European Commission

INTEROPERABILITY SOLUTIONS FOR EUROPEAN PUBLIC ADMINISTRATIONS MONITORING AND EVALUATION

D03.05 ACTION 1.1 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 survey for measuring the Utility of Action 1.1 – Promoting Semantic Interoperability amongst the European Union Member States (SEMIC), was launched during the first semester of 2015. The goal of the survey was to understand and identify the SEMIC usefulness and the benefits that the users might gain from it.

The survey was designed in the EUSurvey tool and distributed by e-mail to 400 SEMIC stakeholders from:

- EU Public administrations at national level;
- EU Public administrations at regional level;
- EU Public administrations at local level;
- Public administrations of non EU-countries;
- EU institutions;
- Non-Governmental organizations;
- Academic;
- Private sector.

The survey was launched on the 9th of June 2015 and was active until the 3rd of July 2015. There were two reminders sent out – the first one on the 22nd of June and the second one on the 29th of June 2015. In total, 81 stakeholders responded to the survey.

The survey result analysis (see Table 1) shows the Action 1.1 Utility scores. The **Utility score** is **4.14** (scale: 1…5).

The detailed score calculation process is described in Section 4.1.3.

TABLE 1 – ACTION 1.1 SURVEY RESULTS

Evaluation criteria	Mean[1]	Mode[1]	StDev[1]	StErr[1]
Action 1.1 Utility	4.14	4	0.79	0.03

Conclusions: The good overall utility score indicates that the SEMIC stakeholders positively evaluate SEMIC and its solutions and agree to the majority of the value statements included in the survey. The findings present that SEMIC raises awareness on the need for semantic interoperability and that its solutions support the interoperability at the European, national and local level.

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[1] See Glossary (Section 6.4)

REVISION HISTORY

Date	Version	Description	Authors	Approved by
9-July-2015	0.10	Initial version	CGI-Accenture	
13-July-2015	0.20	Updated version	CGI-Accenture	
15-July-2015	0.30	Updated version	CGI-Accenture	
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	

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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 thirteen actions. This report covers the Utility measurement for the Action 1.1 – Promoting Semantic Interoperability amongst the European Union Member States (SEMIC).

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 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 List of organizations indicated as "Other";
  - 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 1.1 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[2].**

Utility is measured using an adaptation of the VAST (**V**alue **AS**sessment **T**ool) methodology[3], 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 It. 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 an information system or an 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. A 5-point Likert scale[4] is used as a grading scale, 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'.

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[2] DG BUDG (2004), "Evaluating EU activities, a practical guide for the Commission services"
[3] More information can be found on: http://ec.europa.eu/dgs/informatics/vast/
[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.

As the responses collected are depending on the users' profiles, the user is requested to answer skip logic questions with either 'Yes' or 'No' and afterwards more questions are presented if the respondent selected 'Yes'.

3. ACTION 1.1 SURVEY DATA SUMMARY

Table 2 gives an overview on the survey start date, end date, the sample size, the amount of responses collected and the survey launching method.

TABLE 2 – ACTION 1.1 SURVEY DATA SUMMARY

Action 1.1 – SEMIC	
Start date:	09/06/2015
End date:	03/07/2015
Sample size:	400
Amount of responses:	81
The survey launching method:	E-mail notification

4. ACTION 1.1 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 1.1 Utility survey;
- **Result Analysis According to the Evaluation Criteria** provides a score calculation by evaluation criteria dimensions and the overall evaluation criteria score.

4.1. ACTION 1.1 SURVEY RESULT OVERVIEW

Table 3 presents the Action 1.1 Utility survey respondent demographic profile. Almost one third (24) of respondents were from EU public administrations at national level, 18 were from EU institutions and 15 were from private sector. In total the respondents originated from 23 countries and seven respondents did not specify their country.

TABLE 3 – RESPONDENT DEMOGRAPHIC PROFILE

Group	Austria	Belgium	Bulgaria	Croatia	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Italy	Latvia	Luxembourg	Netherlands	Norway	Poland	Portugal	Romania	Slovakia	Spain	Sweden	United	Unspecified	Total
EU Public administrations at national level	2	1		2	2	1	3		1			1			6						2	1	1	1	**24**
Positions – Advisor content standards; Advisor standards; Assistant Minister (2); Business Analyst; Business Consultant; Enterprise architect (2); Governmental advisor; Head of data.gov.uk; Head of Division; Information management/knowledge technologies consultant; Interoperability Expert; IT Architect (2); Ministerial adviser; Project Manager; Public service development; Senior advisor; Senior E-Government expert; Specialist Adviser; Specialist Adviser at a eGovernment Department; Unspecified (2)																									
EU Public administrations at regional level																					2	1			**3**
Positions – CIO; GIS Analyst; Technical Advisor at the Aragon Government ICT area																									
EU Public administrations at local level					1			1																	**2**
Positions – Consultant; IT project manager																									
Public administrations of non EU-countries																1								1	**2**
Positions – Difi – Norway; Head of data exchange infrastructure division																									
EU institutions		4										5		3		1	1	1	1	2					**18**
Positions – Assistant; Deputy IRM; DG HOME, police information exchange; Enterprise Architecture Team Leader; Enterprise Architecture Team Leader; Head of ICT unit; Head of IT; Information Systems Architect; IT Expert; IT Project Manager; Management; Officer; Postdoctoral researcher; Project leader; Project officer; Scientific / Technical Project Officer; Senior consultant; Unspecified																									
Non-Governmental organisations								1				1									1		1	1	**5**
Positons – Data analyst and researcher; Principal Specialist responsible for development of IT solution for public administration (e-GOV); Project Coordinator; Unspecified (2)																									
Academic					1					2	1	1												2	**7**
Positions – Dean, Full professor; Research Associate; Research director of ISTC-CNR Laboratory for Applied Ontology, Trento; R&D Project Manager; Researcher; Assistant professor; PhD Student																									
Private sector			1					2	2				3		1								4	2	**15**
Positions – CEO; Consultant, CEO of SME; Consultant (2); Data Architect; Executive Director; Managing partner; Partner; Semantic web modeler; Software developer; Software Development Director (2); Systems analyst and project manager for local government open data; Unspecified (2)																									
Other		1		1								1									1		1		**5**
Positions – Consultant (2); EEA Public Administration at national level; Expert/coordinator/observer; Information officer																									
Grand Total	2	6	1	3	4	1	3	4	3	2	1	9	3	3	7	2	1	1	1	2	6	2	7	7	**81**

4.1.1. Overall Survey Response Overview

Figure 1 gives an overview of the overall survey results. The statements were graded based on the users who responded 'Yes' to the skip logic question (a question that directs a respondent to a series of questions based on their responses).

FIGURE 1 – OVERALL ACTION 1.1 SURVEY RESPONSE OVERVIEW
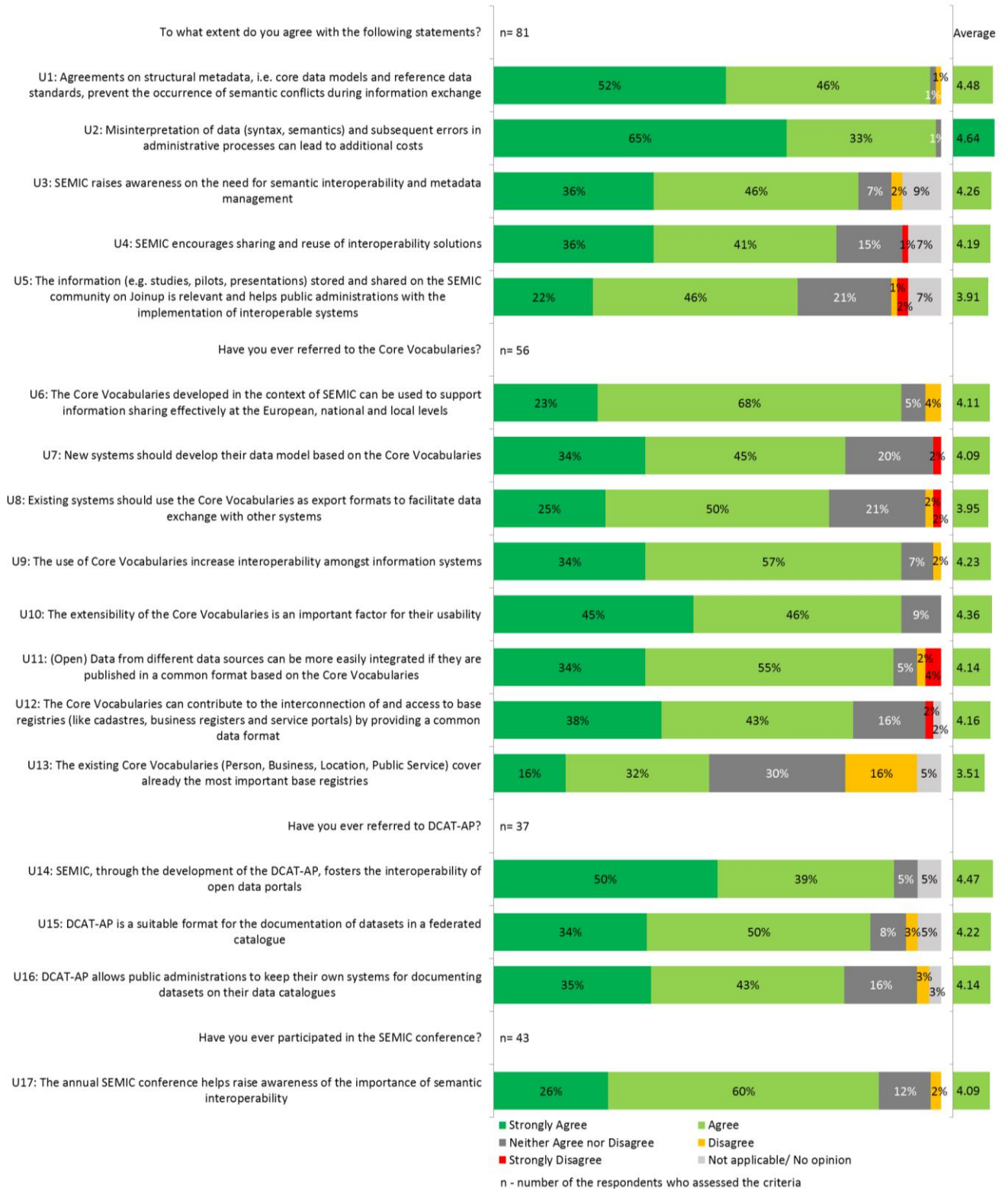
4.1.2. Comments and Recommendations

Table 4 and Table 5 present the feedback provided by the respondents. The original rhetoric has been preserved, with some stylistic/grammatical errors corrected.

The user comments were received once the respondent chose a 'Disagree' or 'Strongly Disagree' option to evaluate the survey statement.

TABLE 4 – ACTION 1.1 USER COMMENTS

General Comments	SEMIC is functionally invisible unless you're a contributor. It therefore fails to achieve its objectives.
Core Vocabularies	This is just a start to be effective. For example in financial and banking system transactions play a more important role.
	In the contextual level the 4 core vocabularies can interpret the connections. But there are several fields that need more than the 4 core vocabularies to be fully addressed such as statistical and weather data.
	In the Netherlands there are 13 base registers. Besides person, business and location (in different granularities) we have base registries for vehicles, cadastral data, income, allowance/social benefits and real estate.
	The core vocabularies is a base to develop data models that fit business activities. It's not so important to reuse exactly the core vocabularies than linking the data model used to the core vocabularies. Interoperability should be reached not only among public sector but also with private activities. Core vocabularies developed in the framework of ISA programme is one business view, the key is to link the different business views.
	Missing governance of core concepts: Handing over to W3C needs to be discussed. Not sure whether this is a sustainable way ISA doing and paying the work and W3C benefitting. Missing key concepts: Public Agency, Period, Country / Member State.
	Need additional Core Voc: Domain core components, Time, Motivation.
DCAT Application Profile	DCAT-AP already includes some information that can be used to document data in a federated environment, but this needs to be extended and supported more consistently to address all the requirements of federated catalogues. This applies, e.g. to provenance information, that currently DCAT-AP supports in a limited way. Another big issue is about the enforcement of effective and efficient harvesting mechanism. E.g., when the same metadata record is already published in different data portals, there should be a way to be able to understand that this is actually the same record, which is the latest version, etc.
	Depends if it is possible to map the catalogues content to DCAT-AP.

TABLE 5 – ACTION 1.1 RESPONDENTS' RECOMMENDATIONS

Recommendations for an Improvement	Be more visible and approachable.
	Work more on shared open source components, federated web services, catalogues, wiki, RDF/SPARQL end points, MEAN stack. More knowledge sharing activities.
	SEMIC need to look into the ontology issues regarding metadata describing of biometric data, and archiving of electronic data (as assets).
	Structural metadata, core data models (e.g. core vocabularies) and reference data standards should be technologically neutral and agnostic focusing exclusively on the semantics and exchange mechanisms, allowing a range of different technologies for implementation. There is currently certain technological bias towards semantic web technologies that could be somehow slowing down progress given their novelty and perceived complexity by most of public administrations, where there is also a lack of expertise on them.

I am aware for SEMIC and the Core Vocabularies. In an ideal world I would like to have been able to give more strongly positive (agreeing) answers than the more or less neutral answers that I have given. In particular I have tried to use the Core Location vocabulary for expressing UK addresses in RDF. However, given the third party data I was trying to map, I was not able to do so. In fact I choose to map to the W3C vCard ontology. It would be good for SEMIC to present some definitive mappings between other common (national) addressing models: vCard, Schema.org: Address and for the UK BS7666.

Next step: legislation.

Make SEMIC have 'public' (specifier) visibility - maybe by promoting stable and agreed content as 'standards'?

The Core Vocabularies are too generic and over-simplified, so that they can't play any role in disambiguating critical terms used in public administration. Especially, there is no attempt to provide general notions which are robust enough to account for the legal implications of terms used in public administration. For example, no attempt is made to characterise crucial notions such as public service or juridical person. Moreover, the temporal dimension is completely ignored, while it would be very important to characterise the crucial events in the life of a citizen or a company.

Use interoperable formats to speak about interoperability instead of class diagrams or similar. This would foster: 1. The practical implementation of the interoperable assets 2. The credibility of the project.

Relationship to IOP NIF documents, connection points to IOP-O, IOP-L as well as IOP-T out of IOP-S semantic benchmarks of implementations & best practice communication.

As coordinator of a project using semantic data for interoperability of various business applications, beyond metadata models, there is a need to identify and (re)use data that are essentials to interoperability (references) such as geographical data (cities, regions...). Having the same data model is not enough, data reconciliation is a heavy work and can be an obstacle for service providers.

The "Interoperability State of play" KPMG report seems to be very different in contrast to what ISA SEMIC community says about the world. Please consider harmonising both activities (e.g. for Germany it is said having 81% NIF compliance but in real no compliance at all beside the federal level).

EU tends to use W3C voc and technology (RDF, DCAT ...). Most part of data in ER DB, so OMG and OASIS technology (SIMF, Odata) can be helpful.

Use XBRL or similar language to develop an extendable Core Vocabulary scheme. XBRL is used by banks, regulators, tax agencies, business registers.... and is the only self-explaining language available to speak between all those sectors.

Why is so difficult to use one vocabulary in some countries?

Other Recommendations	More user-friendly website and easier access to resources + e-learning modules/videos.
	A common EU vocabulary recommendation for RDF - translated into all EU + coming member states languages. The translation has to be confirmed by certified translators, and trough this translation SEMIC will have a real fundament for our future work.
	SEMIC has been in the air for quite a long time without much success. It is time to conclude and try another approach.
	I think that no cross border interoperability will be achieved until the identification structure is defined on the EU level. We have experienced problems regarding the exchange of voters during the election for the EU Parliament. It was impossible to identify people since we received names of voters written without special characters that we use in Croatia.
	A serious attempt should be made to move from the Core Vocabularies to a Reference Ontology for European Public Administration. Europe has a leading role in ontologies worldwide, and can

certainly provide the competence for this task. It is just a matter of involving the research community in the proper way.

Rather a comment: I was pleasantly surprised to see the ISA DCAT (and core vocab, persistent URI...) brochures at the open data conference of the Flemish Region. This really helps to explain / promote SEMIC assets.

Direct reuse of UBL - UBL as core components (EUCC). Else - SEMIC mapping (standard) between the UBL standard (e.g. PEPPOL), and the SEMIC core components (SECC). Establish the fundamentals for a UBL catalogue for EU Public Services to the citizens, based on a common catalogue for the Public Administrations - using at "bottom-up" approach.

Keep on going.

Be less generic on Interoperability, but more specific on semantic interoperability: More business specific interoperability for access to base registries and less general Open Data for everyone. Codelist and reference metadata, How does r3gistry relate to other ISA activities? Is there still a DIGIT Semantic interoperability ribbon that states that a pan-European data exchange project cares for interoperability? ` Where do Member States get a binding country code list from for their national / international data exchange projects?

4.1.3. 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 5-point Likert scale range values need to be 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 w**as 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**[5] (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[6] for each case and divide that sum by the total number of cases;
- **Mode** refers to the most frequent, repeated or common value[6] 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**[7] 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. The **minimum** standard deviation value is **0** which indicates that all answers had the same score, the **maximum** possible standard deviation value is **2,02**[8] that occurs when the values are equally split across the extremes;
- **Standard error**[7] 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 2, the statements were mapped to two Utility dimensions. The detailed mapping of the statements is described in Section 6.1.

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[5] Dictionary of statistics & methodology: a nontechnical guide for the social sciences (page 226).
[6] 5-point Likert scale range values are interpreted as numeric values like described in Section 4.1.3.
[7] Dictionary of statistics & methodology: a nontechnical guide for the social sciences (page 375).
[8] The value has been calculated by equally splitting the max and min score values across the extremes.

4.1.3.1. RESULT ANALYSIS AT STATEMENT LEVEL

Table 6 presents the detailed analysis of each utility statement.

TABLE 6 – ACTION 1.1 UTILITY SCORE DETAILS ON STATEMENT LEVEL

Statement	Mean	Mode	StDev	StErr	Dimension
U1: Agreements on structural metadata, i.e. core data models and reference data standards, prevent the occurrence of semantic conflicts during information exchange	4.48	5	0.60	0.07	Value for cross-border and cross-sector interoperability
U2: Misinterpretation of data (syntax, semantics) and subsequent errors in administrative processes can lead to additional costs	4.64	5	0.51	0.06	Value for EU
U3: SEMIC raises awareness on the need for semantic interoperability and metadata management	4.26	4	0.71	0.08	Value for cross-border and cross-sector interoperability
U4: SEMIC encourages sharing and reuse of interoperability solutions	4.19	4	0.79	0.09	Value for EU / Value for cross-border and cross-sector interoperability
U5: The information (e.g. studies, pilots, presentations) stored and shared on the SEMIC community on Joinup is relevant and helps public administrations with the implementation of interoperable systems	3.91	4	0.87	0.10	Value for EU / Value for cross-border and cross-sector interoperability
U6: The Core Vocabularies developed in the context of SEMIC can be used to support information sharing effectively at the European, national and local levels	4.11	4	0.66	0.09	Value for EU / Value for cross-border and cross-sector interoperability
U7: New systems should develop their data model based on the Core Vocabularies	4.09	4	0.83	0.11	Value for cross-border and cross-sector interoperability
U8: Existing systems should use the Core Vocabularies as export formats to facilitate data exchange with other systems	3.95	4	0.84	0.11	Value for cross-border and cross-sector interoperability
U9: The use of Core Vocabularies increase interoperability amongst information systems	4.23	4	0.67	0.09	Value for cross-border and cross-sector interoperability
U10: The extensibility of the Core Vocabularies is an important factor for their usability	4.36	4	0.62	0.09	Value for cross-border and cross-sector interoperability
U11: (Open) Data from different data sources can be more easily integrated if they are published in a common format based on the Core Vocabularies	4.14	4	0.89	0.12	Value for cross-border and cross-sector interoperability
U12: The Core Vocabularies can contribute to the interconnection of and access to base registries (like cadastres, business registers and service portals) by providing a common data format	4.16	4	0.84	0.11	Value for cross-border and cross-sector interoperability

Statement	Mean	Mode	StDev	StErr	Dimension
U13: The existing Core Vocabularies (Person, Business, Location, Public Service) cover already the most important base registries	3.51	4	0.98	0.13	Value for EU
					Value for cross-border and cross-sector interoperability
U14: SEMIC, through the development of the DCAT-AP, fosters the interoperability of open data portals	4.47	5	0.61	0.10	Value for cross-border and cross-sector interoperability
U15: DCAT-AP is a suitable format for the documentation of datasets in a federated catalogue	4.22	4	0.72	0.12	Value for cross-border and cross-sector interoperability
U16: DCAT-AP allows public administrations to keep their own systems for documenting datasets on their data catalogues	4.14	4	0.80	0.13	Value for cross-border and cross-sector interoperability
U17: The annual SEMIC conference helps raise awareness of the importance of semantic interoperability	4.09	4	0.68	0.10	Value for cross-border and cross-sector interoperability

4.1.3.2. OVERALL UTILITY RESULT ANALYSIS

Table 7 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 UTILITY IS 4.14 **WITH THE STANDARD DEVIATION EQUAL TO** 0.79**, ON A SCALE FROM 1 TO 5, WHERE 5 IS THE MAXIMUM (BEST) VALUE.**

Figure 2 gives a visual overview on the Utility coverage per two predefined dimensions.

TABLE 7 – ACTION 1.1 UTILITY SCORE DETAILS

	MEAN	MODE	StDev	StErr	Dimension	Weight
Per dimension	4.11	4	0.85	0.05	Value for EU	0.24
	4.15	4	0.79	0.03	Value for cross-border and cross-sector interoperability	0.76
	-	-	-	-	Value for EC	-
Utility	**4.14[9]**	**4**	**0.79**	**0.03**		

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[9] 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.

FIGURE 2 – ACTION 1.1 UTILITY AGGREGATION
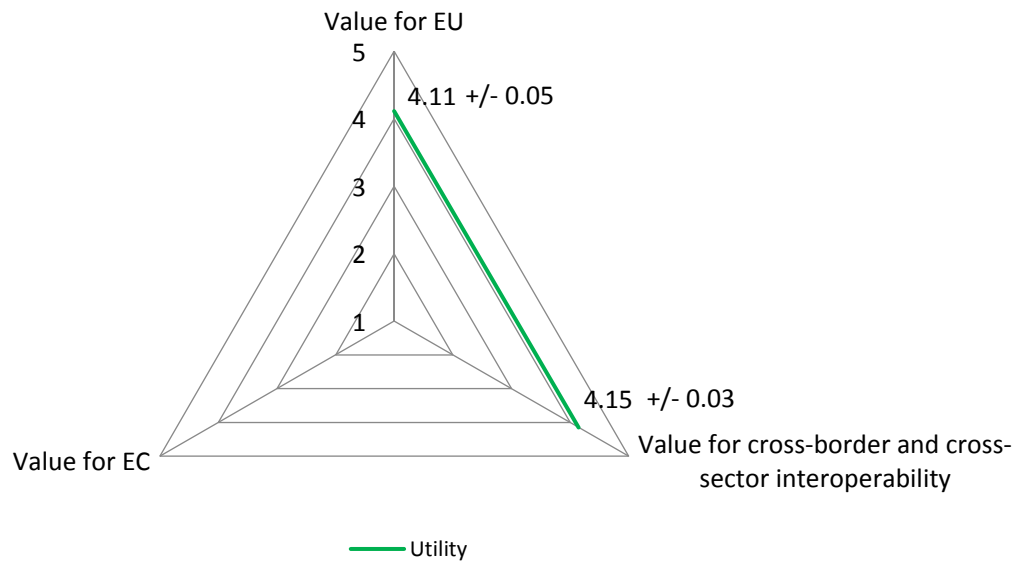
4.2. STRENGTHS AND WEAKNESSES

This section provides an overview of the strong and weak aspects of SEMIC revealed by the Action 1.1 Utility survey.

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

- A Green colour applies to statements that refer to the SEMIC's strong aspects;
- A Grey colour applies to a statement that refers to the aspect that requires attention. For that statement, the respondent opinion was spread proportionally between 'Agree' and 'Disagree';
- An Orange colour applies to statements that refer to the SEMIC's weak aspects. Due to high overall ratings, no aspects were classified as weak, therefore no statements were marked with orange colour.

Table 8 presents an overview of the aspects that are strong or require attention of SEMIC in the context of Utility.

TABLE 8 – ACTION 1.1 UTILITY STRENGTHS AND WEAKNESSES

Utility statement	Mean	Dimension
U2: Misinterpretation of data (syntax, semantics) and subsequent errors in administrative processes can lead to additional costs	4.64	Value for EU
U1: Agreements on structural metadata, i.e. core data models and reference data standards, prevent the occurrence of semantic conflicts during information exchange	4.48	Value for cross-border and cross-sector interoperability
U14: SEMIC, through the development of the DCAT-AP, fosters the interoperability of open data portals	4.47	Value for cross-border and cross-sector interoperability
U10: The extensibility of the Core Vocabularies is an important factor for their usability	4.36	Value for cross-border and cross-sector interoperability
U3: SEMIC raises awareness on the need for semantic interoperability and metadata management	4.26	Value for cross-border and cross-sector interoperability
U9: The use of Core Vocabularies increase interoperability amongst information systems	4.23	Value for cross-border and cross-sector interoperability
U15: DCAT-AP is a suitable format for the documentation of datasets in a federated catalogue	4.22	Value for cross-border and cross-sector interoperability
U4: SEMIC encourages sharing and reuse of interoperability solutions	4.19	Value for EU / Value for cross-border and cross-sector interoperability
U12: The Core Vocabularies can contribute to the interconnection of and access to base registries (like cadastres, business registers and service portals) by providing a common data format	4.16	Value for cross-border and cross-sector interoperability
U11: (Open) Data from different data sources can be more easily integrated if they are published in a common format based on the Core Vocabularies	4.14	Value for cross-border and cross-sector interoperability
U16: DCAT-AP allows public administrations to keep their own systems for documenting datasets on their data catalogues	4.14	Value for cross-border and cross-sector interoperability
U6: The Core Vocabularies developed in the context of SEMIC can be used to support information sharing effectively at the European, national and local levels	4.11	Value for EU / Value for cross-border and cross-sector interoperability

Utility statement	Mean	Dimension
U17: The annual SEMIC conference helps raise awareness of the importance of semantic interoperability	4.09	Value for cross-border and cross-sector interoperability
U7: New systems should develop their data model based on the Core Vocabularies	4.09	Value for cross-border and cross-sector interoperability
U8: Existing systems should use the Core Vocabularies as export formats to facilitate data exchange with other systems	3.95	Value for cross-border and cross-sector interoperability
U5: The information (e.g. studies, pilots, presentations) stored and shared on the SEMIC community on Joinup is relevant and helps public administrations with the implementation of interoperable systems	3.91	Value for EU
		Value for cross-border and cross-sector interoperability
U13: The existing Core Vocabularies (Person, Business, Location, Public Service) cover already the most important base registries	3.51	Value for EU
		Value for cross-border and cross-sector interoperability

5. CONCLUSIONS AND RECOMMENDATIONS

The objective of the survey was to evaluate the Utility of Action 1.1 – Promoting Semantic Interoperability amongst the European Union Member States (SEMIC). The following conclusions and recommendations have been drawn based on the analysis performed.

- The good overall utility score indicates that SEMIC stakeholders positively evaluate SEMIC and its solutions and agree to the majority of value statements included in the survey;
- The findings present that SEMIC raises awareness on the need for semantic interoperability and its solutions support interoperability at the European, national and local levels;
- The findings present that several respondents disagree that the current Core Vocabularies cover the most important base registries.

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

- Taking into consideration the user feedback presented in Table 4 and Table 5, it is recommended to add more core vocabularies and organise the knowledge sharing and learning activities.

6. APPENDIX

6.1. STATEMENT MAPPING TO DIMENSIONS

In order to measure the Utility of the Action 1.1 and calculate the average score of each dimension, all survey statements were mapped to dimensions according to the evaluation criteria.

Table 9 shows the statement mapping according to the three Utility dimensions.

TABLE 9 – ACTION 1.1 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
Agreements on structural metadata, i.e. core data models and reference data standards, prevent the occurrence of semantic conflicts during information exchange	U1			✓	1
Misinterpretation of data (syntax, semantics) and subsequent errors in administrative processes can lead to additional costs	U2	✓			1
SEMIC raises awareness on the need for semantic interoperability and metadata management	U3			✓	1
SEMIC encourages sharing and reuse of interoperability solutions	U4	✓		✓	2
The information (e.g. studies, pilots, presentations) stored and shared on the SEMIC community on Joinup is relevant and helps public administrations with the implementation of interoperable systems	U5	✓		✓	2
The Core Vocabularies developed in the context of SEMIC can be used to support information sharing effectively at the European, national and local levels	U6	✓		✓	2
New systems should develop their data model based on the Core Vocabularies	U7			✓	1
Existing systems should use the Core Vocabularies as export formats to facilitate data exchange with other systems	U8			✓	1
The use of Core Vocabularies increase interoperability amongst information systems	U9			✓	1
The extensibility of the Core Vocabularies is an important factor for their usability	U10			✓	1
(Open) Data from different data sources can be more easily integrated if they are published in a common format based on the Core Vocabularies	U11			✓	1
The Core Vocabularies can contribute to the interconnection of and access to base registries (like cadastres, business registers and service portals) by providing a common data format	U12			✓	1
The existing Core Vocabularies (Person, Business, Location, Public Service) cover already the most important base registries	U13	✓		✓	2
SEMIC, through the development of the DCAT-AP, fosters the interoperability of open data portals	U14			✓	1
DCAT-AP is a suitable format for the documentation of datasets in a federated catalogue	U15			✓	1
DCAT-AP allows public administrations to keep their own systems for documenting datasets on their data catalogues	U16			✓	1

Question	ID	Value for EU	Value for EC	Value for cross-border and cross-sector interoperability	Count of areas covered by question
The annual SEMIC conference helps raise awareness of the importance of semantic interoperability	U17			✓	1
# of questions covering dimension		5	0	16	
% of questions covering dimension		29%	0%	94%	

6.2. LIST OF ORGANISATIONS INDICATED AS "OTHER"

Table 10 shows a detailed list of answers that were provided by respondents that chose the option "Other" to the question regarding their organisation.

TABLE 10 – LIST OF "OTHER" ORGANISATIONS

Organisation	Local government
	Independent
	Norwegian Mapping Authority
	Expert/coordinator/observer
	FAO of the UN

6.3. RAW DATA EXPORT

The attached file provides the survey result export.

RawDataExport.xls

6.4. GLOSSARY

- The mean[5] (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[6] for each case and divide that sum by the total number of cases;

- Mode refers to the most frequent, repeated or common value6 in the quantitative or qualitative data. In some cases it is possible that there are several modes or none;

- Standard deviation7 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 error7 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 programme2;

- 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.