

GéoSAT'25

Transformation Digitale et Géomatique Avancée :  
Vers une Gestion Urbaine Résiliente et Inclusive  
14 -16 mai 2025, FST, Tanger, Maroc



# **Infrastructure de Connaissances Géospatiales et Développement Durable**

*Mohamed Timoulali , GTOPIC*

# CONTENU

- **L'information pour la prise de décisions**
- **Evolution des SDI vers des GKI**
- **Transformation des Ecosystèmes Géospatiaux**
- **Cybersécurité et cybercriminalité**
- **Leadership Géospatial**
- **Stratégies Nationales Géospatiales et Plans d'action Pays**

# RAPPEL

## MORGEO EHTP 16-17 mai 2017



### Geographic Knowledge Infrastructure

Robert Laurini

*Applications to Territorial Intelligence and Smart Cities*

ISTE  
PRESS



# GWF 2025 'Spatial Computing & Digital Twin Enterprise: Accelerating the Future Geospatial Ecosystem'

[HOME](#) [PROGRAM](#) [PARTNERS](#) [SPEAKERS](#) [EXHIBITION](#) [AWARDS](#) [CONTACT](#) [TRAVEL](#) [BLOG](#) [REGISTRATION](#) [ABSTRACT](#)

Geospatial Knowledge Infrastructure

Hydrospatial Infrastructure & Blue Economy

Downstream Space



## Geospatial Knowledge Infrastructure

Two Days Program  
24-25 APRIL 2025

### Global Market



<b>2023</b>
\$530 Billion
<b>2025</b>
\$655 Billion

Source: GW Consulting

### Geospatial Market

The Geospatial market for National Geospatial Agencies is projected to grow significantly by 2030, surpassing the USD 100 bn mark.

Source: GW Consulting

### Driving Sustainable Development

Geospatial Knowledge Infrastructure (GKI) represents a transformative leap in integrating geospatial data with advanced technologies, enabling the seamless transition from data to knowledge and ultimately to wisdom. By leveraging real-time analytics, AI, and automation, the GKI framework transforms raw geospatial data into actionable insights that drive informed decision-making across sectors. This shift empowers governments, businesses, and communities to address global challenges like urban planning, climate change, and disaster response more effectively. Further, GKI fosters collaboration between national mapping agencies and the private sector, creating a framework that supports sustainable economic growth and societal improvements. The GKI Summit is a global platform for industry leaders, policymakers, and experts to shape the future of geospatial technologies. It will focus on key trends such as public-private partnerships, modernization of national mapping agencies, and innovations like blockchain for data security.

[DOWNLOAD BROCHURE](#)

# LE CONTEXTE

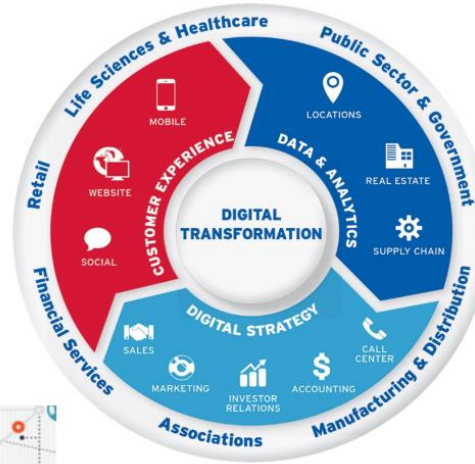
## Geospatial Data and Information Fundamental to Socio-Economic-Environment Workflows

 <p><b>GEOSPATIAL TECHNOLOGY FOR 2030 AGENDA</b></p>	<p><b>1 NO POVERTY</b> </p> <ul style="list-style-type: none"> <li>• GIS-based poverty map</li> </ul> <p>Remote Sensing, GIS and Spatial Analytics, mobile phone</p>	<p><b>2 ZERO HUNGER</b> </p> <ul style="list-style-type: none"> <li>• Geospatial data for agriculture yield estimation</li> <li>• Smart Agriculture</li> </ul> <p>Remote Sensing, GIS and Spatial Analytics, and UAVs/Drones</p>	<p><b>3 GOOD HEALTH AND WELL-BEING</b> </p> <ul style="list-style-type: none"> <li>• Geospatial analysis for examining healthcare system</li> <li>• Location of hospitals</li> <li>• Disease pattern and distribution</li> </ul> <p>Remote Sensing, GIS and Spatial Analytics, and IoT</p>	<p><b>4 QUALITY EDUCATION</b> </p> <ul style="list-style-type: none"> <li>• GIS based maps on online education</li> </ul> <p>GIS and Spatial Analytics</p>	<p><b>5 GENDER EQUALITY</b> </p> <ul style="list-style-type: none"> <li>• GIS based gender mapping on access to financial institutions</li> <li>• Gender equality and women empowerment through ICT</li> </ul> <p>GIS and Spatial Analytics, and ICT</p>
<p><b>6 CLEAN WATER AND SANITATION</b> </p> <ul style="list-style-type: none"> <li>• Spatial location of water resource and distribution of water pollution</li> <li>• Locations of points and non-points pollution source</li> </ul> <p>Remote Sensing, GIS and Spatial Analytics, Sensors, and GNSS and Positioning</p>	<p><b>7 AFFORDABLE AND CLEAN ENERGY</b> </p> <ul style="list-style-type: none"> <li>• GIS based mapping for location of energy resources</li> <li>• Use of drones for oil &amp; gas pipeline monitoring</li> <li>• Use of remote sensing in finding out optimum location for renewable energy</li> </ul> <p>GIS, UAVs, Satellite</p>	<p><b>8 DECENT WORK AND ECONOMIC GROWTH</b> </p> <ul style="list-style-type: none"> <li>• Change in LULC Maps</li> <li>• GIS based maps for mapping parking and other facilities for specially abled</li> </ul> <p>Remote Sensing, and GIS and Spatial Analytics</p>	<p><b>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE</b> </p> <ul style="list-style-type: none"> <li>• Earth observation for sustainable infrastructure development</li> </ul> <p>Remote Sensing, GIS and Spatial Analytics, IoT, and AI/ML</p>	<p><b>10 REDUCED INEQUALITIES</b> </p> <ul style="list-style-type: none"> <li>• Night time lights data to map regional inequality</li> <li>• Detecting spatial pattern of inequality from remote sensing</li> </ul> <p>GIS and Spatial Analytics, and IoT</p>	<p><b>11 SUSTAINABLE CITIES AND COMMUNITIES</b> </p> <ul style="list-style-type: none"> <li>• Global mapping of LULC changes</li> <li>• Smart City development</li> </ul> <p>Remote Sensing, GIS and Spatial Analytics, UAVs/Drones, LIDAR, IoT, and AI/ML</p>
<p><b>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</b> </p> <ul style="list-style-type: none"> <li>• Determining air pollution through remote sensing across different industries</li> </ul> <p>Remote Sensing, GIS and Spatial Analytics</p>	<p><b>13 CLIMATE ACTION</b> </p> <ul style="list-style-type: none"> <li>• Detection on a large-scale impact of climate (CFCs, hazards) on human lives</li> </ul> <p>Remote Sensing, GIS and Spatial Analytics, AI/ML, and IoT</p>	<p><b>14 LIFE BELOW WATER</b> </p> <ul style="list-style-type: none"> <li>• Detection of ocean pollution (oil spills)</li> <li>• Identification of potential fishing zones, ocean temperature</li> </ul> <p>Remote Sensing, and GIS and Spatial Analytics</p>	<p><b>15 LIFE ON LAND</b> </p> <ul style="list-style-type: none"> <li>• Quantifying forest cover</li> <li>• Deforestation and forest degradation</li> <li>• Forest biomass</li> </ul> <p>Remote Sensing, GIS and Spatial Analytics, and AI/ML</p>	<p><b>16 PEACE, JUSTICE AND STRONG INSTITUTIONS</b> </p> <ul style="list-style-type: none"> <li>• GIS based temporal maps on homicide rate</li> <li>• GIS based regional maps on completeness of birth registration</li> </ul> <p>GIS and Spatial Analytics, IoT Sensors, and AI/ML</p>	<p><b>17 PARTNERSHIPS FOR THE GOALS</b> </p> <ul style="list-style-type: none"> <li>• Mapping government revenue as a share of GDP</li> <li>• Mapping share of the population using internet</li> </ul> <p>GIS and Spatial Analytics, and AI/ML</p>



# La transformation Digitale

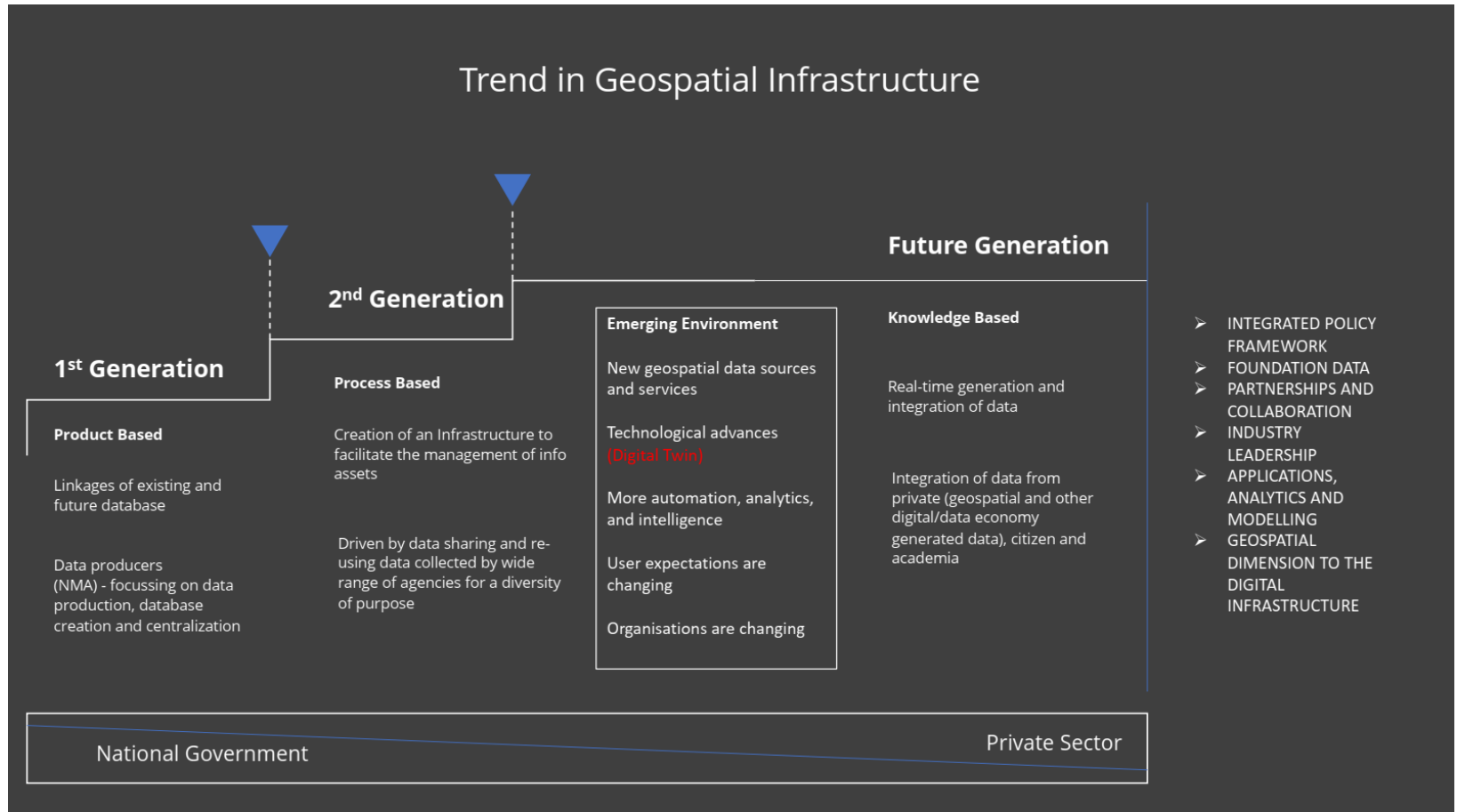
## Disruptive nature of digital transformation



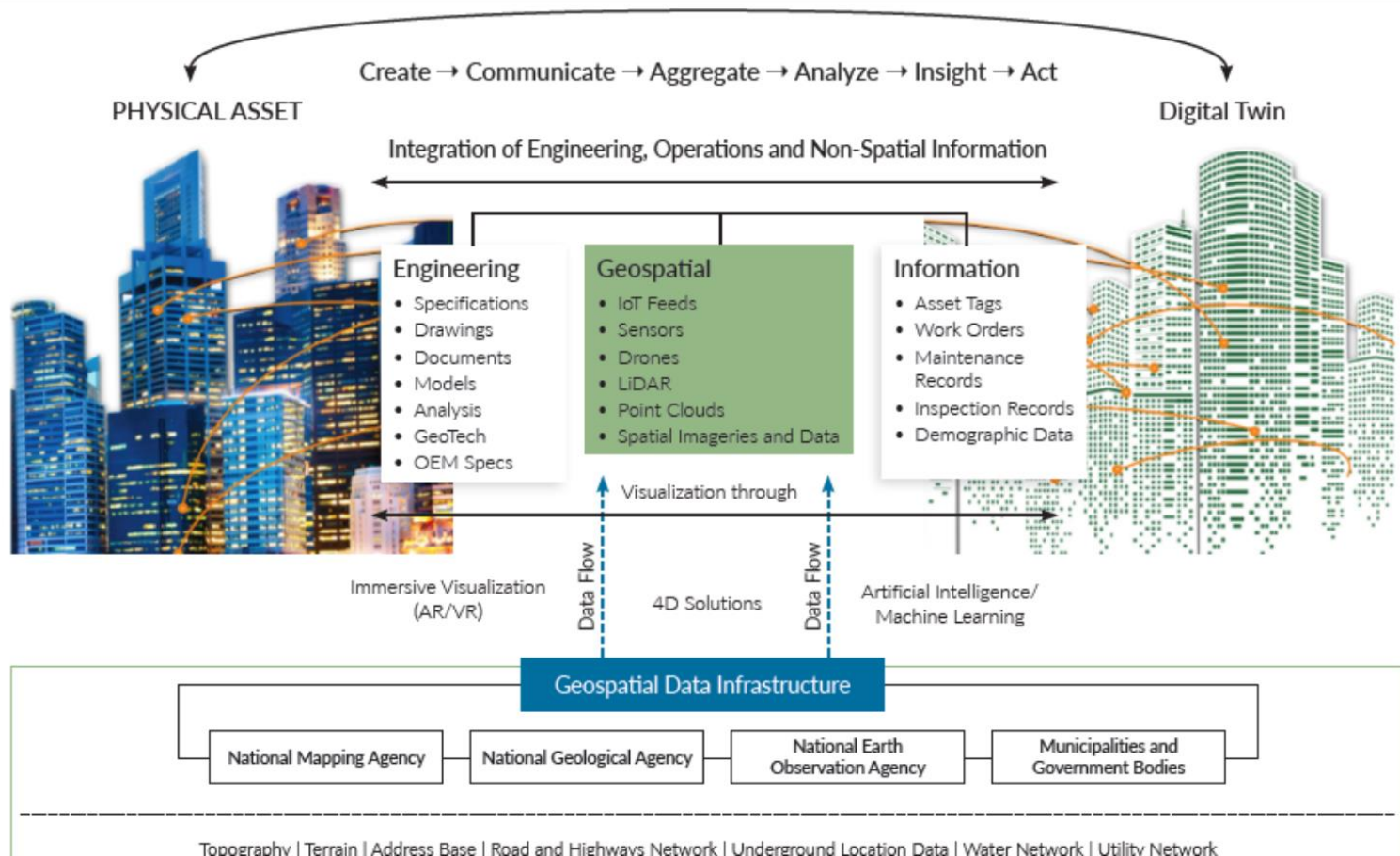
The disruptive nature of digital transformation, technology, innovation, and their exponential impacts, means that society's expectations on how, and at what level of detail, we record what is happening where and when are changing at a rapid pace.



# Evolution des GDI



# GDI

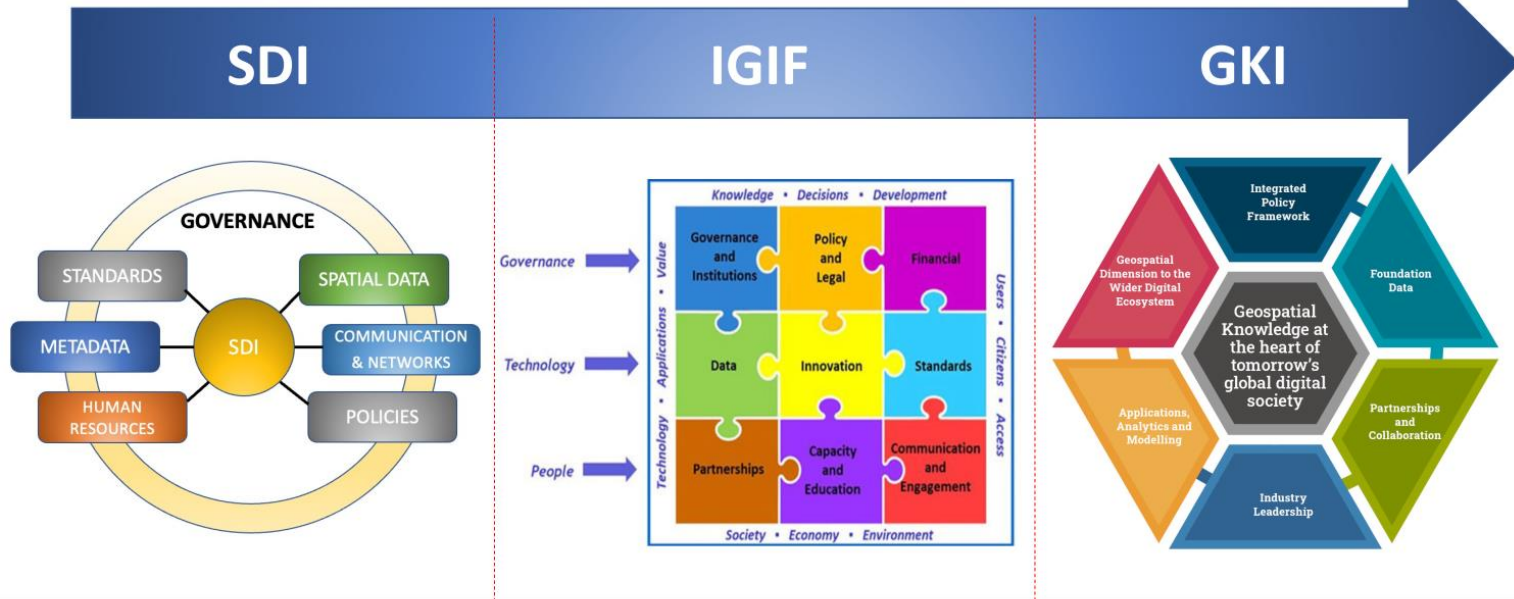




# SDI vers GKI

## GEOSPATIAL INFRASTRUCTURE

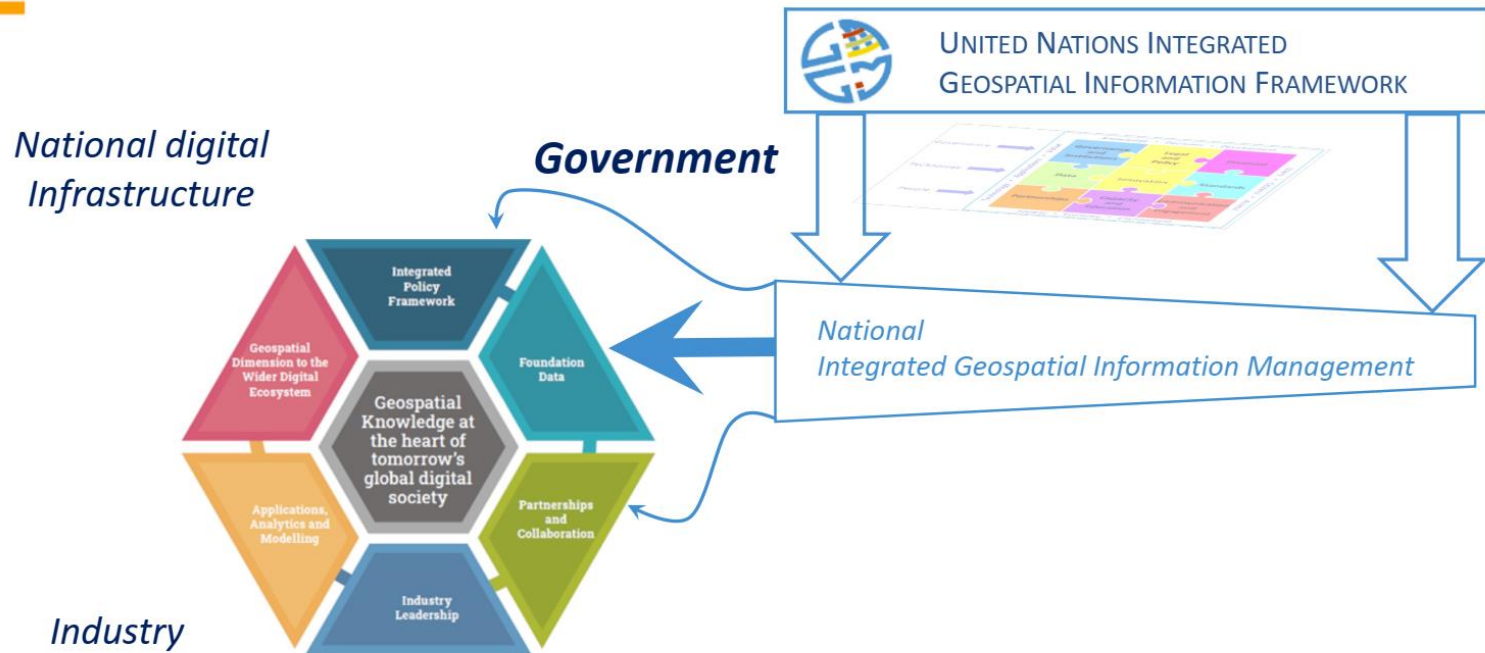
STRENGTHENING NATIONAL GEOSPATIAL INFRASTRUCTURE



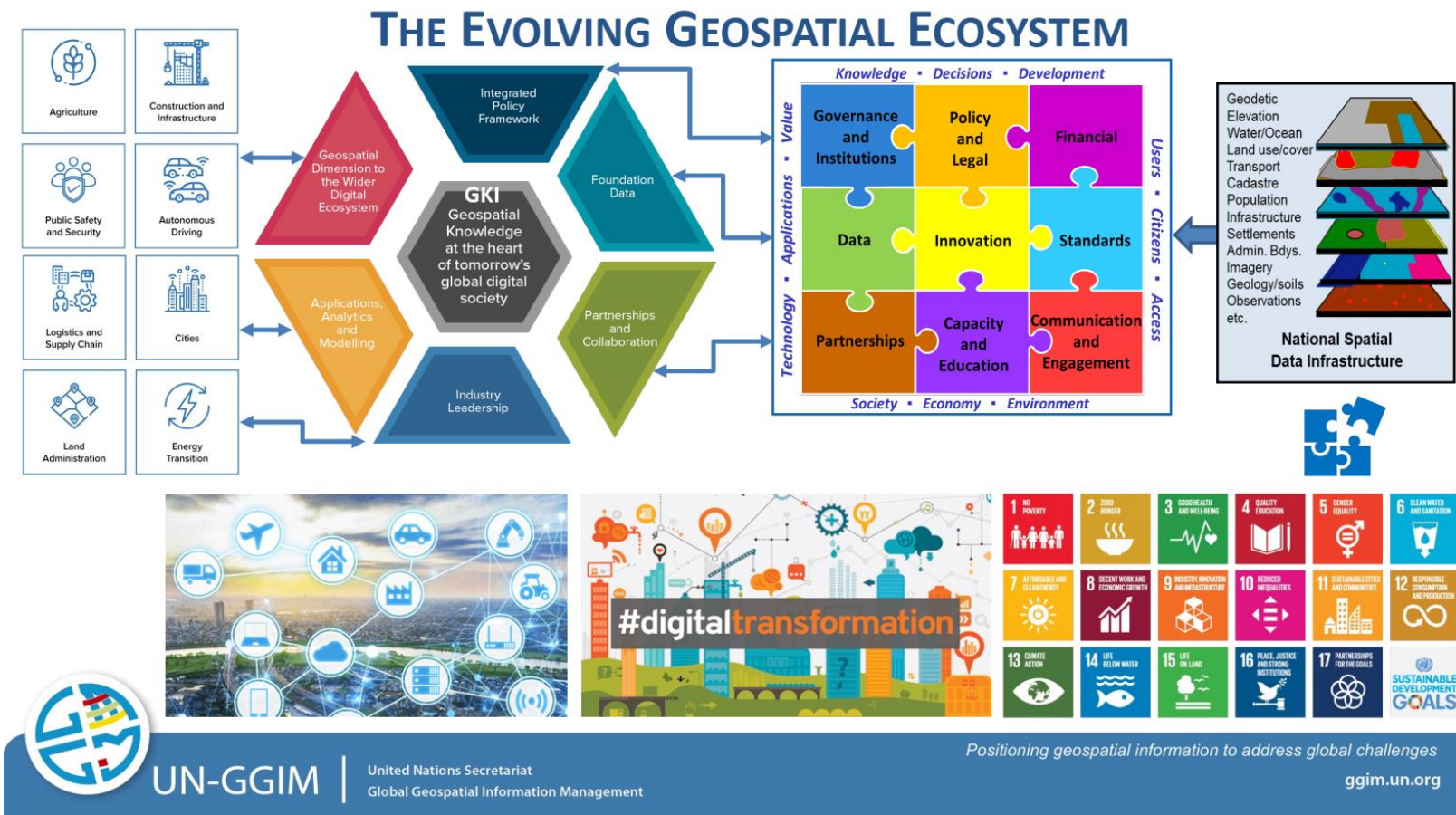
Geospatial Knowledge Infrastructure

# IGIF et GKI

## GKI and the UN Integrated Geospatial Information Framework



# Evolution de l'Ecosysteme Geospatial



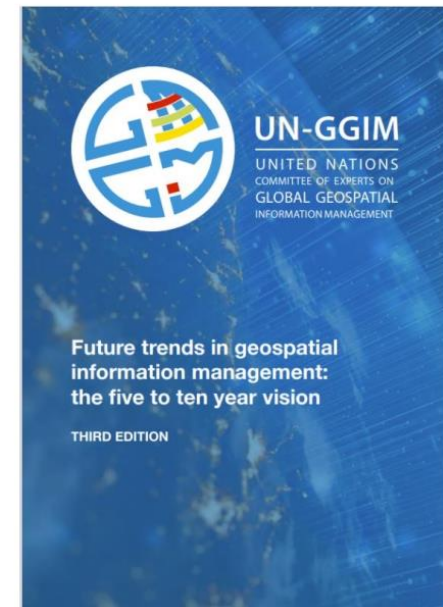
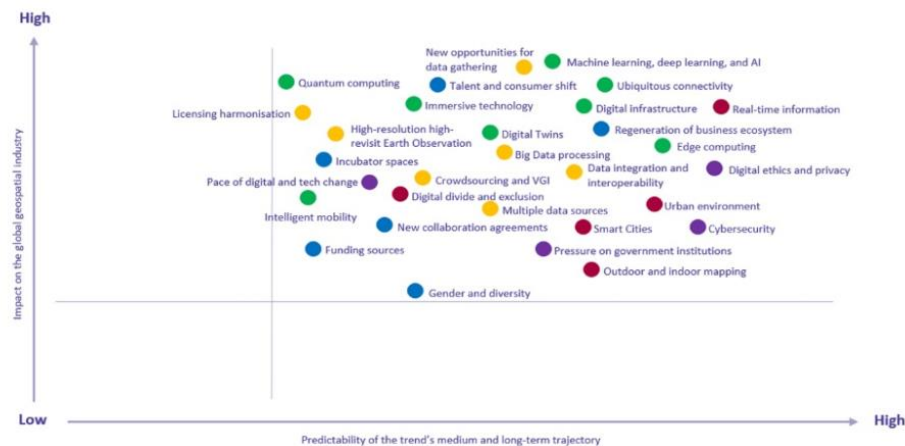
# Pourquoi un nouveau concept ?

## Why a new concept? Geospatial is changing

Five prevailing drivers and an underlying set of trends

- Technological advancements
- Industry structural shift
- Legislative environment

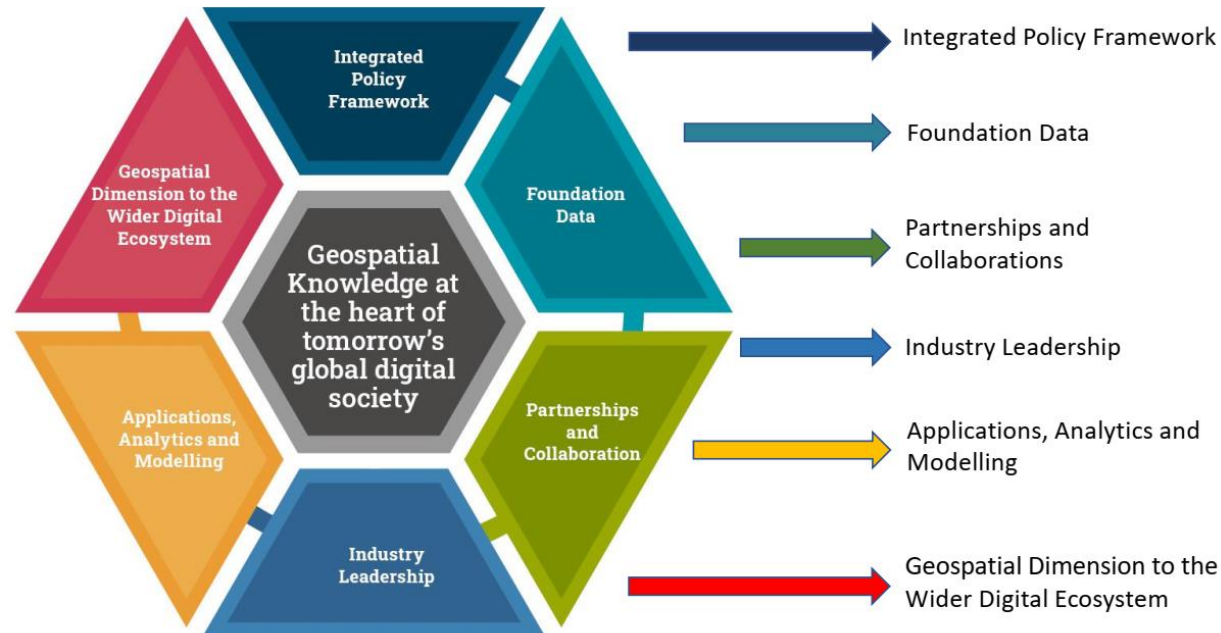
- Rise of new data sources & analytical methods
- Evolution of customer requirements





# Elements et principes du GKI

## Elements & Principles of GKI



### Principles of GKI

- **Predictive**
- **Decentralised**
- **Agility**
- **Achievable actions**
- **Led by users**
- **Wider digital infrastructures**
- **Knowledge focus**



# IGIF

## INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK (IGIF)

- A catalyst for economic growth and opportunity, the IGIF focuses on geospatial information that is integrated with any other meaningful data to solve societal and environmental problems. It also focuses on integrating organizations to deliver national outcomes.
- Recognizing the evolving need to move towards ‘knowledge on demand’ or a ‘knowledge infrastructure’, the IGIF fundamentally recognizes, builds upon, and augments previous investments and achievements in planning and implementing SDIs and NSDIs, building additional structure, reasoning, and evidence.
- The IGIF also provides the guidance, options and actions to plan for, develop, and implement an integrated national geospatial information management program, aligned to national strategic priorities, circumstances, and SDGs, within a country. It is a holistic approach to managing and sustaining national geospatial information capabilities and resources. **The IGIF also captures the value of the GKI.**



UN-GGIM

United Nations Secretariat  
Global Geospatial Information Management

*Positioning geospatial information to address global challenges*  
[ggim.un.org](http://ggim.un.org)

# GKI

## GEOSPATIAL KNOWLEDGE INFRASTRUCTURE (GKI)

- As part of this emerging ‘knowledge infrastructure’, the GKI seeks to bring a geospatial dimension to the wider digital ecosystem - and leveraging innovation and creativity.
- While we in the geospatial community tend to focus on ‘geospatial infrastructure’, it is really much more than this. Geospatial, like geography itself, is about ‘integration’ - of data, technology, infrastructure, social, institutional, organizational, partnerships, innovation...and knowledge.
- While the GKI is anchored by geospatial information, its intent is to engage with a broader range of industry sectors - the commercial geospatial industry, national geospatial agencies, broader user industries, and civil society.
- With geospatial information at the heart of the advancing knowledge environment, the GKI aims to move the geospatial sector closer to the wider 4IR data ecosystem, focusing on delivering knowledge to support human and machine decision-making, with cognition as the path from data to insights, knowledge, and understanding....and anchored by location.



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# Integration IGIF et GKI

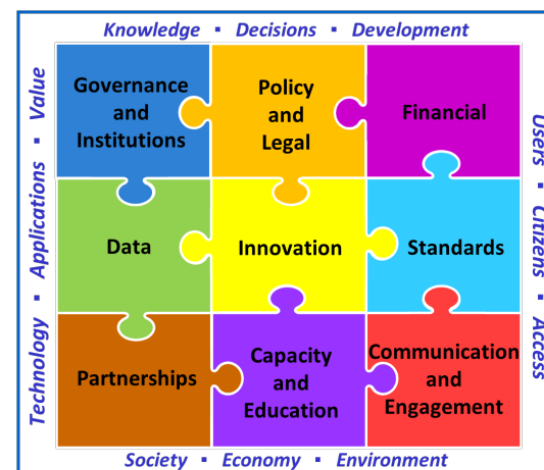


## INTEGRATING THE IGIF AND THE GKI

*“Driven through a geospatial industry perspective, the GKI aims to move the geospatial sector closer to the wider Fourth Industrial Revolution data ecosystem, focusing on delivering knowledge to support human and machine decision-making.*

*In parallel, the GKI will increase the use of geospatial data, information and knowledge across business and government, setting the conditions for better evidence-based decisions.*

*In this regard, the GKI will build upon the IGIF as a coherent set of elements that will contribute to bringing geospatial cognition to the heart of the data, knowledge and decision-support ecosystem”*



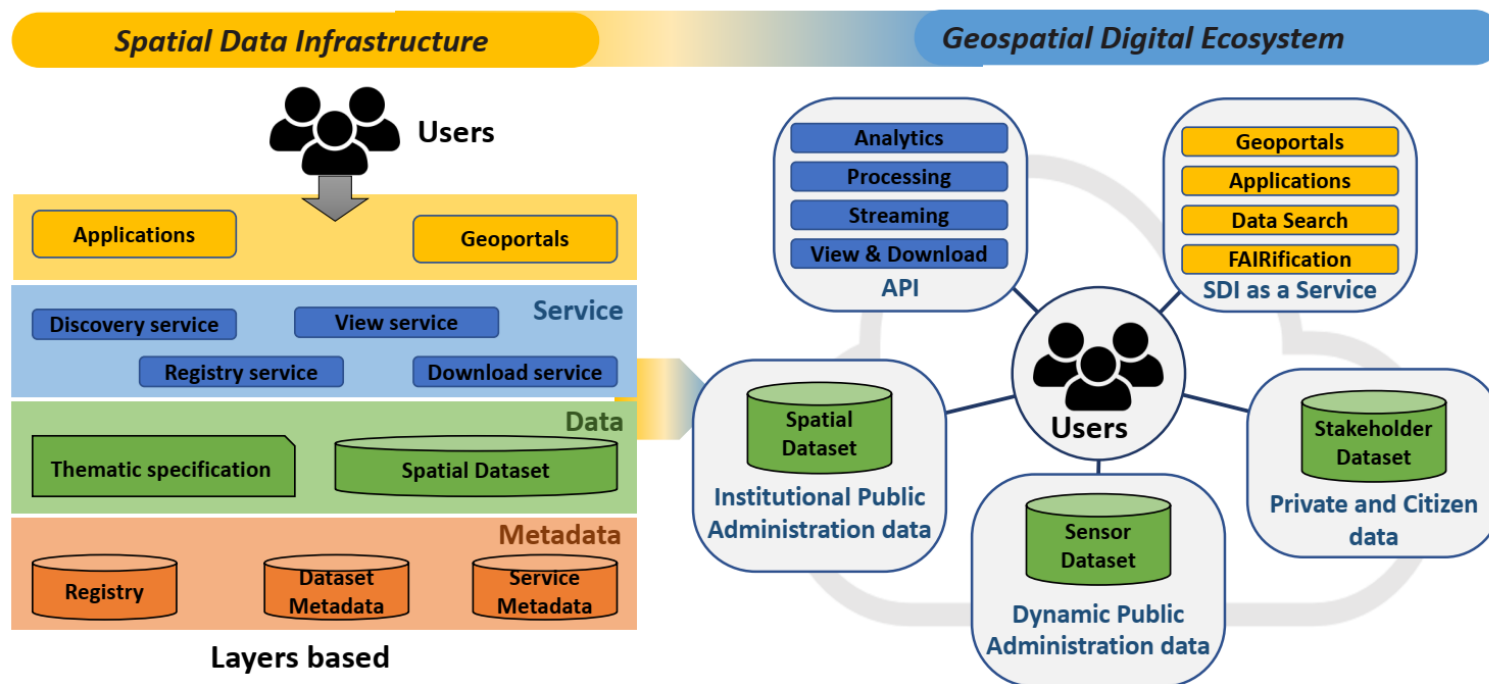
UN-GGIM

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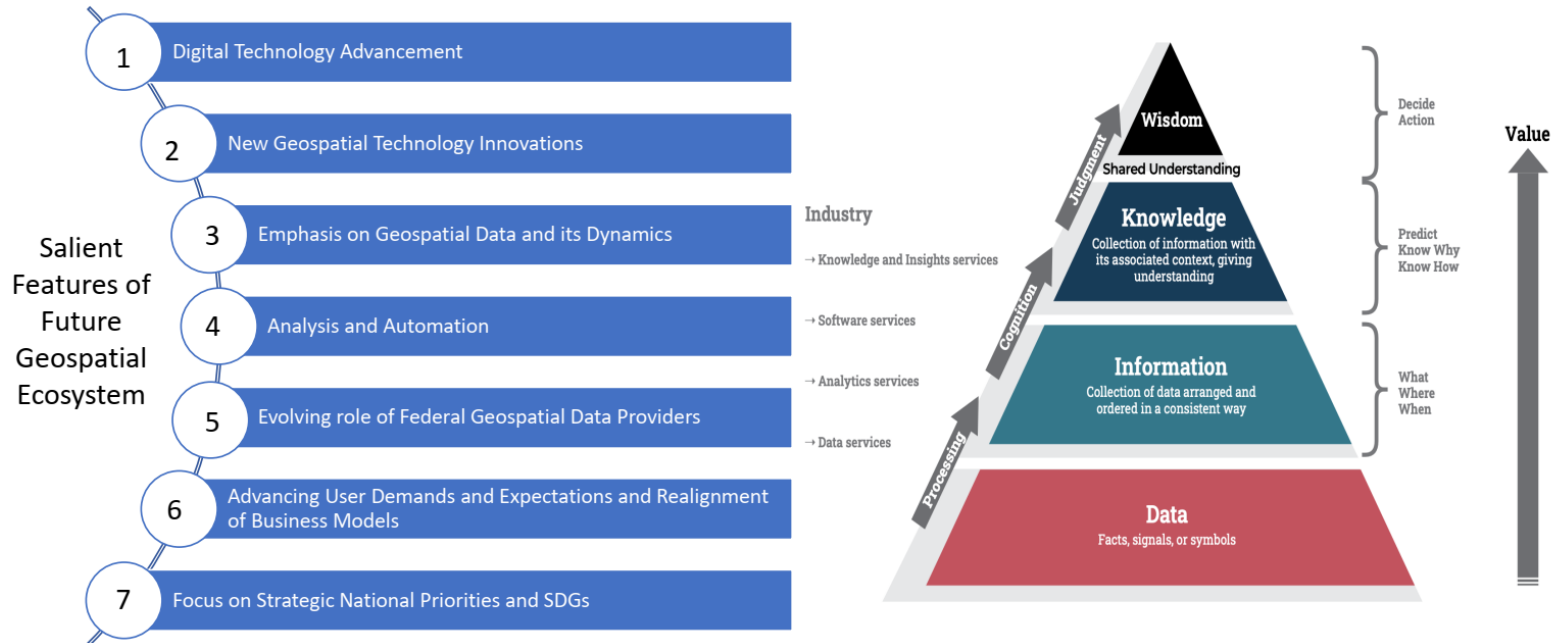
# Du SDI à l'Ecosystème Geospatial

## From SDI to Geospatial Digital Ecosystem



# GKI et le futur Ecosystem Geospatial

## GKI as an enabler for the future geospatial ecosystem

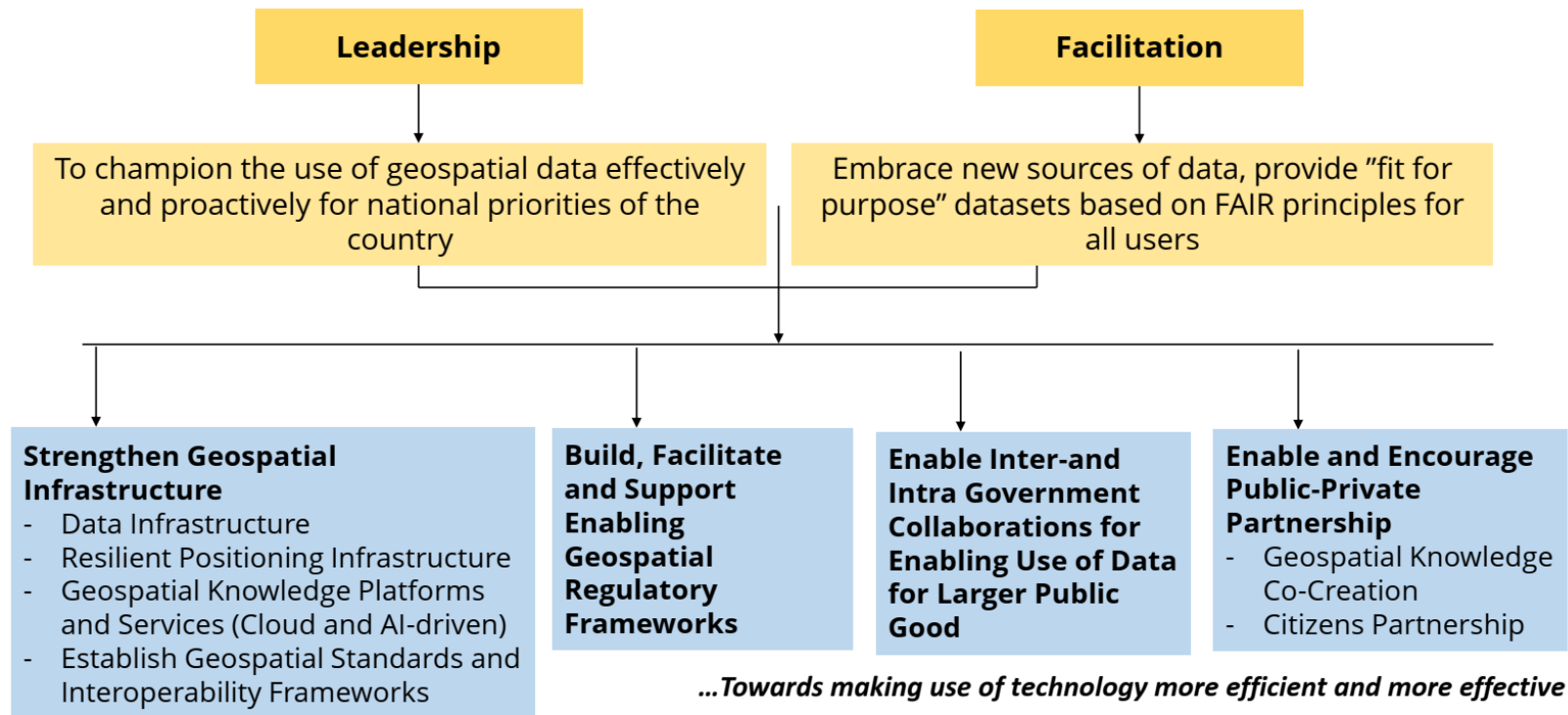


Geospatial Knowledge Infrastructure

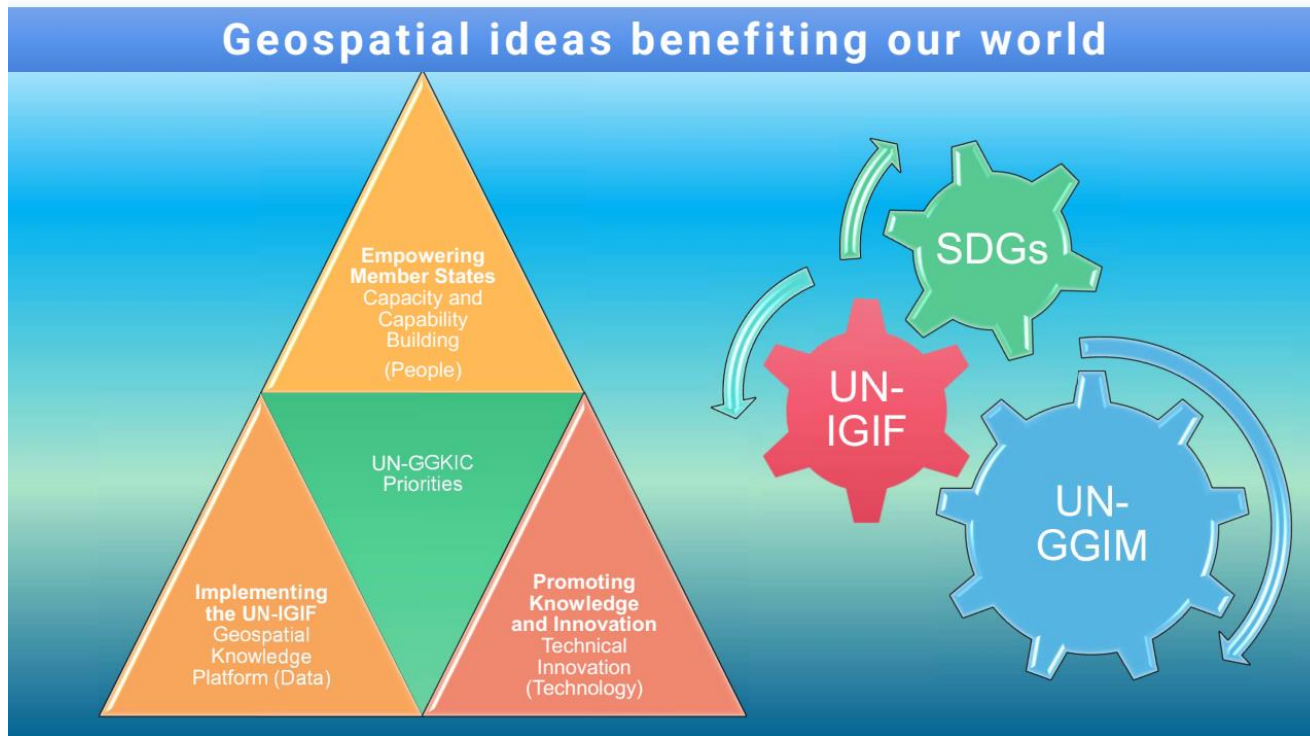


# Roles des NGA

## The “Evolving” Role of National Geospatial Agencies



# Rôle de l'UN-GGKIC



# Cas de l'Union Européenne

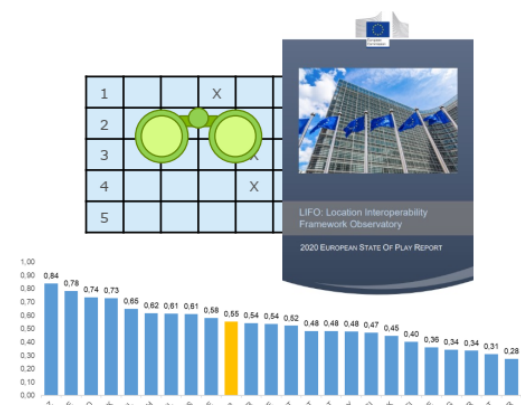
## European Union Location Framework (EULF) Blueprint

A European 'location interoperability framework' with **guidance** for the exchange and use of location information in government policy and digital public services, building on the implementation of **INSPIRE**, and allied closely to the interoperability principles of the **EIF**



Online and downloadable versions

[European Union Location Framework \(EULF\) Blueprint | Joinup](#)



Adoption monitored through the LIFO

[Location Interoperability Framework Observatory \(LIFO\) | Joinup](#)

# Package d'interopérabilité

## Why a legislative interoperability package?



### EU's digital strategy

- Digital Decade: Key public services 100% online by 2030
- Cross-border interoperability as an enabler



### Gaps in existing legislation



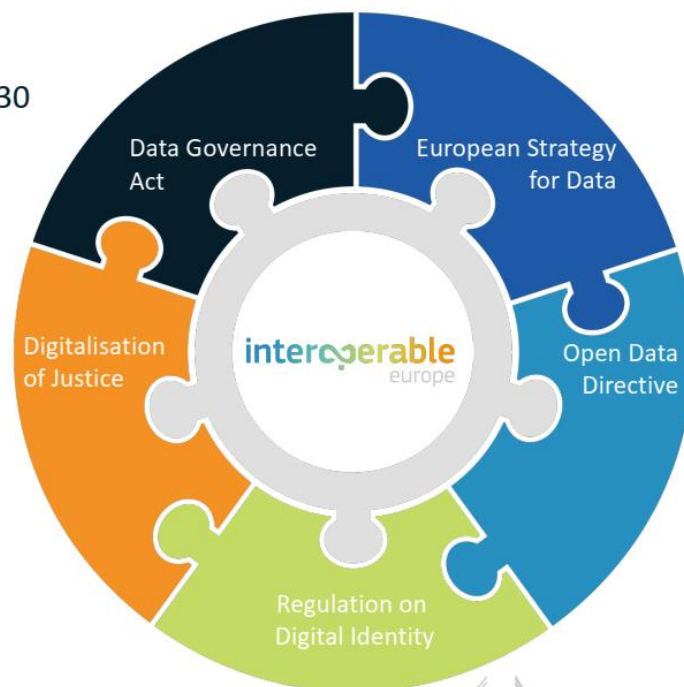
Inefficient governance of interoperability efforts between EU policies, the Commission and Member States for all administrative levels and sectors.



Lack of common minimum interoperability specifications, shared solutions, standards.



Lack of an 'interoperability-by-default' approach in the design and implementation of EU and MS's legislation and policies.

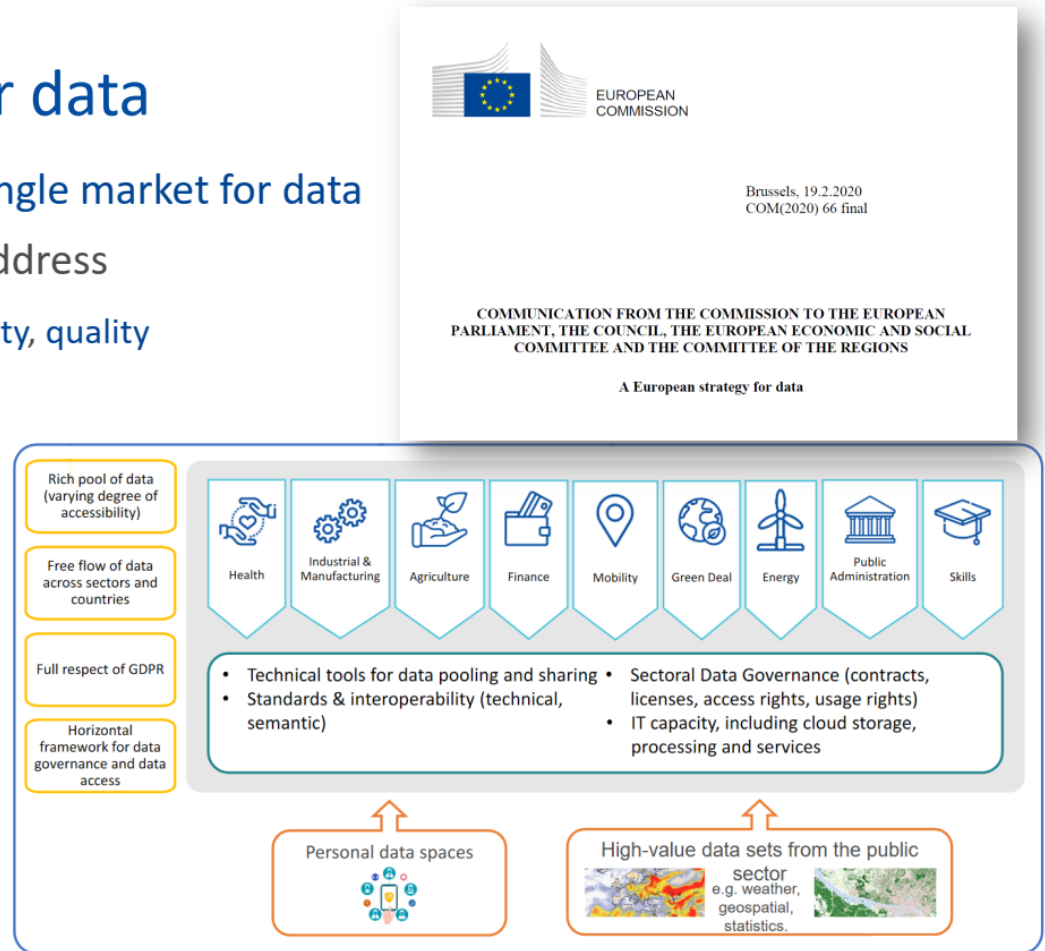


# Stratégie européenne des données

## European strategy for data

- Aims to create a **European single market for data**
- Highlights the problems to address
  - data **availability, interoperability, quality**
  - **governance & infrastructures**
  - **skills & data literacy**
  - **cybersecurity**
- Envisages establishing
  - common European sectoral **data spaces**

<https://digital-strategy.ec.europa.eu/en/policies/strategy-data>





# Implémentation des HVD

## Implementing Act on high-value datasets

- High-value datasets (HVD)
  - datasets the **re-use of** which is associated with important **socio-economic benefits**
- To be made available
  - for **free**, under **open access** licenses (CC BY 4.0 or less restrictive)
  - in **machine-readable formats**, via **APIs** and (when relevant) as a bulk download

- Thematic categories of HVD



- The Implementing Act defines
  - the **list of high-value datasets** for each thematic category
  - the **requirements** for their provision: key attributes, granularity, formats, license, etc.

# Cybersécurité et cybercriminalité

## CONFIANCE ET SÉCURITÉ DANS LE CYBERESPACE

DE MOHAMED TIMOULALI 03/10/2014 - 10:41 TIC



La confiance étant un volet important de toute stratégie numérique, la CEA l'a abordée dans les stratégies nationales, mais l'a...

SUITE

TAGGÉ CER, ConventionAfricaine, Cybeleigation, cybersecurity

## DONNÉES GÉOSPATIALES ENTRE EXIGENCES DE DÉVELOPPEMENT DURABLE ET IMPÉRATIF DE SÉCURITÉS NATIONALES

DE MOHAMED TIMOULALI 21/02/2021 - 11:23

COOPÉRATION SUD SUD, GEOMATIQUE, GOUVERNANCE FONCIÈRE, SIG, TIC



Dans de précédentes publications j'avais abordé les aspects liés la gestion des données spatiales : Planification Stratégiques, cadres institutionnels et légaux...

SUITE

TAGGÉ cybersecurity, FELA, INDG, NSDI, Open Data, Sectoral Strategies, Transformation digitale

# UN-GGIM Arab States



الاجتماع الثاني عشر للجنة العربية لخبراء الأمم المتحدة لإدارة المعلومات الجيومكانية

12<sup>th</sup> Plenary Meeting of UN-GGIM: Arab States

6-2 فبراير 2025 | فندق جدة هيلتون، مدينة جدة  
المملكة العربية السعودية

2-6 February 2025 | Jeddah Hilton, Jeddah  
Kingdom of Saudi Arabia



 UN - GGIM : ARAB STATES | UNITED NATIONS  
GLOBAL GEOSPATIAL INFORMATION MANAGEMENT FOR ARAB STATES [www.un-ggim-as.org](http://www.un-ggim-as.org)

## Geospatial Security Workshop

John Kedar  
[john@johnkedar.uk](mailto:john@johnkedar.uk)

 UN - GGIM : ARAB STATES | UNITED NATIONS  
GLOBAL GEOSPATIAL INFORMATION MANAGEMENT FOR ARAB STATES [www.un-ggim-as.org](http://www.un-ggim-as.org)

# UN-IGIF et sécurité

## UN-IGIF advice on geospatial information security

- Maximize the utility of geospatial information **as well as protect a country or organization against potential security risks.**
- Balance between making information openly available for public good and economic growth and the security of sensitive information.
- Notes that geospatial policies are strongly related to policies such as national security, privacy, intellectual property rights and open data.
- Notes that collaboration improves trust, confidence and security.
- Notes that integrated geospatial information is a powerful tool for determining appropriate policy interventions and decisions for .... national security.
- Asks countries to consider what restrictions will be applied and how these should be decided.

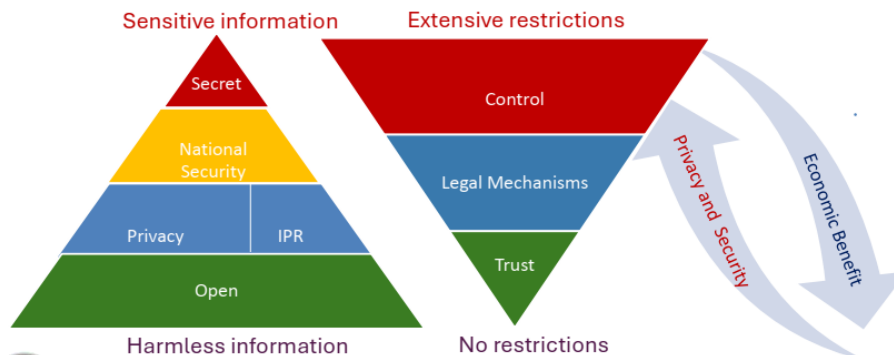


UN - GGIM : ARAB STATES

UNITED NATIONS INITIATIVE ON  
GLOBAL GEOSPATIAL INFORMATION MANAGEMENT FOR ARAB STATES

[www.un-ggim-as.org](http://www.un-ggim-as.org)

## The UN-IGIF judgement on controls v release



UN - GGIM : ARAB STATES

UNITED NATIONS  
GLOBAL GEOSPATIAL INFORMATION MANAGEMENT FOR ARAB STATES

[www.un-ggim-as.org](http://www.un-ggim-as.org)

# Stratégies Nationales Géospatiales et Plans d'action Pays

## Countries developing and implementing clap

### AT INITIAL PHASE



CONGO



COTE D'IVOIRE



MALI



NIGER



TOGO

### IN PROGRESS



CAMEROON



ESWATINI



MOZAMBIQUE



RWANDA



SENEGAL



SOUTH AFRICA

### COMPLETED



BURKINA FASO



ETHIOPIA



UN IGIF  
INTEGRATED GEOSPATIAL  
INFORMATION FRAMEWORK

Enabling a better future with location data

6

[https://ggim.un.org/meetings/2025/Maputo/documents/I-2.2\\_Status\\_Report-UN-GGIM\\_Africa\\_Region.pdf](https://ggim.un.org/meetings/2025/Maputo/documents/I-2.2_Status_Report-UN-GGIM_Africa_Region.pdf)



# Leadership Géospatal



The banner features a dark blue background with a large circular graphic on the left containing a world map and data points. On the right, the GEOSA logo is displayed at the top, followed by the title 'Geospatial Leadership Training' and a subtitle 'Introduction and Global Context'. Below this, the name 'Professor Abbas Rajabifard' and his title 'GEOSA President Advisor, Knowledge and Innovation' are listed.

GEOSA  
الهيئة العامة للمعلومات الجغرافية  
General Authority for Survey and Geospatial Information

## Geospatial Leadership Training

### Introduction and Global Context

Professor Abbas Rajabifard  
GEOSA President Advisor, Knowledge and Innovation



The banner is a screenshot of a website for 'Next-Generation Sustainability: Advancing the Future with Geospatial Intelligence'. It features a dark blue header with navigation links and a search bar. The main content area has a background image of a drone flying over a green landscape. At the bottom, there are logos for the United Nations, UN Women, csdila, The University of Melbourne, CSM, and DBI.

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CSDILA > About > Next-Generation Sustainability

## Next-Generation Sustainability: Advancing the Future with Geospatial Intelligence

1-3 April 2025 | Melbourne

United Nations UN Women csdila THE UNIVERSITY OF MELBOURNE CSM DBI

# GEOSA récompensée à l'international

The Gary Nairn Medal for Leadership



Prix de l'Agence Géospatiale Nationale de l'année



# Impact sur le classement GKI index 2025



# GKI index 2025

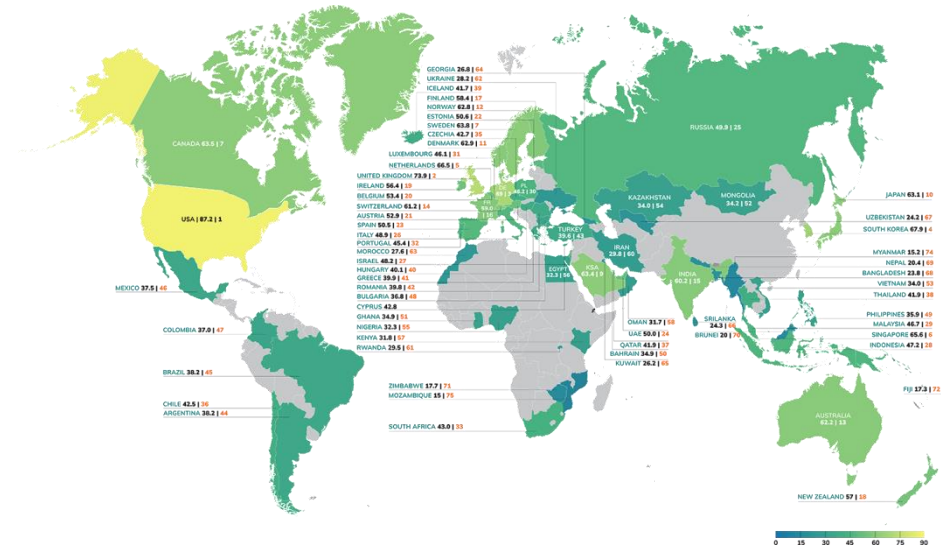
## Top Three GKI-Ranked Countries by Region

- |                   |                    |                 |                       |                      |
|-------------------|--------------------|-----------------|-----------------------|----------------------|
| <b>1 Americas</b> | <b>2 Europe</b>    | <b>3 Africa</b> | <b>4 Asia Pacific</b> | <b>5 Arab States</b> |
| 1. United States  | 1. United Kingdom  | 1. South Africa | 1. South Korea        | 1. Saudi Arabia      |
| 2. Canada         | 2. Germany         | 2. Ghana        | 2. Singapore          | 2. UAE               |
| 3. Chile          | 3. The Netherlands | 3. Nigeria      | 3. Japan              | 3. Qatar             |



## Top Three GKI-Ranked Countries by Income Group

- |                    |                            |                            |                   |
|--------------------|----------------------------|----------------------------|-------------------|
| <b>High Income</b> | <b>Upper Middle Income</b> | <b>Lower Middle Income</b> | <b>Low Income</b> |
| 1. United States   | 1. Indonesia               | 1. India                   | 1. Rwanda         |
| 2. United Kingdom  | 2. Malaysia                | 2. Philippines             |                   |
| 3. Germany         | 3. South Africa            | 3. Ghana                   |                   |



<https://geospatialworld.net/consulting/reports/gki-readiness-index/2025/pdf/gki-readiness-report-2025.pdf>



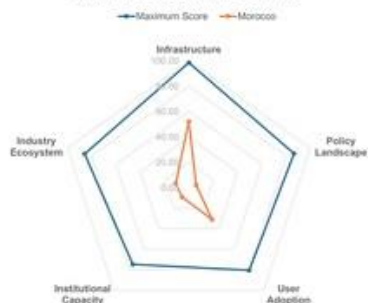
# Classement GKI du Maroc

Morocco x
Saudi Arabia x
South Africa x



Pillars	Score	Rank
Infrastructure	51.99	53
Policy Landscape	6.07	73
User Adoption	31.04	66
Industry Ecosystem	10.75	69
Institutional Capacity	9.14	65

GKI Readiness Index 2025: Relative Score  
Morocco vs Top-ranked Country



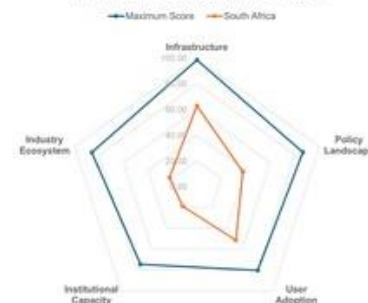
Pillars	Score	Rank
Infrastructure	85.05	7
Policy Landscape	56.27	6
User Adoption	77.51	12
Industry Ecosystem	40.70	8
Institutional Capacity	26.67	25

GKI Readiness Index 2025: Relative Score  
Saudi Arabia vs Top-ranked Country



Pillars	Score	Rank
Infrastructure	62.88	35
Policy Landscape	37.51	23
User Adoption	51.51	36
Industry Ecosystem	22.46	42
Institutional Capacity	18.83	35

GKI Readiness Index 2025: Relative Score  
South Africa vs Top-ranked Country



Note: The top-ranking country in the GKI Readiness Index 2025 is the United States of America



# Pour plus d'informations, visitez :

- <https://geospatialworld.net/gwf/2022/>
- <https://geospatialworld.net/gwf/2023/geospatial-knowledge-infrastructure.php>
- <https://geospatialworldforum.org/gki-training-programme.php>
- <https://www.un-ggim-as.org/Workshop%20on%20Geospatial%20Security.pdf>
- <https://ggim.un.org/UN-IGIF/>
- <https://ggim.un.org/Expert-Group-LAM.cshtml/>
- From Spatial Data Infrastructure to Geospatial Knowledge Infrastructure: the Role of Management and Financing Models  
Martin Saeter (Norway) FIG Working Week 2024 Your World, Our World: Resilient Environment and Sustainable Resource Management for all Accra, Ghana, 19–24 May 2024