



Inspire Policy Making with Territorial Evidence

FINAL REPORT //

DIGISER

Digital Innovation in Governance and Public
Service Provision

Annex 1.2.6 Societal Engagement and Procurement Report //
April 2022

This Final Report is conducted within the framework of the ESPON 2020 Cooperation Programme, partly financed by the European Regional Development Fund.

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States, the United Kingdom and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

This delivery does not necessarily reflect the opinions of members of the ESPON 2020 Monitoring Committee.

Coordination

ESPON EGTC: Martin Gauk, Caroline Clause

Authors

OASC: Martin Brynskov, Geni Raitisoja, Margarida Campolargo,

IS-practice: Hugo Kerschot

Politecnico di Milano: Prof. Grazia Concilio, Dr. Irene Bianchi, MSc. Francesco Fagiani, Dr Matteo Fontana, Dr. Ilaria Mariani, Dr. Michelangelo Secchi, with the support of MSc

Mathyas Giudici, MSc Giulia Mussi, MSc Federico Rita

CPC: Dr. Isaac Sserwanja, Bin Guan, Dr. Reza Akhavan

Deloitte: Diogo Santos, Jean Barroca, Ana Vaz Raposo, Ana Robalo Correia, Andreas Steinbach, João Carvalho Fachada

Advisory group

Kadri Jushkin (Ministry of Finance Estonia), Eedi Sepp (Ministry of Finance Estonia), Akim Oural (Lille Metropole), Paulo Calçada (Porto Digital), Markku Markkula (Helsinki-Uusimaa Region), Lodewijk Noordzij (Eurocities), Wim De Kinderen (ENoLL), Olli Voutilainen (Finnish Ministry of Economic Affairs and Employment), Tanguy Coenen (imec), Martin Brynskov (Aarhus University), Gianluca Misuraca (Krems University), Serge Novaretti and Stefanos Kotoglou (EC-DG Connect), Bert Kuby (Committee of the Regions), Paresa Markianidou (Technopolis Group)

Information on ESPON and its projects can be found at www.espon.eu.

The website provides the possibility to download and examine the most recent documents produced by finalised and ongoing ESPON projects.

© ESPON, 2022

Published on paper produced environmentally friendly

ISBN: 978-2-919816-68-2

Graphic design by BGRAPHIC, Denmark

Printing, reproduction or quotation is authorised provided the source is acknowledged and a copy is forwarded to the ESPON EGTC in Luxembourg.

Contact: info@espon.eu



Inspire Policy Making with Territorial Evidence

FINAL REPORT //

DIGISER

Digital Innovation in Governance and Public
Service Provision

Annex 1.2.6 Societal Engagement and Procurement Re-
port // April 2022

Table of contents

Abbreviations.....	9
1 Introduction	10
1.1 DPSVI Definition and structure.....	10
1.2 DPSVI Methodology	12
1.2.1 Mapping questions and answers.....	12
1.2.2 Standardization	14
1.2.3 Aggregation	14
1.3 Technical note: how to read charts	15
1.3.1 Key info for DPSVI charts and Maps.....	15
1.3.1.1 Index type.....	15
1.3.1.2 Index type.....	15
1.3.1.3 Data sample	15
1.3.1.4 Cluster	15
1.3.2 Key info for Q charts.....	16
1.3.2.1 Question type	16
1.3.2.2 Data sample	16
1.3.2.3 Cluster	16
1.3.2.4 Value	17
2 Societal Engagement in Public Policy and Services in European Cities	18
2.1 Definition of the indices and exploration of its structure	18
2.1.1 Mapping Details.....	18
2.1.2 Aggregation details.....	19
2.2 Index overview	20
2.3 Population	22
2.4 GDP per Capita	22
2.5 Authority Type	23
2.6 Case Studies	23
2.7 Highlights.....	24
3 Co-creation of European Cities.....	25
3.1 Definition of the indices and exploration of its structure	25
3.2 Population	27
3.3 GDP per Capita	27
3.4 Authority Type	28
3.5 Case studies.....	28
3.6 Relevant question results.....	29
3.6.1 Does your public authority use service-related data to improve your digital service offer in the following areas?	29
3.6.2 Are you actively engaging one or more of the following communities in your public authority's co-design activities?	29
3.7 Highlights.....	30
4 E-participation of European Cities.....	31
4.1 Definition of the indices and exploration of its structure	31
4.2 Population	33
4.3 GDP per Capita	33
4.4 Authority Type	34
4.5 Case studies.....	34
4.6 Relevant question results.....	35
4.6.1 Does your public authority use platforms to actively engage with citizens?.....	35

4.6.2	Referring to the most successful initiative of the past year (2020), select the range of the participation percentage achieved through the use of one of the platforms above	35
4.7	Highlights.....	36
5	Social Media Presence of European Cities	37
5.1	Definition of the indices and exploration of its structure	37
5.2	Population	39
5.3	GDP per Capita	39
5.4	Authority Type	40
5.5	Case studies.....	40
5.6	Relevant question results	41
5.6.1	Please select which social media platform(s):.....	41
5.7	Highlights.....	41
6	Innovative procurement in European Cities.....	42
6.1	Definition of the indices and exploration of its structure	42
6.1.1	Mapping Details.....	42
6.1.2	Aggregation details.....	43
6.2	Index overview	44
6.3	Population	45
6.4	GDP per Capita	45
6.5	Authority Type	46
6.6	Case studies.....	46
6.7	Relevant question results	47
6.7.1	Does your public authority have or use an e-procurement platform?.....	47
6.7.2	What licenses are used to publish data openly on your data platform?	47
6.7.3	Are the tenders for procuring innovative digital services/goods including the following requirements?	48
6.8	Highlights.....	48

List of maps, figures, charts and tables

List of maps

Map 1 – Societal Engagement and population size	21
Map 2 – Societal Engagement and GDPPC size	21
Map 3 – Co-creation and population size	26
Map 4 – Co-creation and GDPPC size	26
Map 5 – E-participation and population size	31
Map 6 – E-participation and GDPPC size	32
Map 7 – Social Media Presence and population size	37
Map 8 – Social Media Presence and GDPPC size	38
Map 9 – Procurement and population size	44
Map 10 – Procurement and GDPPC size	44

List of figures

Figure 1 - DPSVI Structure	10
Figure 2 - DPSVI detailed structure – Questions	13
Figure 3 – Societal Engagement index composition (questions tree)	18
Figure 4 – Societal Engagement overview	20
Figure 5 - Societal Engagement composition	20
Figure 6 - Societal Engagement by population	22
Figure 7 - Societal Engagement by GDPC	22
Figure 8 - Societal Engagement by authority type	23
Figure 9 - Societal Engagement, case studies	23
Figure 10 – Co-creation index composition (questions tree)	25
Figure 11 - Co-creation by population	27
Figure 12 - Co-creation by GDPC	27
Figure 13 - Co-creation by authority type	28
Figure 14 - Co-creation, case studies	28
Figure 15 – Service-related data for service design	29
Figure 16 – Inclusive Engagement in Co-design	29
Figure 17 – E-participation index composition (questions tree)	31
Figure 18 - E-participation by population	33
Figure 19 - E-participation by GDPC	33
Figure 20 - E-participation by authority type	34
Figure 21 - E-participation, case studies	34
Figure 22 – Collaborative Platforms and main Functions	35
Figure 23 – Quantitative Engagement Metrics	35
Figure 24 – Social Media Presence index composition (questions tree)	37
Figure 25 - Social Media Presence by population	39
Figure 26 - Social Media Presence by GDPC	39
Figure 27 - Social Media Presence by authority type	40
Figure 28 - Social Media Presence, case studies	40
Figure 29 – Social media presence	41
Figure 30 – Procurement index composition (questions tree)	42
Figure 31 - Procurement by population	45
Figure 32 - Procurement by GDPC	45
Figure 33 - Procurement by authority type	46
Figure 34 - Procurement, case studies	46
Figure 35 – Use of E-procurement Platforms	47
Figure 36 – Procurement of innovation	47

Figure 37 – Requirements in Public Tenders	48
--	----

List of tables

Table 1 - Composite indexes of DPSVI	12
Table 2 - Standardization methods overview	14
Table 3 – Index charts legend	15
Table 4 – Question charts legend.....	16
Table 5 – Societal Engagement related Questions in DIGISURVEY	19
Table 6 – Societal Engagement - Relative weight of underlying questions.....	19
Table 7 – Procurement related Questions in DIGISURVEY	43
Table 8 – Procurement - Relative weight of underlying questions	43

Abbreviations

API	Application Programming Interface
DESI	Digital Economy and Society Index
DIGISER	Digital Innovation in Governance and Public Service Provision
DIGISURVEY	The survey deployed during DIGISER with 255 respondent cities
DPSVI	Digital Public Value Service Index
EAB	European Advisory Board
EDCI	European Digital City Index
EIF	European Interoperability Framework
ESPON	European Spatial Planning Observation Network
EU	European Union
EU ODP	European Union Open Data Portal
FUA	Functional Urban Areas
GDC	Green Digital Charter
GDP	Gross Domestic Product
GDPpc	Gross Domestic Product per Capita
GDPR	General Data Protection Regulation
ICC	Intelligent City Challenge
ICT	Information and Communications Technology
KPI	Key Performance Indicator
LAU	Local Administrative Units
LEA	Learning Technology Accelerator
NUTS	Nomenclature of Territorial Units for Statistics
OASC	Open and Agile Smart Cities
OECD	Organisation for Economic Co-operation and Development
OGD	Open Government Data
PA	Public Administration
PCP	Pre-Commercial Procurement
Q_	Question (in Digiser Survey)
R&D	Research and Development
SAB	Scientific Advisory Board
SAG	Scientific Advisory Group
SDGs	Sustainable Development Goals
SEM	Structural Equation Modelling
SI	Service area Index
T-LL	Triple-Loop Learning
ToR	Terms of Reference
UNDP	United Nations Development Programme
Reference Sample	It refers to 156 cities intended to be the best approximation attainable that could be considered as representative of the variety of European cities.

1 Introduction

This document present one part of the results of the analysis of the DPSVI, the Digital Public Service Value Index.

One of the main goals of DIGISER has been indeed the development of indicators capable of capturing and synthetically describing the performance of cities in the digital transition and their ability to drive this transition towards the creation of public value. This work resulted in the development of the DPSVI, Digital Public Service Value Index (DPSVI), that is reported in detail in the *Annex 1.1 Extended Methodology*.

In summary, the DPSVI is conceived as a multi-level composite index, nourished by primary data collected through a questionnaire (DIGISURVEY) targeting European cities.

These data have been processed and combined to feed a system of composite indicators that provide a synthetic assessment of the performance of cities in relation to complex phenomena underlying digital transformation in European cities.

1.1 DPSVI Definition and structure

The DPSVI and its other sub-indices are meant to be a concise **measurement of the performance of each city** with respect to several phenomena, that are explored through the combination and cross-checking of the answers to several single questions.

The core data model for the computation of the DPSVI, developed on top of the conceptual framework described in the *Annex 1.1 Extended Methodology*, is represented in the following picture:

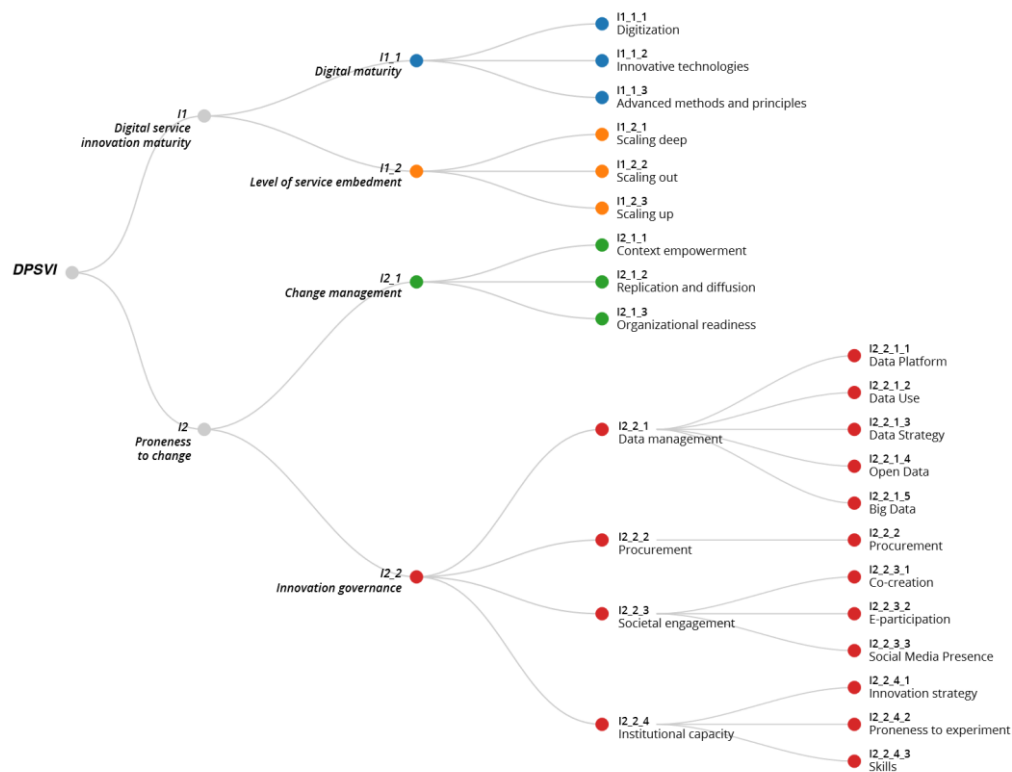


Figure 1 - DPSVI Structure

Overall, the DPSVI is composed of 31 Composite indexes that are organized in three groups (cfr. Table 1 - Composite indexes of DPSVI):

- 3 Top Indexes: are the apical indexes including the DPSVI itself and the two pillars (I1 DIGITAL SERVICE INNOVATION MATURITY and I2 PRONENESS TO CHANGE)
- 21 Bottom Indexes: the indexes directly generated on top of DIGISURVEY data
- 7 Intermediate Indexes: the other indexes in intermediate positions

Code	Label	Level	Description
I1	DIGITAL SERVICE INNOVATION MATURITY	Top	It explores the degree of penetration and maturity of technical and organizational innovation in public service delivery
I1_1	Digital maturity	Intermediate	It assesses the level of digitalization of the public authority, intended not only as shift toward digital technologies, but also encompassing the related organizational change, namely the delivery of innovative public services
I1_1_1	Digitization	Bottom	It focuses on the degree of digitization of pre-existing internal procedures either ancillary or directly related to public service delivery
I1_1_2	Innovative technologies	Bottom	It explores the degree of adoption of innovative technologies (AI, blockchain, wearables, etc.)
I1_1_3	Advanced methods and principles	Bottom	It analyses the level of consistency of methods and principles used to increase the digitalization level of the public authority
I1_2	Level of service embedment	Intermediate	It indicates the extent to which the innovation of services is pervasive and has already generated changes
I1_2_1	Scaling deep	Bottom	It indicates the extent to which the innovation of services is pervasive and has already generated changes in the local context, at societal level
I1_2_2	Scaling out	Bottom	It indicates the extent to which the innovation of services has already generated changes either by replicating successful innovations from other contexts or exported elsewhere the innovations experimented locally
I1_2_3	Scaling up	Bottom	It indicates the extent to which the innovation of services is pervasive and has already generated changes within the organization of the public authority
I2	PRONENESS TO CHANGE	Top	It assesses the inclination or readiness of the public authority to change and alter its behaviour, vision, procedures, and its preparedness to integrate and amplify innovations
I2_1	Change management	Intermediate	The capacity of public administrations to put in play a set of actions, norms, policies, and tools either to proactively support innovation in digital service development and provision, or to increase its capacity to detect and adopt innovation dynamics developed in different contexts (within the context, or towards or from other contexts).
I2_1_1	Context empowerment	Bottom	It measures the effectiveness of the strategies, developed by the public authority, to ensure impacts of innovation within in the local context, at societal level, e.g. instillation of cultural values oriented to innovation and change; encouragement for the development of sustainable relationships
I2_1_2	Replication and diffusion	Bottom	It measures the effectiveness of the strategies developed to ensure replicability in other contexts to the innovations experimented locally, so to impact a larger number of citizens or communities
I2_1_3	Organizational readiness	Bottom	It measures the effectiveness of the strategies developed to ensure impacts of innovation within the organization of the public authority
I2_2	Innovation governance	Intermediate	It refers to the way in which the public authority uses transversal administrative processes (data management, societal engagement, public procurement, capacity building) as a leverage to promote cross-sectoral digital innovation
I2_2_1	Data management	Intermediate	It assesses the innovation capacity of data management strategies used by the public organization
I2_2_1_1	<i>Data Platform</i>	Bottom	It assesses the features of the data platform and the consistency between data management strategy and its underlying technical infrastructure
I2_2_1_2	<i>Data Use</i>	Bottom	It explores, from an operational perspective, how data are used by the public administration for the purposes of evaluation and monitoring, delivery, and anticipation and planning.

Code	Label	Level	Description
I2_2_1_3	Data Strategy	Bottom	It investigates whether the definition and the embrace of governance models effectively set appropriate and favorable conditions for data-driven, data-informed, or data-aware decisions and services for creating public value.
I2_2_1_4	Open Data	Bottom	It provides an overview of the degree of application of open data principles, practices, and framework, that are meant to improve performance and efficiency of government services in general
I2_2_1_5	Big Data	Bottom	It refers to the capacity of the city to generate, manage and use big data
I2_2_2	Procurement	Bottom	It assesses the level of digitalization of the public procurement processes within the public authority and their orientation to digital innovation
I2_2_3	Societal engagement	Intermediate	It provides an overview of the intensity and level of digitalization of societal engagement policies, and their impact on public service design and innovation
I2_2_3_1	Co-creation	Bottom	It gives the level of involvement of the citizens in service design and innovation
I2_2_3_2	E-participation	Bottom	It refers to the level reached by the municipality in involving citizens and/or communities through digital platforms
I2_2_3_3	Social Media Presence	Bottom	It provides information about how pervasive the communication via social media by the municipality is
I2_2_4	Institutional capacity	Intermediate	It refers to the institutional capacity of the public authority in relation to the experimentation and consolidation of digital innovation
I2_2_4_1	Innovation strategy	Bottom	It provides information about the agenda setting and pursuing capacity in relation to digital innovation strategies
I2_2_4_2	Proneness to experiment	Bottom	It analyses the readiness to experiment new organizational settings and methods within the public authority
I2_2_4_3	Skills	Bottom	It assesses the availability, within the public authority, of skills as key to the management of digital innovation

Table 1 - Composite indexes of DPSVI

1.2 DPSVI Methodology

The computation of indexes followed three steps.

- **Mapping** In this first step the DIGISURVEY's questions and answers are mapped to the indexes
- **Standardization:** this second step aims at transforming each question mapped to an index in a standardized value on the scale 0,00-1,00, converting the raw answers provided by the cities into numerical values via data coding and/or standardization techniques.
- **Aggregation:** in this final step the standardized numerical values obtained from the questions are aggregated and combined into indexes according to the hierarchy established in the Data Model. The value of indexes corresponds to a weighted average of the values of the questions aggregated.

1.2.1 Mapping questions and answers

The first step of data processing has been the detailed mapping of questions to the 21 Bottom Indexes, that are the ones directly generated on top of the raw data collected with the Digisurvey, while the other indexes are resulting from a successive aggregation between composite indexes.

Figure 2 maps the detailed relation between the questions of the DIGISURVEY and the DPSVI structure and represents the logical basis for the statistical aggregation of data. Chapter 2 includes a detailed description of the branch analysed in this document.

It is important to clarify that in several cases only a limited number of answers (of a given questions) have been mapped to indexes. In this manner the same question could have been used more than once but considering each time only a limited set of possible answers to which has been attributed a different meaning (and consequently a different numeric value). In summary the same question could have been standardized in different manners according to the indexes to which it is associated.

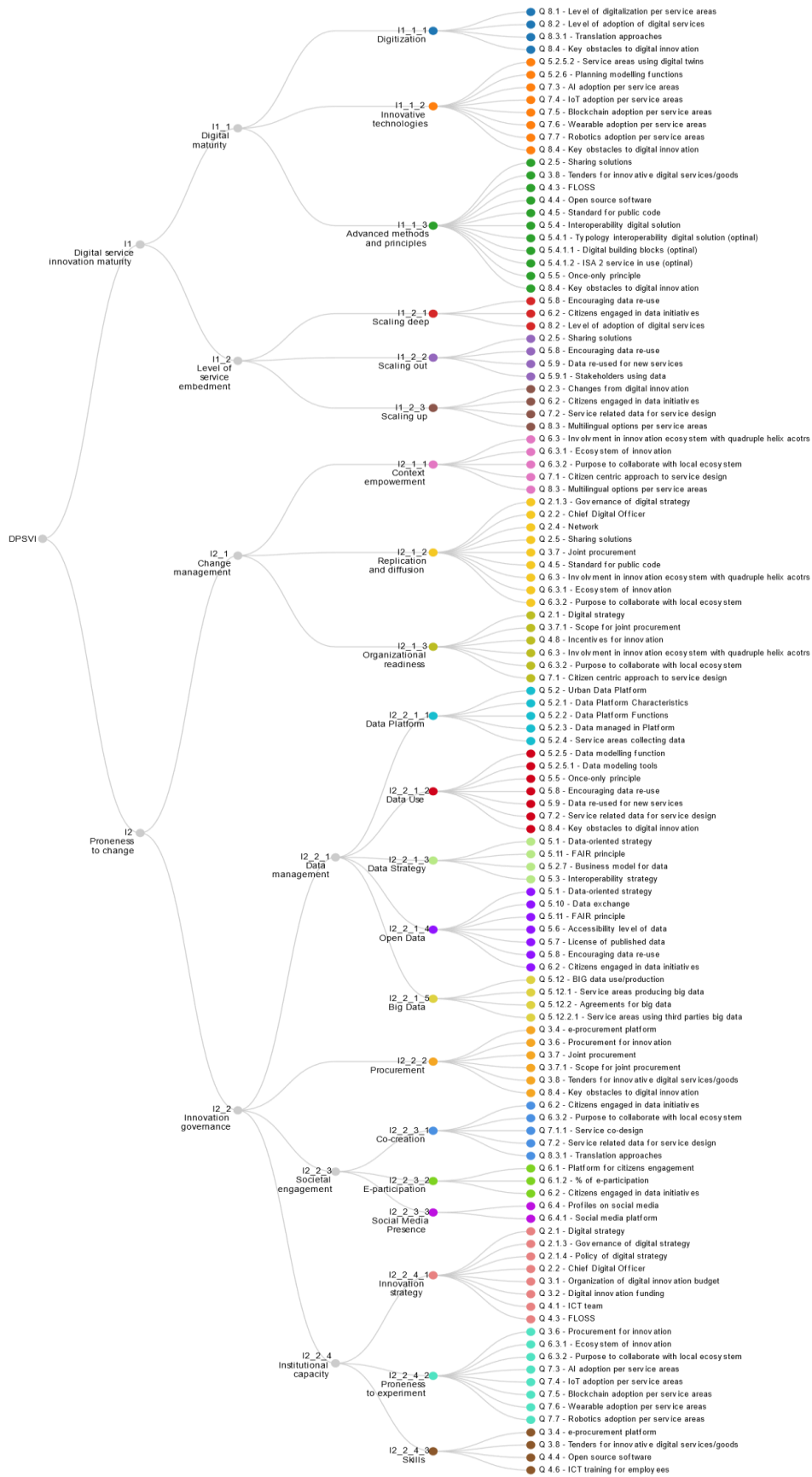


Figure 2 - DPSVI detailed structure – Questions

1.2.2 Standardization

To render the information gathered via the questionnaire processable via computational methods, each question, or group of answers, has been transformed into a number.

In practice, raw data have been replaced by a set of numerical values x_p , where $p = 1, \dots, P$ and P is the total number of questions, or groups of them.

This operation is usually performed in an ad-hoc way, given the specificities of each item of the questionnaire. Nevertheless, the following table provides a synthesis of the methods for data standardization adopted for each category of question.

Type of question	Standardization methods
Binary	Converted into dummy (0-1)
Single Choice	Converted to cardinal value (e.g., answer A = 1, answer B = 3, Answer 3 = 0)
Likert Scales	Converted to correspondent ordinal (e.g., Low = 1, Medium-Low = 2, Medium-High = 3, High = 4)
Multiple Choice / Matrix	Converted into dummies, then (weighted) sum, propaedeutic yes/no are dropped.
Scalars	Normalised using external values (population, size of municipality) if representative of relative phenomena
Matrix – Service Level	Converted into dummies, then summed by column (i.e., process level), finally normalised over number of digitalised services

Table 2 - Standardization methods overview

The *Annex 1.1 Extended Methodology* includes all the information related to the standardization process underlying the DPSVI, including the detailed map of answers to indices and the weight attributed to each answer for standardization purposes.

Before aggregating the numeric answers, these have been rescaled into a 0.00 –1.00 range, so to make them comparable. The mathematical operation that needs to be performed to move these different scales into a unique one, where 0 is the worst possible value and 1 is the best possible one, is the following:

$$x_p^{IT} = \frac{x_p - x_p^{min}}{x_p^{max} - x_p^{min}}$$

Where x_p^{IT} is the rescaled value, x_p is the original value mapped on a generic scale and x_p^{min} , x_p^{max} are, respectively, the minimum possible and the maximum possible value of datum x_p .

1.2.3 Aggregation

In this final phase the standardized values computed on top of the answers to DIGISURVEY questions, are aggregated via a mathematical procedure, with the goal of finally creating the indexes.

After having refined the data to be taken as input, in accordance with the standard literature for this kind of dimensionality reduction task, the indices are introduced as linear combinations of data, that is:

$$I = \frac{\alpha_{n_1^I} x_{n_1^I}^{IT} + \alpha_{n_2^I} x_{n_2^I}^{IT} + \dots + \alpha_{n_{N_I}^I} x_{n_{N_I}^I}^{IT}}{\alpha_{n_1^I} + \alpha_{n_2^I} + \dots + \alpha_{n_{N_I}^I}}.$$

The table published in chapter 2 illustrates the different relative weight attributed to each of the question composing the indexes presented in this document.

1.3 Technical note: how to read charts

This report includes a large number of charts and maps that are generated on top of the indexes that make up the DPSVI and in some cases referred to the same underlying questions. This chapter explains how to interpret the legend that accompanies the publication of charts and maps.

1.3.1 Key info for DPSVI charts and Maps

The charts used to represent DPSVI indexes are relatively simple, being limited to radars, columns, box plots. All charts include a legend reporting the following key information:

Index observed	Index type	Index level	Data Sample	Cluster
<i>Indicates the code and the label of the index observed</i>	<i>Indicates the type of index as either:</i> <ul style="list-style-type: none"> • DPSVI • SI 	<i>Indicates the Index position in its Data model:</i> <ul style="list-style-type: none"> • Top • Intermediate • Bottom 	<i>Indicates the sample that the data refers to</i> <ul style="list-style-type: none"> • All respondents • Reference sample 	<i>Indicates the series showed in the charts and listed in the legend</i> <ul style="list-style-type: none"> • Capital cities • Reference sample • Population • GDPPC • Country

Table 3 – Index charts legend

1.3.1.1 Index type

This information identifies the family of index, being either part of the DPSVI tree (Digital Public Value Service Index) or of the SI tree (Service Areas Index)

1.3.1.2 Index type

This information identifies the position of the index in its data model (cfr. Figure 1 - DPSVI Structure)

- **Top:** refers to the three apical indexes, built on top of all the other indexes:
 - DPSVI
 - Digital Service Innovation Maturity
 - Proneness to Change
- **Bottom:** refers to all the indexes generate directly from questions (cfr Figure 2 - DPSVI detailed structure – Questions)
- **Intermediate:** all the other indexes composed by indexes

1.3.1.3 Data sample

This information identifies the sample on top of which data are computed:

- The “**All respondents**” sample is composed by **all the 255 respondent cities** with the exclusion of duplicate questionnaire coming from the same authority (same city at the same administrative level).
- The “**Reference**” sample is composed by a **selection of 155 respondents**. The reference sample is intended to be the best approximation attainable that could be considered as representative of the variety of European cities.

1.3.1.4 Cluster

Data can be grouped in clusters showed as series in the charts and listed in the legend. The cluster considered in the report could be the followings:

- **None:** no cluster, the data refers to the entire sample
- **Capital cities:** comparing the results of capital cities with all the other respondents.
- **Reference sample:** compared results of reference sample and all other respondents.

- **Population:** compared results among cities by population size
- **GDPPC:** compared results among cities by GDP per capita size
- **Country:** compared results among countries
- **Authority Type:** compared results among different types of local government
- **Case Studies:** 10 selected cities also surveyed through qualitative methods

In few cases cluster and possible answers can be switched, in this case the chart visualizes cluster class on the y-axis and the possible answers as chart series.

1.3.2 Key info for Q charts

In few cases the report presents charts referring to some of the questions that make up the indices. The charts used to present questions are relatively simple, being limited to bars and columns, represented in simple, stacked and 100% stacked formats.

All charts include a summary table reporting the following key information:

Question observed	Question type	Data Sample	Clusters	Value
<i>Indicates the code and the label of the question observed</i>	<i>Indicates the question typology and whether it is a matrix</i>	<i>Indicates the sample that the data refers to</i>	<i>Indicates the series showed in the charts and listed in the legend</i>	<i>Indicates the units in which the data are represented</i>
	<ul style="list-style-type: none"> • Single choice • Single choice - Binary • Single choice - Likert • Multiple choice • Matrix - Single choice • Matrix - Likert • Matrix - Multiple choice 	<ul style="list-style-type: none"> • All respondents • Reference sample 	<ul style="list-style-type: none"> • Capital cities • Reference sample • Population • GDPPC • Country 	<ul style="list-style-type: none"> • Count • Percentage

Table 4 – Question charts legend

1.3.2.1 Question type

Within the two macro-categories of simple and matrix questions it is possible to further distinguish between the following kind of questions, each one collecting data in a different manner:

Simple questions typologies:

- *Single choice – Binary:* One single choice between “Yes” or “No”
- *Single choice – Likert:* One choice among items in a Likert scale
- *Single choice:* One choice among all the possible answers
- *Multiple choice:* Possibility to select multiple answers

Matrix question typologies:

- *Matrix - Single choice:* Possibility to select just one answer (column) per row
- *Matrix – Likert:* Possibility to select just one answer per row. The columns are organized as a Likert scale
- *Matrix - Multiple choice:* Possibility to select multiple answers per row.

1.3.2.2 Data sample

This information identifies the sample on top of which data are computed. The samples used for the question charts are the same used for the Indexes (cfr. 1.3.1.3)

1.3.2.3 Cluster

Data can be grouped in clusters showed as series in the charts and listed in the legend. The cluster explored by the report are the same used for the Indexes (cfr. 1.3.1.4).

1.3.2.4 Value

The value indicates the units in which the data are represented along the x-axis.

The data could be represented as:

- *Count*: DPSVI number that select a particular answer
- *Percentage*: relative number of respondents that select that answer.

In the case of clustered bar charts, the percentage is based on the number of respondents to that specific question. In the case of 100% stacked bar, the percentage is based on the total number of selections received by that answer (row 's percentage). The percentage could also be based on the total number of selections received by the question.

2 Societal Engagement in Public Policy and Services in European Cities

2.1 Definition of the indices and exploration of its structure

Societal engagement measures how the public authority entails and encourages the active participation of different actors and stakeholders in public decision-making processes, and their partaking in co-design and co-creation activities to generate public value. It considers the public administration’s commitment to implement innovative bottom-up initiatives encouraging the inclusion of society in developing innovation in a more transparent, interactive, and responsive way. Consequently, it provides an overview of the intensity and level of digitalisation of societal engagement initiatives, and their impact on public service design and innovation.

This is an *Intermediate Level* Index, composed by three *Bottom Level* Indexes:

- **I2.2.3.1 - Co-creation:** It explores the level and intensity of involvement of the citizens in service design and innovation
- **I2.2.3.2 - E-participation:** It provides an overview of the intensity and level of digitalization of societal engagement policies, and their impact on public service design and innovation
- **I2.2.3.3 – Social Media Presence:** It provides information about how pervasive the communication via social media by the municipality is

2.1.1 Mapping Details

The following figure and table include the detailed list of the questions that have been mapped to this index and its sub-indexes, according to the methodology explained in Chapter 1.2.1.

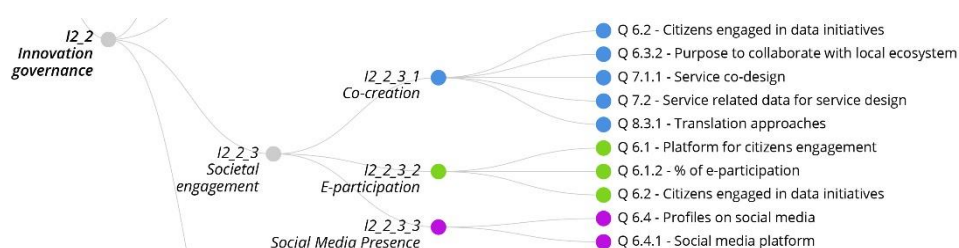


Figure 3 – Societal Engagement index composition (questions tree)

The following table includes the text of all questions used to create the Societal Engagement Indexes and information about the type of questions.

Question number and text	Question Type
6.1 Does your public authority use platforms to actively engage with citizens?	Multiple choice
6.1.2 Referring to the most successful initiative of the past year (2020), select the range of the participation percentage achieved through the use of one of the platforms above	Single choice - Likert
6.2 Does your public authority engage citizens in (open) data initiatives?	Multiple choice
6.3.2 What is the purpose for your public authority to collaborate with the local ecosystem?	Multiple choice
6.4 Does your public authority manage official pages/profiles on social media?	Single choice - Binary
6.4.1 Please select which social media platform(s):	Multiple choice
7.1.1 Are you actively engaging one or more of the following communities in your public authority’s co-design activities?	Multiple choice
7.2 Does your public authority use service-related data to improve your digital service offer in the following areas?	Matrix - Multiple choice
8.3.1 How are the translations provided?	Multiple choice

Table 5 – Societal Engagement related Questions in DIGISURVEY

The *Annex 1.1 Extended Methodology* to the DIGISER Final Report hosts a dedicated Appendix (Appendix I) with all the information related to the standardization process underlying the DPSVI, including the detailed map of answers to indices and the weight attributed to each answer for standardization purposes.

2.1.2 Aggregation details

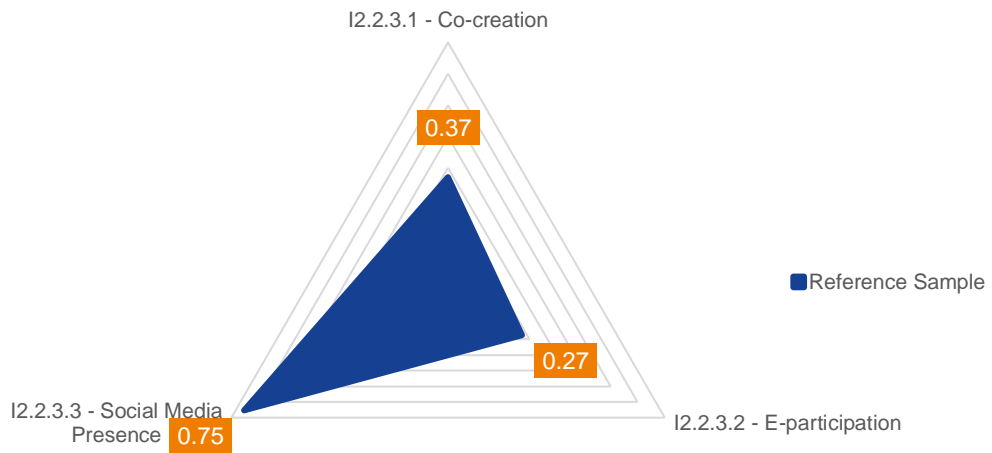
The following table provides information regarding the weights attributed to each question in computing the value of the indexes presented in this report, according to the methodology presented in Chapter 1.2.3.

Q_#	I2_2_3_1	I2_2_3_2	I2_2_3_3
Q_6.1	-	100%	-
Q_6.1.2	-	100%	-
Q_6.2	100%	100%	-
Q_6.3.2	100%	-	-
Q_6.4	-	-	100%
Q_6.4.1	-	-	100%
Q_7.1.1	100%	-	-
Q_7.2	100%	-	-
Q_8.3.1	100%	-	-

Table 6 – Societal Engagement - Relative weight of underlying questions

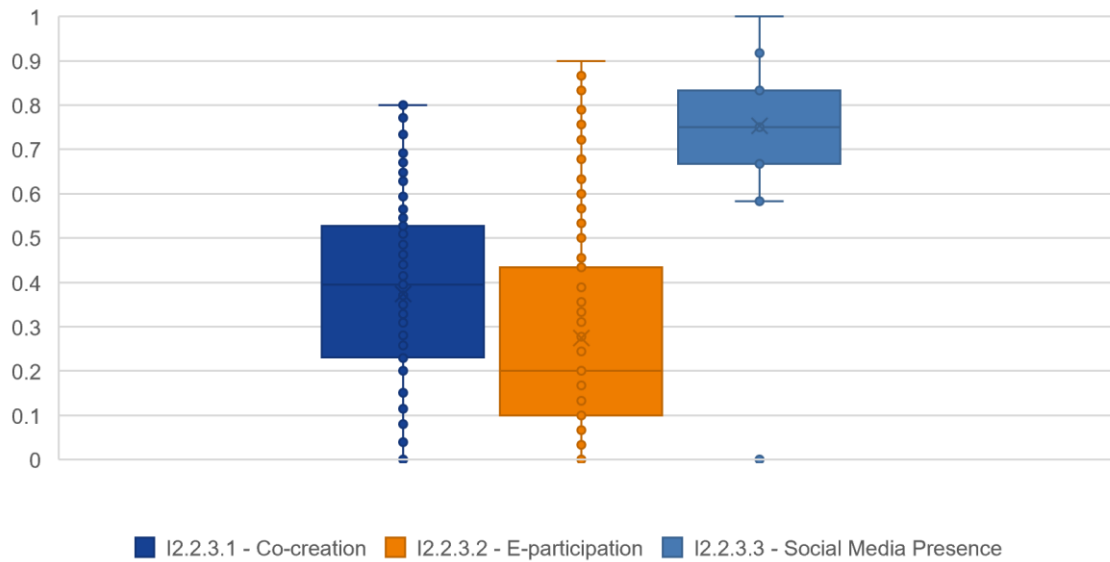
An extensive overview of the weights used to calculate the DPSVI is available in *Annex 1.1 Extended Methodology*.

2.2 Index overview



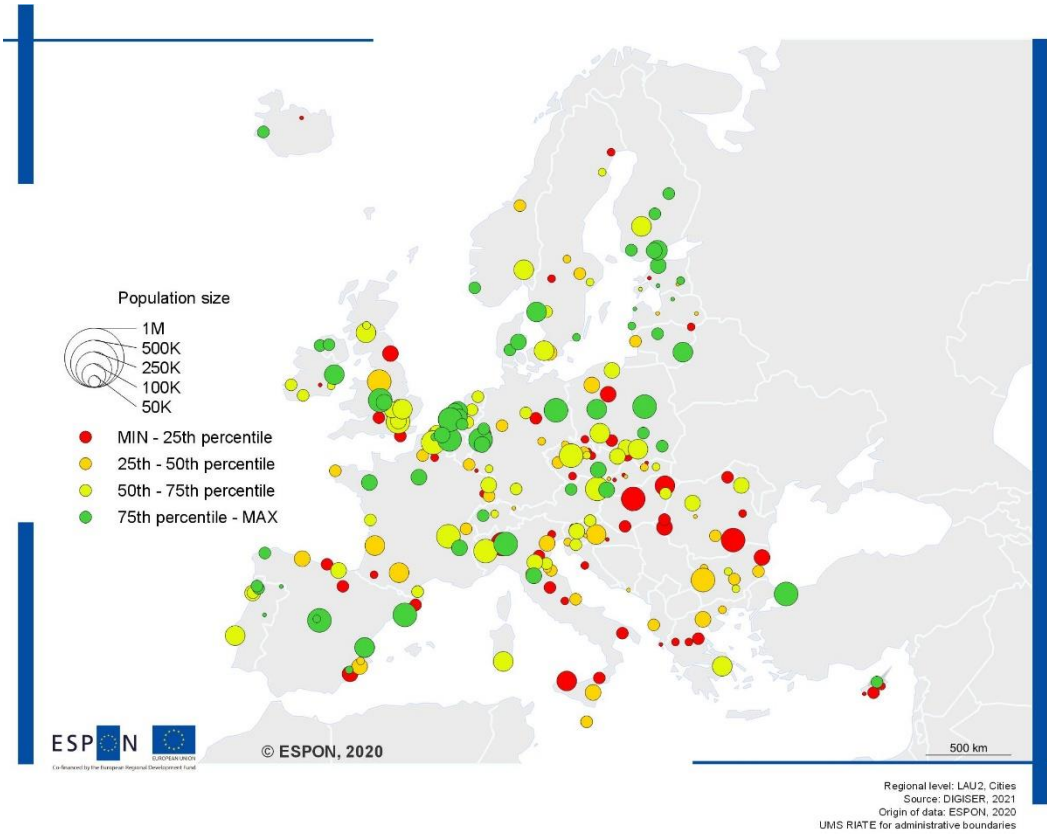
Index observed	Index type	Index level	Data Sample	Clusters
I2.2.3 – Societal Engagement	DPSVI	Intermediate	Reference Sample	na

Figure 4 – Societal Engagement overview

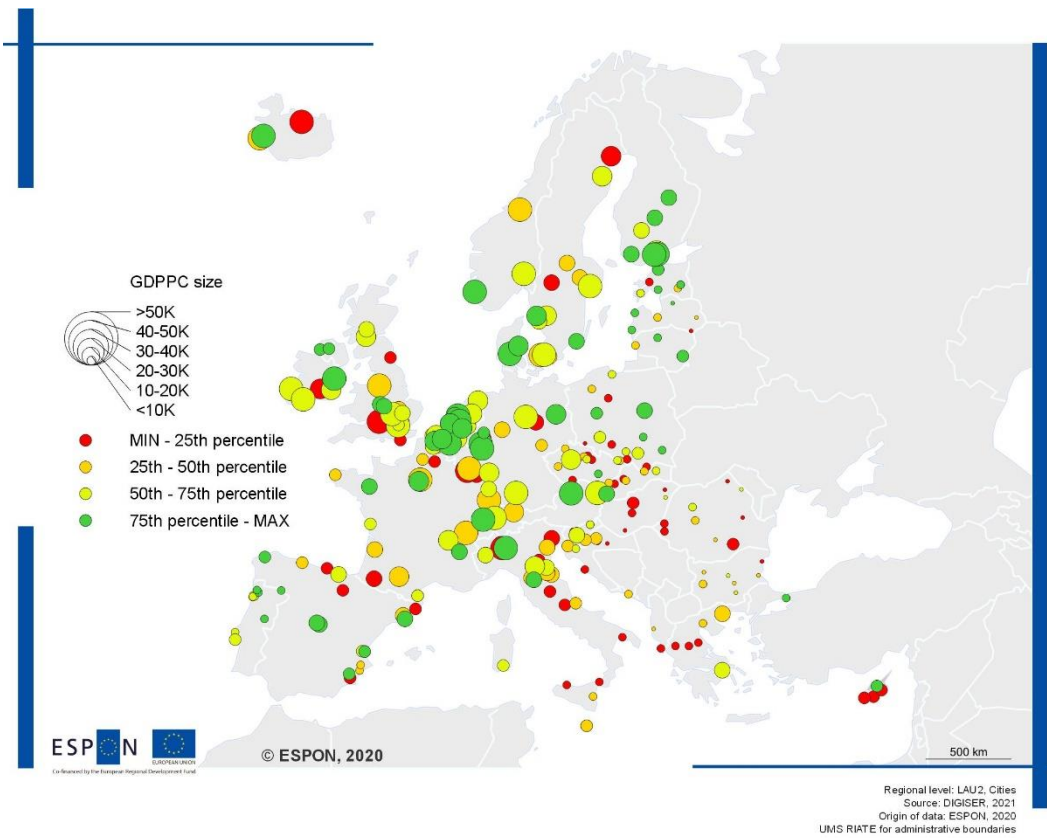


Index observed	Index type	Index level	Data Sample	Clusters
I2.2.3 – Societal Engagement	DPSVI	Intermediate	Reference Sample	na

Figure 5 - Societal Engagement composition

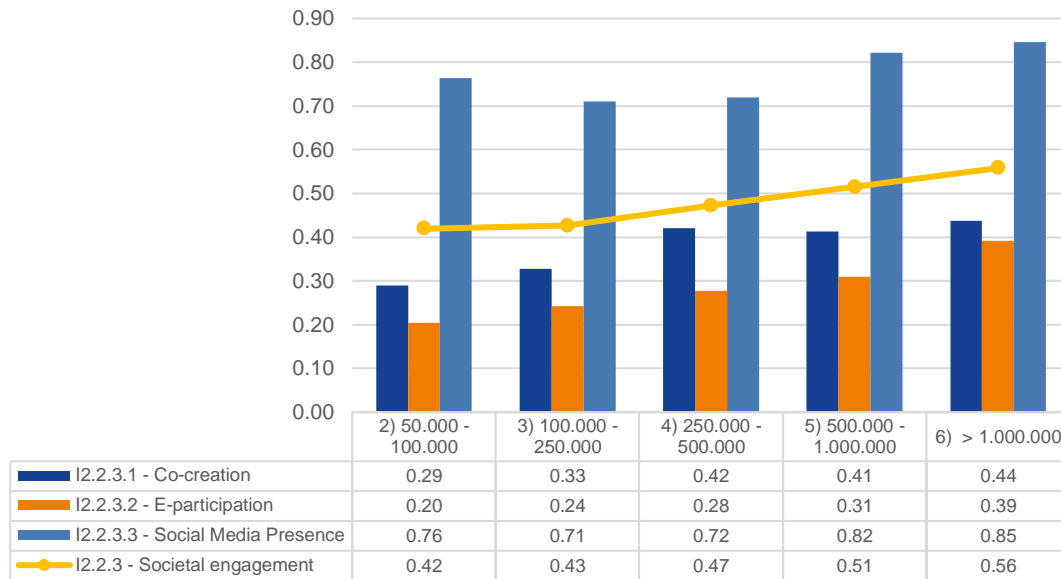


Map 1 – Societal Engagement and population size



Map 2 – Societal Engagement and GDPPC size

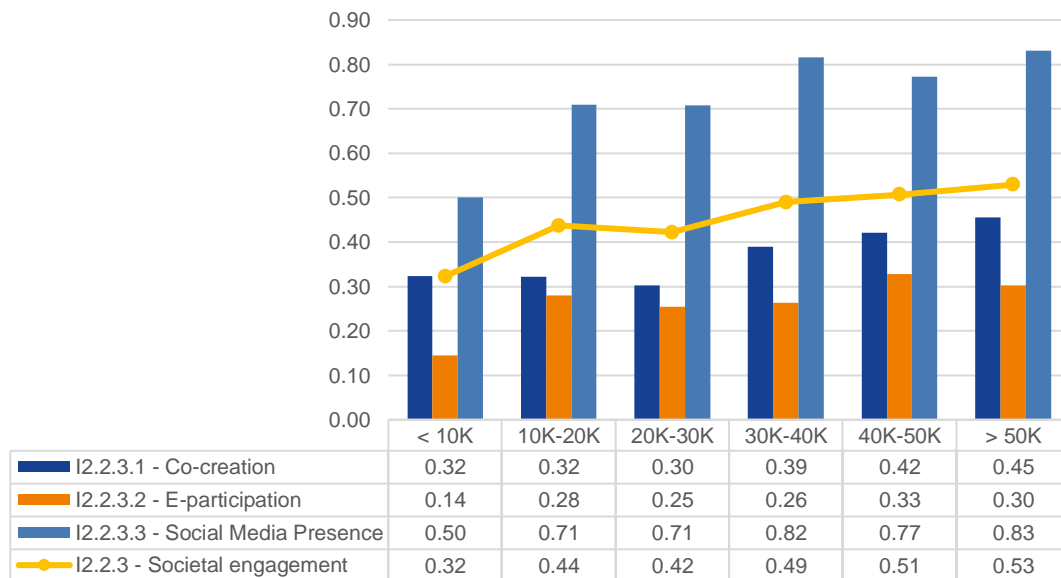
2.3 Population



Index observed	Index type	Index level	Data Sample	Clusters
I2.2.3 – Societal Engagement	DPSVI	Intermediate	Reference Sample	Population

Figure 6 - Societal Engagement by population

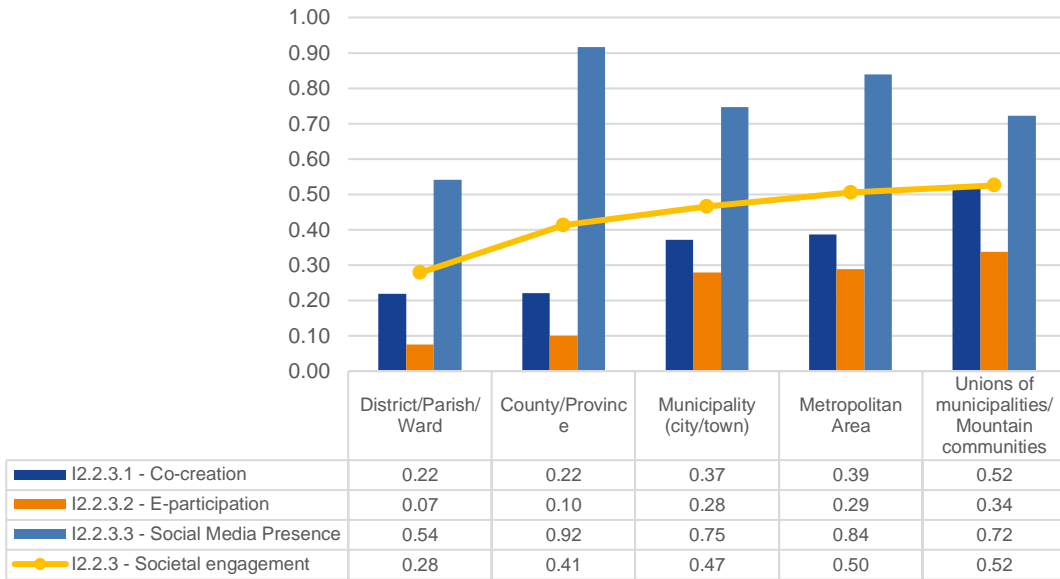
2.4 GDP per Capita



Index observed	Index type	Index level	Data Sample	Clusters
I2.2.3 – Societal Engagement	DPSVI	Intermediate	Reference Sample	GDPPC

Figure 7 - Societal Engagement by GDPC

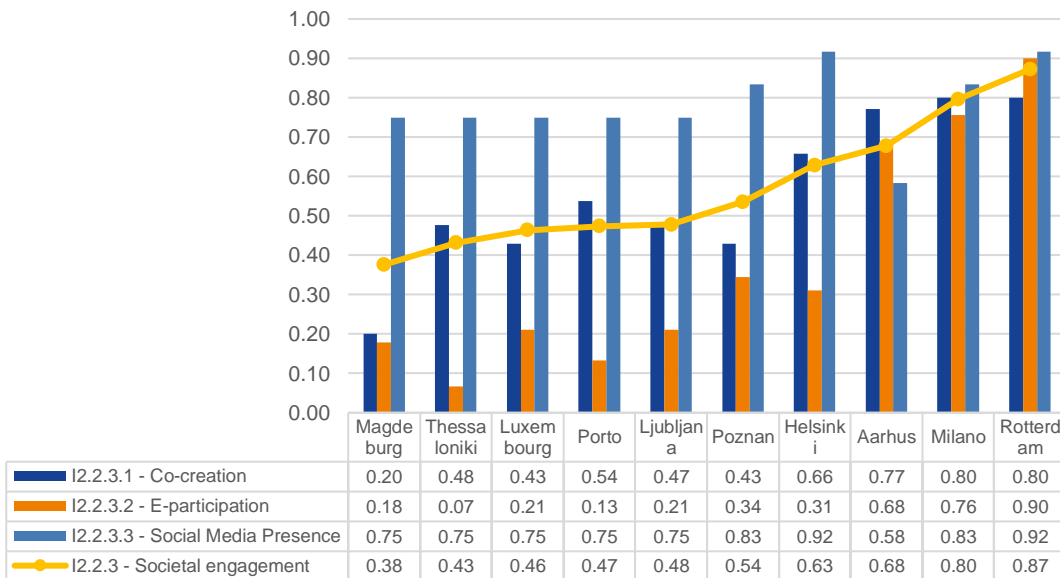
2.5 Authority Type



Index observed	Index type	Index level	Data Sample	Clusters
I2.2.3 – Societal Engagement	DPSVI	Intermediate	Reference Sample	Authority type

Figure 8 - Societal Engagement by authority type

2.6 Case Studies



Index observed	Index type	Index level	Data Sample	Clusters
I2.2.3 – Societal Engagement	DPSVI	Intermediate	Case studies	na

Figure 9 - Societal Engagement, case studies

2.7 Highlights

- The high-level interpretation of this index suggests that the cities investigated still approach societal engagement relatively restrictively and with a low level of integration to the cycles of policy making and service designs, and a strong imbalance on social communication and on the very limited forms of interaction that the main social networks allow.
- The composition of this indicator is not very balanced: the score related to social media presence (whatever the way to analyze it) is much higher than that of the other two components and with the cities concentrated in a very limited range
- Observation of spatial trends outlines a concentration of high-performing cities in French, Belgium, the Netherlands and the Scandinavian countries, while cities in Central and Eastern Europe appear to be achieving lower performance.
- There are direct correlations with both the population and the GDPpc, which at least partially explain the trends described above
- Looking at authority types, shall be highlighted the weak performance of sub-municipal entities, which are conceived in many jurisdictions as institutions of proximity.

3 Co-creation of European Cities

3.1 Definition of the indices and exploration of its structure

Co-creation refers to citizens' participation in devising public services with the purpose of tackling societal challenges, better aligning to the goals of the different actors involved and meeting social demands. As such, it concerns the attitude and capacity of the public authority to effectively plan the active participation of citizens in conceiving, designing, and developing services and innovative solutions.

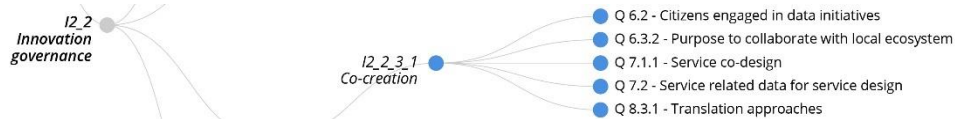
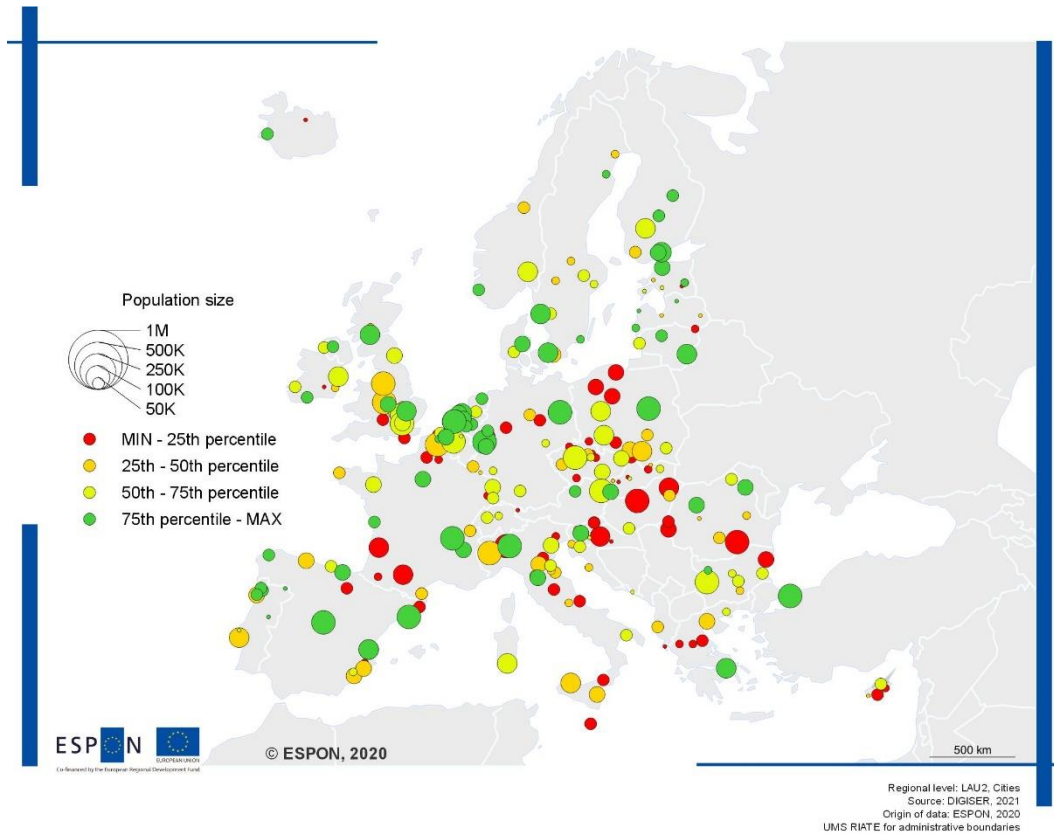


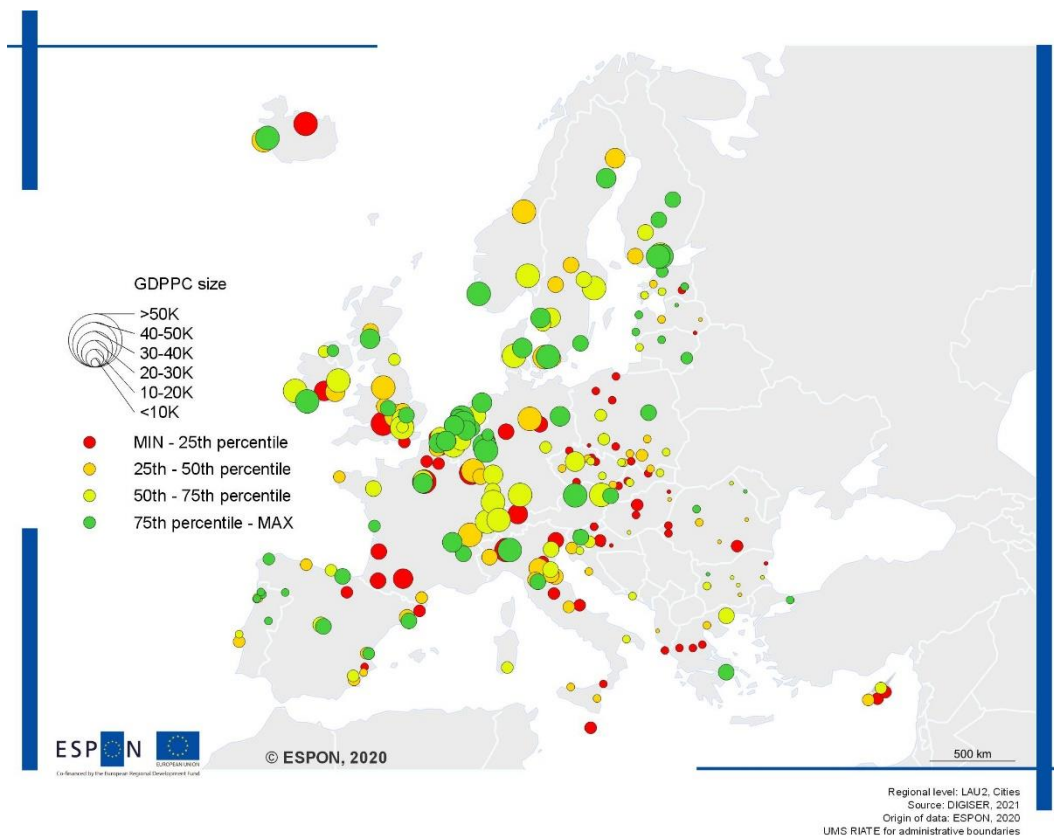
Figure 10 – Co-creation index composition (questions tree)

This is a *Bottom Level* index, composed by five questions, each one computed for a limited number of possible answers:

- **Q 6.2** Does your public authority engage citizens in (open) data initiatives?
- **Q_6.3.2** What is the purpose for your public authority to collaborate with the local ecosystem?
- **Q 7.1.1** Are you actively engaging one or more of the following communities in your public authority's co-design activities?
- **Q 7.2** Does your public authority use service-related data to improve your digital service offer in the following areas?
- **Q 8.3.1** How are the translations provided?



Map 3 – Co-creation and population size



Map 4 – Co-creation and GDPPC size

3.2 Population

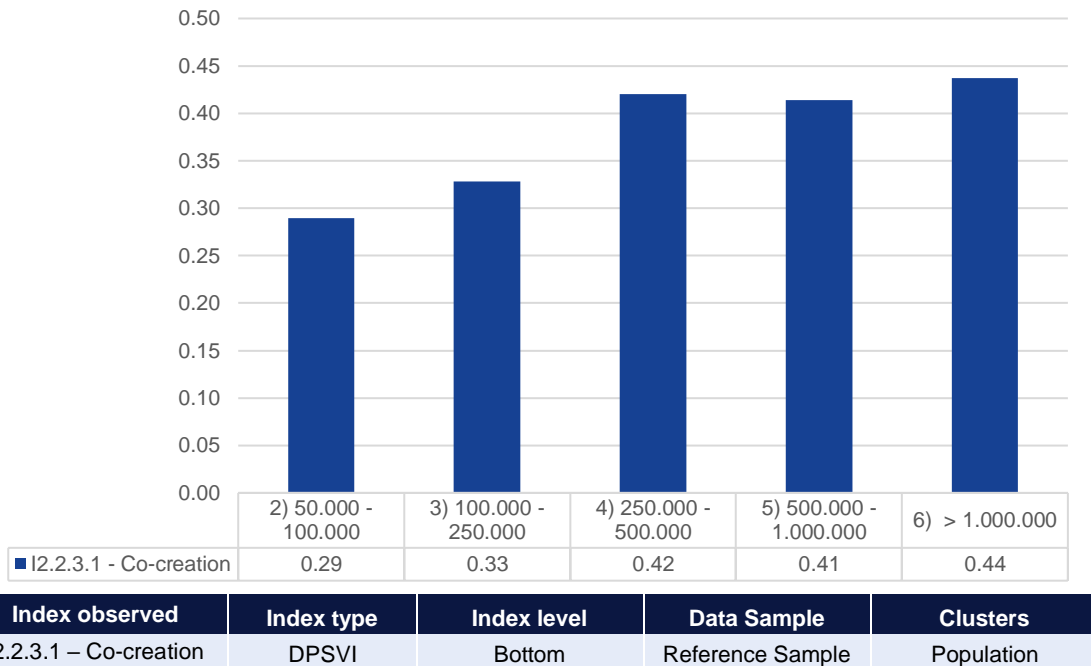


Figure 11 - Co-creation by population

3.3 GDP per Capita

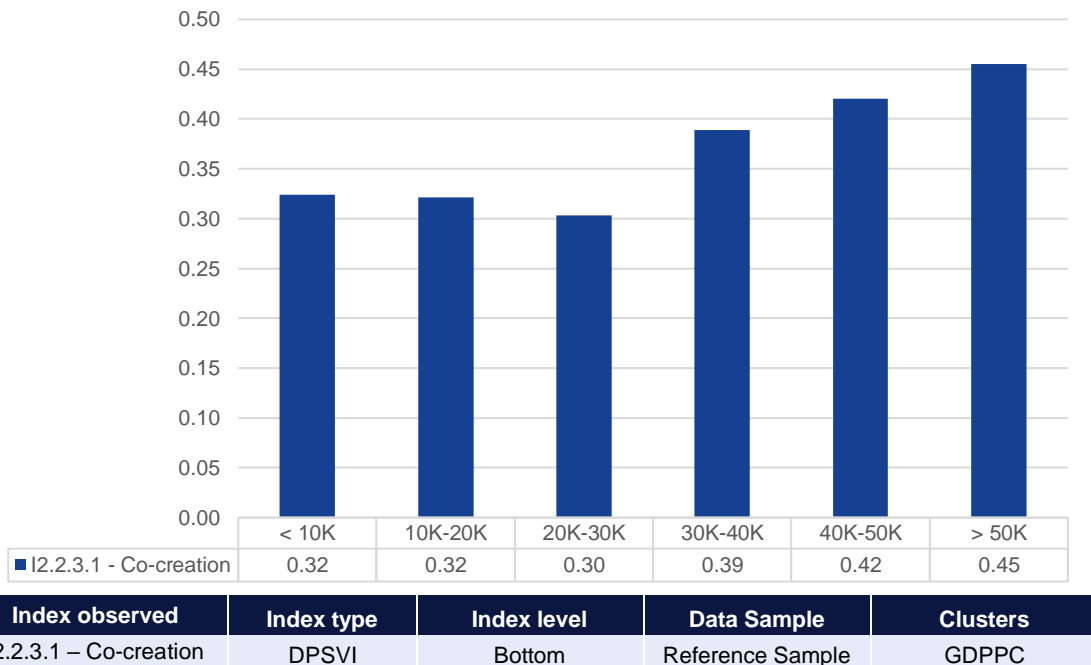
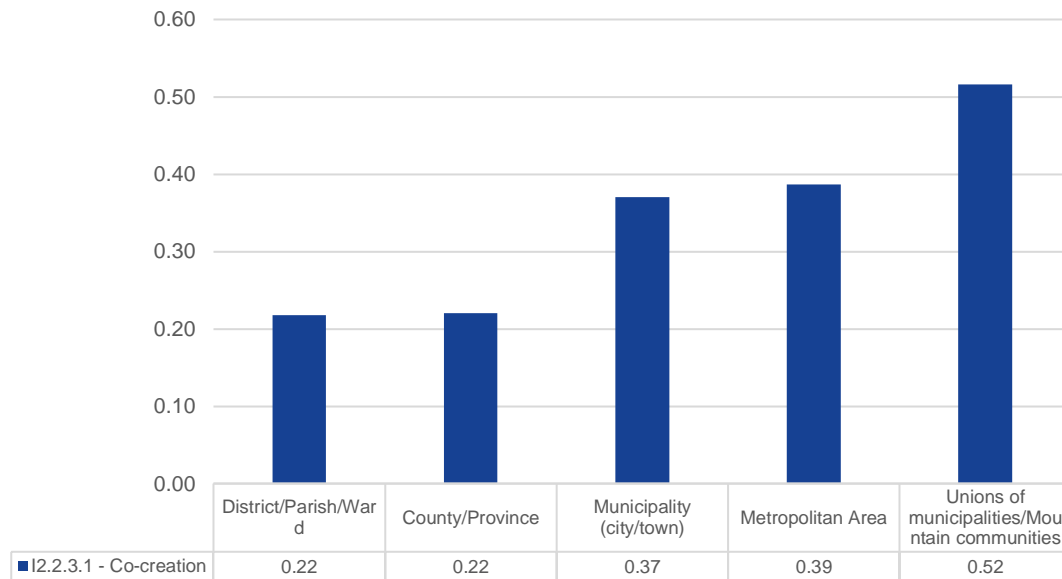


Figure 12 - Co-creation by GDPPC

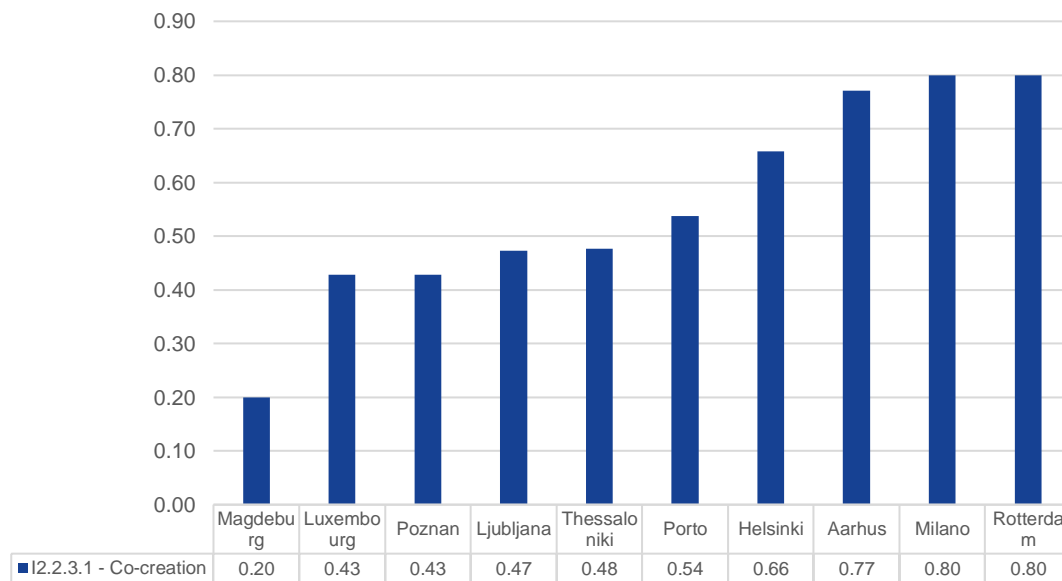
3.4 Authority Type



Index observed	Index type	Index level	Data Sample	Clusters
I2.2.3.1 – Co-creation	DPSVI	Bottom	Reference Sample	Authority type

Figure 13 - Co-creation by authority type

3.5 Case studies

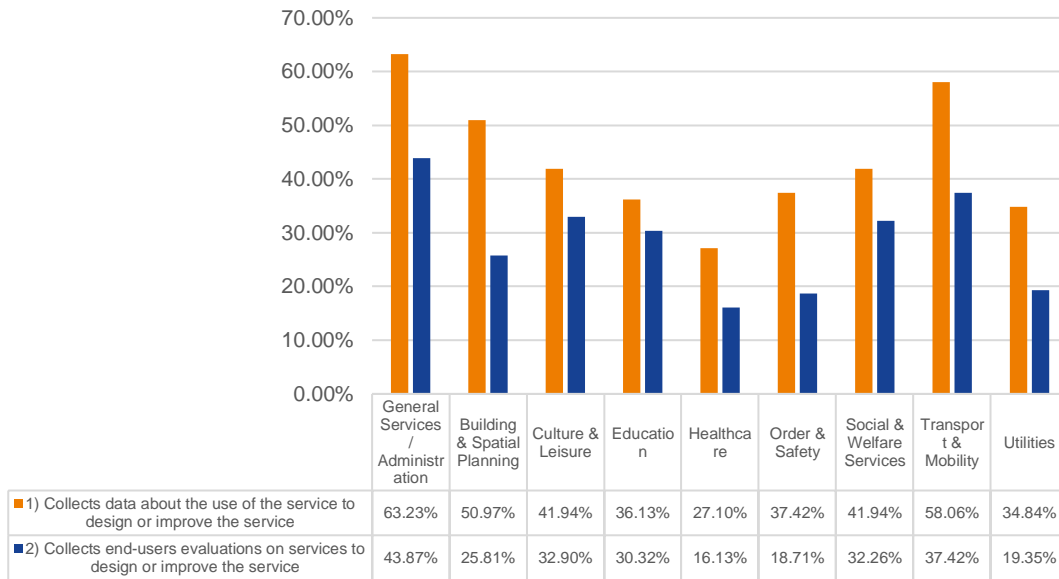


Index observed	Index type	Index level	Data Sample	Clusters
I2.2.3.1 – Co-creation	DPSVI	Bottom	Case studies	na

Figure 14 - Co-creation, case studies

3.6 Relevant question results

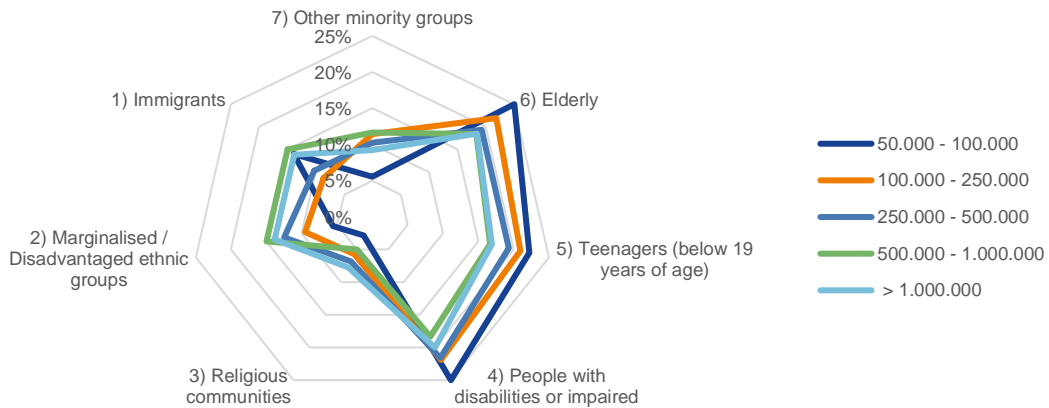
3.6.1 Does your public authority use service-related data to improve your digital service offer in the following areas?



Question observed	Question type	Data Sample	Clusters	Value
Q_7.2	Matrix - Multiple choice	Reference Sample	Population	Percentage

Figure 15 – Service-related data for service design

3.6.2 Are you actively engaging one or more of the following communities in your public authority’s co-design activities?



Question observed	Question type	Data Sample	Clusters	Value
Q_7.1.1	Multiple choice	Reference Sample	Population	Percentage

Figure 16 – Inclusive Engagement in Co-design

3.7 Highlights

- According to the data collected, European cities consider co-creation as a consolidated method for the design of services, practiced by 74% of the reference sample. However, the broad spectrum of oscillation of this index means that there are significant differences in the ways in which it is implemented cross-sectoral and in its actual influence on public service design and delivery.
- The data clustered by population and GDPpc do not seem to show strong correlations, although the cities belonging to the higher scoring groups (in both clusters) seem to perform slightly better.
- Demand analysis 7.2 allows to observe the spread of “light” co-creation methods (limited to the active collection of feedbacks) among different service areas:
 - The sectors with the greatest involvement are the General Administration and Transport, in line with what has been observed for other types of questions of the survey related to the innovation of services
 - Culture and Social Services areas are very active on the co-creation front. It is possible to hypothesize an affinity between the methods of collecting feedbacks and the relational nature of these kind of services
 - The score for Utilities area is much lower than the average of other sectors, even though the latter have as their core mission the provision of public services and ordinarily manage direct interactions with the citizens /customers
- Question 7.1.1 allows to observe the scope of policies and initiatives aimed at the inclusion of fragile groups. Data tells that these initiatives focus mainly on the involvement of the groups elderly and teenagers and people with disabilities, while only some larger cities implement active policies aimed at the inclusion of foreigners and ethnic minorities

4 E-participation of European Cities

4.1 Definition of the indices and exploration of its structure

E-participation stands for electronic participation, and it refers to ICT-supported participation in processes which involve citizens and government. Among the others, it analyses the degree of inclusion of all stakeholders in democratic decision-making processes. Particularly, e-participation entails engaging citizens at different levels by digitalising processes such as co-creation, public consultations, debates, petitions, and voting. Moreover, it also considers the outreach of participatory services such as crowdfunding, crowdsourcing, and crowdmapping.

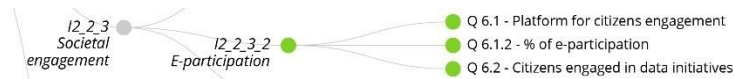
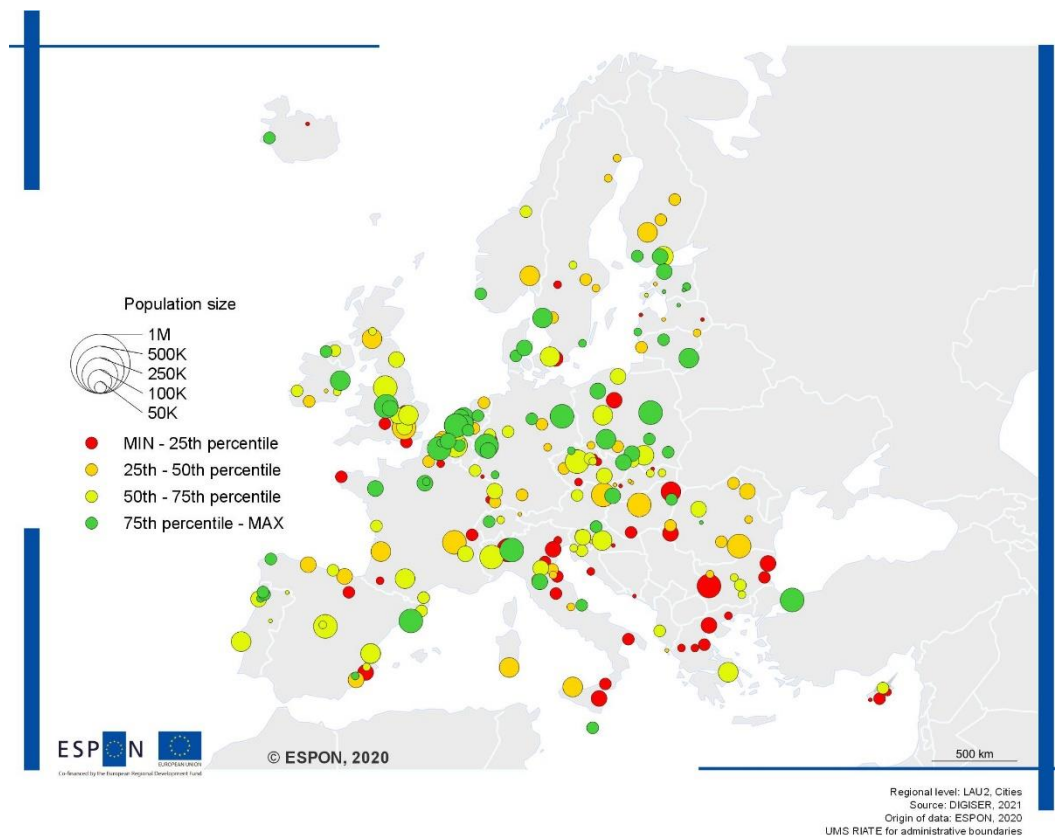


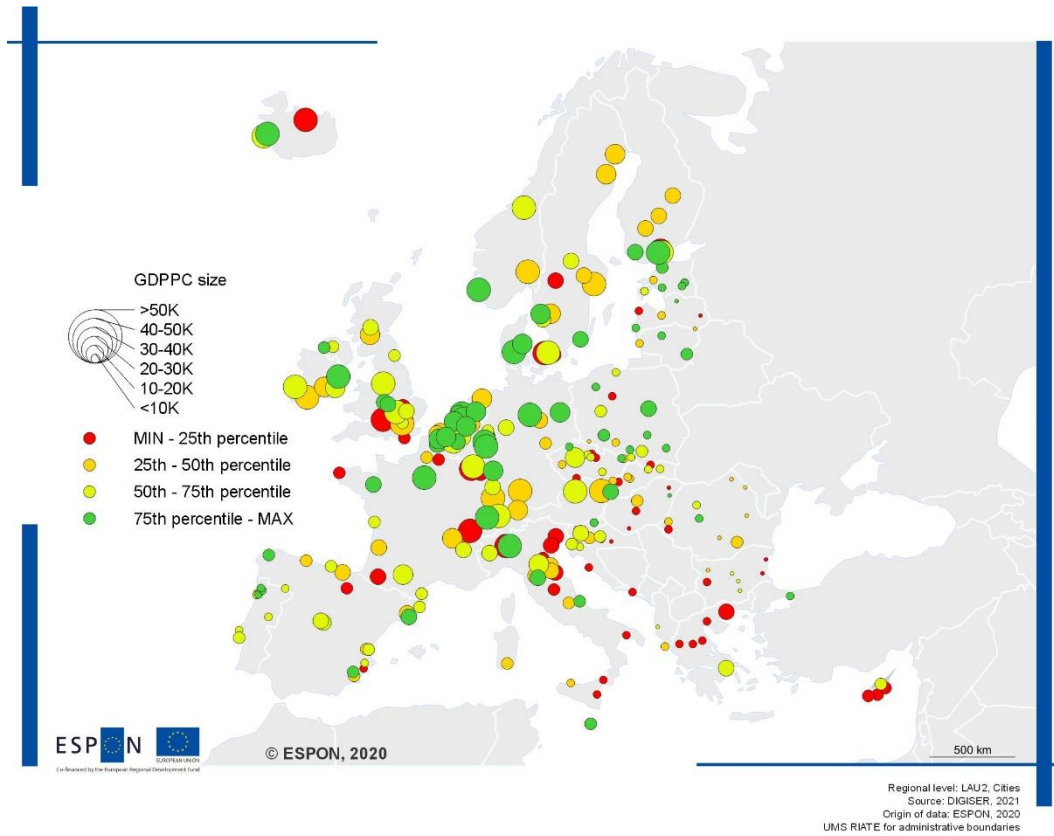
Figure 17 – E-participation index composition (questions tree)

This is a *Bottom Level* index, composed by three questions, each one computed for a limited number of possible answers:

- **Q 6.1** Does your public authority use platforms to actively engage with citizens?
- **Q 6.1.2** Referring to the most successful initiative of the past year (2020), select the range of the participation percentage achieved through the use of one of the platforms above
- **Q 6.2** Does your public authority engage citizens in (open) data initiatives?



Map 5 – E-participation and population size



Map 6 – E-participation and GDPPC size

4.2 Population

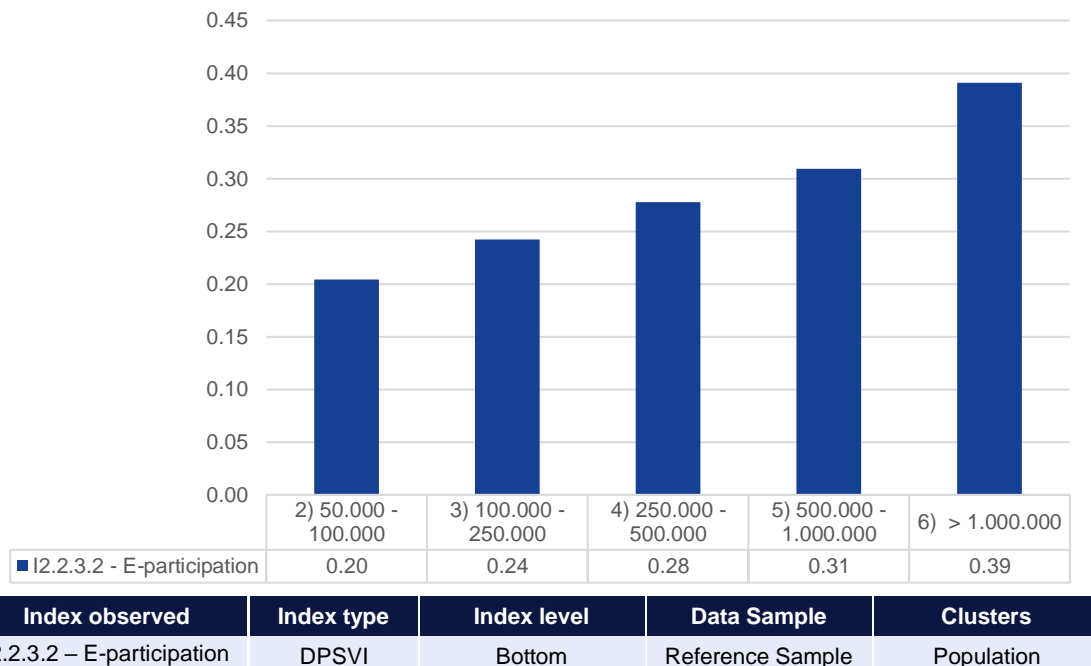


Figure 18 - E-participation by population

4.3 GDP per Capita

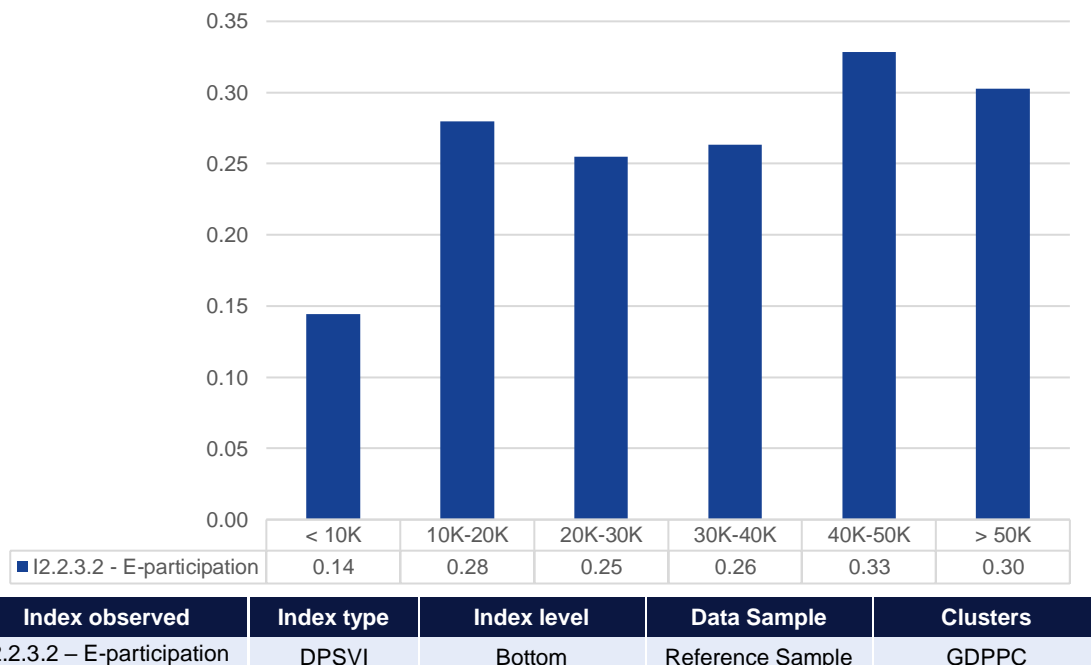
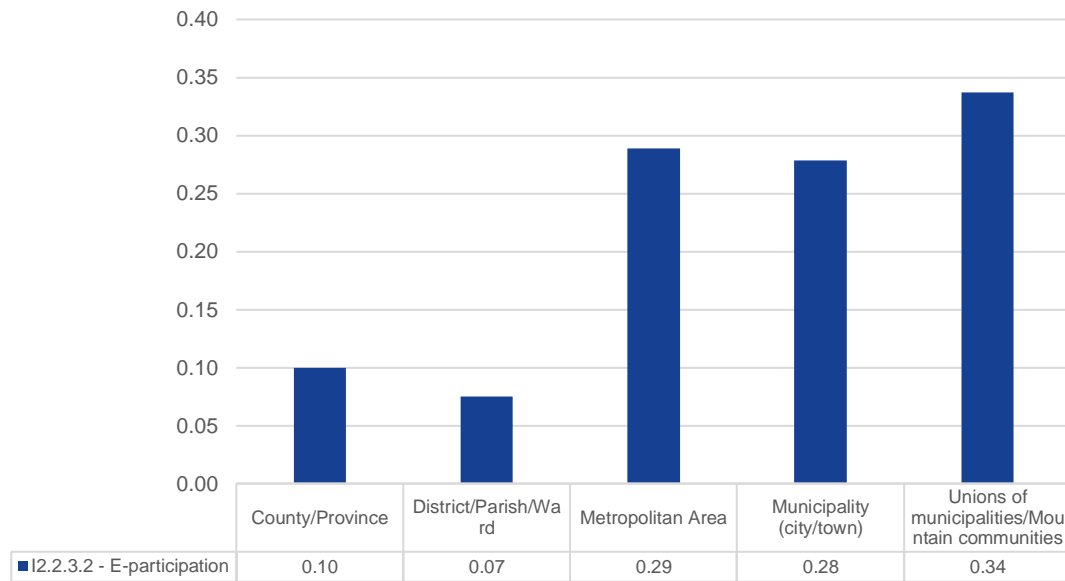


Figure 19 - E-participation by GDPC

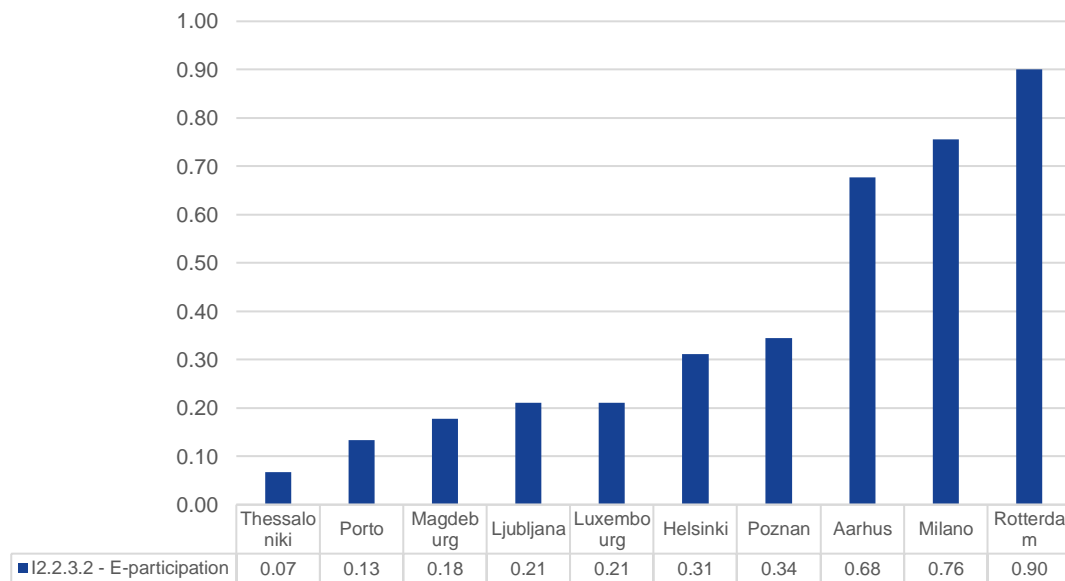
4.4 Authority Type



Index observed	Index type	Index level	Data Sample	Clusters
I2.2.3.2 – E-participation	DPSVI	Bottom	Reference Sample	Authority type

Figure 20 - E-participation by authority type

4.5 Case studies

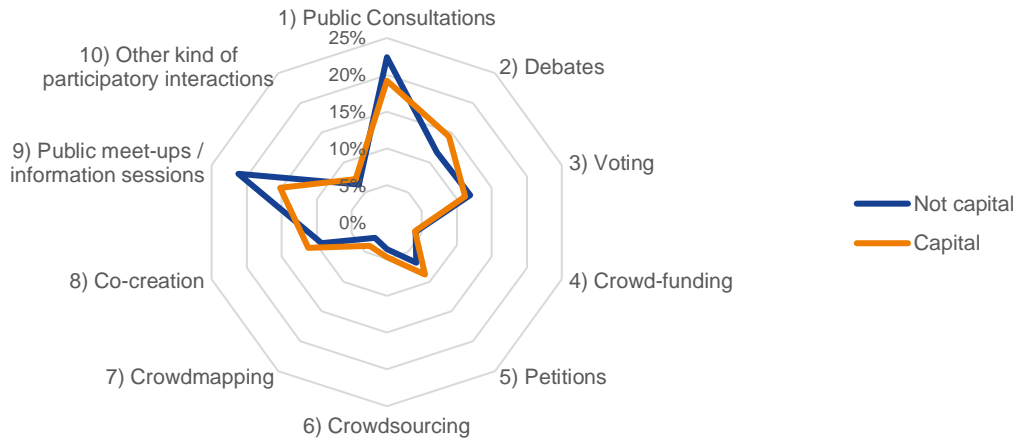


Index observed	Index type	Index level	Data Sample	Clusters
I2.2.3.2 – E-participation	DPSVI	Bottom	Case studies	na

Figure 21 - E-participation, case studies

4.6 Relevant question results

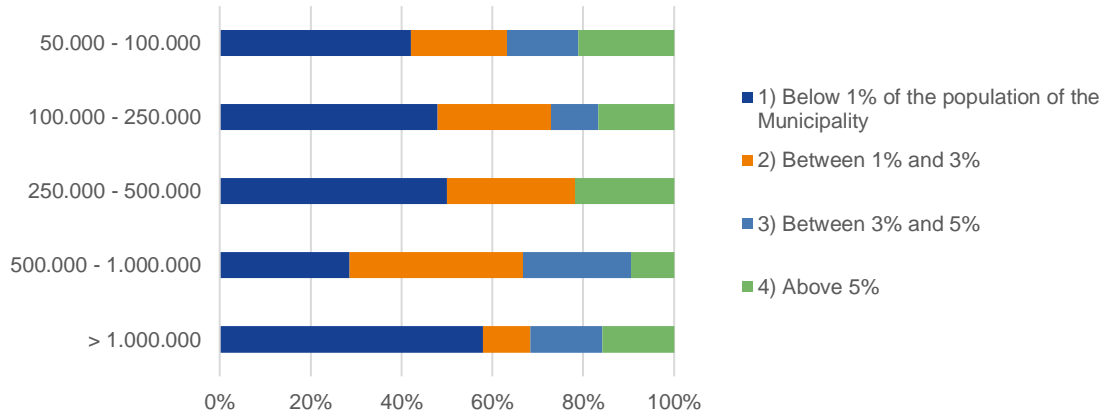
4.6.1 Does your public authority use platforms to actively engage with citizens?



Question observed	Question type	Data Sample	Clusters	Value
Q_6.1	Multiple choice	Reference Sample	Capital cities	Percentage

Figure 22 – Collaborative Platforms and main Functions

4.6.2 Referring to the most successful initiative of the past year (2020), select the range of the participation percentage achieved through the use of one of the platforms above



Question observed	Question type	Data Sample	Clusters	Value
Q_6.1.2	Single choice - Likert	Reference Sample	Population	Percentage

Figure 23 – Quantitative Engagement Metrics

4.7 Highlights

- This index portrays a nuanced situation in which European cities seem to exploit only in a limited way the possibilities of active involvement of citizens in public decisions and in local democratic life opened by digital technologies and in particular by the several collaborative and deliberative platforms available on the market, and easily accessible even for less equipped cities.
- Question Q_6.1 illustrates the weaknesses of this approach: in very few cases the most advanced functions and features are used. Those kinds of functions that presuppose some sort delegation of decision-making power (such as voting, petitioning, crowdsourcing and crowdfunding) are rarely implemented, while most of the activity remains merely consultative and is limited to information sessions and public consultations
- Observing the breakdown of the results in different clusters:
 - There is a strong correlation between population and e-participation initiatives, although, as demand Q_6.1.2 indicates, the number of participants tends to fall in inverse proportion to the total population of the city. This observation makes hypothesize that the best performance of major cities could be related to the greater offer of digital participatory venues and their better integration into the public policy formulation cycle
 - The GDPpc influences e-participation capacity in a partial way, only for the cities belonging to the lowest Group seem to be penalized
 - Sub-municipal institutions, although institutionally aimed at strengthening local democratic systems, seem to have a very limited track record on e-participation, while metropolitan authorities are on the same level as cities

5 Social Media Presence of European Cities

5.1 Definition of the indices and exploration of its structure

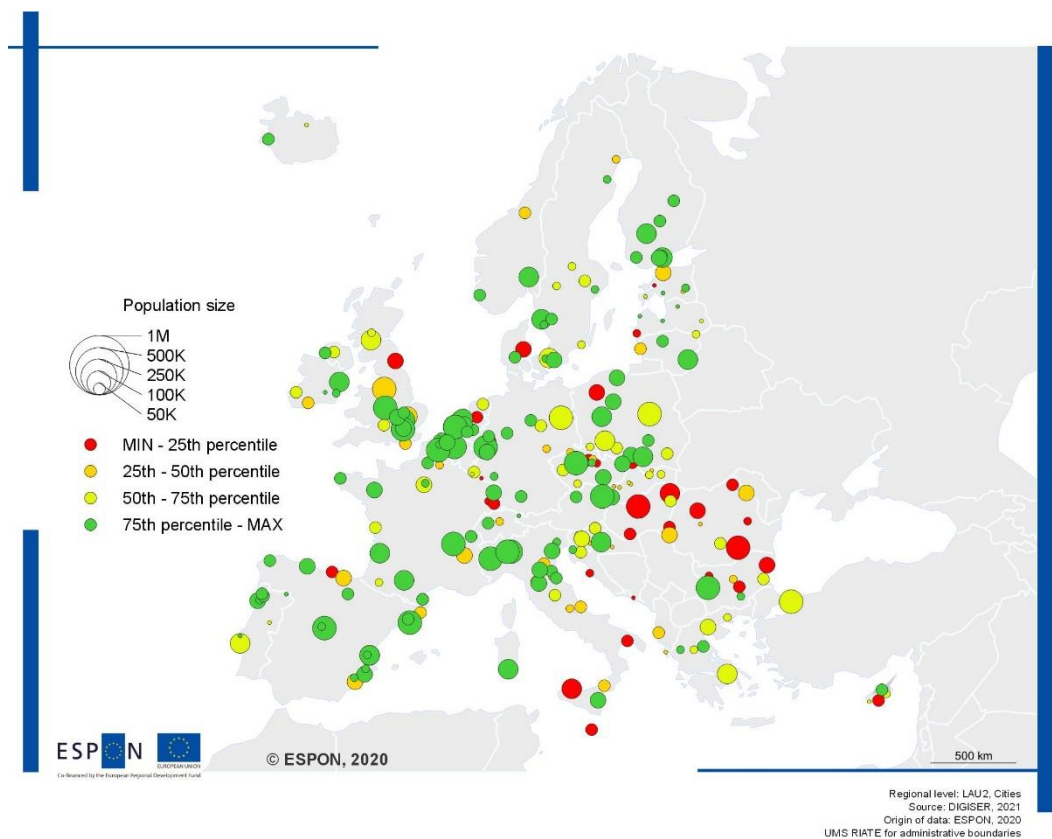
Over time, social media and their platforms have evolved from being a means for regularly engaging with small circles of close-by persons to one of the most common and primary forms of communication. Their inherent features significantly encourage users to go beyond engagement, sharing their opinions on civic and political issues.



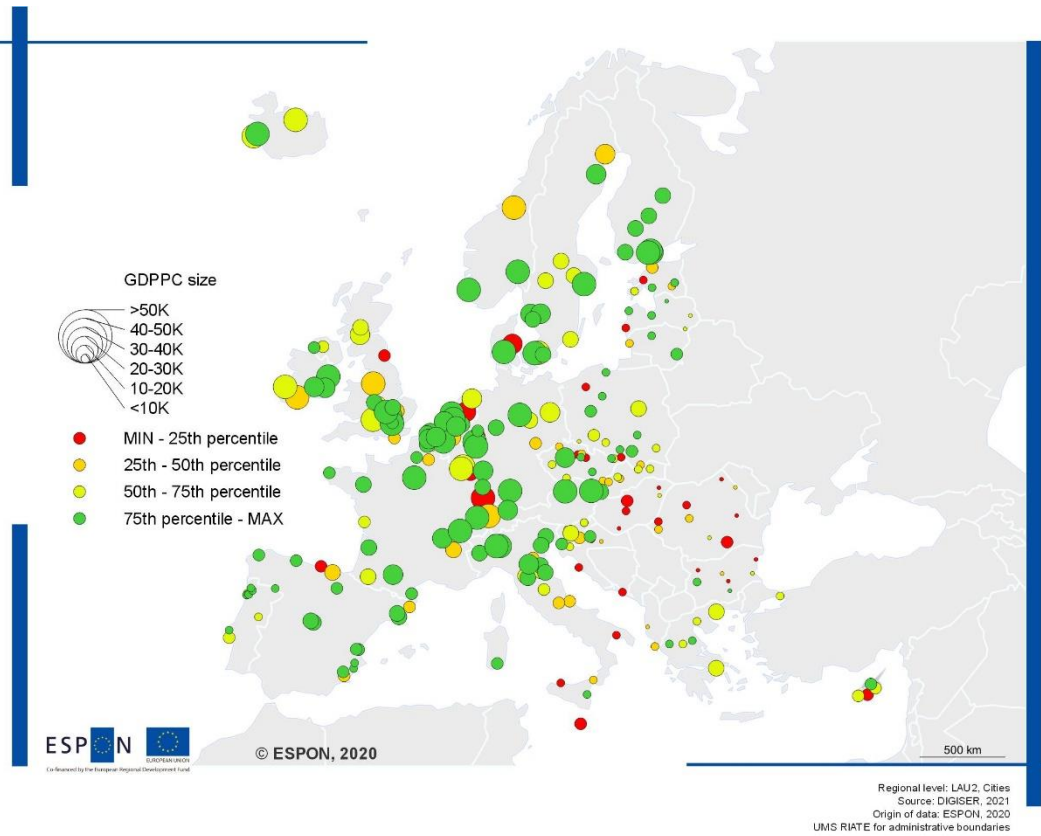
Figure 24 – Social Media Presence index composition (questions tree)

This is a *Bottom Level* index, composed by eight questions, each one computed for a limited number of possible answers:

- **Q_6.4** Does your public authority manage official pages/profiles on social media?
- **Q_6.4.1** Please select which social media platform(s):



Map 7 – Social Media Presence and population size



Map 8 – Social Media Presence and GDPPC size

5.2 Population

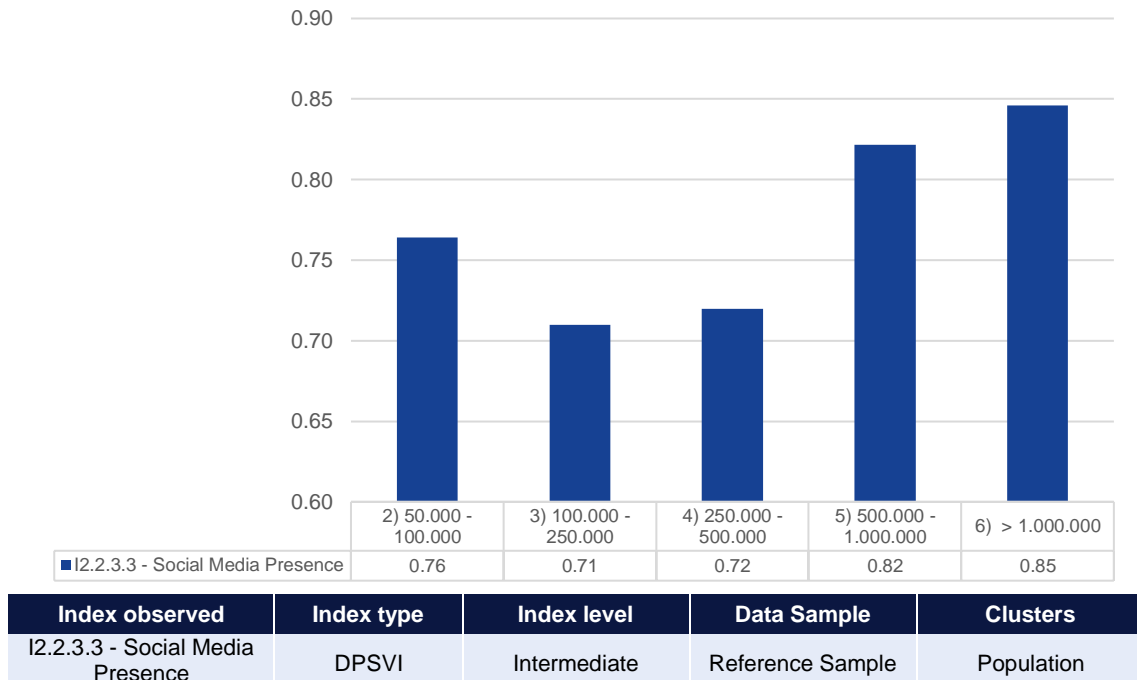


Figure 25 - Social Media Presence by population

5.3 GDP per Capita

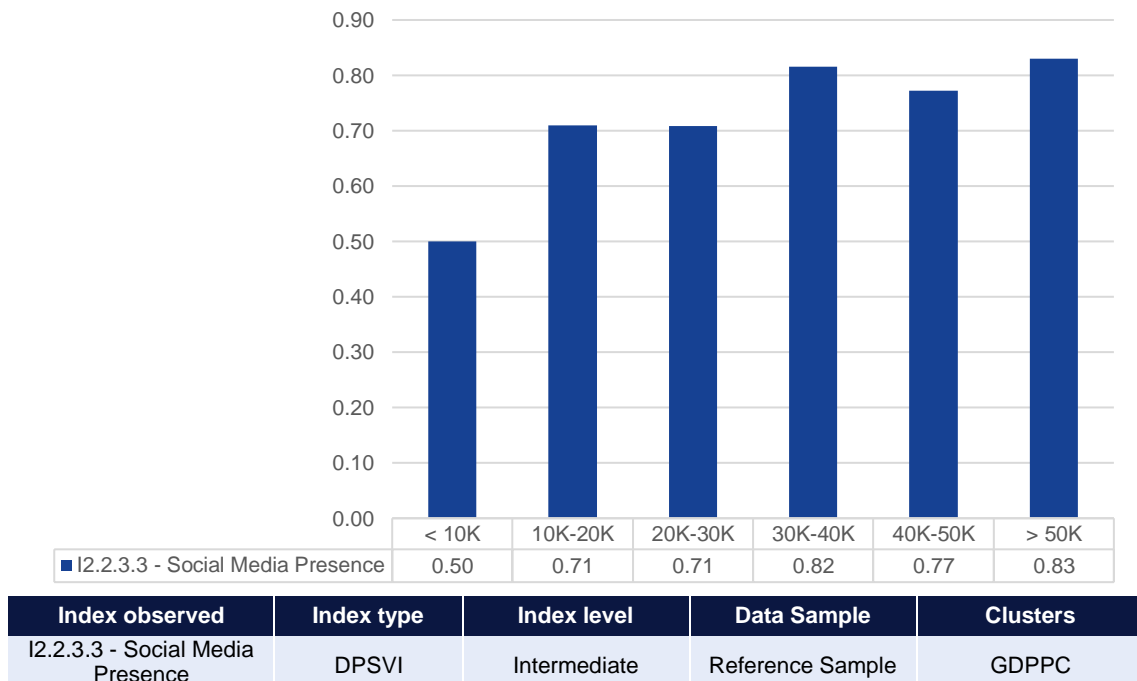
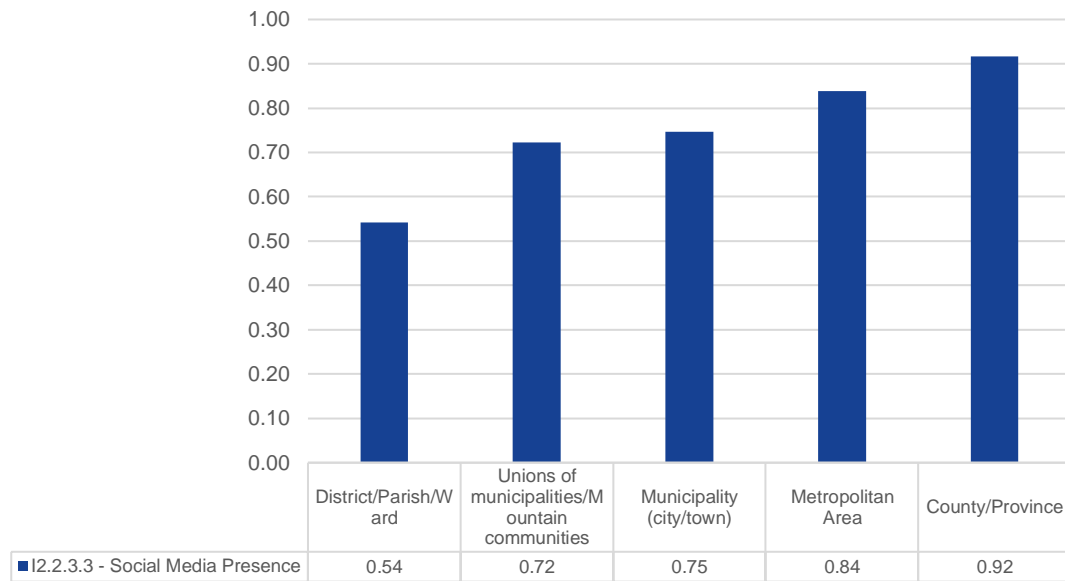


Figure 26 - Social Media Presence by GDPC

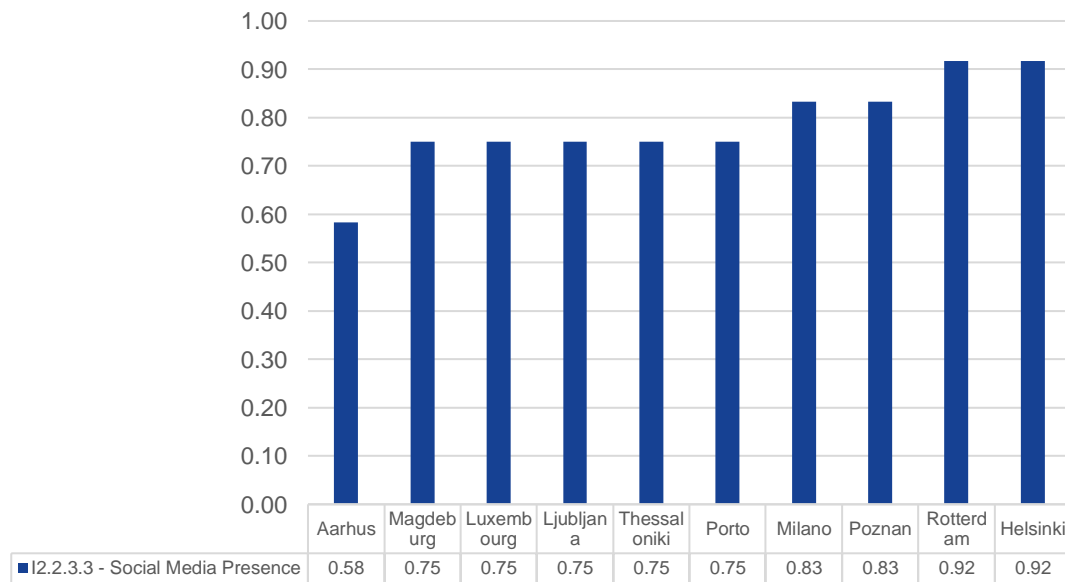
5.4 Authority Type



Index observed	Index type	Index level	Data Sample	Clusters
I2.2.3.3 - Social Media Presence	DPSVI	Intermediate	Reference Sample	Authority type

Figure 27 - Social Media Presence by authority type

5.5 Case studies

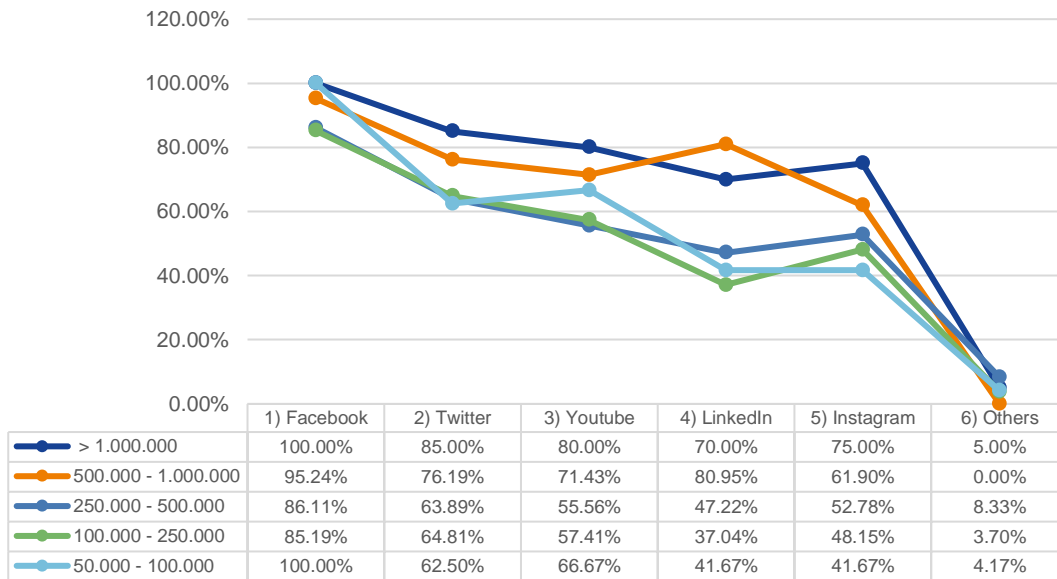


Index observed	Index type	Index level	Data Sample	Clusters
I2.2.3.3 - Social Media Presence	DPSVI	Intermediate	Case studies	na

Figure 28 - Social Media Presence, case studies

5.6 Relevant question results

5.6.1 Please select which social media platform(s):



Question observed	Question type	Data Sample	Clusters	Value
Q_6.4.1	Multiple choice	Reference Sample	Population	Percentage

Figure 29 – Social media presence

5.7 Highlights

- This index shows very high values and a very limited oscillation spectrum between cities, which almost all obtain excellent scores. This result indicates that the presence on social networks is considered a priority in a transversal way, and that the skills required to ensure a social presence in cities are widespread.
- To support this hypothesis, it can be observed that the results remain very high whatever the mode of clustering of cities, without highlighting any particular trends.
- The question Q_6.4.1 illustrates the different use of the main commercial social networks, where the use of Facebook stands out, widespread in almost all respondents, while almost no one uses alternative social networks. Over 60% of the major cities are also featured on Instagram and LinkedIn.

6 Innovative procurement in European Cities

6.1 Definition of the indices and exploration of its structure

Procurement refers to techniques, structured methods, and means used to streamline an organisation's procurement process and achieve desired results while saving cost, reducing time, and building win-win supplier relationships. It is one of the main demand-side innovation policies to adopt innovative goods and services.

This is a *Bottom Level* index, composed by 6 questions, each one computed for a limited number of possible answers:

- **Q_3.4** Does your public authority have or use an e-procurement platform? Note: The question refers to tenders below €200.000. Tenders above €200k are not considered since their publication on the European TED portal is mandatory by law.
- **Q_3.6** If any, which of the following public procurement procedures did your public authority run - in addition to standard procurement procedures? Note: Please select what is most relevant. : Pre-Commercial Procurement (PCP)
- **Q_3.7** Does your public authority procure innovative digital services/goods together with one or more public authorities (i.e. Joint Procurement)?
- **Q_3.7.1** What is the main reason to opt for Joint Procurement Procedures?
- **Q_3.8** Are the tenders for procuring innovative digital services/goods including the following requirements? Note: Please select as many as apply
- **Q_8.4** Please indicate the key obstacles that your public authority is experiencing: Note: Please select as many as apply.: Integrating Blockchain in public services

6.1.1 Mapping Details

The following figure and table include the detailed list of the questions that have been mapped to this index and its sub-indexes, according to the methodology explained in Chapter 1.2.1.

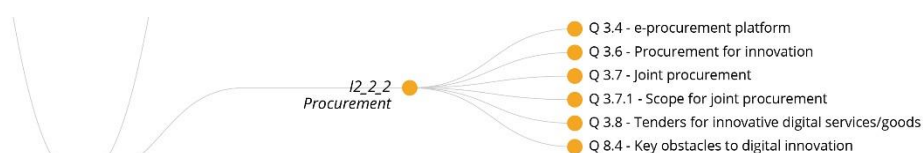


Figure 30 – Procurement index composition (questions tree)

The following table includes the text of all questions used to create the Societal Engagement Indexes and information about the type of questions.

Question number and text	Question Type
3.4 Does your public authority have or use an e-procurement platform?	Single choice
3.6 If any, which of the following public procurement procedures did your public authority run - in addition to standard procurement procedures?	Matrix - Single choice
3.7 Does your public authority procure innovative digital services/goods together with one or more public authorities (i.e. Joint Procurement)?	Single choice
3.7.1 What is the main reason to opt for Joint Procurement Procedures?	Single choice
3.8 Are the tenders for procuring innovative digital services/goods including the following requirements?	Multiple choice
8.4 Please indicate the key obstacles that your public authority is experiencing:	Matrix - Multiple choice

Table 7 – Procurement related Questions in DIGISURVEY

The *Annex 1.1 Extended Methodology* to the DIGISER Final Report hosts a dedicated Appendix (Appendix I) with all the information related to the standardization process underlying the DPSVI, including the detailed map of answers to indices and the weight attributed to each answer for standardization purposes.

6.1.2 Aggregation details

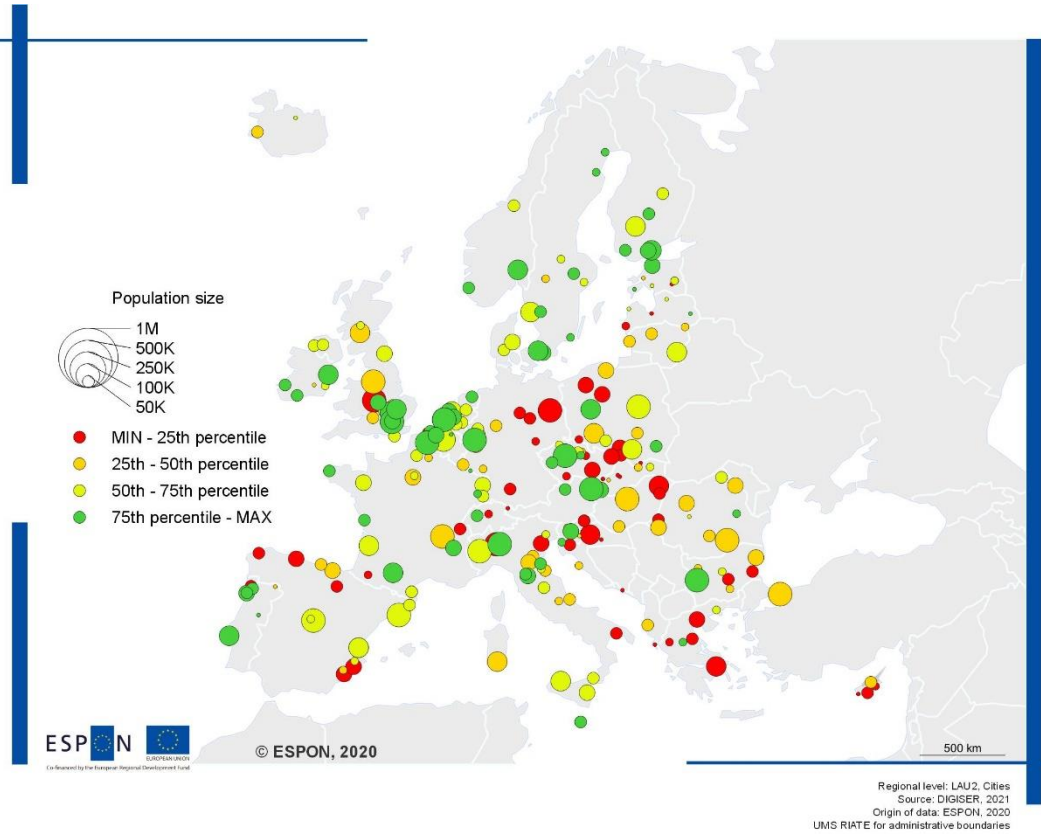
The following table provides information regarding the weights attributed to each question in computing the value of the indexes presented in this report, according to the methodology presented in Chapter 1.2.3.

Q_#	I2_2_2
Q_3.4	100%
Q_3.6	100%
Q_3.7	100%
Q_3.7.1	100%
Q_3.8	100%
Q_8.4	100%

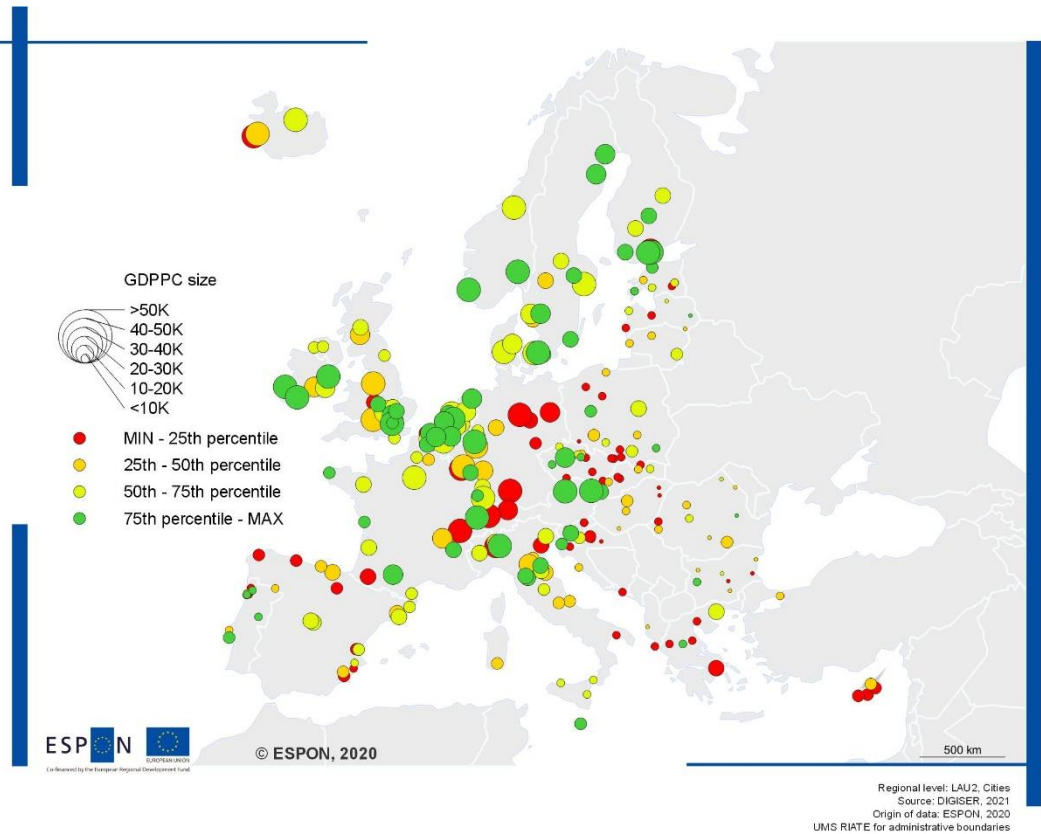
Table 8 – Procurement - Relative weight of underlying questions

An extensive overview of the weights used to calculate the DPSVI is available in *Annex 1.1 Extended Methodology*.

6.2 Index overview



Map 9 – Procurement and population size



Map 10 – Procurement and GDPPC size

6.3 Population

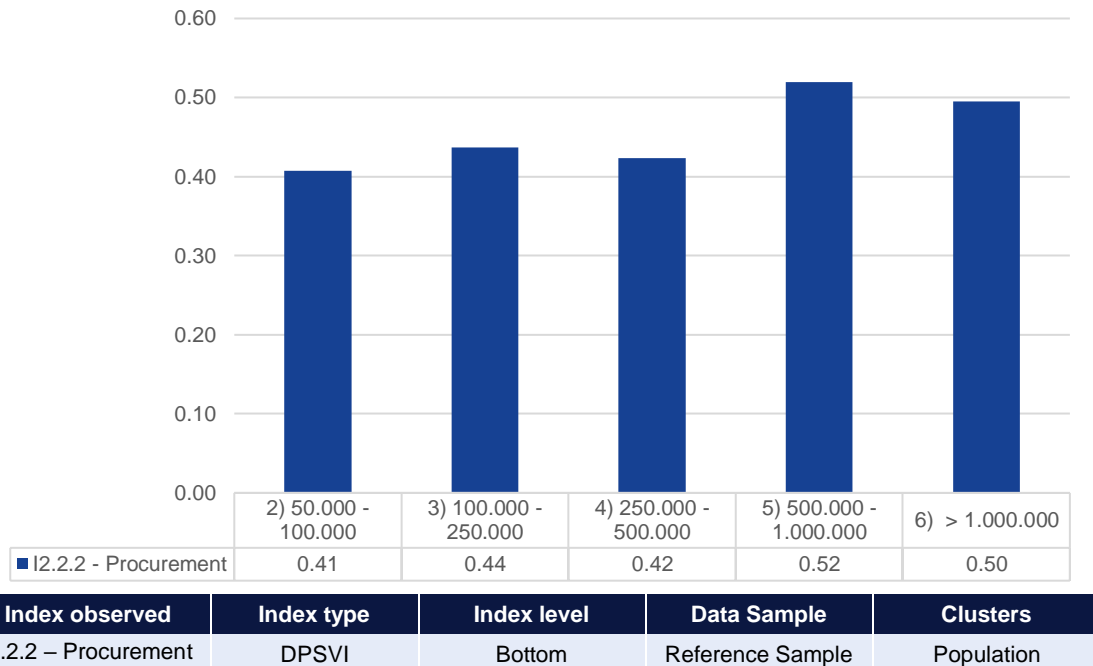


Figure 31 - Procurement by population

6.4 GDP per Capita

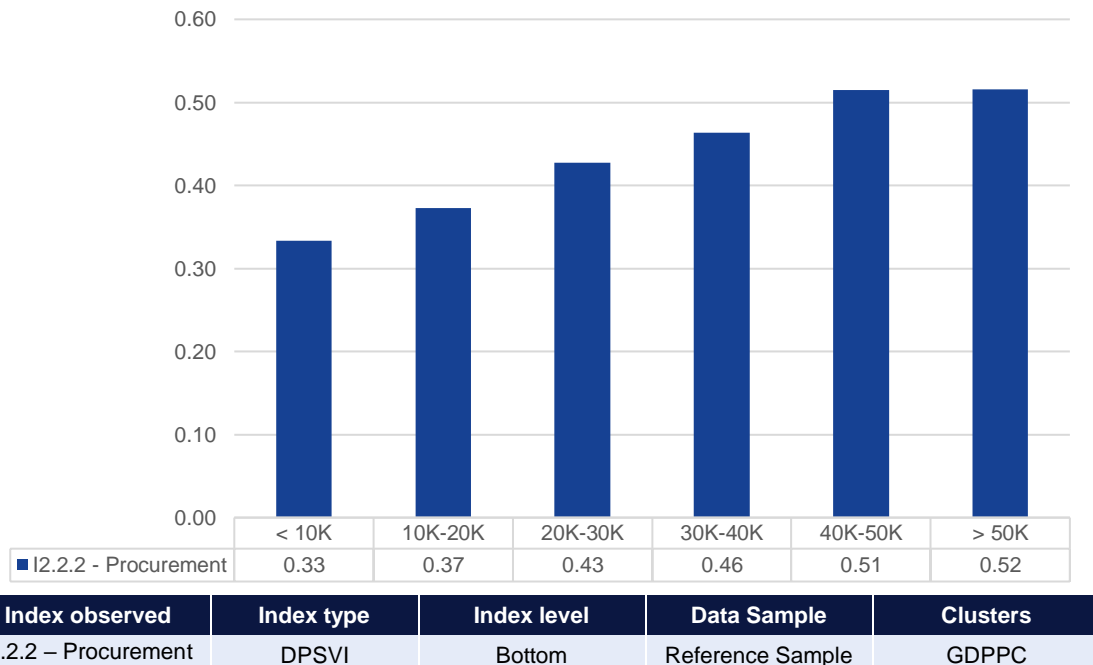
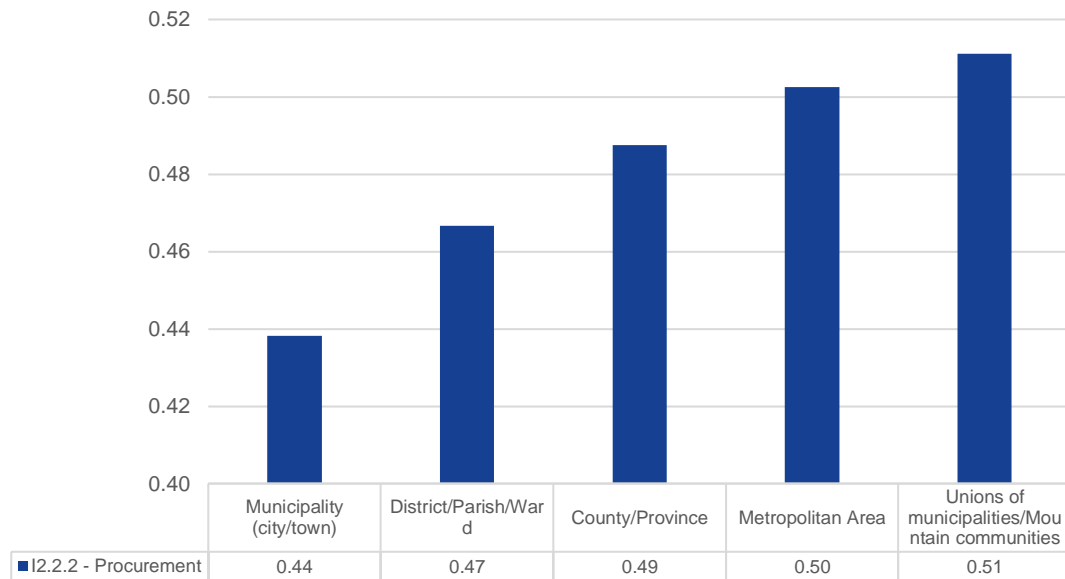


Figure 32 - Procurement by GDPC

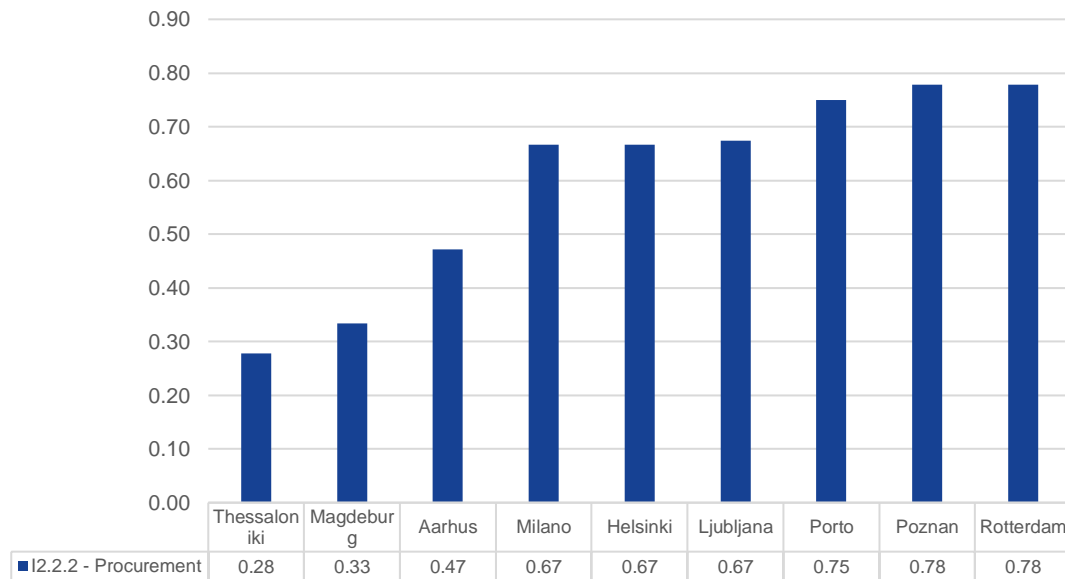
6.5 Authority Type



Index observed	Index type	Index level	Data Sample	Clusters
I2.2.2 – Procurement	DPSVI	Bottom	Reference Sample	Authority type

Figure 33 - Procurement by authority type

6.6 Case studies

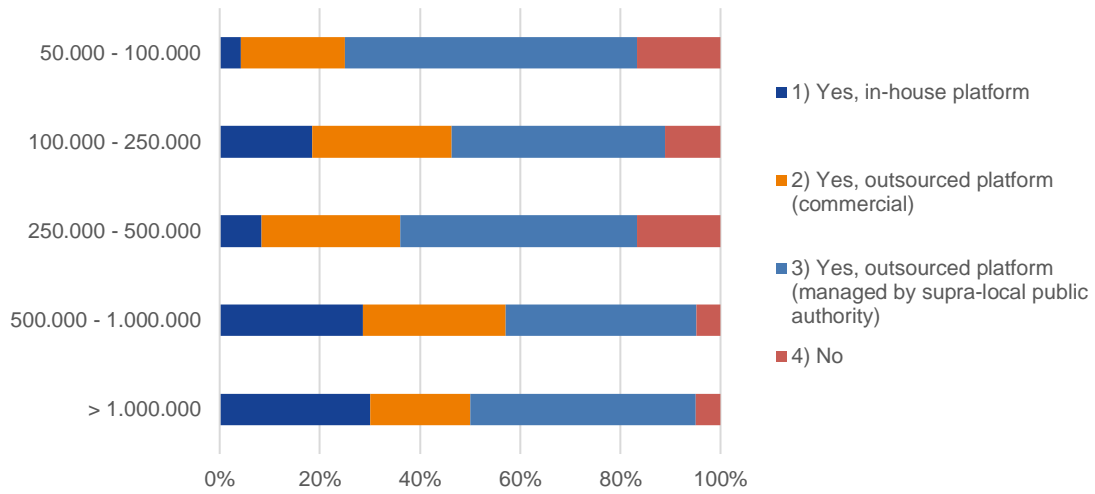


Index observed	Index type	Index level	Data Sample	Clusters
I2.2.2 – Procurement	DPSVI	Bottom	Case studies	na

Figure 34 - Procurement, case studies

6.7 Relevant question results

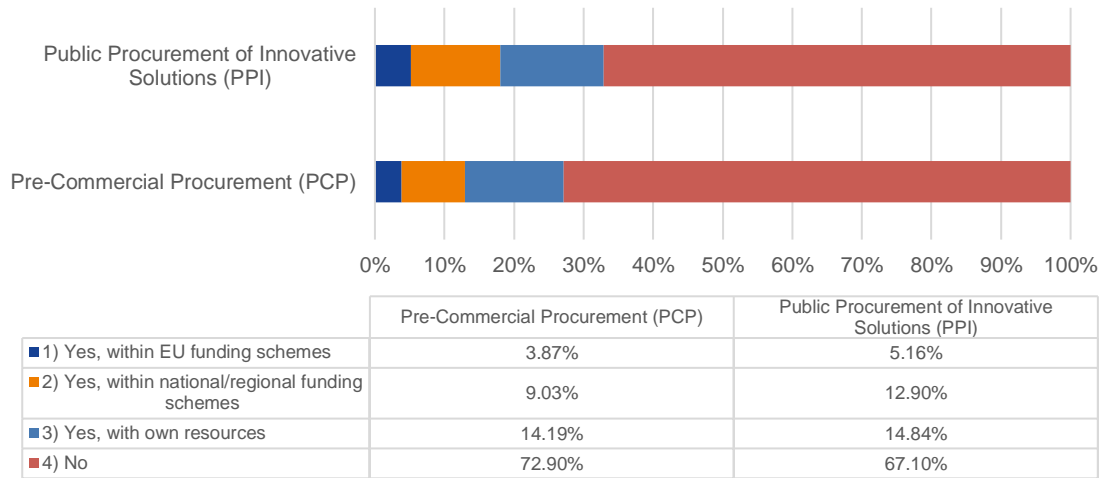
6.7.1 Does your public authority have or use an e-procurement platform?



Question observed	Question type	Data Sample	Clusters	Value
Q_3.4	Single choice	Reference Sample	Population	Percentage

Figure 35 – Use of E-procurement Platforms

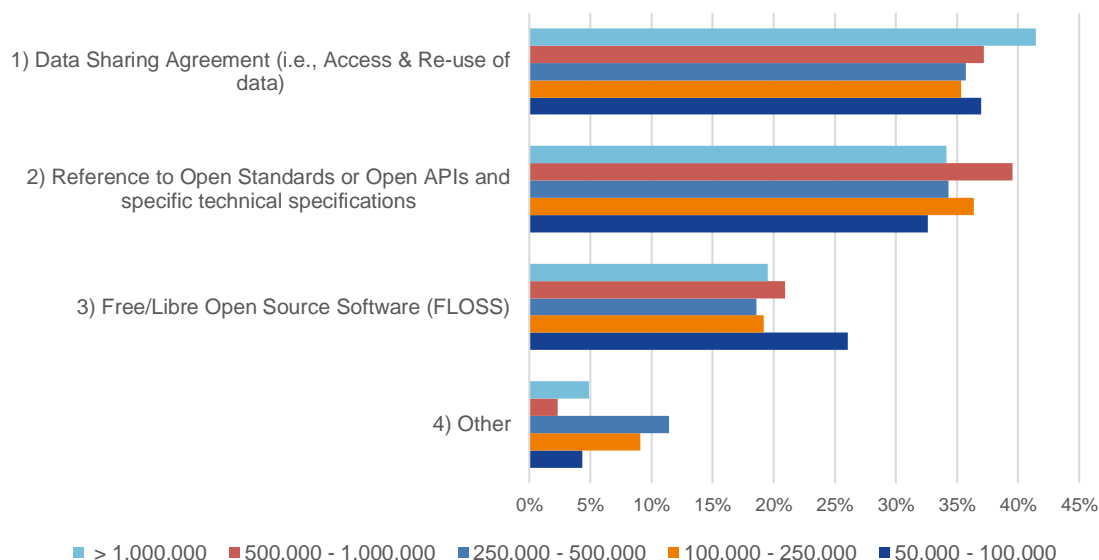
6.7.2 What licenses are used to publish data openly on your data platform?



Question observed	Question type	Data Sample	Clusters	Value
Q_3.6	Single choice	Reference Sample	Na	Percentage

Figure 36 – Procurement of innovation

6.7.3 Are the tenders for procuring innovative digital services/goods including the following requirements?



Question observed	Question type	Data Sample	Clusters	Value
Q_3.8	Multiple choice	Reference Sample	Population	Percentage

Figure 37 – Requirements in Public Tenders

6.8 Highlights

- This indicator explores both the level of digital transformation of procurement procedures and how cities use procurement to leverage innovation.
- Unlike most of the other indicators, it has no direct correlations with the population size of cities, but is instead related to the wealth produced by cities so those with a higher GDPPC perform better
- Another interesting result concerns the performance of supra-municipal entities (metropolitan cities and unions of municipalities) which is higher than the average of cities. This creates room to hypothesize that more recently established and more complex entities are capable to experiment and consolidate more innovative procurement procedures.
- Looking at the questions that compose the index:
 - The use of procurement platforms is widespread in every category of city, with a clear predominance of outsourced platforms. Here the platforms made available by the higher-scale institution are the most used compared to those operated by private third parties, while only the major cities have the capacity to develop and manage their own procurement platform in-house.
 - The use of innovative tools such as the CFP or the PPI affects about 30% of cities (the slightly more used PPI). Differently from the research hypothesis, at least half of the cases are co-financed by the city with its own resources, while the other cases are implemented in the Regional, National or (to a lesser extent) European Funding Schemes
 - Regardless of their size, the cities of the reference sample proved capable to establish (in public tenders) requirements oriented to the future reusability of the services and goods purchased. The high attention of smaller cities for the use of Free Open Source Software would require further investigation.



Co-financed by the European Regional Development Fund

Inspire Policy Making with Territorial Evidence

espon.eu



ESPON 2022

ESPON EGTC

11 Avenue John F. Kennedy
L-1855 Luxembourg - Kirchberg
Grand Duchy of Luxembourg
Phone: +352 20 600 280
Email: info@espon.eu
www.espon.eu

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States, the United Kingdom and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

Disclaimer

This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.