



# State of Geodesy 2026

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# State of Geodesy 2026

## What we want

- Accurate and reliable satellite services.
- Satellite services required by governments and the private sector to support critical infrastructure operations, economic growth and societal needs.

## How do we achieve that?

- You need an accurate and reliable global geodesy supply chain.

## Is the global geodesy supply chain accurate and reliable?

- No.



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# Maturity assessment process

## Round 1:

UN-GGCE with assistance from Dr Richard Gross in May 2025

Based on evidence of Global Geodesy Needs Assessment

## Round 2:

Consultation with over 130 people holding leadership or coordination positions within the IAG, the UN Committee of Experts on Global Geospatial Information Management (UN-GGIM) Subcommittee on Geodesy, and the UN-GGCE International Advisory Committee.



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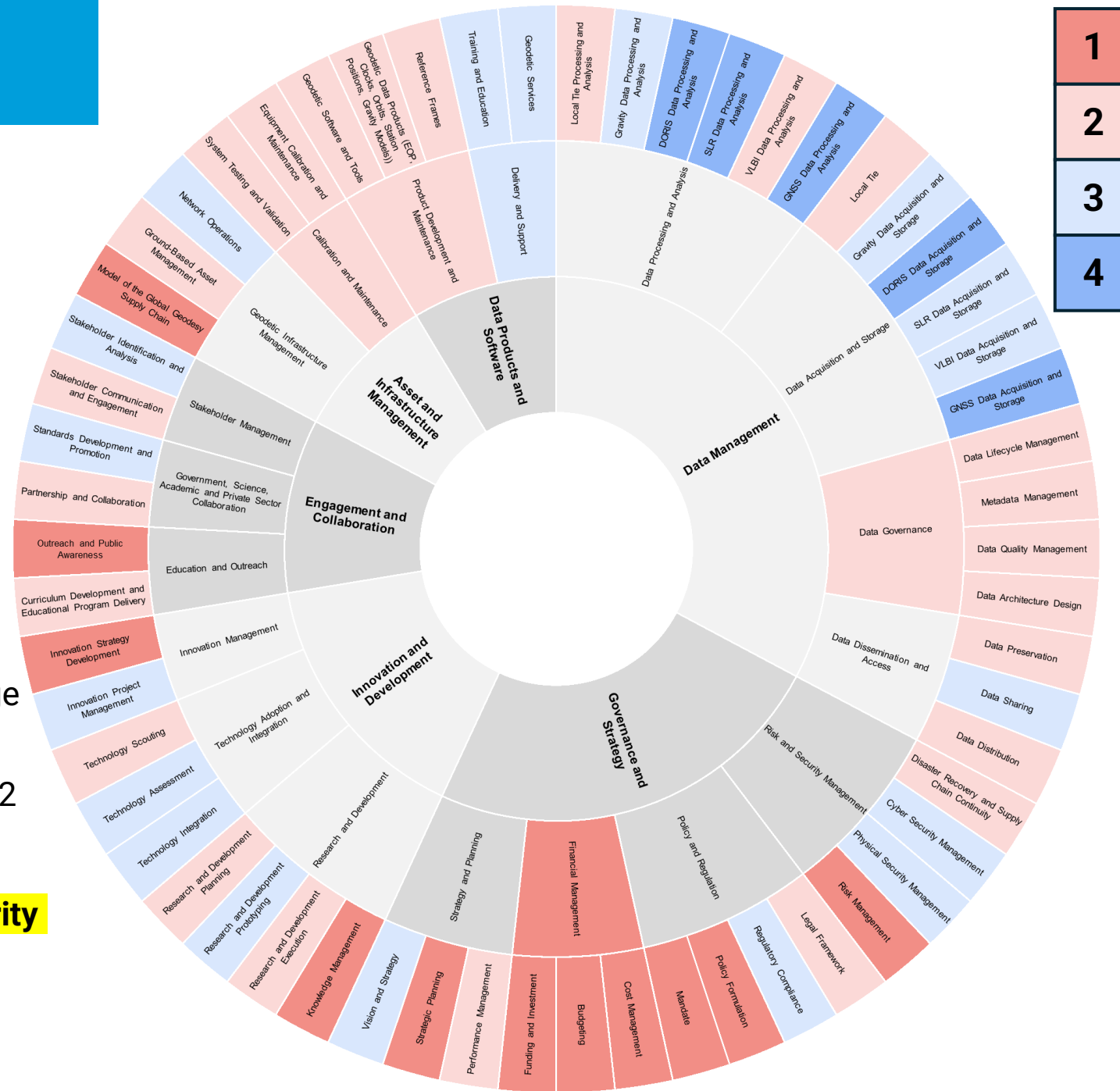
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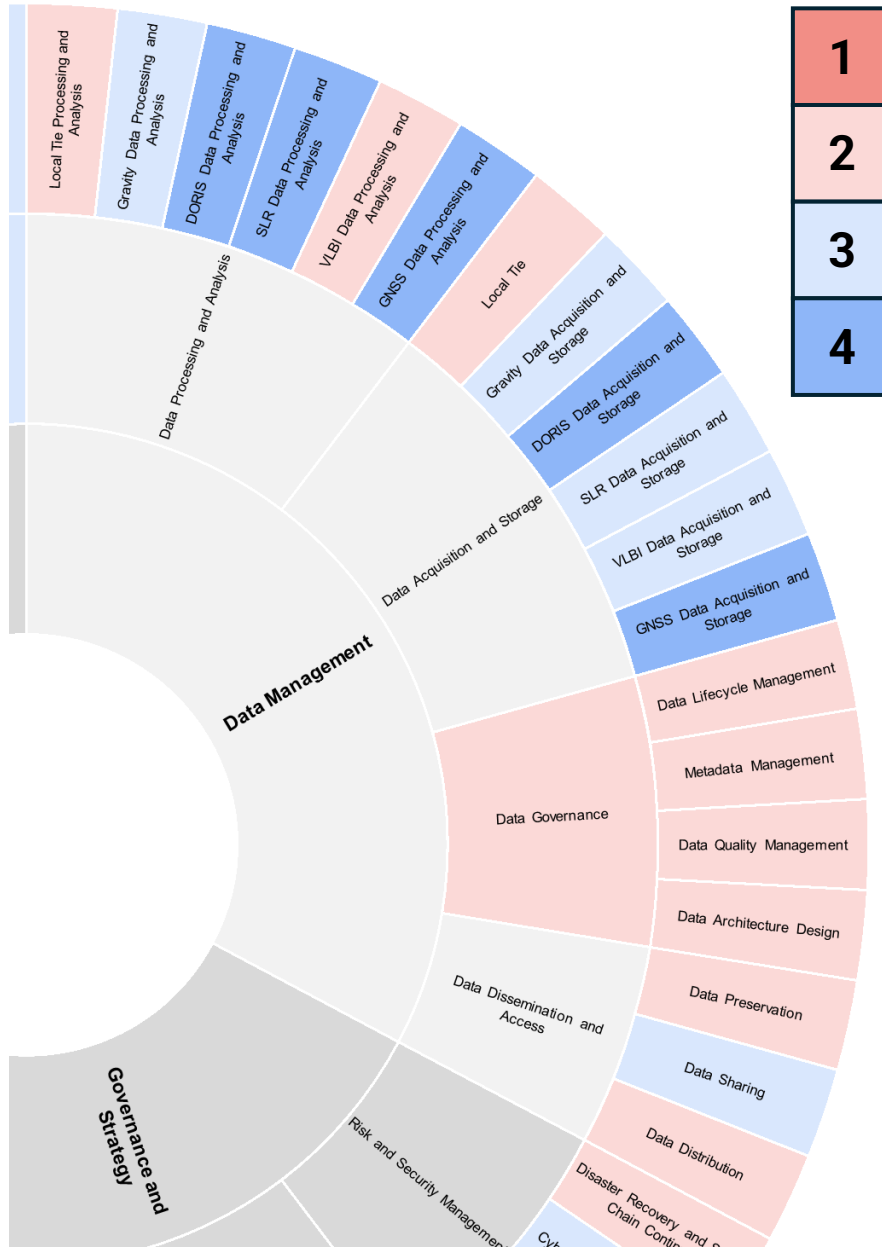
# State of Geodesy 2026

Domains	Average Score
Data Management	2.7
Data Products and Software	2.3
Asset and Infrastructure Management	2.3
Engagement and Collaboration	2.2
Innovation and Development	2.1
Governance and Strategy	1.8

- The maturity assessment yielded an overall average score of 2.3 across 58 assessed capabilities.
- The global geodesy supply chain is between Level 2 on the maturity scale, indicating it has **basic operational capabilities and some standardized processes, but with significant variations in maturity across different functional areas.**

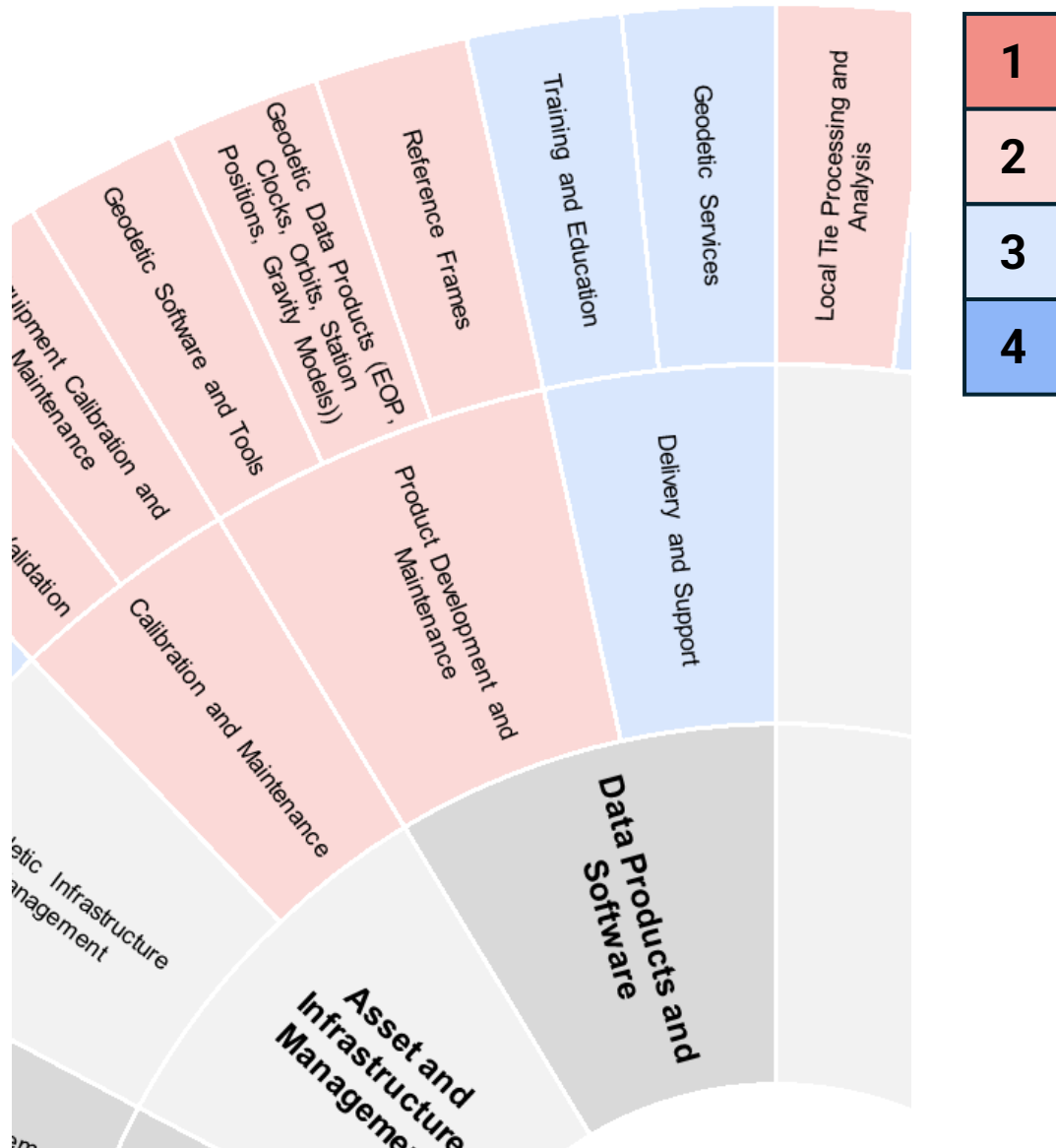


# Data Management (2.7/5)



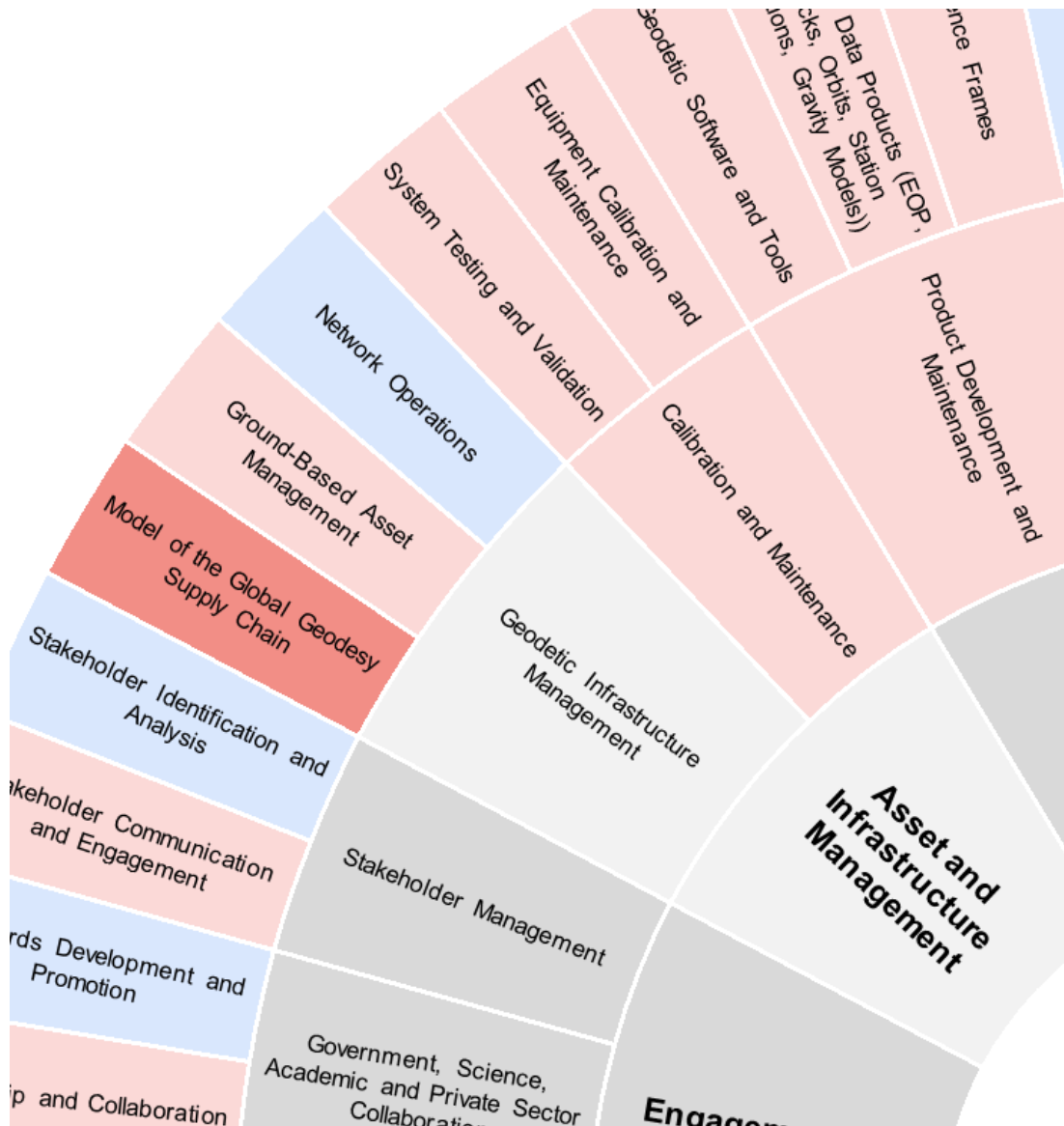
- The **Data Management domain** achieved the highest average score at 2.7
- Relatively mature capabilities in data acquisition, processing, and analysis for established geodetic techniques.
- GNSS data acquisition and storage scored particularly well (3.5).
- DORIS data collection also demonstrated strong performance (4.0), benefiting from consistent institutional support and a well-distributed global network.
- However, even within this highest-performing domain, significant gaps exist in data governance capabilities, including data quality management (2.0), metadata management (2.0), and data preservation (2.0), where limited personnel capacity and absence of coordinated redundancy protocols constrain effectiveness.

# Data Products and Software (2.3/5)



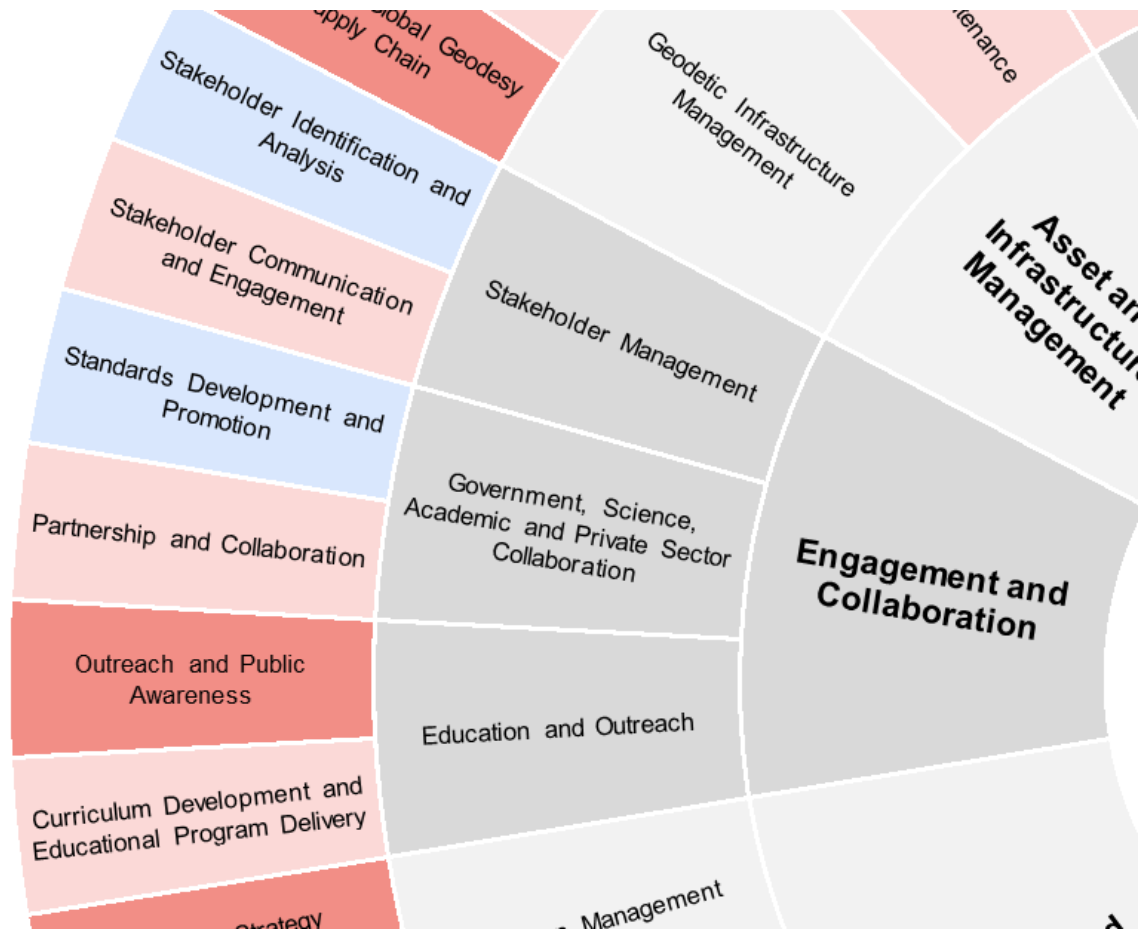
- The **Data Products and Software domain (2.3)** scored at the overall average.
- Reasonable capability in reference frame maintenance (3.0) and geodetic data product generation (2.8), with established processes documented in scientific literature and multiple software tools available to the global community.
- Challenges in geodetic software development (2.0), where dependencies on individual developers and incomplete documentation create vulnerabilities, and in geodetic services delivery (2.0), where limited resources affect the implementation of FAIR principles and service reliability.

# Asset and Infrastructure Management (2.3/5)



- The **Asset and Infrastructure Management domain** (2.3) also scored at the overall average.
- A mixed picture, with adequate equipment calibration and maintenance capabilities (3.3) when resources are available, but fundamental gaps in network operations oversight (2.0) and the complete absence of comprehensive supply chain modelling (1.0), reflecting the lack of end-to-end visibility across the system.

# Engagement and Collaboration (2.2/5)



- **Engagement and Collaboration** (2.2) domain scored slightly below the overall average.
- Demonstrates reasonable capability in stakeholder identification within the scientific community (2.5) and standards development (3.0), supported by active participation in technical bodies such as ISO and OGC.
- However, this domain faces significant challenges in stakeholder communication beyond the geodetic community (2.0), where inadequate mechanisms exist to engage policymakers and end-users, and in public awareness activities (1.3), where extremely limited resources and absence of coordinated outreach platforms constrain effectiveness.

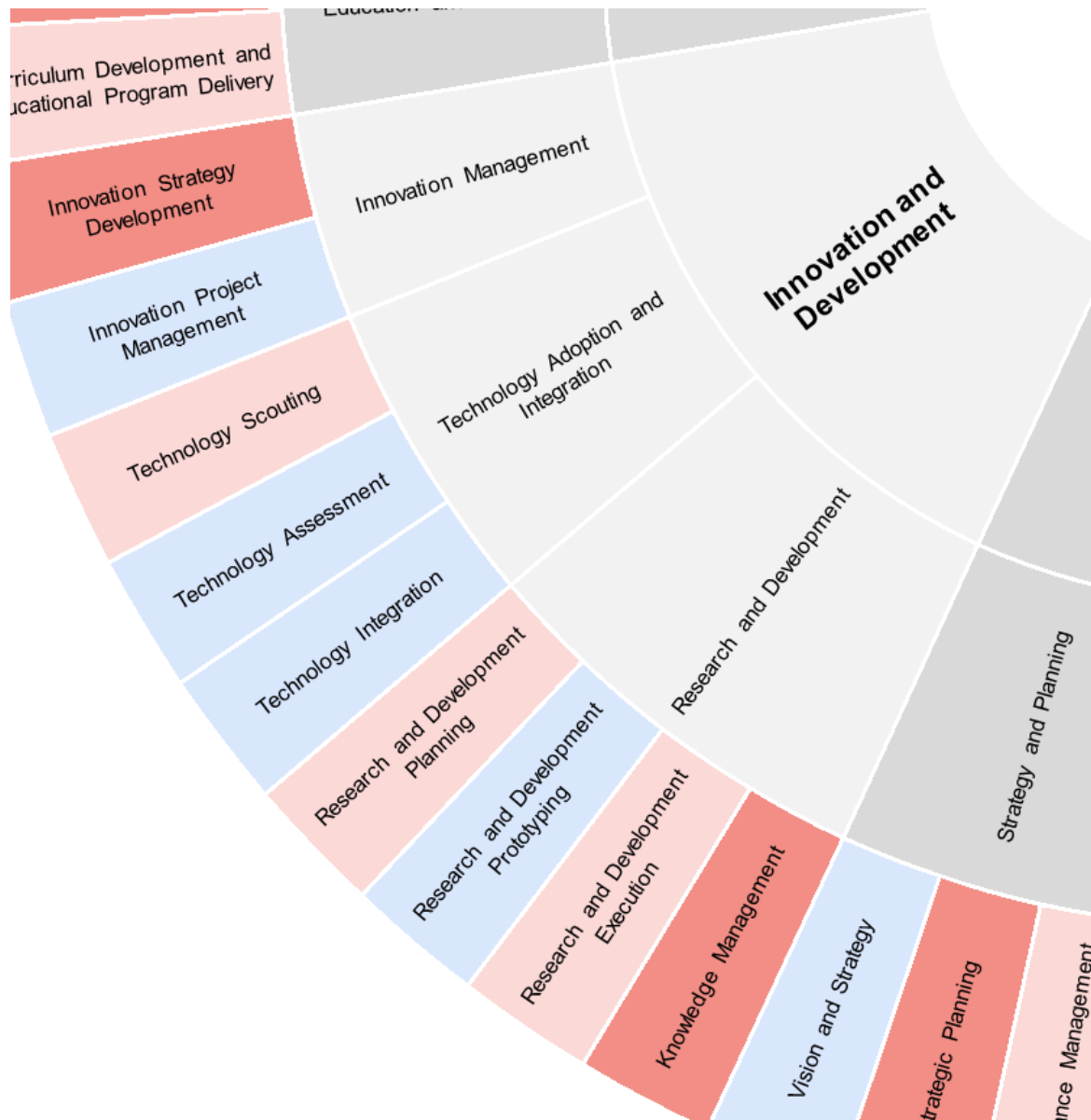


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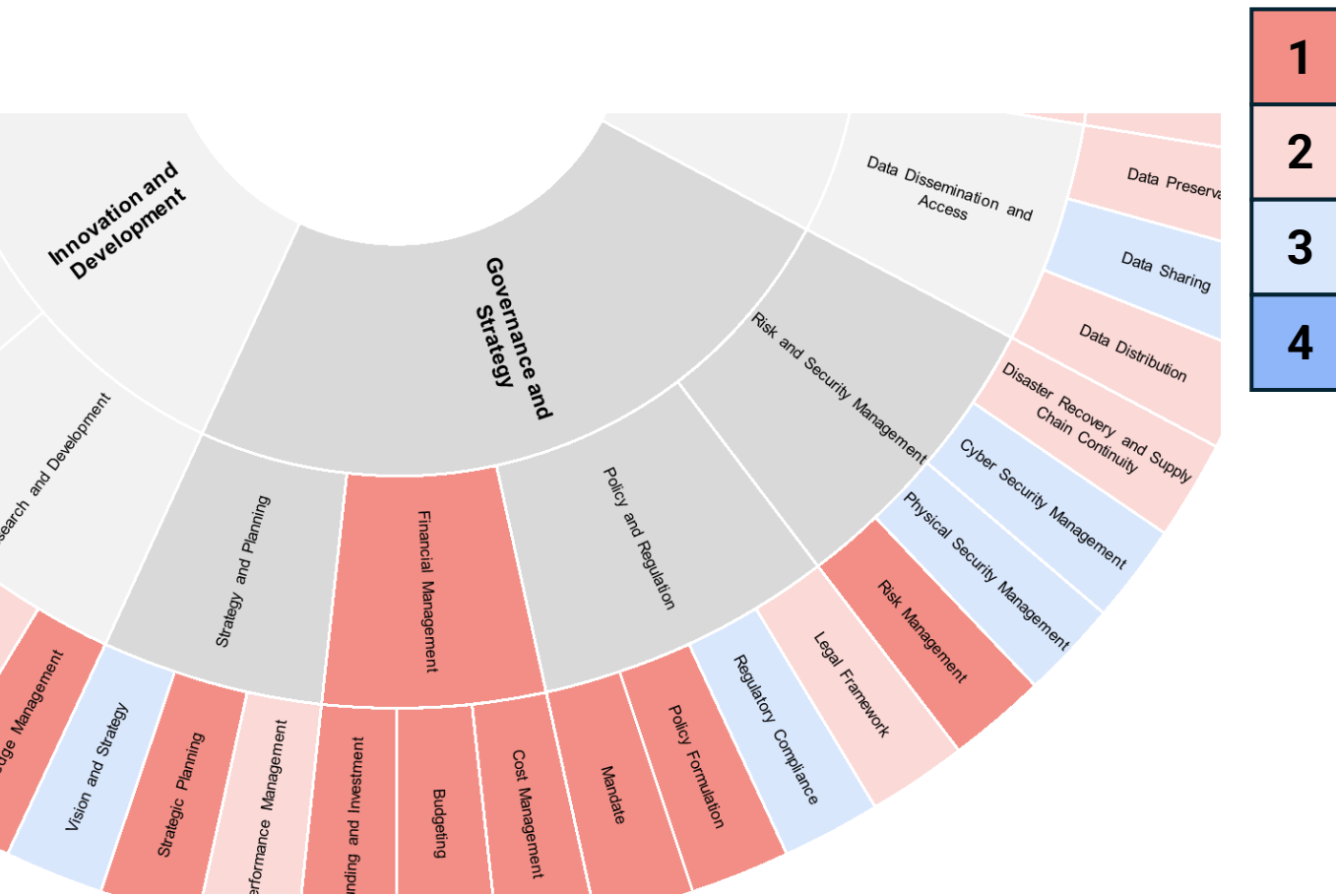
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# Innovation and Development (2.1/5)



- **Innovation and Development (2.1)** domain also scored slightly below the overall average.
- Shows active research and development prototyping (3.0) occurring primarily in academic institutions and space agencies, but this activity remains ad-hoc and uncoordinated due to the absence of formal governance structures.
- Knowledge management in this domain is particularly weak (1.3), with critical dependencies on individual experts, limited documentation, and lack of systematic processes to capture and transfer institutional knowledge as senior specialists retire.

# Governance and Strategy (1.8/5)



- The **Governance and Strategy** domain received the lowest average score at 1.8, with multiple capabilities scoring at Level 1 including mandate development (1.0), policy formulation (1.0), strategic planning (1.0), and all three financial management capabilities—funding and investment (1.0), budgeting (1.0), and cost management (1.0).
- The Level 1 scores in these areas reflect the absence of an international governance structure with visibility, authority, and accountability across the GGSC.
- Risk management capabilities also scored at Level 1, indicating that no organization systematically identifies, assesses, and mitigates supply chain risks, despite acknowledged dependencies on small numbers of experts and single-jurisdiction control of critical components.



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- The significant variation in scores across domains reveals that operational and technical capabilities (particularly in data management) function at moderate maturity levels, while strategic, governance, and coordination capabilities remain largely undeveloped.
- This pattern suggests a system that evolved organically through scientific collaboration, developing strong technical expertise and established operational practices within individual geodetic technique communities, but lacking the overarching governance, strategic planning, and coordination mechanisms that would typically characterise mature critical infrastructure systems.
- The concentration of Level 1 scores in foundational governance and financial management capabilities, combined with widespread reliance on voluntary contributions and in-kind support across multiple domains, indicates structural constraints that affect the long-term sustainability of even those capabilities that currently demonstrate adequate operational performance.



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## Critical Pattern: Governance as cross-cutting constraint

- **Governance and financial management capabilities** received the lowest level of maturity, indicating these functions are **largely absent or operate ad-hoc** without formal structures. Specifically:
  - Mandate development (1.0): No international organization has formal authority to develop, implement, or enforce policies for the GGSC.
  - Strategic planning (1.0): Plans exist but lack governmental authority for implementation.
  - Financial management (1.0): No coordinated mechanisms for assessing needs, developing investment strategies, or allocating resources across the supply chain.
  - Risk management (1.0): No systematic risk assessment or mitigation at supply chain level.
- The International Association of Geodesy (IAG) provides effective scientific and technical coordination within its scope. However, as a scientific membership organisation, the IAG operates without governmental authority to direct Member State actions, mandate resource contributions, or enforce operational requirements beyond its member institutions.
- At the intergovernmental level, UN General Assembly resolution 69/266 represents the strongest mandate for geodesy, but as a non-binding resolution, it encourages voluntary action without implementation mechanisms or accountability structures.



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## The role of the International Association of Geodesy

- The IAG provide essential coordination for scientific and technical functions within the GGSC.
- The assessment found that IAG Services have established well-defined technical processes and procedural frameworks that enable this coordination.
- The IAG's coordination role operates within the scope of a scientific membership organization, facilitating voluntary collaboration among researchers and institutions that contribute observatories, data centres, analysis facilities, and expertise to the supply chain.
- This model has enabled the development and operation of the geodetic techniques and product generation capabilities that currently support numerous applications.
- As a scientific body, the IAG operates without governmental authority to direct Member State actions, mandate resource contributions, establish binding operational requirements, or enforce compliance with standards beyond its member institutions.
- The effectiveness of IAG coordination in scientific and technical domains, combined with the governance capability, suggests that current supply chain operations depend substantially on the IAG's scientific coordination role while lacking complementary governmental coordination mechanisms that could address strategic planning, resource allocation, and policy implementation functions.



# Discussions

- What inclusions or changes would you advise the UN-GGCE consider before finalising this report for UN-GGIM 16?
- Should UN-GGCE develop a Policy Brief which explains this to policy makers?
- Should UN-GGCE communicate State of Geodesy with broader community (including private sector, space agencies etc.)?
- What is needed to improve the State of Geodesy 20xx report?



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