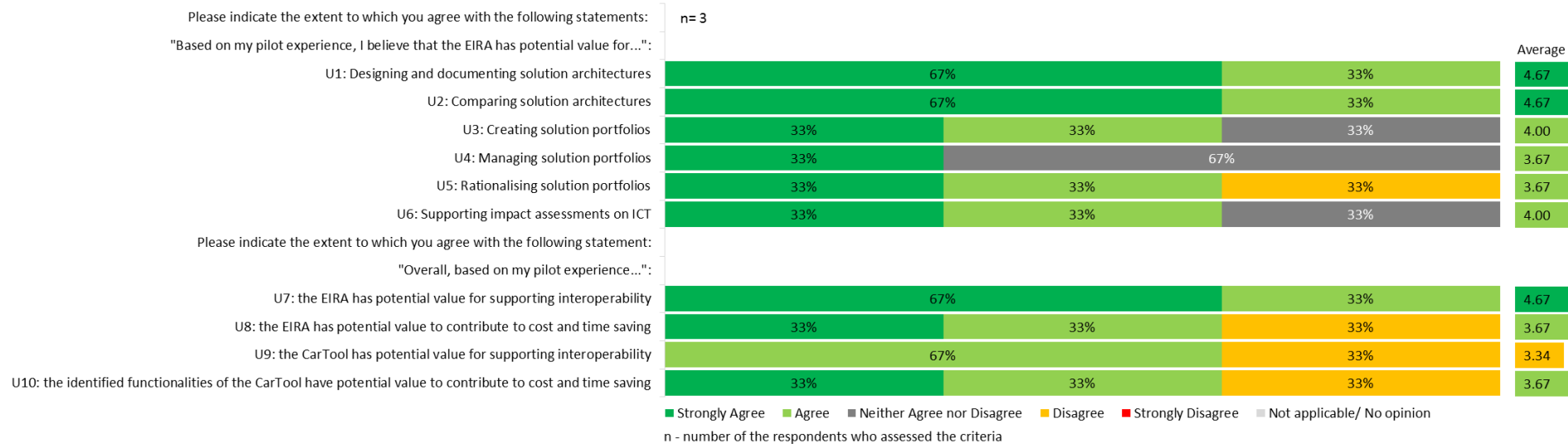
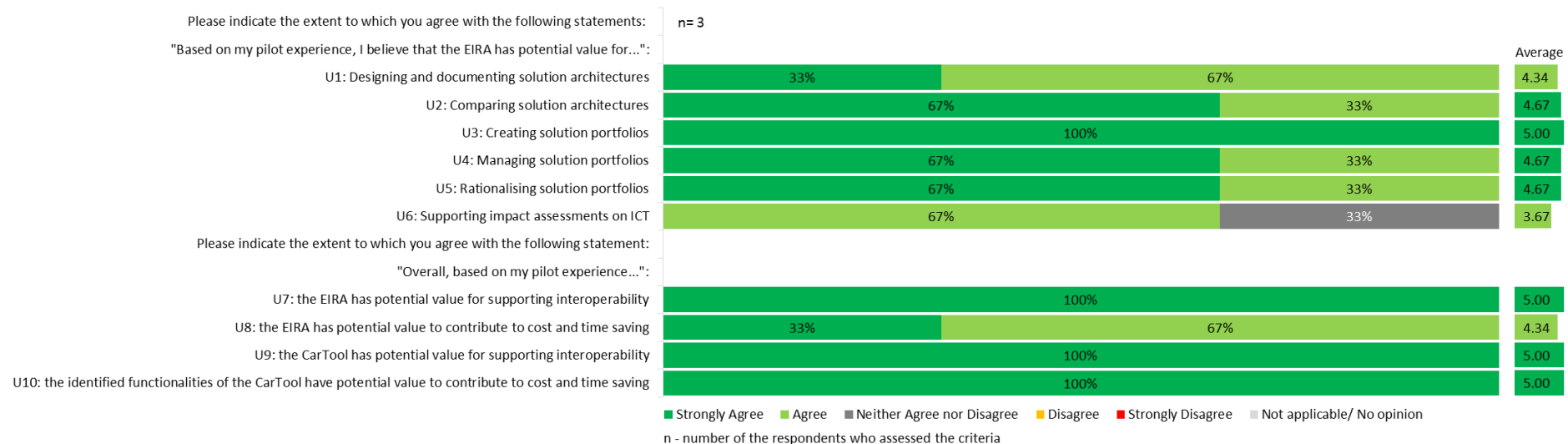


FIGURE 10 – RESULT OVERVIEW FROM DG RESPONDENTS



4.3. COMMENTS AND RECOMMENDATIONS

This section provides an overview of the comments received for Action 2.1 in the context of the pilots conducted with three public administrations in MS and three DGs. The comments are divided into two categories:

- Comments on the European Interoperability Reference Architecture (EIRA);
- Comments on the Cartography Tool (CarTool).

Table 12 provides the comments received from respondents from the MS public administrations, while Table 13 provides the comments from respondents from the DGs.

TABLE 12 – RESPONDENT COMMENTS FROM MS

EIRA	Although EIRA has potential to support interoperability, a lot of assumptions are made about semantics used in applying it. The pilot experience clearly demonstrates the different ways EIRA can be applied and it is not clear how compatible they actually are. As to saving cost and time, there is unlikely to be cost- or time saving as documenting systems to the extent required and keeping that documentation up to date is a monumental undertaking. While it is possible sufficient wins are created, they need to be substantial to justify the investment.
	Better comment, review and approval functions are needed for better management of portfolios - Impact assessments require knowledge about number of uses/cases and financial information about licenses and maintains.
	We have still to learn a lot in the area where EIRA is operating. The cooperation we have is key to success on doing that. In close cooperation with other groups as Mads mentioned in the closing call.
CarTool	In the context of interoperability, CarTool can add little value as it exposes solution internals and not clean interfaces thus leading to complex integration challenges. For documenting enterprise architecture, CarTool can add some value but in our experience, interoperability needs are fairly limited to understanding the data collected and interfaces provided.
	- I would prefer a simple domain specific textual query language over a graphical. "Select application components that depends on node X", "Select base registers that contains information object A". - Searching for SBB works pretty well in Joinup. No need to replicate. - A few versioning guidelines are needed to allow models to be continuously aligned. I would like to see a tool that can merge and resolve conflicts between to Archimate Exchange Format files. The format needs a few extension like "last modified by" or "is planned to be in operation on date".

I am less enthusiastic on the CarTool yet. It needs more development to become a realistic bridge between Architecture and runtime reusable solutions. Cloud based delivery is key in this in contrary to open source.

TABLE 13 – RESPONDENT COMMENTS FROM DGS

<p>EIRA</p>	<p>If it has the potential to contribute to cost and time saving is still too early to say. In relation to get a higher quality and harmonization of interoperability solutions it has, so in that way we get more value for money.</p> <p>- I think it is very good and useful for designing/documenting solutions and creating/managing solutions portfolios as it offers the architectural perspectives and elements needed to do so. - the other questions/aspects are possible to be covered/supported by EIRA but to be effective would require similar way(s) of documenting different solution architectures so that they can be compared/manager/asses impacts.</p> <p>In my job I am constantly confronted with the difficulties related to translating business requirements into IT solutions. I experience the current "isolated IT project" approach based on PM2 project methodologies as very negative; too slow to cope with the business deadlines, too expensive; and often delivering (under time and resource constraints) poorly performing software. A major cause of this negativity is because in most projects we are re-inventing the wheel, spending our scarce project resources to develop common functions (like user management) that have been made many times before. Even for our business specific requirements, generic technologies such as business rules and workflow engines could be used, if only there was a decent support structure helping us with the learning curve. EIRA, and CarTool seem well placed to grow to become such structure, offering a solution suite in which we can simply plug in our specific business requirements.</p>
<p>CarTool</p>	<p>No doubt that the CarTool has great potential, but from our perspective it needs a higher focus on reusable standards, specifications and solutions (sw), thereby giving a tool to avoid the usual process of "can't find anything similar, so let's start from scratch".</p> <p>I think CarTool delivers the promised features. It indeed has a good potential for supporting interoperability and could contribute to cost and time savings. Of course, everything also depends on the quality of the documentation of solutions in the repository...</p>

4.4. RESULT ANALYSIS ACCORDING TO THE EVALUATION CRITERIA

This section presents the method used for Utility score calculations. In order to obtain more accurate results, mean, mode, standard deviation and standard error values have been calculated.

Before performing the calculations, the initial 7-point Likert scale was adapted to a 5-point Likert scale. The Likert scale range values are interpreted as numeric values, i.e.:

- 5 – Strongly Agree;
- 4 – Agree;
- 3 – Neither Agree nor Disagree;
- 2 – Disagree;
- 1 – Strongly Disagree;
- 0 – No opinion/ not applicable **was not considered for the calculation.**

Mean and mode are used in statistics and hereafter in this report for measuring the Utility evaluation criteria:

- The **mean**¹⁴ (average) is the most popular measure of location or central tendency; has the desirable mathematical property of minimizing the variance. To get the mean, you add up the values¹⁵ for each case and divide that sum by the total number of cases;
- **Mode** refers to the most frequent, repeated or common value¹⁵ in the quantitative or qualitative data. In some cases it is possible that there are several modes or none.

In order to measure the degree of dispersion of a probability distribution, i.e. how far the data points are from the average, the standard deviation and standard error values are applied:

- **Standard deviation**¹⁶ shows the spread, variability or dispersion of scores in a distribution of scores. It is a measure of the average amount the scores in a distribution deviate from the mean. The more widely the scores are spread out, the larger the standard deviation;
- **Standard error**¹⁶ is the standard deviation of the sampling distribution of a statistic. It is a measure of sampling error; it refers to error in estimates due to random fluctuations in samples. It goes down as the number of cases goes up. The smaller the standard error, the better the sample statistic is as an estimate of the population parameter – at least under most conditions.

Based on the survey methodology presented in Section 3, the statements were mapped to two Utility dimensions. The detailed mapping of the statements is described in Section 6.1.

¹⁴ Dictionary of statistics & methodology: a nontechnical guide for the social sciences (page 226).

¹⁵ 5-point Likert scale range values are interpreted as numeric values like described in Section 4.4.4.

¹⁶ Dictionary of statistics & methodology: a nontechnical guide for the social sciences (page 375).

The sample size of each organisation type (3 respondents from MS and 3 from DGs) is too small to perform statistically valid mode, standard deviation and standard error calculations, therefore the meaning of these scores can be less valuable.

4.4.1. Result Analysis at Statement Level

Table 14 presents the Mean scores and Utility dimensions for each survey statement. The table shows the scores according to the respondent organisation type, as well as the total survey statement Mean score.

TABLE 14 – ACTION 2.1 UTILITY SCORE DETAILS AT STATEMENT LEVEL

Statement	Mean	Mode	StDev	StErr	Dimension
U1: Designing and documenting solution architectures	4.50	4	0.55	0.23	Value for EU
					Value for cross-border and cross-sector interoperability
U2: Comparing solution architectures	4.67	5	0.52	0.22	Value for EU
					Value for cross-border and cross-sector interoperability
U3: Creating solution portfolios	4.50	5	0.84	0.35	Value for EU
					Value for cross-border and cross-sector interoperability
U4: Managing solution portfolios	4.17	5	0.99	0.41	Value for EU
					Value for cross-border and cross-sector interoperability
U5: Rationalising solution portfolios	4.17	5	1.17	0.48	Value for EU
					Value for cross-border and cross-sector interoperability
U6: Supporting impact assessments on ICT	3.84	4	0.76	0.31	Value for EU
					Value for cross-border and cross-sector interoperability
U7: Overall, based on my pilot experience, the EIRA has potential value for supporting interoperability	4.84	5	0.41	0.17	Value for EU
					Value for cross-border and cross-sector interoperability
U8: Overall, based on my pilot experience, the EIRA has potential value to contribute to cost and time saving	4.00	4	1.10	0.45	Value for EU
U9: Overall, based on my pilot experience, the CarTool has potential value for supporting interoperability	4.17	5	1.17	0.48	Value for EU
					Value for cross-border and cross-sector interoperability

Statement	Mean	Mode	StDev	StErr	Dimension
U10: Overall, based on my pilot experience, the identified functionalities of the CarTool have potential value to contribute to cost and time saving	4.34	5	1.22	0.50	Value for EU

4.4.2. Overall Utility Result Analysis

Table 15 gives an overview on the analysis of each Utility dimension as well as a total score for the Utility evaluation criteria. In order to make the total Utility score calculation more accurate, a weighted mean was used. The dimension weight is defined based on the amount of statements within specific dimension.

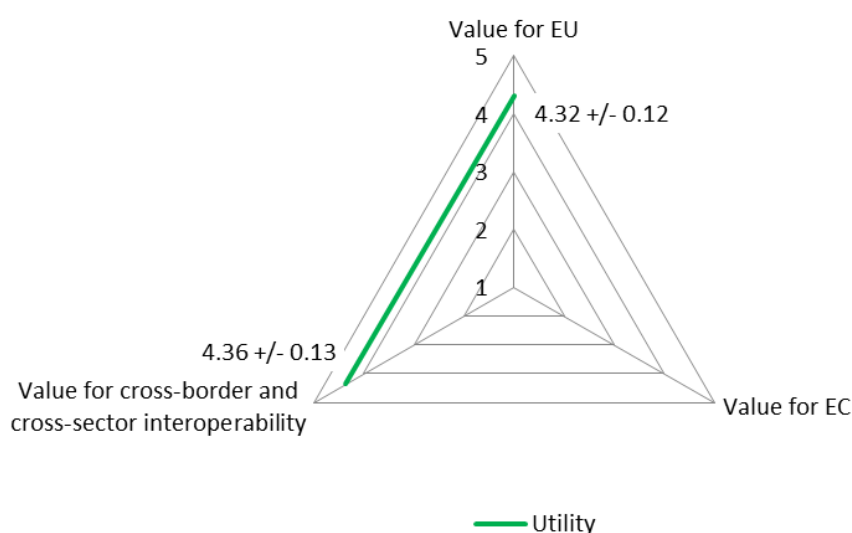
The weighted average of the total Utility score is **4.34** with the standard deviation equal to **0.90**, on a scale from 1 to 5, where 5 is the maximum (best) value.

TABLE 15 – ACTION 2.1 UTILITY SCORE DETAILS

	MEAN	MODE	StDev	StErr	Dimension	Weight
Per dimension	4.32	5	0.90	0.12	Value for EU	0.66
	4.36	5	0.84	0.13	Value for cross-border and cross-sector interoperability	0.44
	-	-	-	-	Value for EC	-
Utility	4.34¹⁷	5	0.90	0.12		

Figure 11 gives a visual overview on the Utility coverage per two predefined dimensions.

FIGURE 11 – UTILITY SCORE AGGREGATION



¹⁷ Weighted mean is a procedure for combining the means of two or more groups of different sizes; it takes the sizes of the groups into account when computing the overall or grand mean.

4.5. STRENGTHS AND WEAKNESSES

This section provides an overview of the strong and weak aspects of the EIA revealed by the Action 2.1 Utility survey. The results are presented according to the respondent organisation types – MS public administrations and DGs.

Prioritization of the statements were made based on the mean value of each statement. Statements with nearby mean values were grouped into different clusters to which the following colours have been applied:

- A **Green** colour applies to statements that refer to EIRA and CarTool's overall strong aspects;
- A **Grey** colour applies to statements that refer to the aspects that require attention;
- An **Orange** colour applies to statements that refer to EIRA and CarTool's weak aspects. Due to high overall ratings, no aspects were classified as weak, therefore no statements were marked with orange colour.

Table 16 and Table 17 presents an overview of the aspects that are strong or may require attention of the EIRA and CarTool in the context of Utility according to the respondents from MS public administrations and DGs respectively.

TABLE 16 – STRENGTHS AND WEAKNESSES ACCORDING TO MS

Utility statement	Mean	Dimension
U1: Designing and documenting solution architectures	4.67	Value for EU
		Value for cross-border and cross-sector interoperability
U2: Comparing solution architectures	4.67	Value for EU
		Value for cross-border and cross-sector interoperability
U7: Overall, based on my pilot experience, the EIRA has potential value for supporting interoperability	4.67	Value for EU
		Value for cross-border and cross-sector interoperability
U3: Creating solution portfolios	4.00	Value for EU
		Value for cross-border and cross-sector interoperability
U6: Supporting impact assessments on ICT	4.00	Value for EU
		Value for cross-border and cross-sector interoperability
U4: Managing solution portfolios	3.67	Value for EU
		Value for cross-border and cross-sector interoperability
U5: Rationalising solution portfolios	3.67	Value for EU
		Value for cross-border and cross-sector interoperability

Utility statement	Mean	Dimension
U8: Overall, based on my pilot experience, the EIRA has potential value to contribute to cost and time saving	3.67	Value for EU
U10: Overall, based on my pilot experience, the identified functionalities of the CarTool have potential value to contribute to cost and time saving	3.67	Value for EU
U9: Overall, based on my pilot experience, the CarTool has potential value for supporting interoperability	3.34	Value for EU
		Value for cross-border and cross-sector interoperability

TABLE 17 – STRENGTHS AND WEAKNESSES ACCORDING TO DGS

Utility statement	Mean	Dimension
U3: Creating solution portfolios	5.00	Value for EU
		Value for cross-border and cross-sector interoperability
U7: Overall, based on my pilot experience, the EIRA has potential value for supporting interoperability	5.00	Value for EU
		Value for cross-border and cross-sector interoperability
U9: Overall, based on my pilot experience, the CarTool has potential value for supporting interoperability	5.00	Value for EU
		Value for cross-border and cross-sector interoperability
U10: Overall, based on my pilot experience, the identified functionalities of the CarTool have potential value to contribute to cost and time saving	5.00	Value for EU
U2: Comparing solution architectures	4.67	Value for EU
		Value for cross-border and cross-sector interoperability
U4: Managing solution portfolios	4.67	Value for EU
		Value for cross-border and cross-sector interoperability
U5: Rationalising solution portfolios	4.67	Value for EU
		Value for cross-border and cross-sector interoperability
U1: Designing and documenting solution architectures	4.34	Value for EU
		Value for cross-border and cross-sector interoperability
U8: Overall, based on my pilot experience, the EIRA has potential value to contribute to cost and time saving	4.34	Value for EU
U6: Supporting impact assessments on ICT	3.67	Value for EU
		Value for cross-border and cross-sector interoperability

5. CONCLUSIONS AND RECOMMENDATIONS

The objective of this survey was to evaluate the Utility of Action 2.1 – European Interoperability Architecture (EIA) in the context of the pilots conducted with three public administrations in MS and three DGs. The following conclusions and recommendation relate directly to the conducted pilots and are only interpretation that can be biased by the small sample size and are to be treated with caution.

- Overall, the respondents from DGs valued the Utility of EIRA and CarTool slightly higher than the respondents from MS public administrations.
- All pilot phase participants agreed that EIRA has the potential to support interoperability, however MS representatives did not fully agree that it has value to contribute to cost and time saving, as the activities of documenting and updating the systems to the required extent require great undertaking;
- All respondents from the DGs strongly agreed that based on their pilot experiences, the CarTool has a potential value for supporting interoperability and contributing to cost and time saving. However, the pilot participants from the MS did not fully agree that the CarTool has this potential;
- Most of the pilot phase participants from the MS agreed that EIRA has the highest potential value for comparing, designing and documenting solution architectures and creating solution portfolios.

Based on the conclusions drawn, CGI-ACN adduces the following recommendation:

- It is recommended to carry out the informative seminars and workshops with interested parties from the MS that would promote and demonstrate the EIRA and CarTool's potential value for supporting interoperability and contributing to cost and time saving.

6. APPENDIX

6.1. STATEMENT MAPPING TO DIMENSIONS

In order to measure the Utility of the Action 2.1 and calculate the average score of each dimension, all survey statements were mapped to dimensions according to the evaluation criteria.

Table 18 shows the statement mapping according to the three Utility dimensions.

TABLE 18 – ACTION 2.1 SURVEY STATEMENT MAPPING TO DIMENSIONS

Question	ID	Value for EU	Value for EC	Value for cross-border and cross-sector interoperability	Count of areas covered by question
Designing and documenting solution architectures	U1	✓		✓	2
Comparing solution architectures	U2	✓		✓	2
Creating solution portfolios	U3	✓		✓	2
Managing solution portfolios	U4	✓		✓	2
Rationalising solution portfolios	U5	✓		✓	2
Supporting impact assessments on ICT	U6	✓		✓	2
Overall, based on my pilot experience, the EIRA has potential value for supporting interoperability	U7	✓		✓	2
Overall, based on my pilot experience, the EIRA has potential value to contribute to cost and time saving	U8	✓			1
Overall, based on my pilot experience, the CarTool has potential value for supporting interoperability	U9	✓		✓	2
Overall, based on my pilot experience, the identified functionalities of the CarTool have potential value to contribute to cost and time saving	U10	✓			1
# of questions covering dimension		10	0	8	
% of questions covering dimension		100%	0%	80%	

6.2. RAW DATA EXPORT

The attached file provides the survey result export.



Raw Data
Export.xlsx

6.3. GLOSSARY

- The mean¹⁴ (average) is the most popular measure of location or central tendency; has the desirable mathematical property of minimizing the variance. To get the mean, you add up the values for each case and divide that sum by the total number of cases;
- Mode refers to the most frequent, repeated or common value in the quantitative or qualitative data. In some cases it is possible that there are several modes or none;
- Standard deviation¹⁶ shows the spread, variability or dispersion of scores in a distribution of scores. It is a measure of the average amount the scores in a distribution deviate from the mean. The more widely the scores are spread out, the larger the standard deviation;
- Standard error¹⁶ is the standard deviation of the sampling distribution of a statistic. It is a measure of sampling error; it refers to error in estimates due to random fluctuations in samples. It goes down as the number of cases goes up. The smaller the standard error, the better the sample statistic is as an estimate of the population parameter – at least under most conditions;
- ‘Utility’ is defined as the extent to which the effects (impact) of an ISA action correspond with the needs, problems and issues to be addressed by the ISA programme¹¹;
- A Likert Scale is a widely used scaling method developed by Rensis Likert. Likert scale refers to the use of an ordinal 4- or 5- point rating scale with each point anchored or labelled;
- Weighted mean is a procedure for combining the means of two or more groups of different sizes; it takes the sizes of the groups into account when computing the overall or grand mean.