

# INSPIRE

## Strengths, Weaknesses, Opportunities & Threats (SWOT) & Way Forward

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*Presentation to the INSPIRE 2017 Conference 7 September 2017*



# THE PRESENTERS

- DARA KEOGH
  - CEO GeoDirectory
  - GeoDirectory provides over 2.2m address points at 1m spatial accuracy, updated quarterly
  - Provides the basis for Irish postcodes
- BRUCE McCORMACK
  - Land use planning and spatial information consultant
  - Involvement in INSPIRE from early days
  - EUROGI Past President, current IRLOGI President



# PRESENTATION AIMS

- Review some aspects of *data availability* on the INSPIRE geoportal
- Present a *SWOT evaluation* of INSPIRE on the basis of responses to a questionnaire sent to a small sample of persons
- Make some suggestions at a broad strategic level regarding the *way forward* for INSPIRE

# PRESENTATION **OUTLINE**

- Data on INSPIRE Geoportal
- SWOT
- Way Forward



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# INSPIRE GEOPORTAL HOME PAGE

**European Commission**

## INSPIRE GEOPORTAL

Enhancing access to European spatial data

EUROPEAN COMMISSION > INSPIRE > INSPIRE GEOPORTAL

**Welcome to the INSPIRE geoportal**

The INSPIRE Directive requires the Commission to establish a community geo-portal and the Member States shall provide access to their infrastructures through the geo-portal as well as through any access points they themselves decide to operate.

[More...](#)

**Discovery / Viewer**

Search, discover and access geographic information provided by European governmental, commercial, and non-commercial organizations.

[More ...](#)

**Validator**

The purpose of the INSPIRE Metadata Validator is to test the compliance of INSPIRE metadata with the INSPIRE Metadata Regulation.

[More ...](#)

**Resource Browser**

Technical insight into resource metadata

[More ...](#)

**Metadata Editor**

Create metadata according to the INSPIRE implementing rules.

[More ...](#)

# INSPIRE GEOPORTAL DATA DISCOVERY/VIEW PAGE

INSPIRE GEOPORTAL  
Enhancing access to European spatial data

EUROPEAN COMMISSION > INSPIRE > INSPIRE GEOPORTAL > Discovery / Viewer

Find a place in:  Powered by GeotNames

Search:  [Advanced Search](#)

datasets  series  services  layers  download service

Austria Belgium Bulgaria Croatia Cyprus  
Czech Republic Denmark Estonia Finland  
**France** Germany Greece Hungary Iceland  
Ireland Italy Latvia Liechtenstein Lithuania  
Luxembourg Malta Netherlands Norway **Poland**  
Portugal Romania Slovakia Slovenia Spain Sweden  
Switzerland **United Kingdom** Addresses  
Administrative Units Agricultural and Aquaculture Facilities  
Area management/restriction/regulation zones and reporting units  
Atmospheric Conditions Buildings Cadastral Parcels  
Coordinate Reference Systems Elevation  
Energy Resources Environmental Monitoring Facilities  
Geographical Grid Systems Geographical Names Geology  
Habitats and Biotores Human Health and Safety  
Hydrography Land Cover **Land Use**  
Meteorological Geographical Features Mineral Resources  
Natural Risk Zones Oceanographic Geographical Features  
Orthoimagery Production and Industrial Facilities

# INSPIRE GEOPORTAL – A COUNTRY PAGE

The screenshot displays the INSPIRE Geoportal interface. At the top, the European Commission logo and the text "INSPIRE GEOPORTAL Enhancing access to European spatial data" are visible. Below this, a navigation bar shows the path: "EUROPEAN COMMISSION > INSPIRE > INSPIRE GEOPORTAL > Discovery / Viewer".

The main interface is divided into several sections:

- Search:** A search bar contains the query "at". Below it, the results are sorted by "relevance" (most relevant). It shows "displaying 1 to 10 out of 730 results" with pagination controls.
- Map:** A map of Europe is shown on the left, with a search box above it containing "Europe". The map includes a scale bar (1000 km / 1000 mi) and coordinates (81.77854, 57.08026).
- Active Layers:** Below the map, it indicates "Active Layers: 0".
- Dataset List:** A list of search results is shown on the right, including:
  - [dataset] KM500 Vektor - Wald:** "Dieser Datensatz entspricht dem Wald des Objektbereichs Vege ... (show more)"
  - [dataset] Orthophoto Farbe:** "Die Orthophotos Color (Kurzname: OP-Color) werden aus Luftbi ... (show more)"
  - [dataset] Berichtsgewässernetz des Bundes (BGN v12) - Stehende Gewässer, Österreich:** "Seen des Berichtsgewässernetz des Bundes zur Erfüllung der B ... (show more)"
  - [dataset] Aktuelle BEV Orthophotos 2010, analoger Bildflug:** "Die Orthophotos werden aus Luftbildern in Echtfarbe hergeste ... (show more)"
- Advanced Search:** A sidebar on the right contains "Advanced Search" options, including "Active Search Criteria" (Bounding Box Restrictions), "Active Search Filters" (Remove all criteria), and "Refine search by" (Origin, Metadata Language, Spatial Data Theme, Topic Category, Service Type).



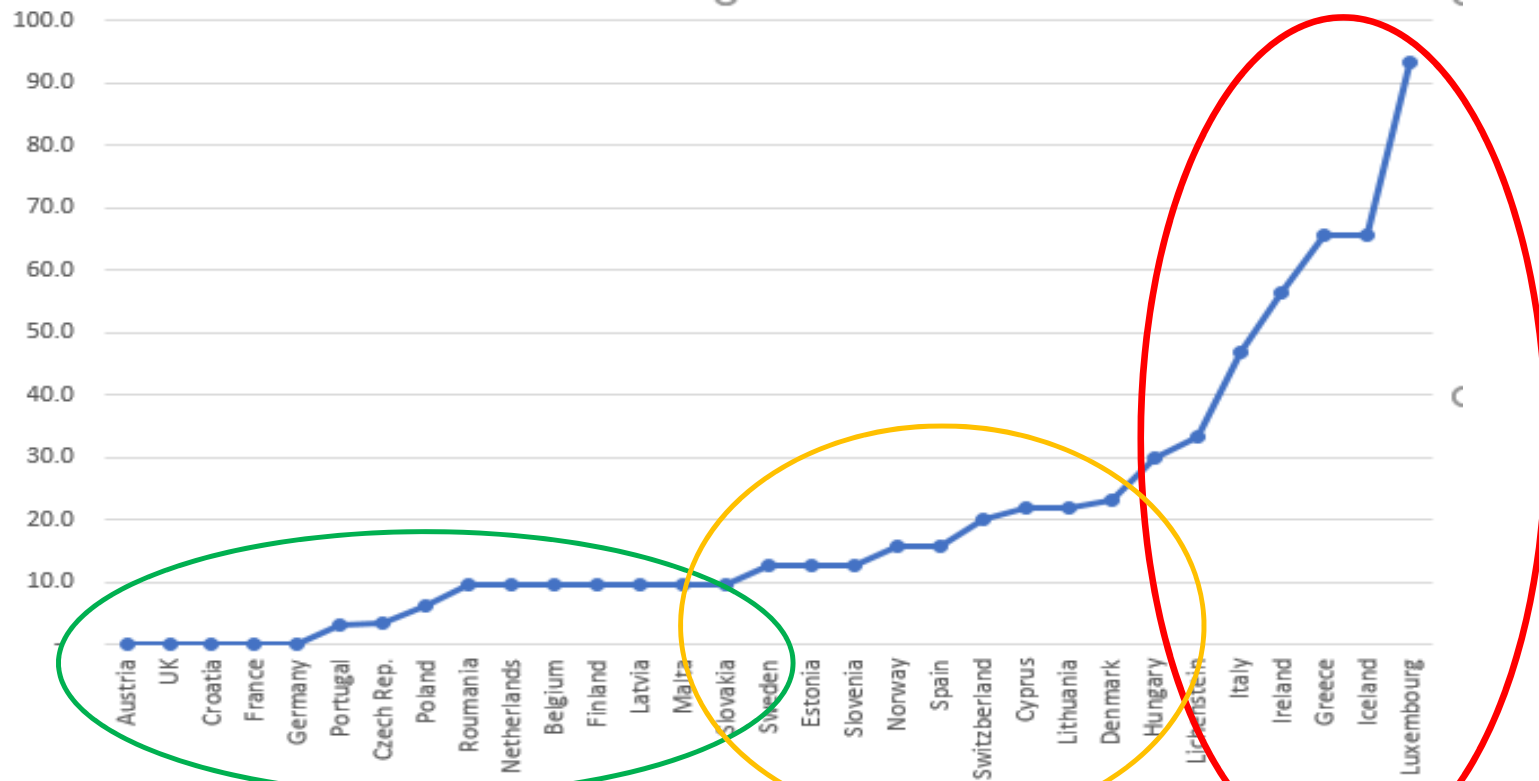
# INSPIRE GEOPORTAL – DATA SET METADATA

The screenshot displays the INSPIRE Geoportal interface. At the top, the European Commission logo and the text 'INSPIRE GEOPORTAL Enhancing access to European spatial data' are visible. Below this, a search bar contains 'Europe' and a 'Find a place in:' dropdown menu. A map of Central Europe is shown with a red rectangle highlighting the area around Munich, Vienna, and Bratislava. The map includes labels for cities like Frankfurt, Prague, Zurich, and Milan, and geographical features like the Alps. Below the map, it says 'Active Layers: 0'. On the right, a 'Metadata' window is open, showing details for the dataset '(AT) - KM500 Vektor - Wald'. The window includes a 'Translator' section with a language dropdown set to 'English'. The metadata fields are as follows:

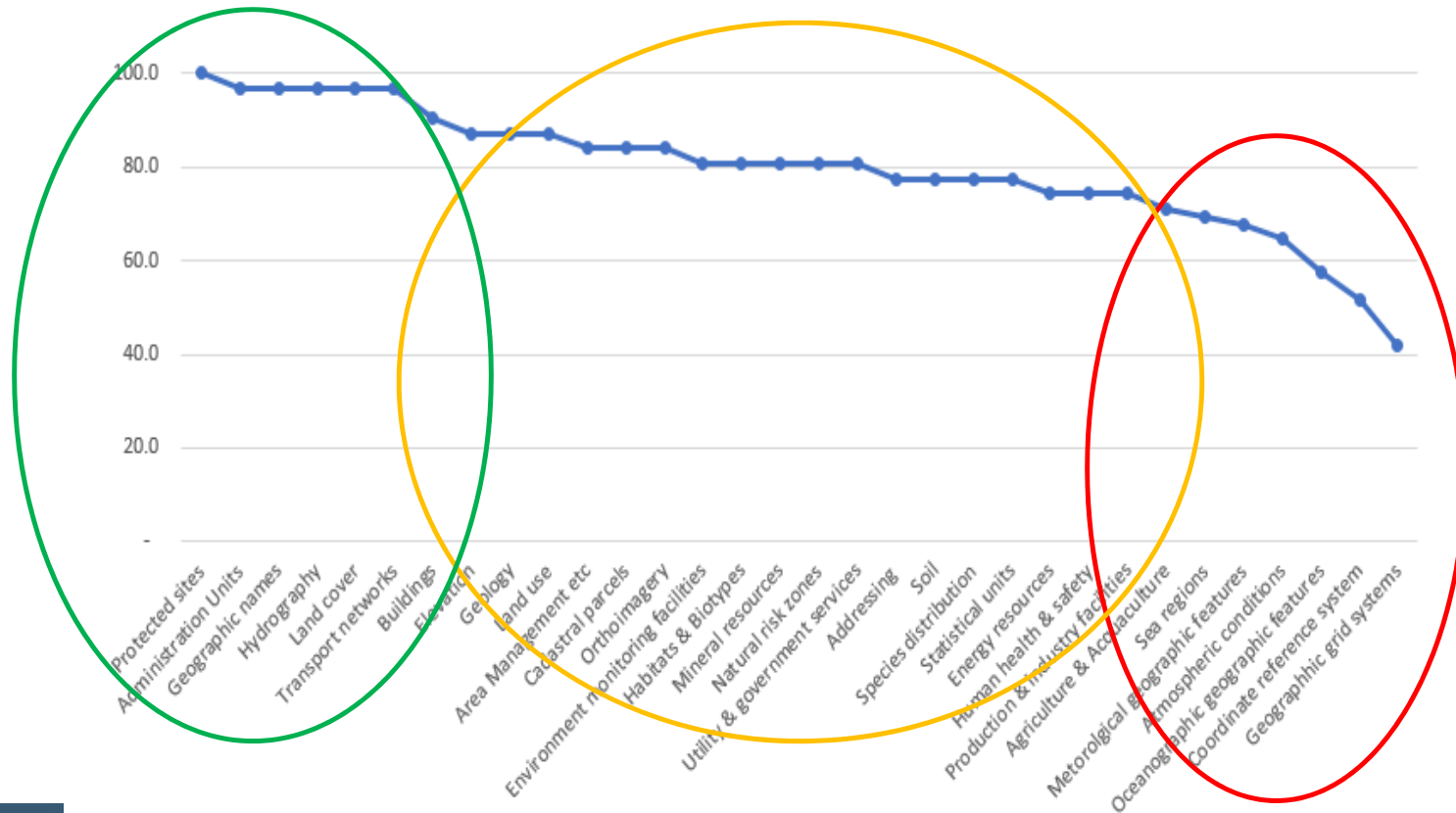
| Metadata Language                               |        | Resource Language           |
|---|--------|-----------------------------|
| German  | German | German                      |
| Metadata Date                                   |        |                             |
| 2015-08-24                                      |        |                             |
| Metadata Point Of Contact                       |        |                             |
| Bundesamt für Eich- und Vermessungswesen        |        |                             |
| E-mail: kundenservice@bev.gv.at                 |        |                             |
| Responsible Party                               |        |                             |
| Owner: Bundesamt für Eich- und Vermessungswesen |        |                             |
| E-mail: kundenservice@bev.gv.at                 |        |                             |
| Resource Title                                  |        | Spatial Data Theme          |
| KM500 Vektor - Wald                             |        | Land cover (Bodenbedeckung) |
|   |        | Topic Category              |



# % OF DATA THEMES FOR WHICH NO DATA IS AVAILABE ON THE GEOPORTAL x COUNTRY



# % OF DATA THEMES WITH DATA ON THE GEOPORTAL



# GEOPORTAL DATASETS - CONCLUSIONS

- Very limited focussed review
- Quite a bit of
- Wider review needed

# INSPIRE SWOT QUESTIONNAIRE

- Questionnaire sent to a small sample of colleagues who have been involved directly in INSPIRE over a number of years
- 11 colleagues responded, in 6 European countries, includes state sector, academic and 1 business person
- Responses give a snapshot view ... certainly not a rigorous survey
- Questions
  - What in your view are the main **Strengths** associate with INSPIRE? Please list.
  - What do you consider are the main **Weaknesses** regarding INSPIRE? Please list.
  - What do you regard as the main **Opportunities** opened up by INSPIRE? Please list.
  - What do you consider to be the main **Threats** which could impact on INSPIRE? Please list
  - Have you been **directly involved** in any aspect associated with the preparation of the INSPIRE Directive or its implementation (yes or no) and if yes could you briefly indicate what type of involvement you have had
  - What **sector** are you in ... public, private, academia, NGO, other?

## STRENGTHS – A BROAD CATEGORISATION OF RESPONSES

- Standardisation / *interoperability* / data harmonisation / common approach
- *Open access* / easier discoverability / more data readily available
- Raises *awareness of benefits* of organising spatial data

# STRENGTHS – RESPONDENT RESPONSES(1)

- “***Its objectives*** (interoperability, European infrastructure, transparency, reusability...)”
- “Its ability to pull together 28 (and more) Member States to have a ***common-ish approach*** to their geospatial data. Whilst legislation appeared heavy-handed, previous voluntary efforts had had little real impact”
- “***Does not require data collection/capture*** – a strength in that it limits the investment required by public authorities (see also weaknesses!)”
- “***Uses recognised standards***”
- “Has a ***maintenance process*** (however flaky!)”
- INSPIRE has ***established a regulatory framework*** to bring public administrations together.



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## STRENGTHS – RESPONDENT RESPONSES (2)

- “Technically: The **standardization of spatial data** on pan-EU level. In practice (today) only Open Street Map can be used for a cross-border needs. Inspire is becoming a **second powerful infrastructure** with much more information included”
- “Organizationally: The way how **gov. and non-gov organizations should cooperate** on establishing common understanding, common projects, common services, ...”
- INSPIRE has **helped open what was a closed environment** through data licensing
- **Detailed guidelines of 34 spatial data themes** relevant for environmental applications were specified.
- “Mostly authoritative data were made **web accessible and interoperable**”
- “Has greatly **improved discovery** of spatial data”
  - “Is **encouraging coordination** between stakeholders” Built by consensus across EU
- Draws on **existing global standards**
- The prize if INSPIRE succeeds is **interoperability** which is worth the effort
- INSPIRE is **universally agreed to be a good thing**



## STRENGTHS – RESPONDENT RESPONSES (3)

- “It is a **legal standard** for EU MS (legal obligations) but also a “de facto standard” that is **influencing the other countries** and various initiatives, projects; INSPIRE has become “lingua franco” of geographic information”
- “To **facilitate the search** of public geographic data (metadata)”
- “Make it (somewhat) **easier exchanges** between administrations”
- “For boundaries, creating **shared digital boundary lines**, INSPIRE is a good pretext to solve very old small disputes”
- “European cooperation on geospatial information, and **raising awareness** about geospatial information at governance level – including high level politicians”
- “Driver for **standardization and homogenisation**”
- “Proof of strength for general **SDI idea and concept**”
- “Facilitating **trans-border interoperability**”



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# WEAKNESSES – A BROAD CATEGORISATION OF THE RESPONSES

- **Complexity** / burdensome / difficult to implement / costly
- **Limited use cases**, few practical benefits (particularly to data providers) / not reflect what environmentalists really need/want
- **Governance** - Top down whereas now need more bottom up / loss of momentum / not sure who is 'European czar'
- **Technical** - Not adequately integrated with open data initiatives, linked data /out of date architecture

# WEAKNESSES – RESPONDENT RESPONSES (1)

- “**Complexity** (implementing rules, technical guidances, specifications...)”
- “**Focused only on geographic data** creating a gap between SDI and other kind of data infrastructure”
- “**Overly burdensome** on small, lower-level public authorities with limited resources so liable to be increasingly ignored?”
- “**Does not require data collection/capture** – this is a weakness if we are looking to get pan-European data”
- “**Limited really good examples** of where it has made a difference, but maybe still too early?”
- “It is too **complicated**”
- “The implementation rules are way **too complex** (advanced) to be used for “a normal” GIS user. Only specialist can understand it”
- INSPIRE is comprehensive but the volume of written regulations, rules and guidance make it **perceived as complex**
- **Lack of use cases**
- **Lack of immediate benefits to data publishers**
- The fact that other reporting directives use their **own schemas** (though this is being addressed)

## WEAKNESSES – RESPONDENT RESPONSES (2)

- “Maybe it is time to **create two levels**: “basic” Inspire and “advanced” Inspire”
- “The underlying architecture was originally specified in the early 2000s, the technical guidelines and implementing rules published about 10 years ago. Quoting Carl Reed, OGC: “**Ten years is an eternity in IT**”
- “INSPIRE still uses a top-down, specification driven SDI approach while meanwhile **bottom-up and citizen-driven open data initiatives** have taken off”
- “INSPIRE is **complex** and the implementation **costs are high**”
- “Until now, **limited use of INSPIRE** (interoperable) data”
- “Some **uncertainties regarding “simplification”** that may delay the implementation of annexes II and III”
- “Data models are **not easily implementable**, and are difficult to read, so to use”

## WEAKNESSES – RESPONDENT RESPONSES (3)

- “Schedules don't have mostly ***not been reflected with environmentalists***, so have gaps (nothing on the corrective measures outside the areas of management, nothing on applications, nothing on the obstacles to the flow, nothing on outcome indicators...)”
- “***Little real use*** outside catalogues”
- “***GML*** is ideal but not yet operational”
- “The ***priorities are not pragmatic enough*** : located database would have to be first (..but base data are after Env needs)”
- “Due to the economic crisis, there has been a ***slowing down in the implementation*** process. Although important – there are more important things than INSPIRE”
- “***Lack of communicating benefits*** for large sets of stakeholders”
- “***Perception as obligation*** with ***little direct benefit***, not as a chance/opportunity”
- “INSPIRE was established before ***(linked) open data frameworks*** took hold, it has not yet caught up”
- “Theme leadership is not (publicly) visible enough, ***who is the ‘European INSPIRE champion/czar’?***”

# OPPORTUNITIES – A BROAD CATEGORISATION OF RESPONSES

- **More spatial data** readily available > **more uses possible**, including into non-environmental fields / development of apps
- Governance – **better decision-making**, coordination could make a difference
- **Better awareness of benefits** of interoperability and open data, of spatial data
- **Open data** initiatives
- Support **Single Digital Market**, SDG monitoring
- Creates more **research opportunities**



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# OPPORTUNITIES – RESPONDENT RESPONSES (1)

- “**Generalisation** of the use of geographic information (in all kinds of economic activities)”
- “Growth of the **open data** initiatives”
- “**Better policy and decision-making** across Europe”
- “**Europe as an exemplar** to the rest of the world – opportunity to export European experience and expertise. For example, Europe is now seen as a leader on the global stage e.g.UN-GGIM”
- “Its very existence has **stimulated discussion about geospatial** across Europe and the world. Countries have developed geospatial strategies and have plans in place”
- “**Spatial data becoming standardized and available** (more and more open) to many users. This is important for pan-EU, global questions”
- “INSPIRE has forced authoritative data custodians to rethink how to make their data available, i.e. **open and interoperable**”
- “INSPIRE is **linking to other initiatives** like e.g. Copernicus or GEOSS”



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## OPPORTUNITIES – RESPONDENT RESPONSES (2)

- “Significant step to get *easily accessible and interoperable, harmonised data* from national and local authoritative data providers in *whole Europe*”
- “Possibility to get *more harmonised methodologies for reporting*, to compute indicators for European Directives and other initiatives (as UN Sustainable Development Goals)”
- “Interoperable data should facilitate the *development of applications* on the European market”
- “Likely, big opportunity for *research* in Europe”
- “*Little real use outside catalogues*”
- “Creation of *interoperable infrastructure*”
- Understanding *what users want and need* from the European SDI



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## OPPORTUNITIES – RESPONDENT RESPONSES (3)

- “Even the partly implementation of the INSPIRE directive will facilitate **easier transnational cooperation** regarding environmental protection, infrastructure works, climate change adaptation, etc. Besides, the the INSPIRE Directive will build a foundation for the implementation of the **EU Digital Single market**. Software developed in one country can be used across the whole Europe”
- “Establishing **geospatial services as foundation** for various application domains”
- “Contribution to European integration, and to **highlight European leadership** in this field”
- “**Turn perception** from ‘this has to be done because of EC’ towards ‘this is a great benefit we get from EC”

# THREATS – A BROAD CATEGORISATION OF RESPONSES

- **Standards outdated**, poor implementation taking place
- **Complexity** / burdensomeness / time consuming > being increasingly ignored
- Not keeping pace with technology eg **outdated** relative to modern architectures
- **Not clear benefits** > less motivation
- **Too much focus on compliance** not creating useful information
- Generally **not sustainable**

# THREATS – RESPONDENT RESPONSES (1)

- “*Poor OGC/ISO implementations*”
- “*OGC/ISO specs outdated*”
- “*Major software editors* not really interested in INSPIRE”
- “*Overly burdensome* on small, lower-level public authorities with limited resources so *liable to be increasingly ignored* and hence create large gaps in data”
- “*Time consuming* process to update it keep pace with technology”
- “Local spatial platforms and local users *don't see any advantage* of Inspire implementation if they are not “involved” in cross border projects”
- “INSPIRE still has many constraints when turning *raw data into useful information* products. There is *too much focus on compliance*”
- “INSPIRE will not be sustainable when *modern architectural approaches* are not being considered. This specifically relates to a distributed Web GIS pattern which allows access to information via simple and mobile apps from any device”

## THREATS – RESPONDENT RESPONSES (2)

- “European Commission funding **competitive products** (e.g. with Copernicus) to the national ones => make harmonisation efforts less motivating”
- “Did not really allow (in my country) to coordinate and facilitate data producers: suddenly, filled with catalogues of plenty of references **without real interest**, duplicates in shambles,…”
- “The main thread is the **lack of momentum in the further implementation**, and this is usual in programmes with so long termed implementation time. Other topics like **Open Data is replaced INSPIRE** in the top position on the geospatial agenda”
- “Also, the **uneven starting position** among EU countries is a major thread for reaching the end goal. The path to the final implementation is much shorter for Denmark or Finland than for Romania and Bulgaria”
- “Perceived as ‘**meddling**’ in **industry / enterprise** matters”
- “**Open (cyber) security** issues (eg infrastructure data)”
- “**Cost and effort** involved for public institutions”
- The **perception of complexity**
- **Lack of use cases and benefits**

# INSPIRE – AN OVERALL EVALUATION : SOME ISSUES

- *Complexity, complexity, complexity*
  - Big, big underlying issue
  - Governance complexity
    - 28 MS x 32 data themes x 15 (30) authorities/theme = 13 440 (26 880) authorities/sub-authorities
  - *Numbers guestimates*
    - Staff turnover & government turnover 'on top of' thousands of authorities/sub-authorities
  - Data complexity
    - Irish zoning dataset (Generalised Zone Type) .... 1 dataset in INSPIRE geoportal ... 300+ underlying datasets ... took 5 – 7 years to get full harmonisation needed for the 1 dataset in the INSPIRE geoportal .... updating remains an issue ... a lot of very focussed motivated effort required, dealing with many obstacles
    - Land use – Poland 19 040 datasets / Germany 11 748 / France 9679
  - Implementing Rules and Guidelines complexity
- *Use cases*
  - General perception that the practical uses are somewhat limited
- *New and emerging technologies*
  - System designed over 10 years ago ... need to be updated

# WAY FORWARD – CHANGES SINCE 2007

- Proliferation of *sensors* which have a location
- Shift from static/historical data to dynamic *real-time* data
- Massive expansion of *smartphone* availability & smartphones becoming more and more powerful & able to access geospatial data and run analyses
- Big expansion in *open data* & expectation amongst users that the data will be there when needed with no strings attached
- Increasing power and application of *AI/machine learning*
- Shift to *internet based* and the *cloud*
- More widespread capacity for *non-experts* to provide
- More *linked data* & increasing realisation of the importance of *semantics*
- *Stronger emergence of systems of systems*
- *Social media with location component*
- *Massive expansion of data production*



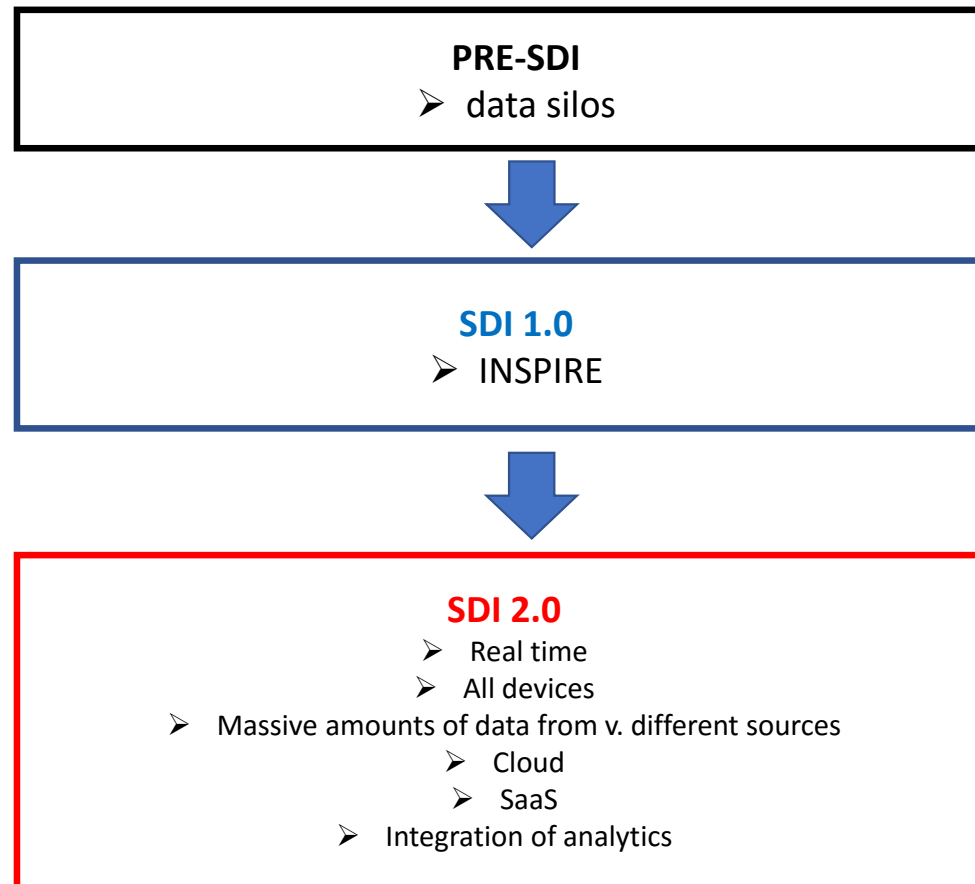
## WAY FORWARD – COMING DOWN THE TRACK (1)

- *5G*
- Expansion of *AI/machine* learning into very many walks of life, with location aspect
- *Robots* with strong spatial awareness doing more and more task
- More *3/4D*
- Expansion of *Augmented and Virtual Reality*
- *Quantum computing* ... massive expansion of processing power
- Increasingly meaningful *Single Digital Market*
- *Sustainable Development Goals*
- More and more use of *drones*, and more *satellite* data with higher resolution & more and more frequent updates (hourly any place in the world?)



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# WAY FORWARD – COMING DOWN THE TRACK (2)



# WAY FORWARD (1)

- **Inspire Vision** Widely Accepted ... ambitious, great, world leading, Importance Of spatial Information awareness raising
- Inspire **at Crossroads** ... three broad options for way forward
  - 1) Continue as is with focussed supports/interventions (eg 10/8/16 Commission report to the Council and Parliament (COM(2016) 478 final/2)
  - 2) Significantly up level and nature of interventions within the current framework ... some ideas
    - Dedicated INSPIRE EU funding directly to MSs
    - Offer 5 – 10 dedicated staff to each MS + central ‘emergency response/intervention’ unit at EC
  - 3) As quickly as possible (now!) adapt INSPIRE in substantial ways to the new SDI 2.0 realities
    - User Needs
    - Technical Changes
    - Data Provider Issues/Difficulties
- **Option (3)** would be the ideal (if possible given inertia, bureaucracy, MS and EU commitments, etc) > **Option (2)** > **Option (1)**
- Options need serious **urgent focussed discussion** beyond 10/8/16 Commission report

## WAY FORWARD (2)

- Broad Strategic Foci
  - 1) Data Focus > **User Needs** focus
  - 2) **Technical** update
  - 3) Complexity > **Simplicity**
  - 4) Rigid compliance > **Flexibility & Future Proofing**
  - 5) Direct **Financial Support** for Members States
- User Needs Focus .... Some Thoughts
  - 1) Static historical data > **Real Time** (near real time)
  - 2) Data & analytics on **All Types Of Devices**, particularly mobile
  - 3) Integration of spatial data with **Data From Other Domains**
  - 4) **Fit For Purpose** .... 100% solution not necessarily needed In 90% of cases

# WAY FORWARD (3)

- Technical Focus .... Some Thoughts

- 1) **Web based** .... eg Persistent Identifiers for Linked Data ... suggest they are not just Member State responsibility but Eu role needed
- 2) Simpler **Data Models** ... egs
  - DCAT-AP as the Standardised Metadata Model which is the eGovernment model (19 elements for datasets metadata vs INSPIRE Model Which has 58 possible metadata elements, many of which are mandatory)
  - Addressing ... Universal Postal Union approach which simpler and globally agreed
- 3) Real time, enhanced visualisation, linking to other datasets, incorporation of spatial data analytics (eg involving machine learning applications, prediction technologies, etc)

- How to take forward from today

- **Review** over say 9 months ... user needs focus + data provider focus + technology focus + make clear recommendations based on a number of scenarios
- Focus **support for countries** and datasets experiencing greatest difficulties



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INSPIRE is a really great initiative  
Great vision, hugely ambitious, Europe can be  
proud

*'We really, really want it to succeed, and to succeed  
not just well, but very well'*



THANK YOU

