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WELCOME TO THE ESPON Week in Slovenia Quality of Life for territorial and citizen-centric policies

02.12.2021

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Territorial indicators based on big data from private digital platforms

Presentation of Final Results
ESPON Week in Slovenia “Quality of Life for territorial and citizen-centric policies

Dr. Jan-Phillipp Kramer, Dr. Georg Klose

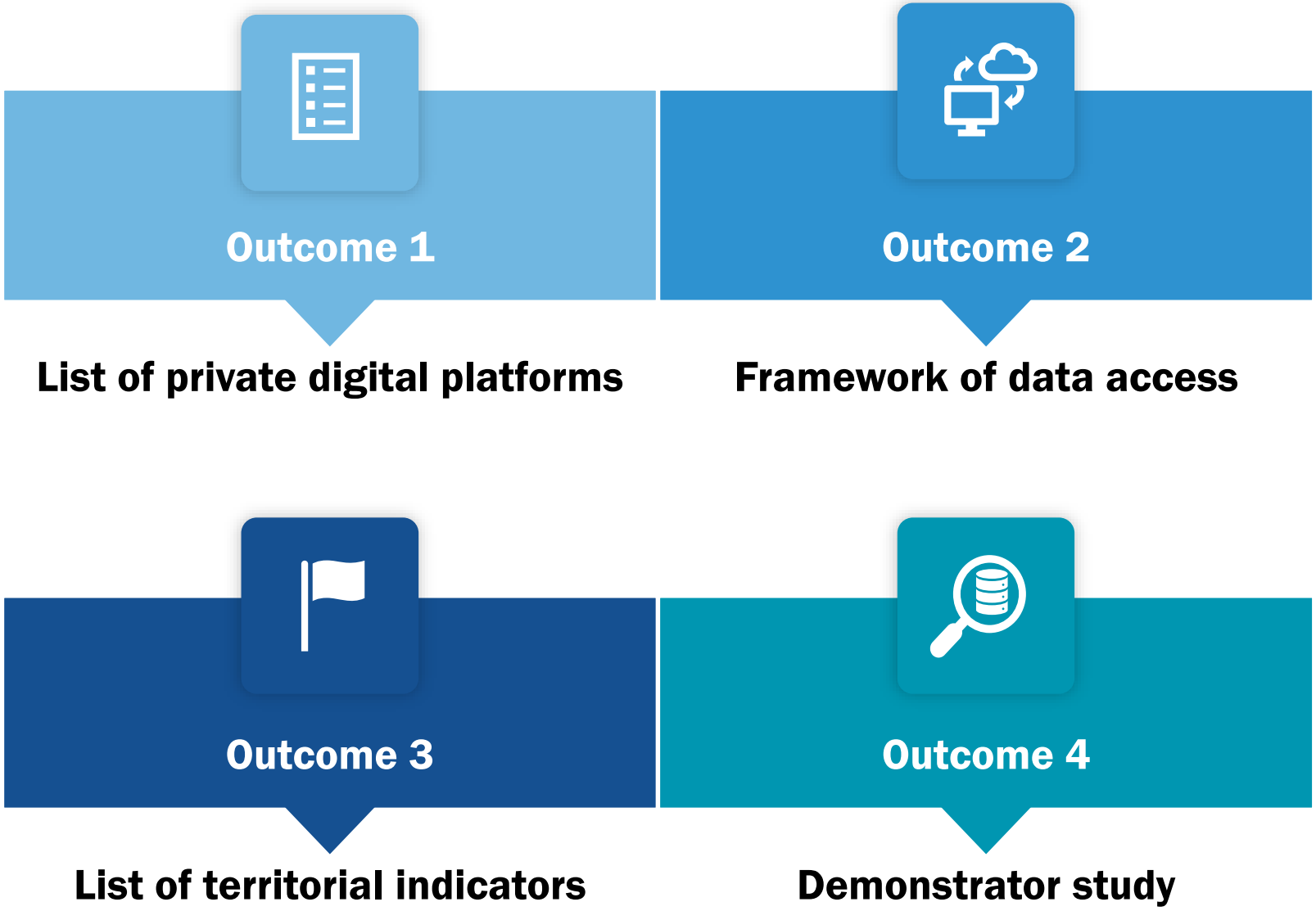
02.12.2021

Agenda

11:00 – 11:05	**Welcoming**
11:05 – 11:30	**Presentation of the Study ‘Territorial indicators based on big data’**
11:30 – 11:40	**Question & Answers**
11:40 – 12:10	**Panel Discussion**
12:10 – 12:15	**Closing remarks**

Objectives of the project & outcomes:

- Demonstrate the strengths of big data
- Explore options for regular big data access & extraction
- Develop feasible and implementable examples of indicators and methods



Dimensions of territorial indicators based on big data

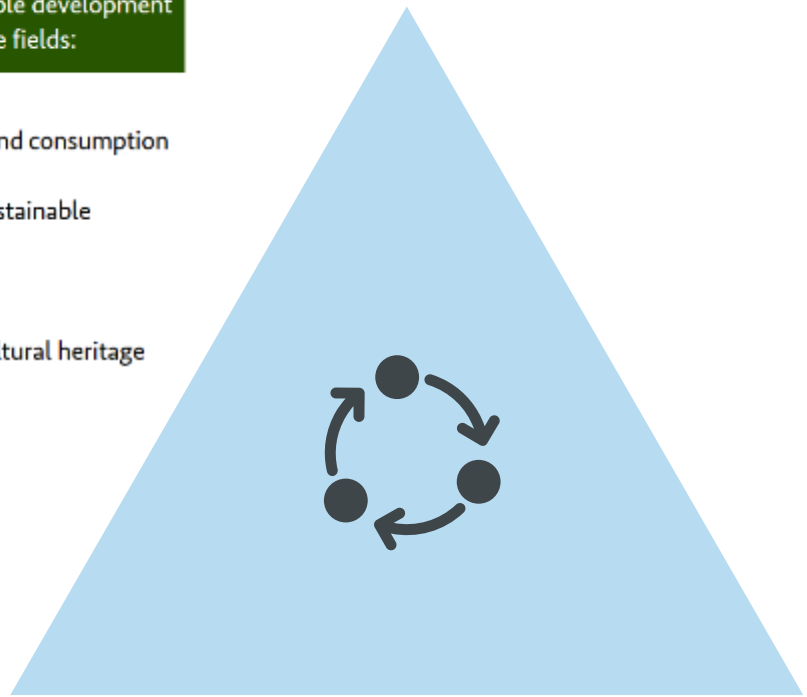
There is need to act as people and places drift apart – increasing imbalances and inequalities, e.g. in the fields:

- Quality of life
- Services of general interest
- Demographic and societal imbalances
- Digitalisation and the 4th industrial revolution
- Employment and economic development
- Interdependencies between places
- Global embeddedness

There is need to respond to the increasing pressure concerning sustainable development and climate change, e.g. in the fields:

- Climate change
- Loss of biodiversity and land consumption
- Air, soil and water quality
- Secure, affordable and sustainable energy
- Just transition
- Circular value chains
- Nature, landscape and cultural heritage

Territorial indicators



Thematic fields of Territorial Agenda

Data insights (Biases, user group, territorial Information)

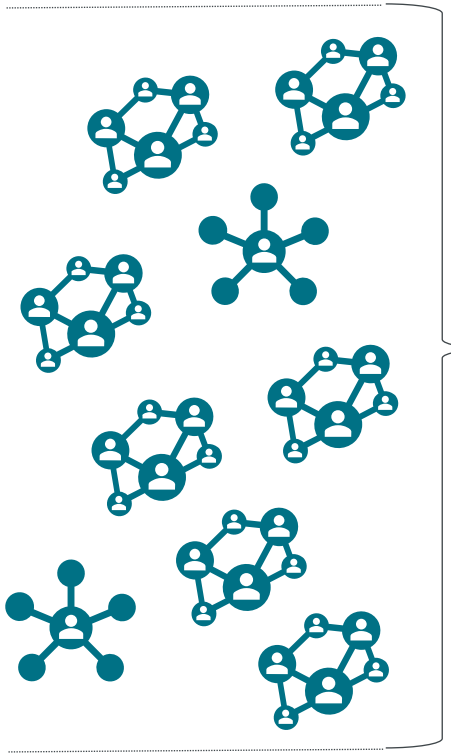
Data

Data access

More information: https://www.territorialagenda.eu/documents.html

Overview of our project approach - Steps (I)

1 Identify digital platforms for acquiring big data for European territorial analysis



Research strategy & framework

+

Literature review/ state of play

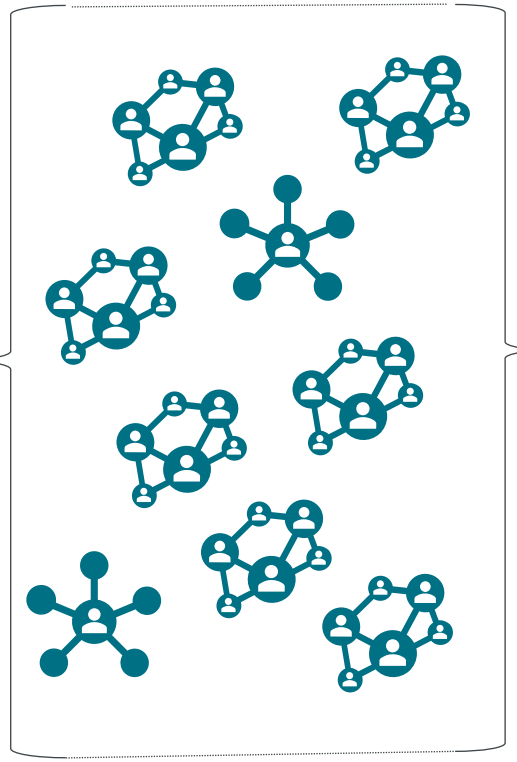
+

Open research on data platforms

+

Pre-qualification of data platforms

2 Develop a framework of cooperation with selected private platforms



Identification of dialogue needs

+

1st consultation with advisory group

+

Individual consultation process

+

Development of proposal and validation by advisory group

Overview of our project approach – Steps (II)

3 Develop a list of territorial indicators based on big data from selected private digital platforms

Research and stocktaking of relevant and feasible indicators

+

Development of new indicators

+

New territorial indicators on COVID-19

+

Documenting indicators

4 Prepare a brief description of territorial trends based on a selection of big data-based indicators

Consultation with ESPON EGTC

+

Data collection & analysis

+

Data verification – official statistics

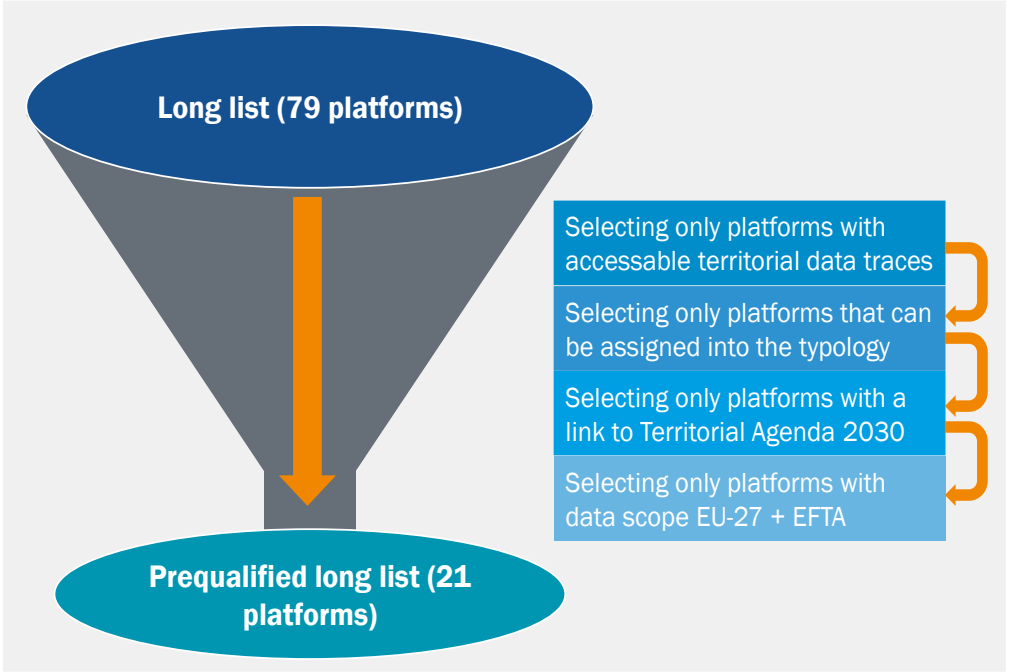
+

Reporting

Overview of relevant private digital platforms

Starting point: From long list to prequalified long list

Schematic overview of qualification process



20 Platforms in the prequalified long list

Knowledge platforms	News/Information/ Picture Sharing	Tourism platform
Google Scholar	Facebook	Expedia
	Tumblr	Foursquare
	Twitter	Trivago
		TripAdvisor
		Booking
Knowledge and Social media platforms	**Route planning/ location identification**	**Picture Sharing**
Academia	Google Maps	Flickr
ResearchGate		Instagram
Finance	**Sports**	**Employment**
PayPal	Strava	LinkedIn
Mobility	**Lodging**	
Kayak	Airbnb	
skyscanner		

Source: Prognos AG/DevStat (2021). Own illustration

Methodology for identifying the candidates for the short list

Overview

Classification of platforms by type

- Platforms with similar functions
- Ensuring to reflect diversity of platforms by selecting different types

Qualitative analysis

- Primary user groups (e.g., journalists)
- Insights into kinds of information to be derived (e.g., network interconnectedness)
- Options of analysis

Quantitative analysis

- Occurrence of different thematic fields (territorial agenda) on each platform
- Orientation to which extent thematic fields are covered by platforms

Selection of platfoms

- Selection of the platforms by type based on qualitative and quantitative analysis

Qualitative & quantitative analysis (1)

Advantage in analysing **dynamic and rapidly evolving topics** as well as **multi-perspective topics**

Examples of analysis:

- news (nowcasting)
- (real-time) discussions to a wide range of topics and trends
- opinions and attitudes

Micro-blogging platforms

A Just Europe

Micro blogging platform\thematic field	Quality of Life	Services of general interest	Demographic and societal imbalances	Digitalisation and the 4th industrial revolution	Employment and economic development	Interdependencies between places	Global embeddedness
twitter.com	4	1	2	3	3	1	2
tumblr.com	3	1	1	1	2	1	1

A Green Europe

Micro blogging platform\thematic field	Air soil water	Climate change	Loss of biodiversity and land consumption	Secure, affordable and sustainable energy	Just transition	Circular value chains	Nature, landscape and cultural heritage
twitter.com	3	4	3	3	2	2	2
tumblr.com	2	3	2	2	1	2	1

→ Selection of **Twitter** for short list → higher values

Qualitative & quantitative analysis (2)

Advantage in analysing **multi-perspective topics** like opinions, feelings, attitudes

Opportunity to introduce supplementary forms of **measurement**

Example of analysis:

- private & professional networks
- pictures
- opinions and attitudes
- interests
- demographics

Social media platforms

A Just Europe

Social Media platform\thematic field	Quality of Life	Services of general interest	Demographic and societal imbalances	Digitalisation and the 4th industrial revolution	Employment and economic development	Interdependencies between places	Global embeddedness
linkedin.com	4	2	3	4	4	1	2
facebook.com	4	3	3	3	3	2	2
flickr.com	2	1	1	2	2	1	1
instagram.com	2	1	1	1	2	1	1
foursquare.com	2	1	1	1	1	1	1

A Green Europe

Social Media platform\thematic field	Air soil water	Climate change	Loss of biodiversity and land consumption	Secure, affordable and sustainable energy	Just transition	Circular value chains	Nature, landscape and cultural heritage
linkedin.com	3	3	3	4	2	3	3
facebook.com	3	4	3	3	3	4	3
flickr.com	2	3	3	2	1	2	2
instagram.com	2	2	2	2	1	2	2
foursquare.com	1	2	1	1	1	2	1

→ Selection of **LinkedIn** for short list → highly connected to digitalisation and employment-related field

Qualitative & quantitative analysis (3)

Advantage in analysing **multi-perspective topics** like opinions, interests, attitudes especially of location

Opportunity to introduce supplementary forms of **measurement**

Example of analysis:

- popularity places
- tourist flows
- possibilities of activity of places
- distribution of entities like restaurants

Tourist platforms

A Just Europe

Tourism platform\thematic field	Quality of Life	Services of general interest	Demographic and societal imbalances	Digitalisation and the 4th industrial revolution	Employment and economic development	Interdependencies between places	Global embeddedness
tripadvisor.com	4	2	2	2	3	2	2
airbnb.com	4	2	2	2	3	1	1
booking.com	3	1	2	2	3	2	2
kayak.com	3	0	1	2	2	1	0
trivago.com	3	1	1	2	2	0	1
skyscanner.com	3	0	2	1	2	0	1
expediagroup.com	2	0	0	1	1	0	0

A Green Europe

Tourism platform\thematic field	Air soil water	Climate change	Loss of biodiversity and land consumption	Secure, affordable and sustainable energy	Just transition	Circular value chains	Nature, landscape and cultural heritage
tripadvisor.com	4	4	4	3	2	4	3
airbnb.com	3	4	3	3	1	4	3
booking.com	3	3	3	3	1	4	3
kayak.com	3	3	2	2	1	3	2
trivago.com	2	2	2	2	2	3	2
skyscanner.com	2	2	3	2	0	3	2
expediagroup.com	1	1	1	1	1	1	1

→ Selection of **TripAdvisor** for short list → insights into many dimensions of leisure activities

Tripadvisor

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Qualitative & quantitative analysis (4)

Advantage in analysing **dynamic and rapidly evolving topics and trends**

Example of analysis:

- scientific thematic focuses at specific locations and educational institutions
- cross-site collaboration of scientists
- scientific trends

Knowledge platforms

A Just Europe

Knowledge platforms platform\thematic field	Quality of Life	Services of general interest	Demographic and societal imbalances	Digitalisation and the 4th industrial revolution	Employment and economic development	Interdependencies between places	Global embeddedness
researchgate.net	4	3	3	3	3	3	2
academia.edu	3	3	3	3	3	2	2
scholar.google.com	3	2	2	2	2	2	2
academic.microsoft.com	2	0	1	1	2	0	1

A Green Europe

Knowledge platforms platform\thematic field	Air soil water	Climate change	Loss of biodiversity and land consumption	Secure, affordable and sustainable energy	Just transition	Circular value chains	Nature, landscape and cultural heritage
researchgate.net	3	4	4	4	3	3	4
academia.edu	3	3	3	3	2	3	3
scholar.google.com	2	3	3	3	2	2	2
academic.microsoft.com	2	2	2	2	1	2	2

→ Selection of **ResearchGate** for short list → highest hit rate in qualitative analysis

ResearchGate

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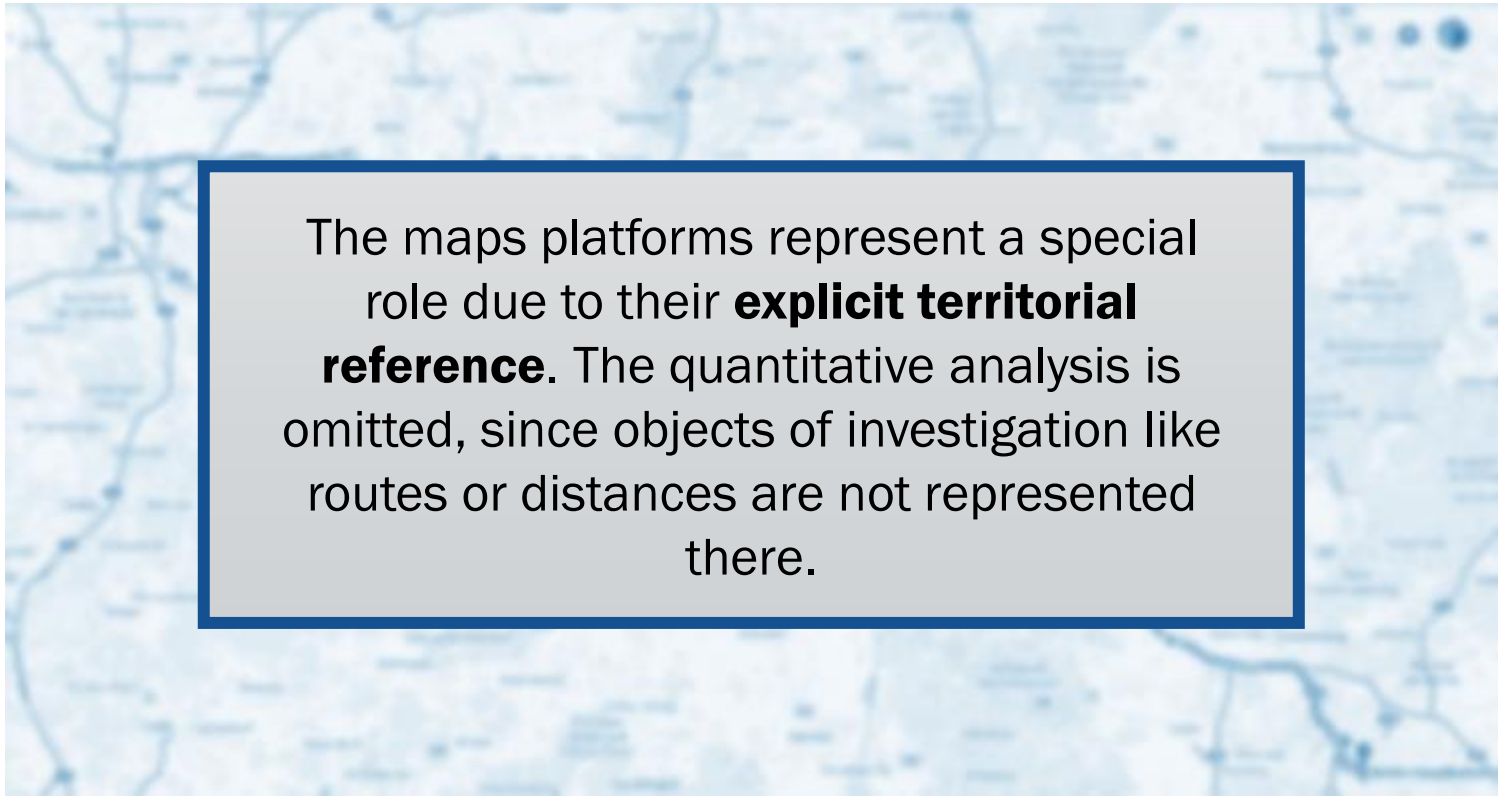
Qualitative & quantitative analysis (5)

Advantage in analysing search queries by location, routs, ratings of entities

Example of analysis:

- entities
- paths
- flows
- routs
- distances

Maps



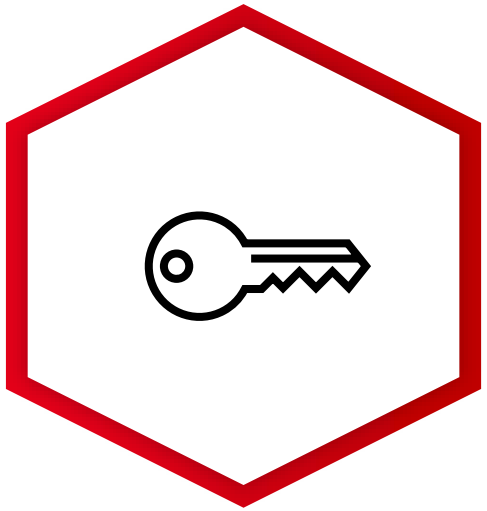
→ Selection of **Google Maps** for short list → supporting function for territorial analysis (e.g., in case of ambiguity, measurement of distances, etc.)

Private, digital platforms suitable for big data analyses

Twitter	LinkedIn	TripAdvisor	Research Gate	Google Maps
Micro blogging	Social media	Tourism	Knowledge platform	Maps
Qualitative Analysis: Objects of analysis …				
• News • Discussions of a wide range of topics, opinions, attitudes	• Networks • Labour markets • Job profiles • Highly relevant scientific topics	• Location • Opinions, attitudes interests related to locations • Leisure activities	• Scientific topics and trends • Scientific collaboration/ cooperation	• Location • distribution of entities • Routes or flows of people
Quantitative Analysis: Top 3 of thematic fields …				
1. Quality of life 2. Climate Change 3. Biodiversity, Digitalisation & more	1. Digitalisation & the 4th industrial revolution 2. Quality of life 3. Employment	1. Circular value chains 2. Quality of life 3. Climate change	1. Quality of life 2. Climate change, biodiversity & sustainable energy 3. Cultural heritage	Quantitative analysis omitted → relevant information not available in form of words

Data access framework

Legal aspects of accessing and processing data



Entitlement to data access

Data access is voluntarily:
There is currently no explicit statutory right to access the data of private platform operators.

Terms of use as legal basis

Pre-formulated agreements as reliable (and fast) data access:
Restrictions and details of data access and data utilisation are regularly regulated in the terms of use

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Law

Data protection law: GDPR
Copyright: DSM Directive

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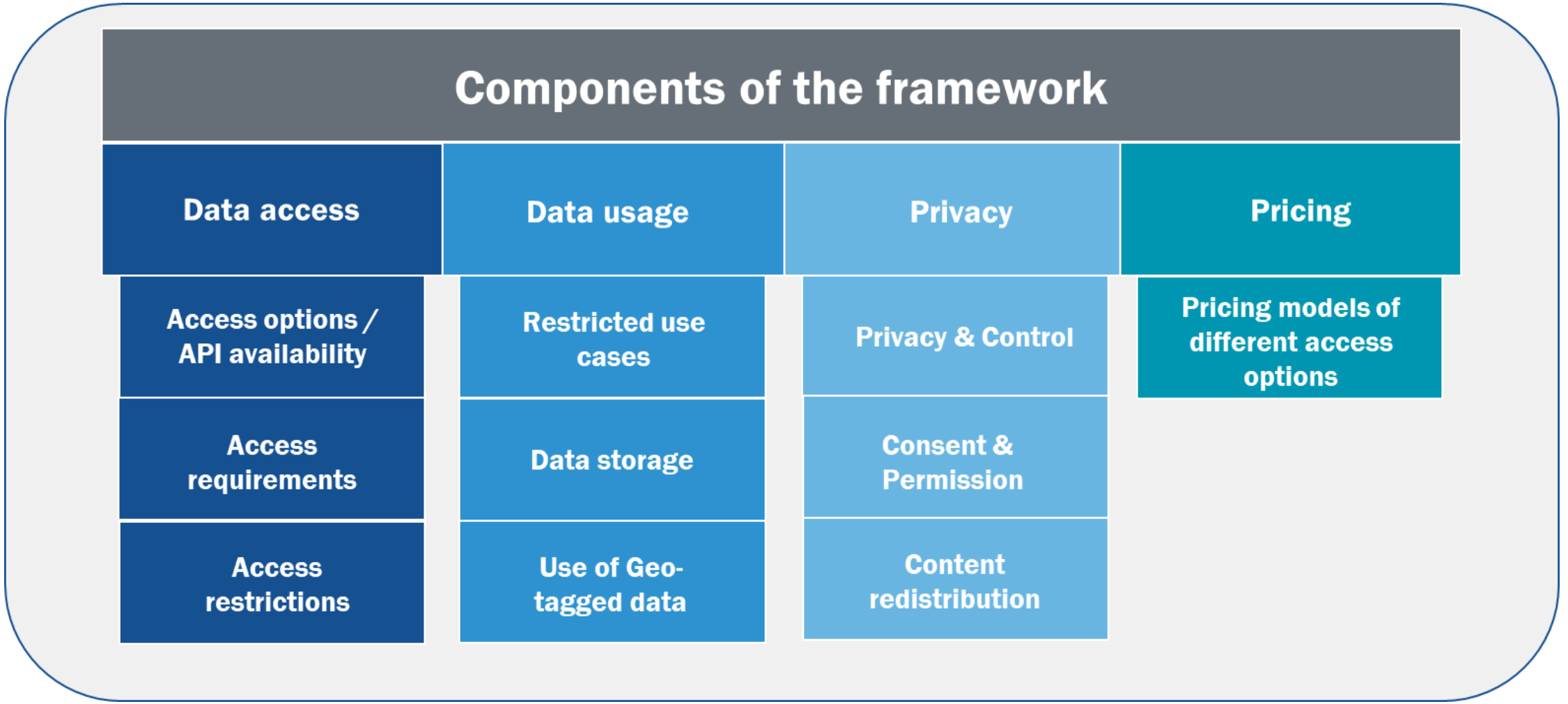
Developed framework can be applied when accessing other private, digital platforms in the future

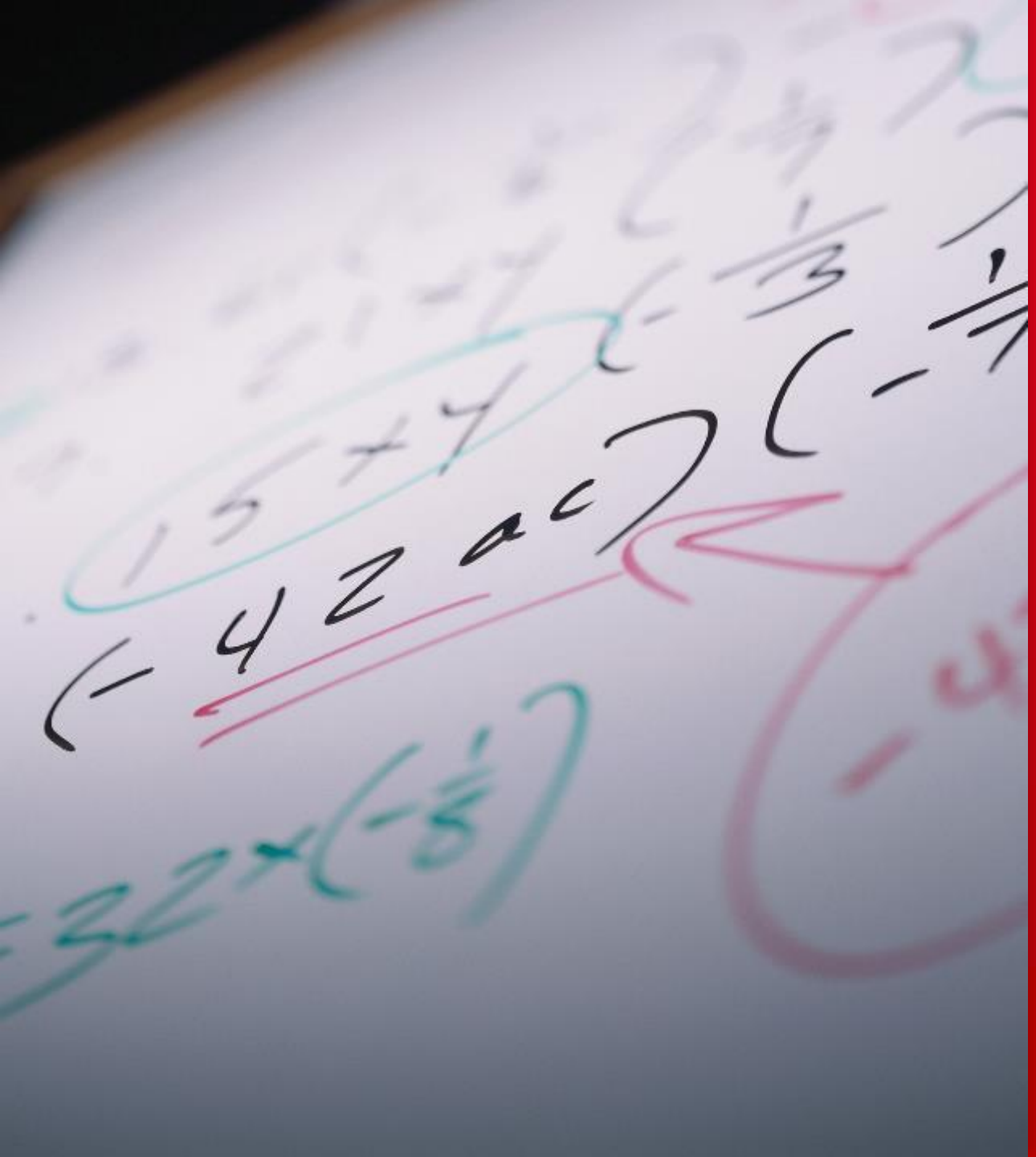


Overview of data access & restrictions

- All platforms permit data access to external users
- API as method of choice for regular big data extraction. Web crawling as second-best option
- Almost all platforms provide APIs
- No significant access restrictions for most platforms
- Rate limits that curb API-access are implemented by all platforms

All platforms permit external data access & most platforms provide an API

Platform	External data access permitted	API available	API access restrictions	API rate limits
Twitter	Yes	Yes	No, if developer account available	Yes
LinkedIn	Yes	Yes	No, if developer account available	Yes
TripAdvisor	Yes	Yes	Yes	Yes
ResearchGate	Yes	No	n.a.	n.a.
Google Maps	Yes	Yes	No, if developer account available	Yes



Territorial indicators based in big data

Strengths of big data (possibilities & specificities)

Using the **strengths of big data** to develop new indicators and complement existing sources.

Big data can measure what cannot or is difficult to be measured by "classic sources"!

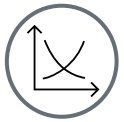
Big data provides advantages especially for...

- **Dynamic and rapidly evolving topics**
- **Multi-perspective topics**
- **New possibilities of measurement and profiling**
- **Topics with low data availability or high collection costs**

Different types of big data indicators offer new methodological possibilities

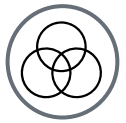
Trend indicators, measuring evolution over time.

Comparison indicators: to build (1) ranking of regions, (2) quantification of differences and (3) measures of inequality.



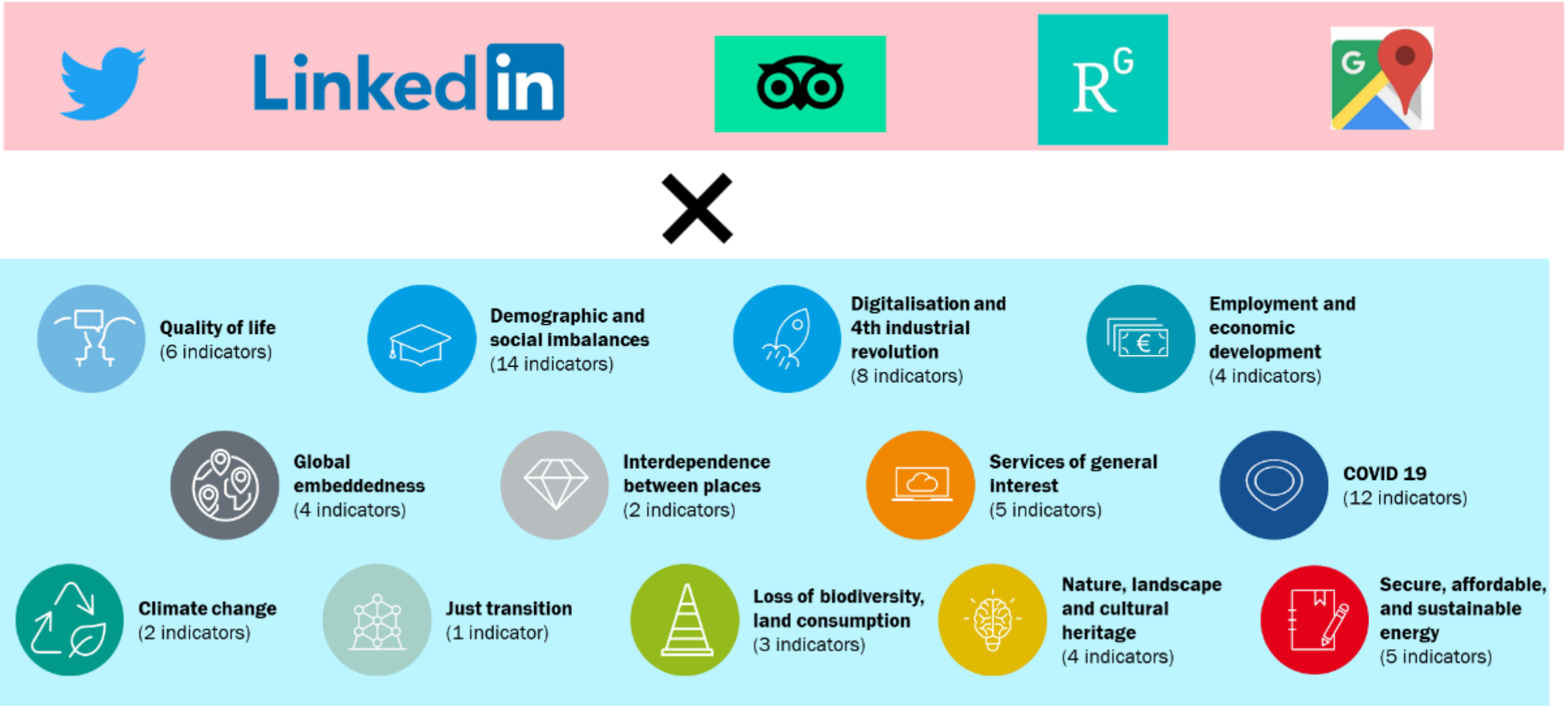
Convergence indicators, to evaluate if different regions converge/diverge according to the topics of the Territorial Agenda 2030

Nowcasting indicators, relating high-frequency territorial indicators based on big data with classical low-frequency indicators.



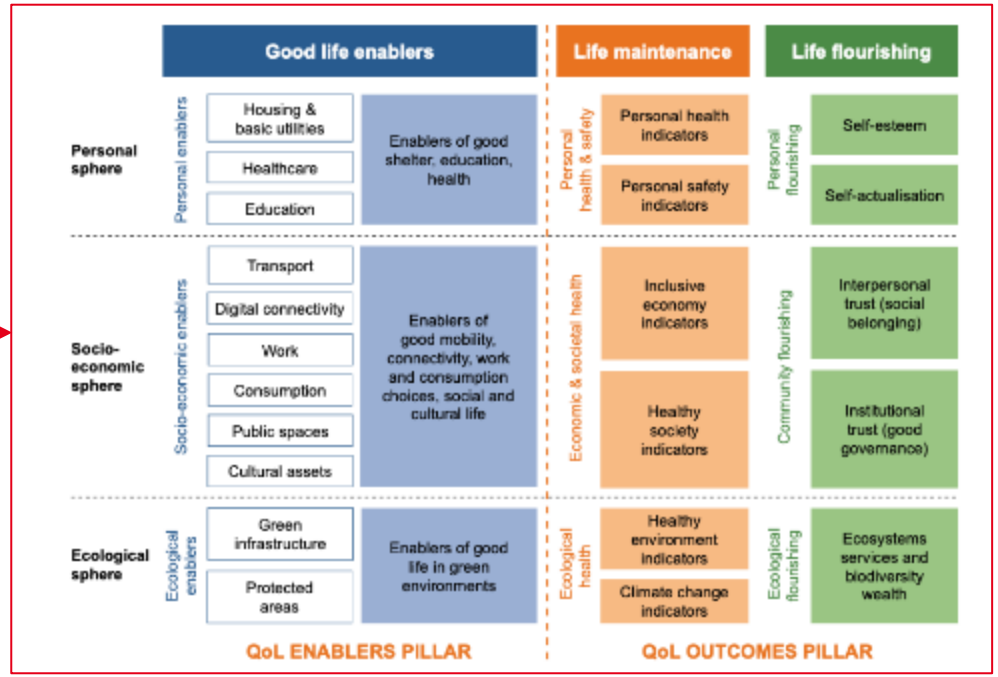
Composite indicators.

Proposed territorial indicators based on big data can measure subject areas of the Territorial Agenda 2030



Examples of big data based on territorial indicators

- Indicators relevant to the perception of COVID-19 crisis
- Indicators relevant for technical skills for digital innovation
- Indicators relevant for quality of life
- Indicators relevant to access to bank services
- Indicators relevant to R&D employment
- ...

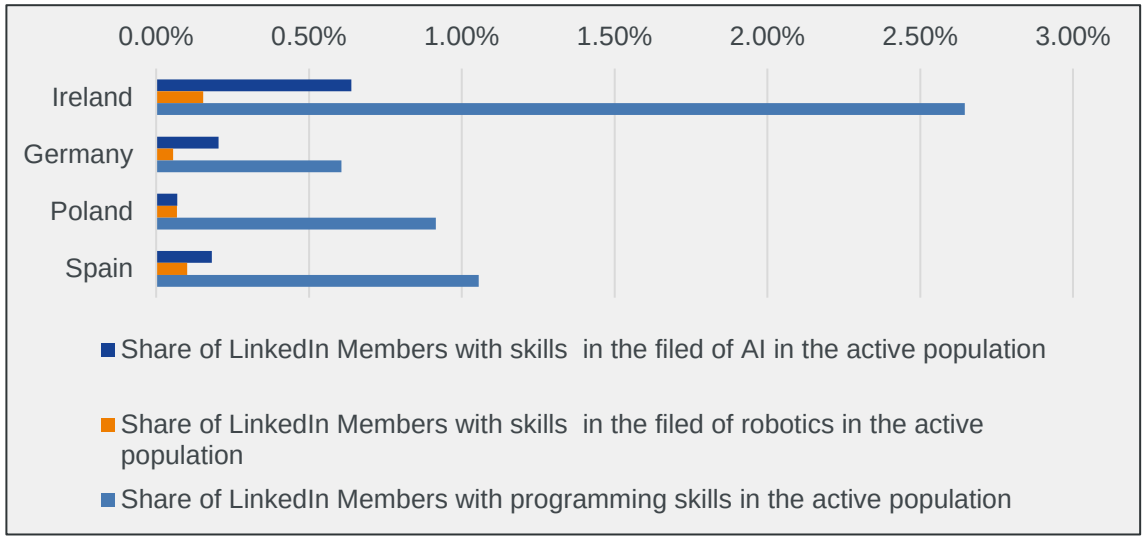


ESPON (2021) Is our life good enough?

Demonstrator Study: Territorial big data

Special information content as strength of the data

Share of LinkedIn Members with skills in the field of Programming, Robotics, and AI in the active population by country

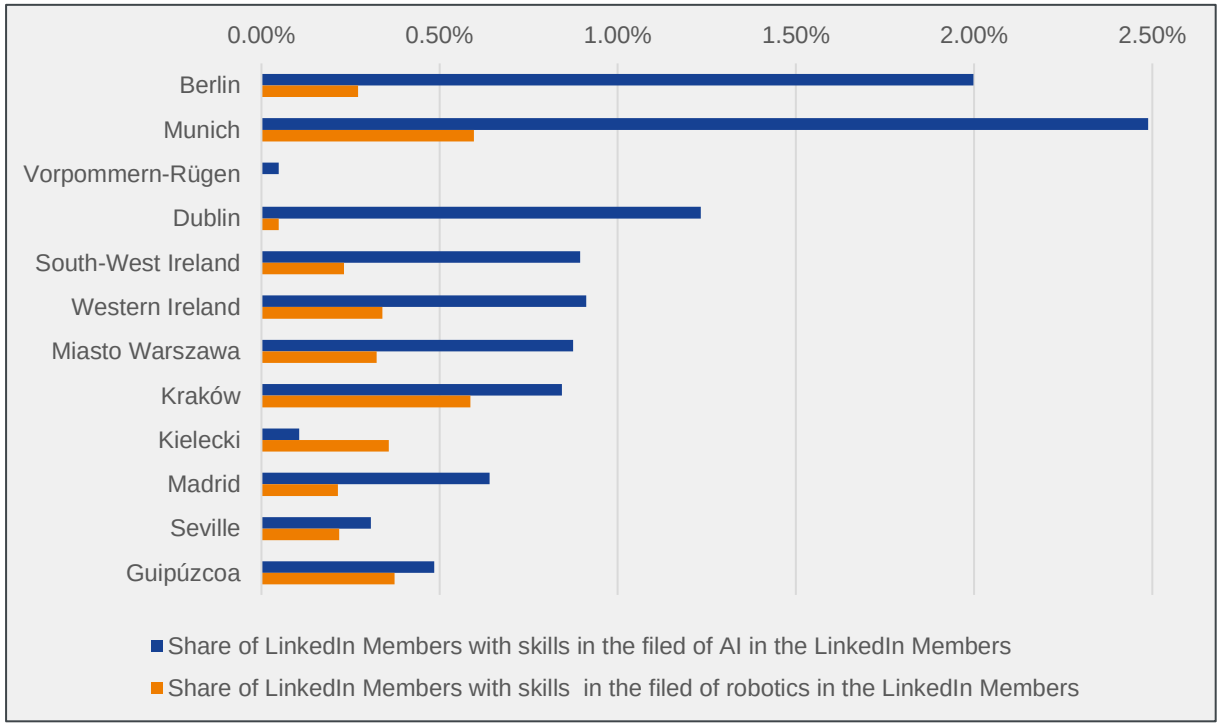


- Limitations concerning LinkedIn's **sectoral and educational representativeness**
  - **High educated individuals** with at least a bachelor's degree are more likely to be in LinkedIn
  - **Self-reported** information

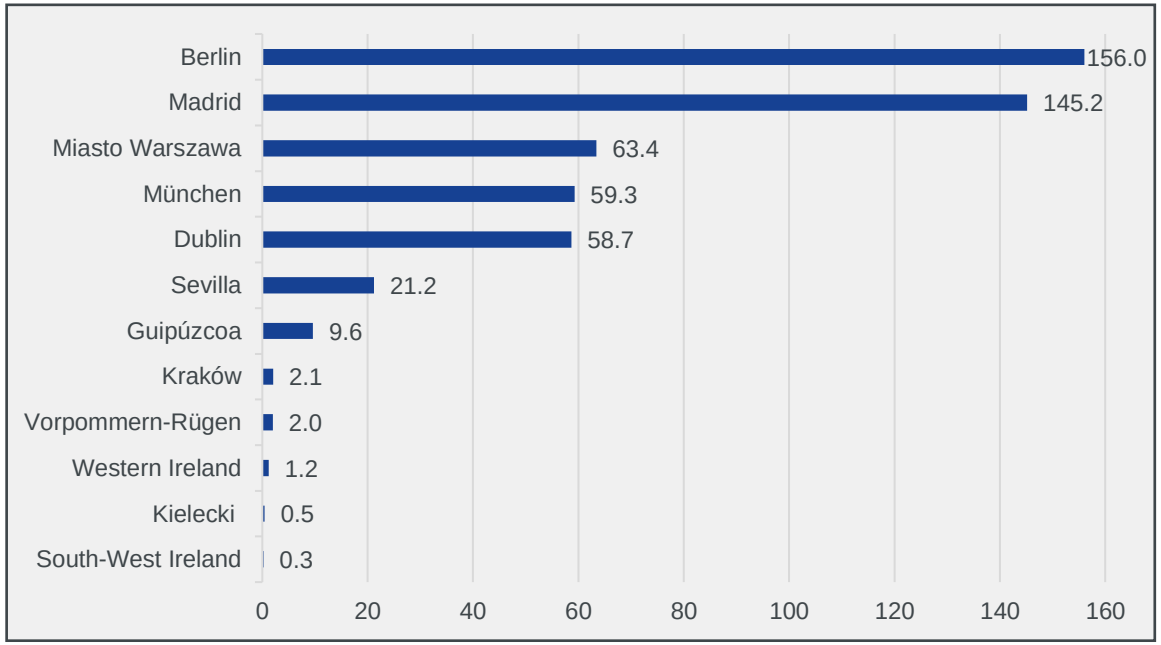
Investigation of highly qualified persons benefiting from the indication of their qualifications

Broad range of possibilities

Share of LinkedIn Members with skills in the field of AI and Robotics in the total LinkedIn Members



Number of tweets on Covid-19 per 10,000 capita



- Large differences between private digital platforms → **Different strengths**
- Strengths of the different platforms must be exploited
- This results in a **very wide range of possibilities** regarding indicators and methods

Summary & Outlook

Key lessons learned and messages

Strength of territorial indicators based on big data

1. Territorial indicators based on big data offer a **multitude of new possibilities** (in policymaking, for economic decision makers, and society).
2. Data must not be understood as a sample of the entire population → make use of the **special information content**, the strengths of this data
3. Subject areas of the **Territorial Agenda 2030** can be measured using these new indicators.
4. **New methodological possibilities** like e.g., almost real-time and nowcasting
5. Full range of possibilities shows **large differences** between private digital platforms & a **variety of possible** indicators and methods

Data access

1. No explicit statutory right to access data of private platform operators (**voluntary**)
2. Platforms **terms of use** as pre-formulated agreements (+privacy- & copyright-law) for reliable access and processing of data (**Framework**)
3. **List of private, digital platforms** that are suitable for such analysis as a key result.
4. **Challenges** in obtaining territorial data from private digital platforms depend to a large extent on the specific indicator & the specific methodological implementation

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Panel Discussion

Questions:

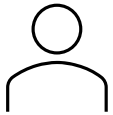
1. Where do you see the **greatest potentials** for using the results of the experimental study on Territorial indicators based on big data from private digital platforms?

2. What are the **key aspects** (topics, types of indicators, types of data) ESPON should focus on in the future?

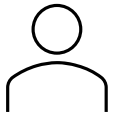
3. What are the next **key challenges** in utilising big data from private digital platforms for territorial analysis?

4. New perspectives – where are we heading in the **future** when it comes to using big data from private digital platforms for regional policy making?

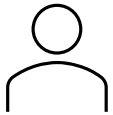
Participants:



Zintis Hermansons (Moderator)
ESPON



Juergen Wastl
Digital Science (UK)



Luigi La Riccia
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Question & Answer

Link to the study ‘Territorial indicators based on big data’: https://www.espon.eu/BigDataIndicators

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