

Third expert meeting of the working group on policy and legal frameworks for geospatial information management, including addressing issues related to authoritative and reliable geospatial data and emergent technologies

07-09 October 2025

Riyadh, Saudi Arabia



UN-GGIM

United Nations Committee of Experts on
Global Geospatial Information Management

WORKING GROUP ON POLICY AND LEGAL FRAMEWORKS
FOR GEOSPATIAL INFORMATION MANAGEMENT

Positioning geospatial information to address global challenges

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Third expert meeting of the working group on policy and legal frameworks for geospatial information management, including addressing issues related to authoritative and reliable geospatial data and emergent technologies

1. Opening of the third expert meeting, welcome and introductions
2. Agenda, organization of the meeting and setting the scene
3. Policy and legal developments – national and regional
4. Workplan and deliverables for 2025 – 2027
5. Awareness, communication, engagement, developing and sustaining legal-policy capacity
6. Evolving geospatial and technological landscape, artificial intelligence, and its regulation
- 7. UN-IGIF strategic pathway on Policy and Legal frameworks**
8. Collaboration with partnering international organizations and other functional groups
9. Sixteenth session of the Committee of Experts
10. World Geospatial Information Congress 2026
11. Summary, next meeting and close





Third Expert Meeting of the Working Group on Policy and Legal Frameworks for Geospatial Information Management

October 7 – 9, 2025, Riyadh, Saudi Arabia

Agenda item #7

UN-IGIF Strategic Pathway 2 on Policy and Legal Frameworks Some Observations

Tim Trainor



UN High Level Group of the Integrated Geospatial Information Framework

- The role of the HLG-IGIF is to provide strategic leadership, coordination and oversight in order to ensure the sustained success of the IGIF, and to mobilize the resources necessary to maintain the momentum and refinement of the IGIF as a continuously evolving process.



Recommendations from 2nd expert meeting of the Working Group on Policy and Legal Frameworks for Geospatial Information Management

- Geospatial community should be tracking legal and regulatory developments in Artificial Intelligence within their country.
- Members of the geospatial community should be actively participating in the development of these laws and regulations.
- Organizations that create or procure geospatial technologies, products and services that use Artificial Intelligence should be mindful of potential impact of laws and regulations.

Conclusion: the geospatial community must work across sectors/silos to address the complex issues posed by Artificial Intelligence.



Basic Considerations for Effective Policy and Legal Framework for Geospatial Information Management for Maximizing the Utility and Value of Geospatial Information

- Privacy
- Confidentiality
- Security
- Risks



Extracts from Kevin Pomfret's address to the U.S. National Academy of Science

- Issues:
 - Authoritative geospatial data
 - Reliable geospatial data and
 - Impacts from emerging technologies
- Authoritative Data
 - Accurate
 - Timely
 - Precise
 - Complete
 - Fit for purpose
- *Norms are subject to change



Work Plan 2025-2027

- Highlighting key policy and legal considerations related to AI and geospatial information
- Development of norms, principles and guidelines
- Sustaining and building legal-policy capacity to respond to the needs of Member States and UN-GGIM functional groups
 - What is required to build legal-policy capacity?
- Continue to engage and communicate the value of sound, robust policy and legal frameworks for geospatial information management, among and with relevant stakeholders and partners
- Consider a new goal of engaging the legal community first, rather than as an after-thought



Considerations for Modifications and Edits to SP2

- Members should review the content of SP2 to reflect any changes in policy and legal references.
 - Suggest beginning with the structure diagram on page 3 to review the principal content for SP2.
- Some content should be updated. Examples to consider include:
 - 2.4.2 Policies, Norms, and Guides
 - References to nonbinding may be changing in some circumstances
 - 2.5 Guiding Principles – should “Inclusive Expertise” be added with a reference to encourage and include legal experts in planning, discussions, and decisions?



Suggestions for Consideration

- Working Group members should review SP2 and provide any comments for consideration to a central contact within the Working Group for consolidation and review by the Working Group.
 - Consider language that is simple to understand and that clearly conveys helpful guidance.
- Reference the resources available for developing a Country-level Action Plan (CAP). Part 3 of the IGIF was prepared after SP2 was developed. Part 3 offers insight into how a country considers policy and legal topics in developing their CAP.
 - Task 4 Current and desired (or future) situation assessment (references to policy and law)
 - Task 5 Baseline assessment (many questions on policy and legal topics)
 - Task 6 Environmental scanning and analysis (SWOT and PEST – external references to policy and law topics)
 - Task 8 Strategic alignment (and benefits) (aligning geospatial planning and efforts to national priorities)
 - Task 10 Gap analysis matrix (based on the nine Strategic Pathways; encourages actions to take in CAP development)
 - Task 11 Needs assessment and gap analysis (a CAP tool that includes each Strategic Pathway for identifying gaps in geospatial information management capabilities, for making decisions about how to address the gaps as well as prioritizing them, and for how to proceed with resolving the gaps through actions)
 - Task 12 Template for Country-level Action Plan (a template for developing a CAP that includes suggestions and wording for each Strategic Pathway; similar to Task 11 with additional detail and examples)



Suggestions for Consideration (continued)

- Develop strategies for greater involvement by the legal community in policy and legal topics for geospatial information management as a way of establishing and strengthening partnerships with the legal community
- The close connection between geospatial and technology demands that legal arrangements and legal requirements reflect new and evolving technology developments. This need exists within SP2 and should be encouraged by the WG.
- Add references to emerging technologies and the potential role of policy and legal frameworks where appropriate in SP2 such as:
 - AI and machine learning
 - Other new developments in remote sensing technologies such as unmanned aerial systems and drones
 - Cloud computing and big data platforms
 - 5G and Internet of Things
 - Earth observation satellites
 - Augmented reality/virtual reality and digital twins
 - Blockchain and geospatial security
 - Edge computing
 - Quantum computing



Suggestions for Consideration (continued)

- Review the Country-level Action Plans on the UN-GGIM website for policy and legal points to consider
 - <https://ggim.un.org/UN-IGIF/part3.cshtml#NationalCAPS>
- Add to Resources Section 2.9 recent documents created or used by the Working Group on Policy and Legal Frameworks
 - Paper on Data for Public Good in the Digital World
 - Rallying Statement to the Geospatial Sector on the Development of a Legal and Regulatory Framework for AI
 - Report on International Regulations on AI in Geospatial Applications
 - Concept Paper To Address the Potential Implications to the Geospatial Sector of the Developing Legal and Regulatory Framework on AI
 - Authoritative Data for Crises
 - Others?
- Add content from discussion papers into SP2



Reminder...

- Strategic Pathway 2 has sound and clear content. It would be helpful to have the Working Group members read through SP2 for any required additions and clarifications following the discussions during the expert meeting



Thank You



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GEOISA
الهيئة العامة للمساحة
والمعلومات الجيومكانية
General Authority for Survey
and Geospatial Information



National Geospatial Governance for the Kingdom of Saudi Arabia

Alignment with the United
Nations Integrated
Geospatial Information
Framework



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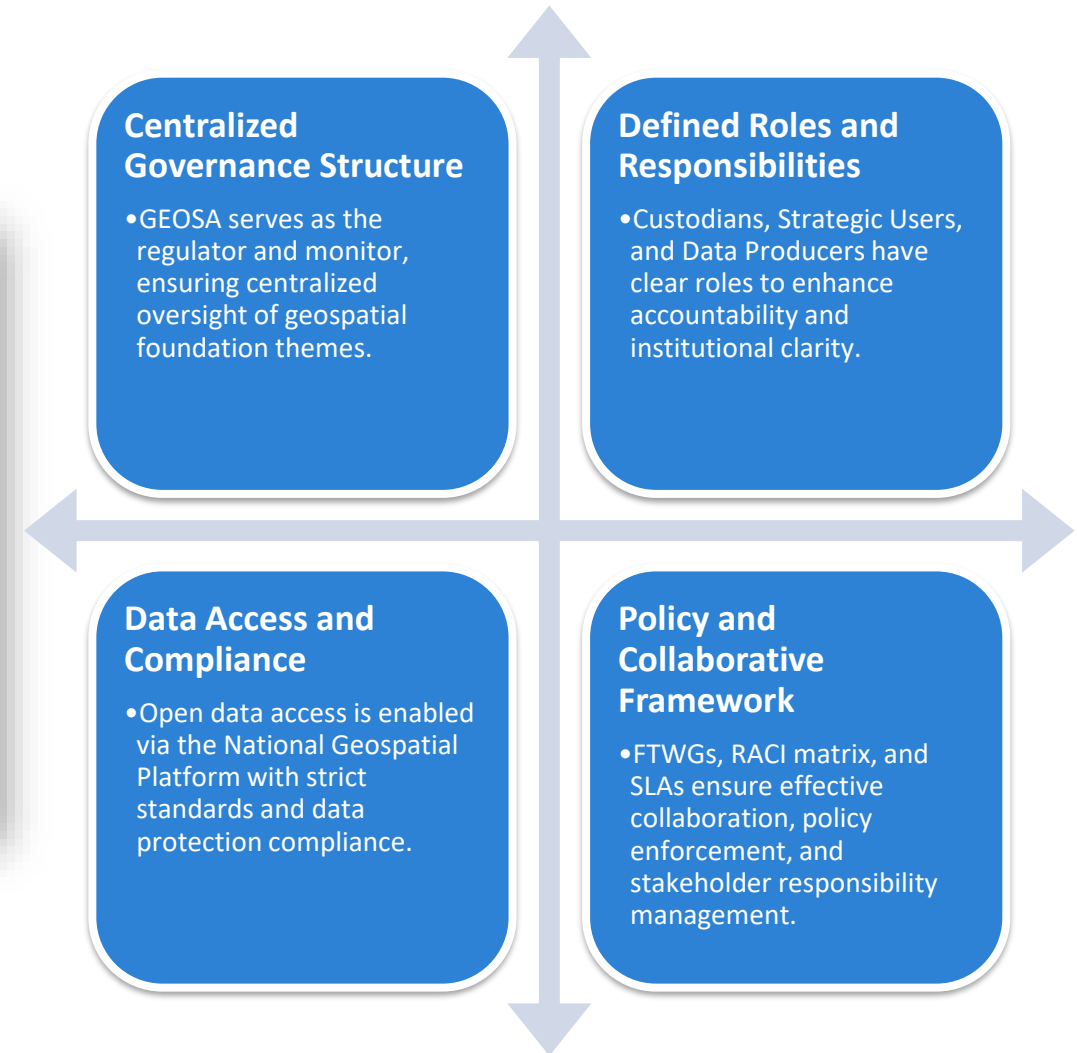
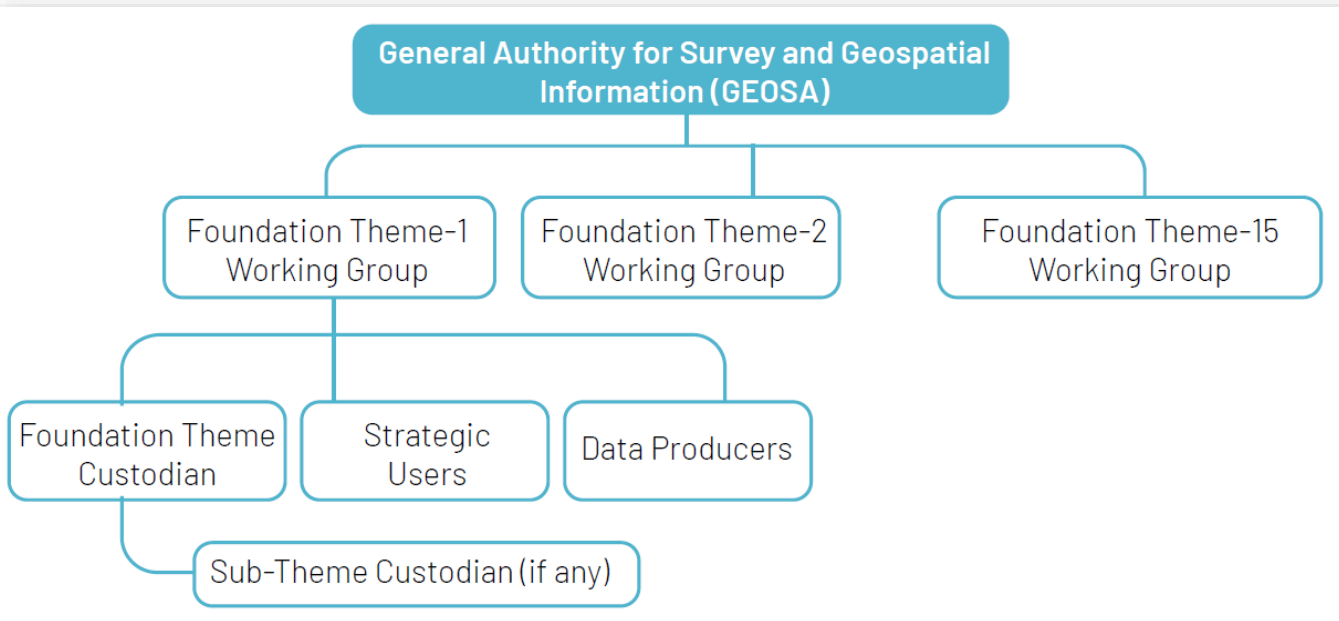
<p>STRATEGIC PATHWAY 1: GOVERNANCE AND INSTITUTIONS</p> <ul style="list-style-type: none">• National Geospatial Data Governance Framework• Establishing Geospatial Information Units in Government Agencies	<p>STRATEGIC PATHWAY 2: POLICY AND LEGAL</p> <ul style="list-style-type: none">• National Geospatial Policy<ul style="list-style-type: none">- National Geospatial Data Governance Principles- National Geospatial Data Classification- National Geospatial Data Licensing- National Geospatial Data Sharing- National Geospatial Data Protection	<p>STRATEGIC PATHWAY 3: FINANCIAL</p> <ul style="list-style-type: none">• National Geospatial Data Pricing• Licensing and Permits for Professionals and Businesses
<p>STRATEGIC PATHWAY 4: DATA</p> <ul style="list-style-type: none">• National Feature Concept Dictionary• National Geospatial Metadata Profile• National Geospatial Data Model	<p>STRATEGIC PATHWAY 2: INNOVATION</p> <ul style="list-style-type: none">• Saudi Arabian National Geospatial Ecosystem• United Nations Global Geospatial Ecosystem Centre of Excellence	<p>STRATEGIC PATHWAY 6: STANDARDS</p> <ul style="list-style-type: none">• National Geospatial Standards• National Geospatial Foundation Theme Specifications
<p>STRATEGIC PATHWAY 7: PARTNERSHIPS</p> <ul style="list-style-type: none">• GEOSA's Strategic Partnerships for National Geospatial Governance	<p>STRATEGIC PATHWAY 8: CAPACITY AND EDUCATION</p> <ul style="list-style-type: none">• National Geospatial Academy	<p>STRATEGIC PATHWAY 9: COMMUNICATION AND ENGAGEMENT</p> <ul style="list-style-type: none">• National Geospatial Forums

GEOSA Governance Aligning with UN-IGIF



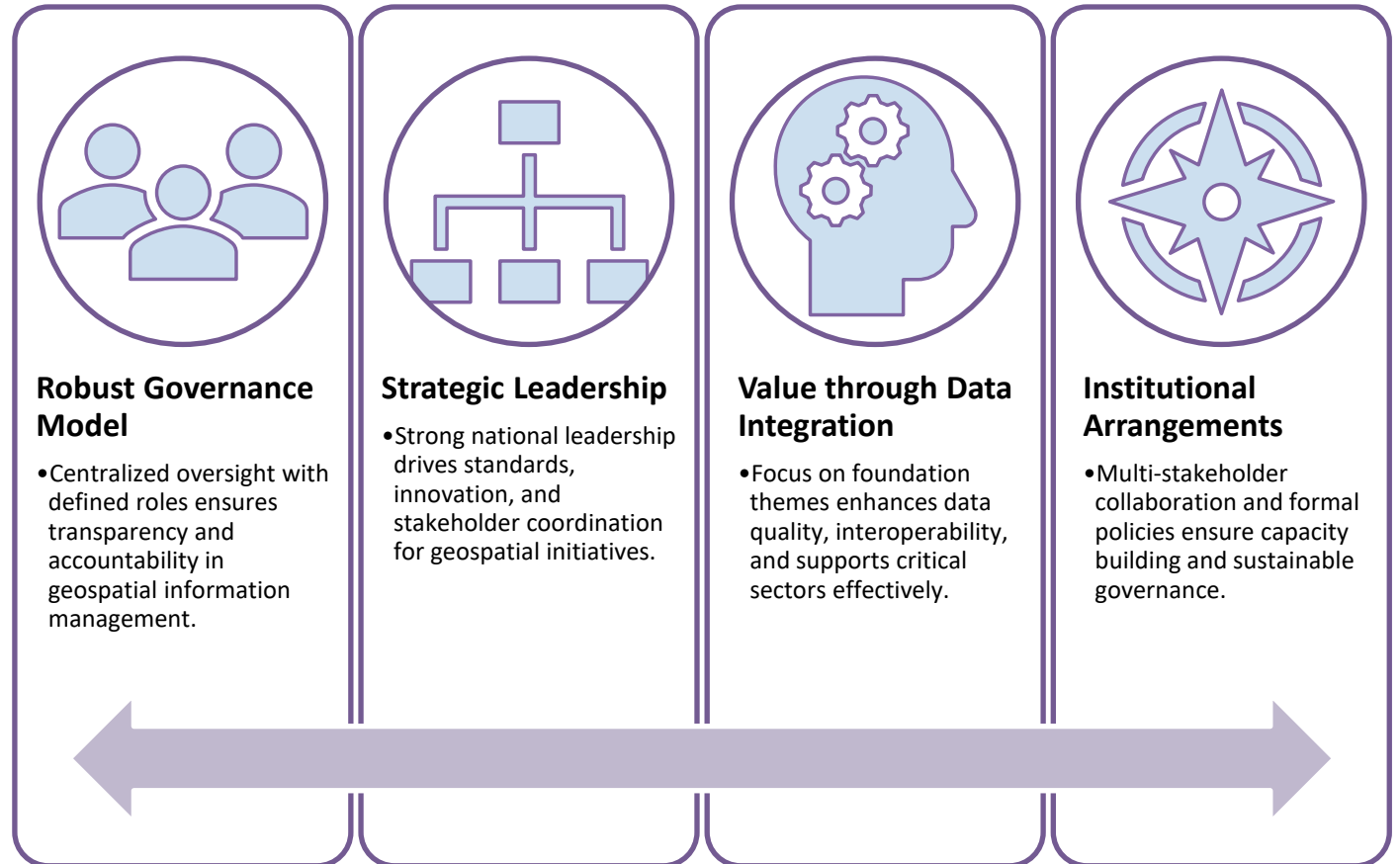


National Geospatial Data Governance Framework





ALIGNMENT WITH UN-IGIF





Establishing Geospatial Information Units in Government Agencies

Purpose of GIUs

GIUs institutionalize geospatial roles, enforce policies, and improve inter-agency coordination within government.

Organizational Structure

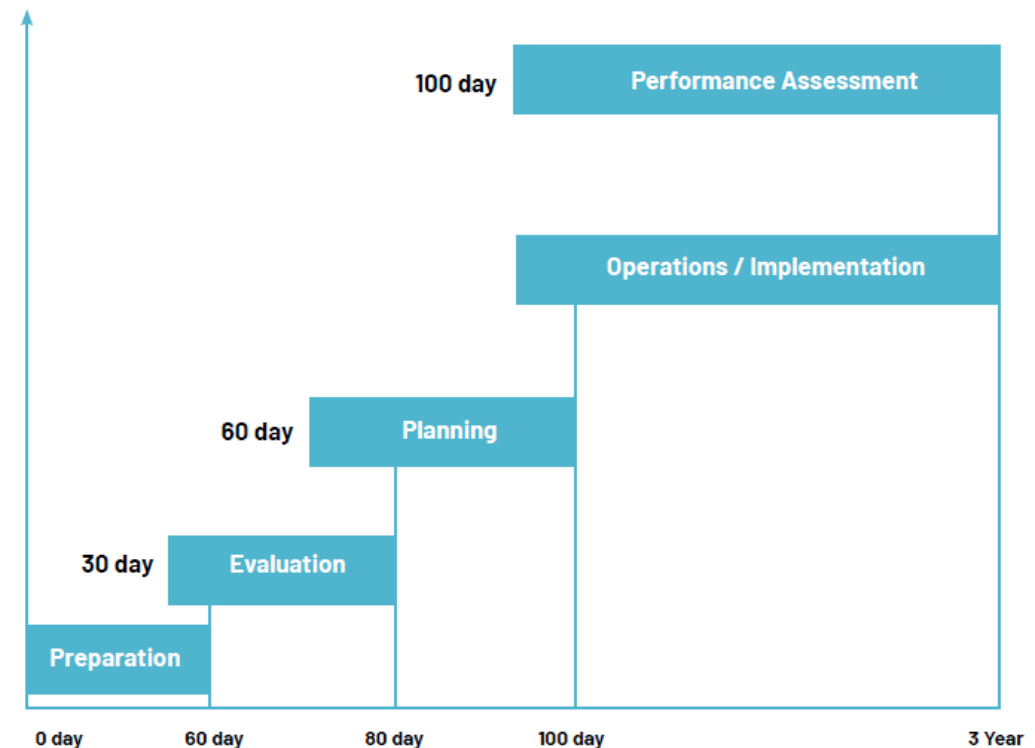
GIUs have specialized functions including data management, governance, applications, intelligence, and security roles.

Implementation Phases

Implementation involves five phases: Preparation, Evaluation, Planning, Operation, and Performance Assessment for long-term monitoring.

Capacity Building and Roles

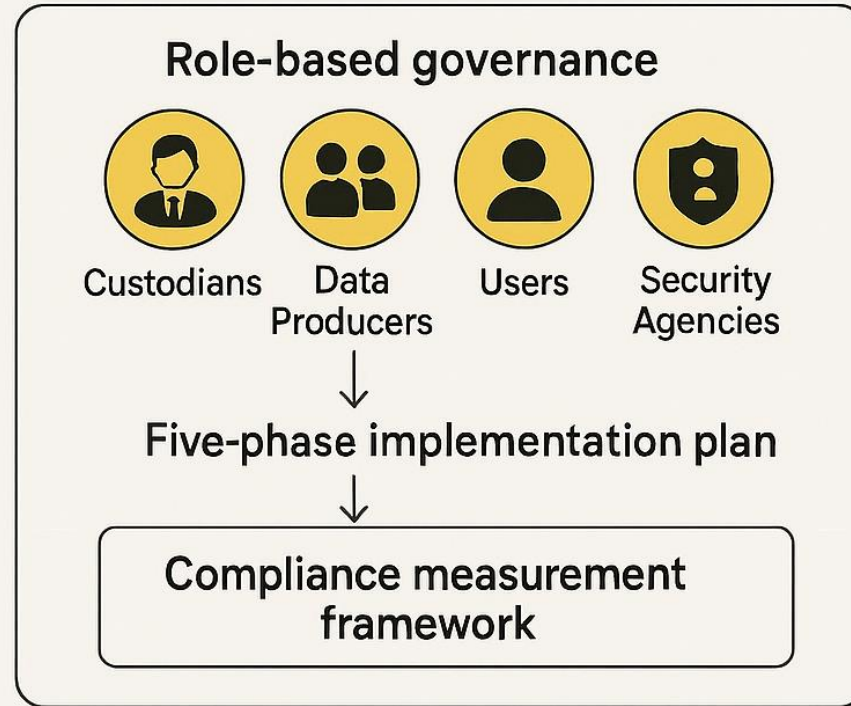
Defined roles such as Supervisor, Data Officer, and Security Officer support institutional clarity and human resource development.





Alignment
with
UN-IGIF

GOVERNANCE MODEL



Institutional Arrangements

- Specialized functional roles (é.g. Data Officer, Governance Officer, Intelligencsc Officer)
- Clear job descriptions and responsibilities

Leadership

GEOSA provides central leadership

- Issuing guide and overseeing its implementation
- Coordinating with agencies during setup and operational phases
- Monitoring performance and compliance

Value Proposition

The GIU initiative delivers clear value

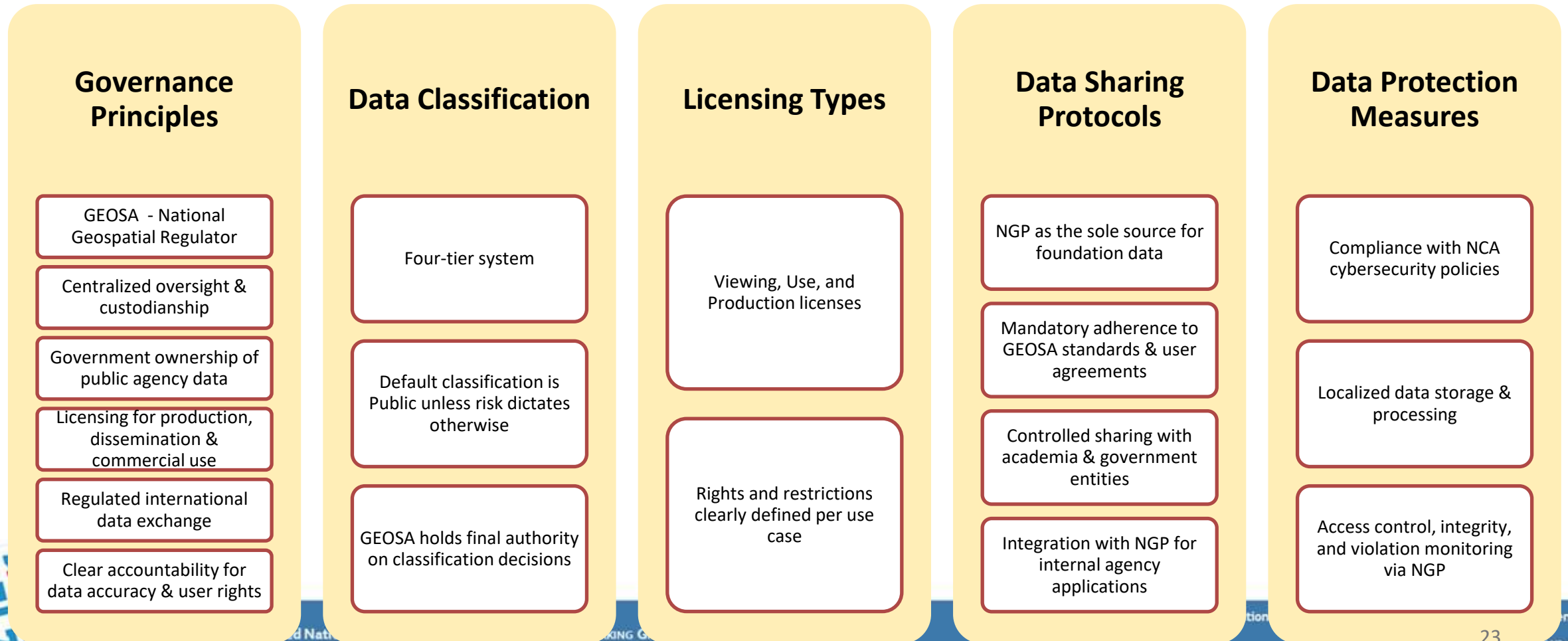
- Reducing duplication and improving data sharing
- Enhancing system integration and data quality
- Improving cost-effectiveness through rolé-based opérations
- Supporting national documentation requirements





STRATEGIC PATHWAY 2: POLICY AND LEGAL

Comprehensive framework to **govern, protect, classify, license, and share** geospatial data as strategic national assets





Alignment with UN-IGIF

Legal Mandate

GEOSA designated as the national regulator, ensuring institutional authority.

Government Ownership & Custodianship

Sovereign control of data with clear roles for producers and custodians.

Data Protection & Privacy

Classification, licensing, and security practices uphold confidentiality and integrity.

Balanced Open Data Approach

Default openness with proportional restrictions to manage risks and maximize public benefit.

Licensing & Pricing Models

Use of Creative Commons and cost recovery mechanisms supports fair, sustainable access.

International Engagement

GEOSA controls cross-border data exchange, aligning with global standards.



Models for Estimating Cost of Geospatial Data & Products

1. Cost Recovery Model: Calculates marginal cost plus the operational cost of providing geospatial data or developing data products.

Ensures sustainability by covering the actual cost of data provision.

2. Cost Recovery + ROI Model: Includes cost recovery plus a Return on Investment (ROI) component.

Adds a profit margin for value-added services, supporting long-term innovation and reinvestment.

	Type of Data	Cost of Geospatial Data	Geospatial Products
G2G	Open Geospatial Data	Free	Cost recovery model (model No. 1).
	Classified Geospatial Data (Restricted and higher)	Free	Cost recovery model (model No. 1).
G2B	Open Geospatial Data	Free	Cost recovery model (model No. 1).
	Classified Geospatial Data (Restricted and higher)	Cost recovery (model No. 1)	Cost recovery + ROI (model No. 2)





Alignment with UN-IGIF

Business Models

Cost Recovery Model: Covers data collection and delivery costs.

Cost Recovery + ROI Model: Adds profit margin for value-added services and innovation.
Enables revenue generation and financial sustainability.

Opportunities

Monetization for private sector (G2B/G2I)

Encourages innovation and public-private partnerships

Supports digital economy growth

Benefits Realization

Cost recovery and reinvestment in infrastructure

Broader access to reliable data

Enhanced decision-making and service delivery

Strategic Investment

Recognizes geospatial data as a national asset

Promotes accountability and informed budgeting

Ensures oversight via GEOSA for pricing and ROI



Licensing & Permits for Professionals and Businesses

Strategic Objectives:

Economic Empowerment: Attract investment, boost innovation, and enable new business growth.

Capacity Building: Certify and develop national talent via programs like the Geospatial Academy.

Quality & Standardization: Enforce national geospatial data standards ensuring accuracy and interoperability.

Innovation Enablement: Support emerging tech (e.g., Digital Twins, smart cities, NEOM).

For Professionals

- Digital Licensing via Nafath – streamlined online registration.
- Certification & Skills Development – ensures competency and continuous learning.
- Professional Credibility – GEOSA license as a mark of quality.

For Businesses

- Digital Portal Access – transparent, efficient licensing.
- Sector-Specific Permits – tailored for advanced applications.
- National Alignment – ensures compliance with Saudi data governance.



Alignment with UN-IGIF

Business Model

Digital-first, **tiered licensing**

Predictable revenue & reduced admin costs

Supports a **self-sustaining regulatory** ecosystem

Opportunities

Market expansion for local & global firms

Integration with national priorities (e.g., smart cities, energy)

Workforce development via certification & training (e.g., Geospatial Academy)

Benefits Realization

Professionals: Career pathways & credibility

Businesses: Tailored permits & reduced friction

Government/Society: Trusted data, better services, and planning

Investment

Legal certainty & quality standards attract investors

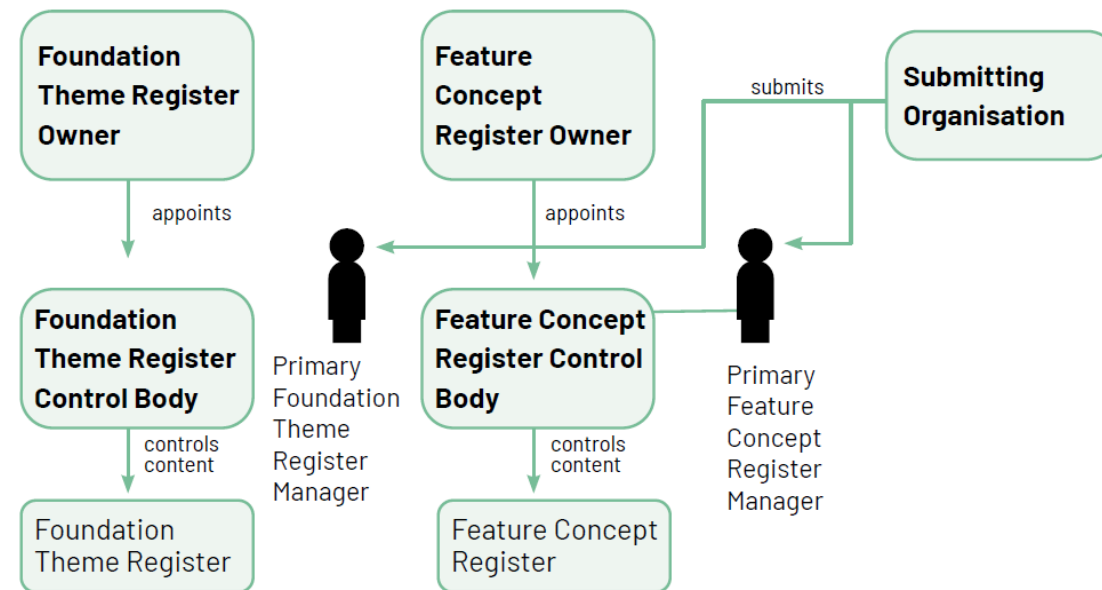
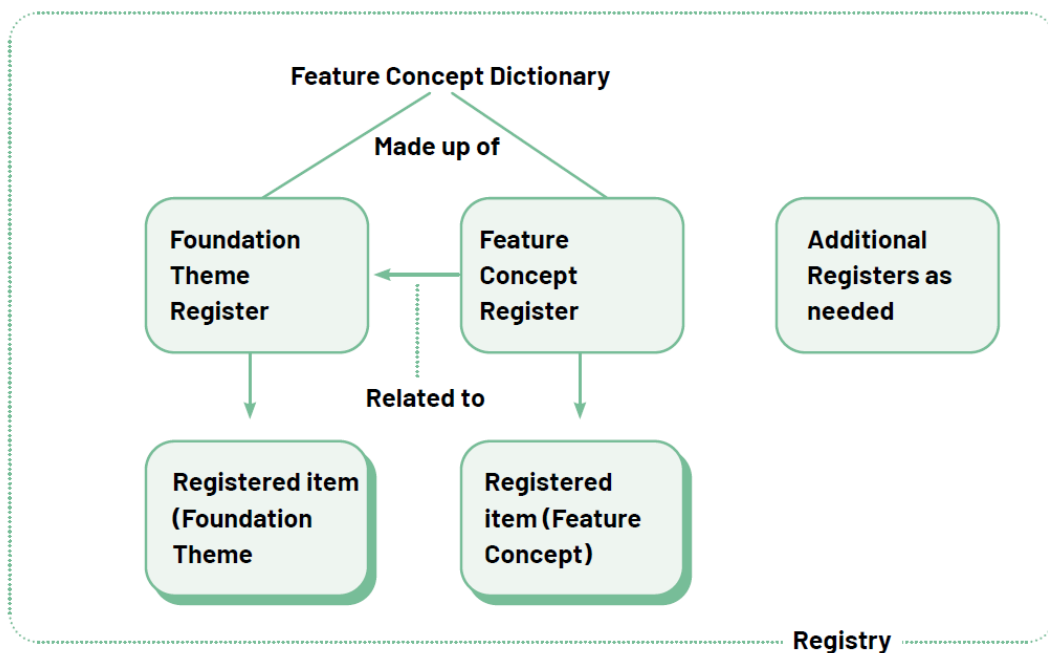
Supports Digital Twins, AI, and NEOM-scale innovation

Continuous monitoring ensures alignment with national goals





National Feature Concept Dictionary



The KSA NFCD supports Saudi Arabia’s National Geospatial Data Infrastructure (NGDI) by enabling:

1. **Discovery** – easier identification of relevant datasets.
2. **Harmonization** – consistent classifications across agencies and themes.
3. **Management** – clear custodianship and accountability for geospatial resources.



Alignment with UN-IGIF

Data Availability and Accessibility

- Authoritative registers of foundational datasets
- Persistent identifiers & metadata standards
- Open, trusted access for government & society

Data Quality and Consistency

- ISO-based conformance & version control
- Standardized, validated, and traceable datasets
- Reduces duplication and enhances reliability

Interoperability and Integration

- Aligned with ISO, UN-GGIM, INSPIRE standards
- Enables cross-sector and international data exchange
- Supports global geospatial collaboration

Governance and Stewardship of Data

- Custodians accountable for data themes
- GEOSA provides regulatory oversight
- Promotes sustainability and shared responsibility

Future-Proofing Data Ecosystems

- “Other” pseudo-theme & change management
- Designed as a living system adaptable to evolving priorities and technologies



National standard for creating, managing and sharing geospatial metadata

Metadata
Structure and
Standards

Governance and
Responsibilities

Implementation
Framework

Strategic Value:

- ✓ Datasets become **discoverable and usable** across agencies and sectors.
- ✓ **Enhanced decision-making** due to better access to reliable geospatial information.
- ✓ **Innovation opportunities** grow, as developers and researchers gain access to well-documented geospatial resources.

International collaboration is strengthened, as Saudi Arabia's datasets become compatible with global metadata standards.



Alignment with UN-IGIF

Data Availability and Accessibility

NGMP mandates metadata standards to increase dataset visibility and uses federated catalogs for easy data access.

Data Quality and Trust

Rigorous quality checks and documentation of data lineage and accuracy ensure trustworthy data ecosystems.

Interoperability and Integration

Alignment with international standards like ISO 19115 enables seamless national and global geospatial data integration.

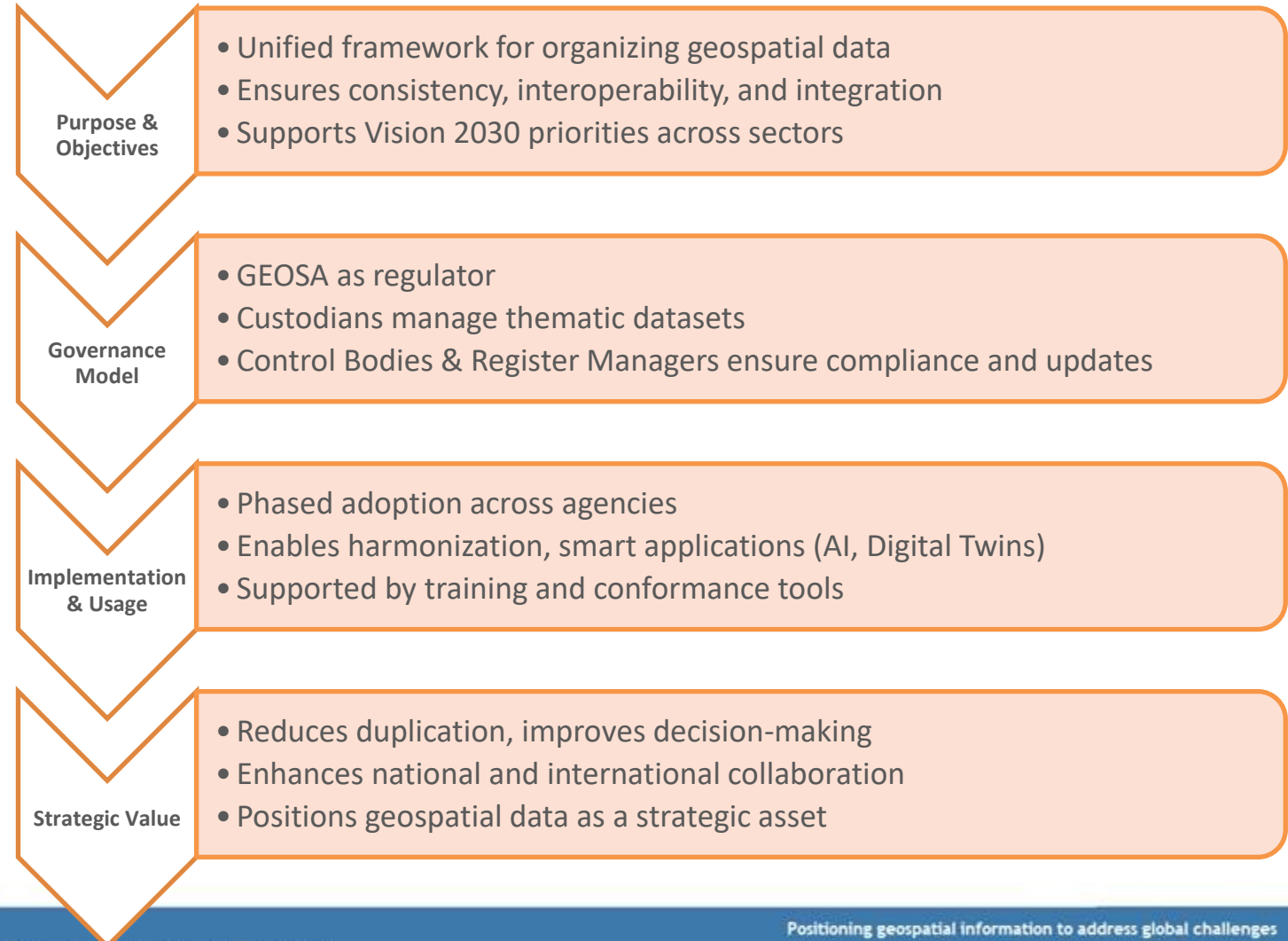
Sustainability and Governance

Institutional roles and governance ensure long-term data stewardship and adaptability to emerging technologies.



National Geospatial Data Model

- ❑ Based on Geospatial Foundation Themes
- ❑ Uses standardized Feature Types, Attributes, Relationships
- ❑ Aligned with ISO 19100 and UN-GGIM standards



Alignment with UN-IGIF



Making data discoverable and usable



Creating a connected ecosystem



Building trust through quality and consistency



Ensuring global and national interoperability



Embedding stewardship and sustainability



Future-ready design





STRATEGIC PATHWAY 5: INNOVATION

Saudi Arabian National Geospatial Ecosystem

NATIONAL GEOSPATIAL ECOSYSTEM

 **VISION**

A sustainable, active, and nationally relevant Geospatial Ecosystem that contributes to real-world applications that require an element of Geospatial knowledge by interconnecting people, policies, practices, and processes.

 **MISSION**

Provides a ubiquitous network of interconnected Geospatial information, products, technology, and services, enabling the delivery of knowledge-based insights to facilitate a bottom-up approach to problem-solving and decision-making.

OBJECTIVES

Create a secure, shared network based on commonly agreed-upon Geospatial principles, policies, and standards.

Connect diverse stakeholders for Geospatial data and solutions partnerships.

Integrate existing datasets within the Saudi Arabian Geospatial network by adopting a shared semantics-based architecture.

Deliver knowledge-oriented analytics and solutions for real-world problems leveraging many Geospatial infrastructures and services.

Provide advanced visualization options to experience the Ecosystem's Geospatial data and associated non-spatial attributes.

Adopt an intelligent automated approach limiting human interventions.

Embrace a user-centric approach to deliver personalized Geospatial products and services.

VALUES

SYSTEMIC | DYNAMIC | USER-CENTRIC | KNOWLEDGE-BASED | AUTOMATED | SECURE | COLLABORATION & COMPETITION | FUTURISTIC



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Positioning geospatial information to address global challenges

UN-GGIM Centre of Excellence – Riyadh, Saudi Arabia

UN-GGIM approved the establishment of the **Global Geospatial Ecosystem Centre of Excellence** in Riyadh, marking a major milestone in global geospatial collaboration.

Innovation Hub

- Focus on integrating geospatial data with AI, Digital Twins, IoT to drive sustainable development.

Global Collaboration

- Platform for international forums, knowledge exchange, and capacity building.

National Leadership

- Backed by Vision 2030 and high-level national support, reinforcing Saudi Arabia's role in digital transformation.

Support for Developing Nations

- Strengthens geospatial capabilities through strategic coordination and targeted development.



Alignment with UN-IGIF

Governance & Institutions Institutional arrangements and leadership models have been established to coordinate multi-sectoral geospatial activities.	Policy & Legal A solid legal and policy framework governs data access, privacy, and ethical use.	Financial Investment evaluation frameworks and sustainable business models underpin long-term ecosystem viability.
Data Structured data management, interoperability, and quality assurance are central to the ecosystem's operations.	Innovation Emerging technologies such as AI/ML, automation, and extended reality drive innovation.	Standards International standards (OGC, ISO) ensure interoperability and consistency.
Partnerships The ecosystem fosters collaboration with national, regional, and international stakeholders.	Capacity & Education Training modules, outreach programs, and maturity frameworks support lifelong learning and skill development.	Communication & Engagement Advocacy strategies and feedback mechanisms ensure stakeholder involvement and responsiveness.





STRATEGIC PATHWAY 6: STANDARDS

National Geospatial Data Standards

Geospatial Data
Quality

Geospatial Data
Quality
Evaluation

Geospatial Data
Specification

Geospatial Data
Quality
Management

Geospatial Data
Collection and
Documentation

Geospatial Data
Maintenance
and Update

Geospatial
Standards
Registry





Alignment with UN-IGIF

Integrated Standards Approach

Governance & Policy

Mandated custodianship, formal approvals, and adherence to ISO & W3C standards ensure consistency and transparency.

Interoperability

Standards like DCAT, ISO metadata, and OGC enable seamless data sharing across platforms and borders.

Community of Practice

Custodians, producers, and users co-develop standards, supported by certification and training via the Geospatial Academy.

Compliance & Certification

Quality models and conformance testing ensure data is accurate, trustworthy, and fit for national applications.





National Geospatial Foundation Theme Specifications

Cover a wide range of technical and governance aspects, including:

- ✓ Logical data model design
- ✓ Linkages to the Saudi National Spatial Reference System (SANSRS)
- ✓ Unique identifiers and metadata standards
- ✓ Data quality and maintenance protocols
- ✓ Cartographic portrayal guidelines
- ✓ Data capture and delivery methods

KSA Geospatial Foundation Theme Specifications														
Administrative Regions	Buildings	Elevation		Geology	Imagery	Land Cover	Land Parcel	Land Use	National Addresses	Population Distribution	SANSRS	Transport	Utilities	Water
National Documents			KSA National Geospatial Policies and Standards			KSA National Data Model			KSA National Feature Concept Dictionary					
International Best Practices			ISO 19135:2015 Standard			UNGGIM Foundational Data Themes			INSPIRE & ANZLIC Foundational Data Themes					





Alignment with UN-IGIF

GEOSA's specifications directly support this pathway through:

- ✓ Adoption of international standards such as **ISO 19131:2022** for data product specifications.
- ✓ **Integration with global frameworks** like UN-GGIM, INSPIRE, and OGC.
- ✓ Definition of **metadata profiles** and **quality assurance protocols**.
- ✓ Standardized **identifiers and referencing systems** (e.g., UUIDs, spatial reference system identifiers).
- ✓ Guidelines for **cartographic portrayal** and data visualization.





Alignment with UN-IGIF

Identifying and engaging	Identifying and engaging stakeholders across sectors through its Geospatial Foundation Theme Working Groups.
Establishing	Establishing formal agreements and service-level arrangements with Geospatial Foundation Theme Custodians and Data Producers.
Contributing	Contributing to international standards development, ensuring interoperability and global relevance.
Promoting	Promoting capacity building and knowledge exchange.
Leveraging	Leveraging partnerships to support national priorities, including Saudi Vision 2030 and digital transformation goals.





To position the Kingdom as a hub for cutting-edge geospatial research, a magnet for talent, and a producer of high-value knowledge assets.



Knowledge Assets Dissemination

Creating and sharing high-value geospatial content.

Promotion of Decision Making

Enabling evidence-based policy and planning.

Human Capital Realization

Building a skilled and future-ready geospatial workforce.

Research & Innovation Leadership

Fostering a culture of scientific excellence.

Knowledge Sector Activation

Institutionalizing geospatial knowledge as a national priority.

Wider Public Outreach

Making geospatial data accessible and relevant to citizens.

Economic Benefits

Monetizing geospatial assets to fuel innovation and entrepreneurship.

Enhanced Digital Governance

Integrating geospatial intelligence into public service delivery.

ESG Focus

Using geospatial tools to address environmental and social challenges.





Alignment with UN- IGIF



Workforce Development



Curriculum and Learning Platform



Capacity Building Programs



Knowledge Networks and Repositories



Policy and Institutional Support



Monitoring and Evaluation



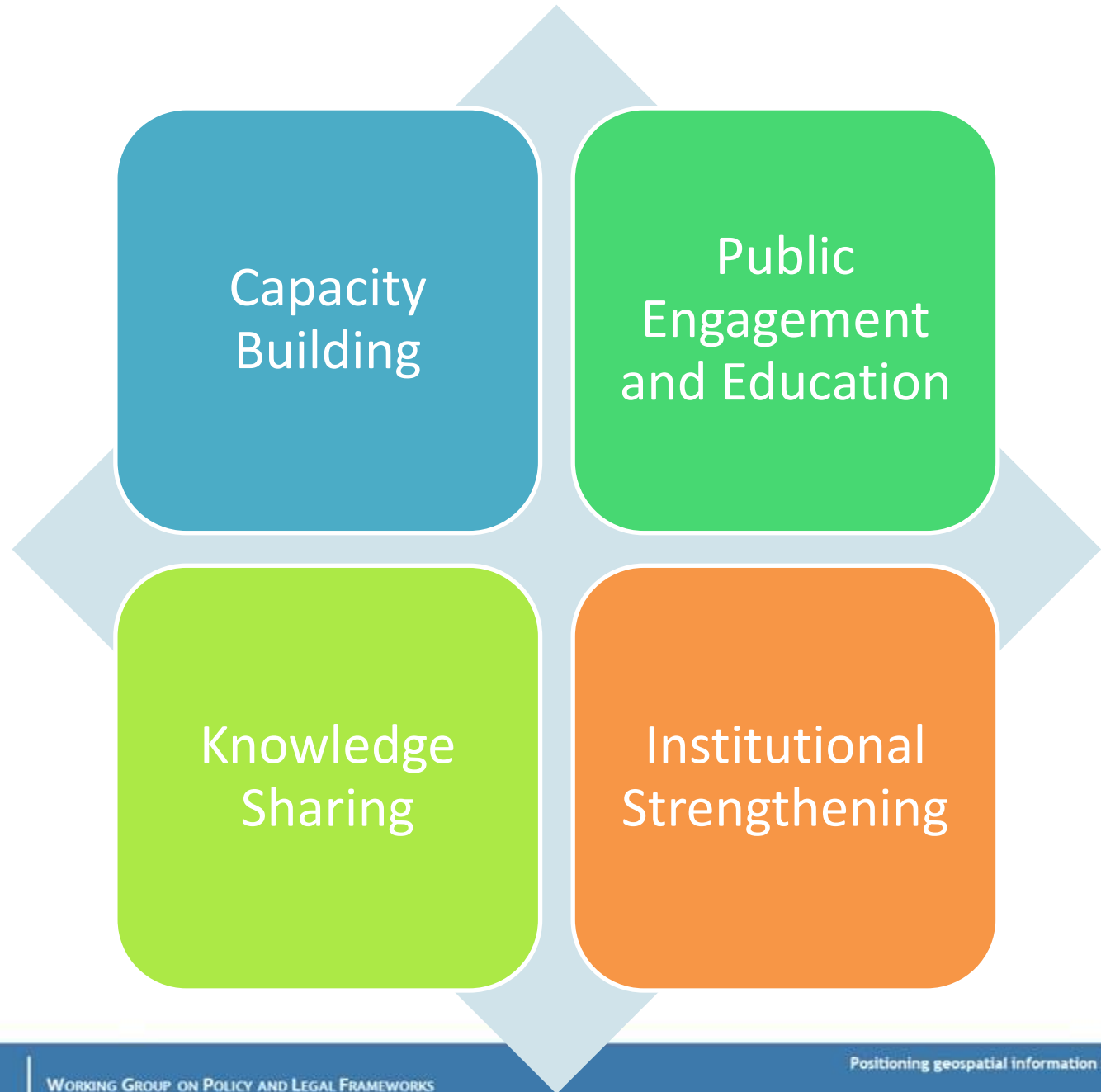


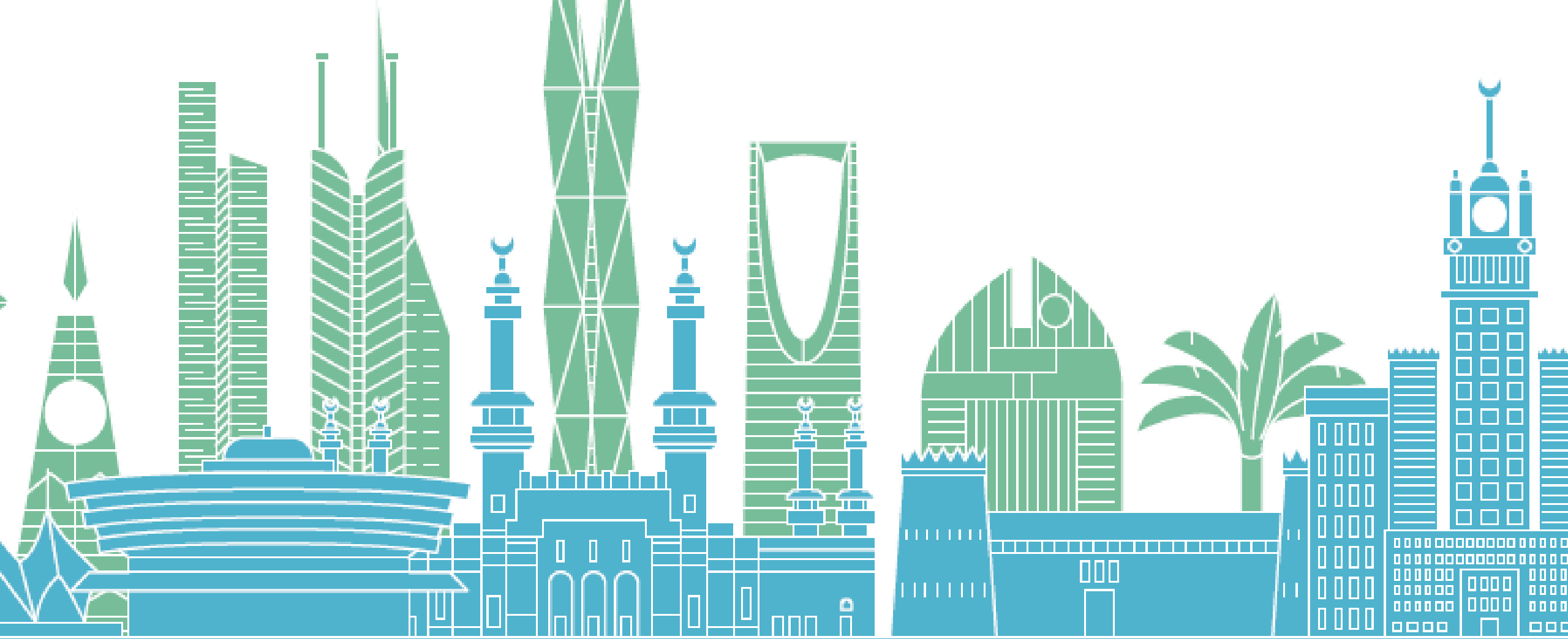
National Geospatial Forums



- Fostering Collaboration and Partnerships
- Enhancing Public Awareness and Engagement
- Promoting Transparency and Accountability
- Driving Policy Development
- Encouraging Knowledge Sharing and Capacity Building
- Addressing Societal Challenges
- Strengthening Community Resilience







Thank you



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A world **where** geospatial information solves local to global challenges

