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Modernization of NSOs through digitalization

14th Session of the OIC Statistical Commission

2 October 2025



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The Future of National Statistics Offices

A Call to Action

Executive editor: Osama Rahman

May 2025

- Adapt to the changing environment
- Transform production and outputs
- Expand roles and strengthening trust
- Strengthen agile, open, and collaborative culture
- Build capabilities and fostering agile culture



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Why modernization is urgent

- Declining survey response rates and rising costs
- Explosion of alternative data sources (administrative, big data, geospatial)
- Keeping up with technological change
- Competition from private data providers
- Demand for more granular, real-time insights



Information technology and data quality

- Requirement 11.4 calls for the application of modern information and communication technologies to improve the effectiveness and efficacy of statistical processes.
 - Importance of having an **IT strategy, architecture and infrastructure** that are regularly reviewed and updated, with a view to continuously identify possibilities for innovation and modernization.
 - Value of **automating routine clerical operations and statistical processes** such as data capture, coding, editing, validation and exchange).
 - Benefits of **pooling IT resources and investments** across different areas of a statistical organization.



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Capacity bottlenecks in statistical modernization projects

- Inadequate access to data sources
- Shortage of facilities or equipment
- Gaps in technical skills
- Lack of staff time
- Shortage of modern software tools



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Digital transformation

- Cloud-based infrastructures supporting experimentation and scaling
- Mainstreaming data innovation projects
- NSO as hubs of collaboration on data innovation across government and the broader national statistical system
- Institutional culture of continuous innovation

Enablers of modernization

- People, skills and culture
- Technology and infrastructure
- Access to new data sources
- Governance and institutional arrangements



The journey to digital transformation starts with people

- The primary barrier is often a skills gap, not a technology gap.
→ Training in **both technical and “soft” skills** is essential
- Modernization requires a **cultural** shift:
 - Continuous learning and experimentation
 - Knowledge sharing and collaboration
- Modernization projects are **time**-intensive



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Technology and infrastructure

- Modernization of legacy systems
- Adoption cloud computing for scalability and cost-effectiveness
- Automation of statistical production processes from data collection to dissemination
- Modern, user-centric dissemination platforms



Sustainable access to source data

- Effective legal data exchange arrangements
- Adequate incentives and business models
- Appropriate technical data exchange standards and protocols
- Good data exchange infrastructure, including connectivity and bandwidth

Governance and institutional frameworks

- Legal frameworks need modernizing to enable data access and sharing
- Establishing ethical oversight processes is essential
- Maintaining public trust is crucial as NSOs embark in a path of digital transformation



Effective modernization is pragmatic

- Re-use before designing new
- Design new for re-use
- Maximize use of existing data assets.
- Operate withing existing constraints
 - Policy priorities and mandates
 - Regulatory frameworks and compliance requirements
 - Political environment and institutional arrangements
 - Short-term budget ceilings

Start small

- Automate high-frequency, repetitive tasks
- Adopt reproducible analytical pipelines with Git, testing, versioning
- Move toward CI/CD and metadata-driven processes
- Avoid over-engineering: simplicity and sustainability first!



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From chores to value creation

- Automation allows to focus on higher-value analytical work
- Integration of geospatial, administrative, and big data sources
- New insights from secondary analysis and faster indicators
- Enhanced agility to respond to emerging policy needs



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Making data interoperable and machine-actionable

- Use of canonical data models and metadata standards
- Geo-reference all data inputs and use unique identifiers
- Use common vocabularies, classifications and code lists
- Develop of standardized API documentation



Modernization requires change management

- Data innovation initiatives require introducing significant organizational changes
 - New business processes
 - New roles and responsibilities
 - Interdisciplinary collaboration and agile mindset.
- Senior management needs to model desired behaviors



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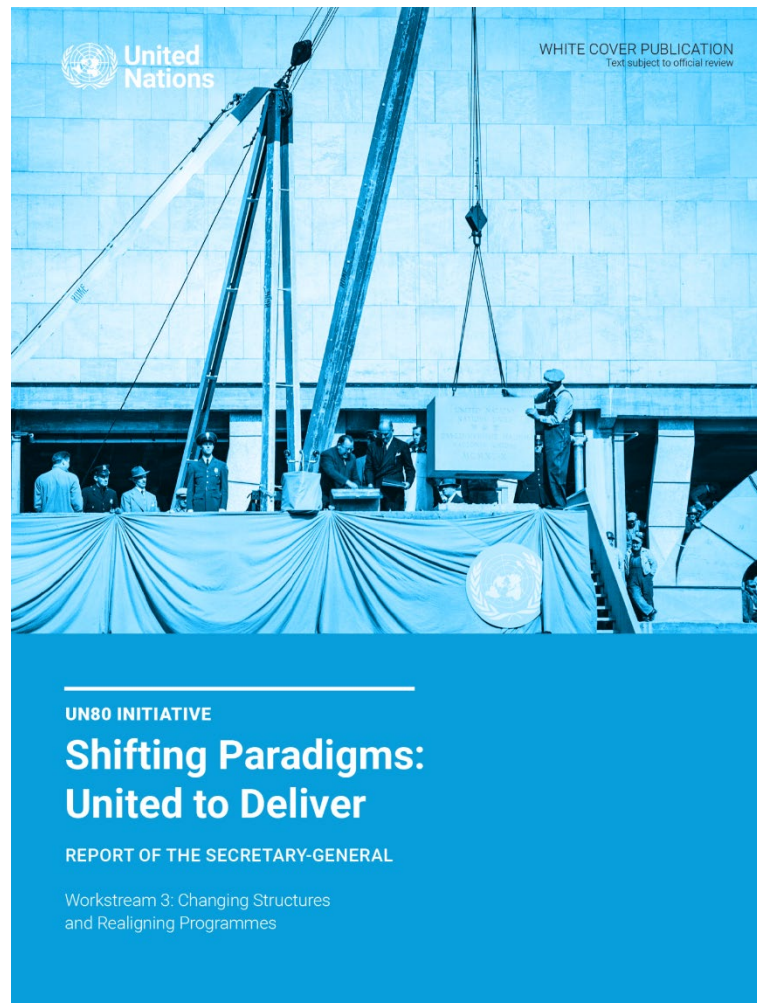
Collaboration and partnerships

- Engage with academia, private sector, and civil society
- National and international cooperation essential for scale
- Leverage shared infrastructure



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Shifting paradigms

- The **Secretary-General's** report, **"Shifting Paradigms: United to Deliver,"** proposes a series of paradigm shifts to strengthen the UN system.
- The September 2025 report explicitly calls for building a **"UN System Data Commons to better link data, statistics, and insights"**.
- Vision: Shared data infrastructure, interoperability, clear data governance



UNSD digital transformation initiatives

To better link data, statistics, and insights:

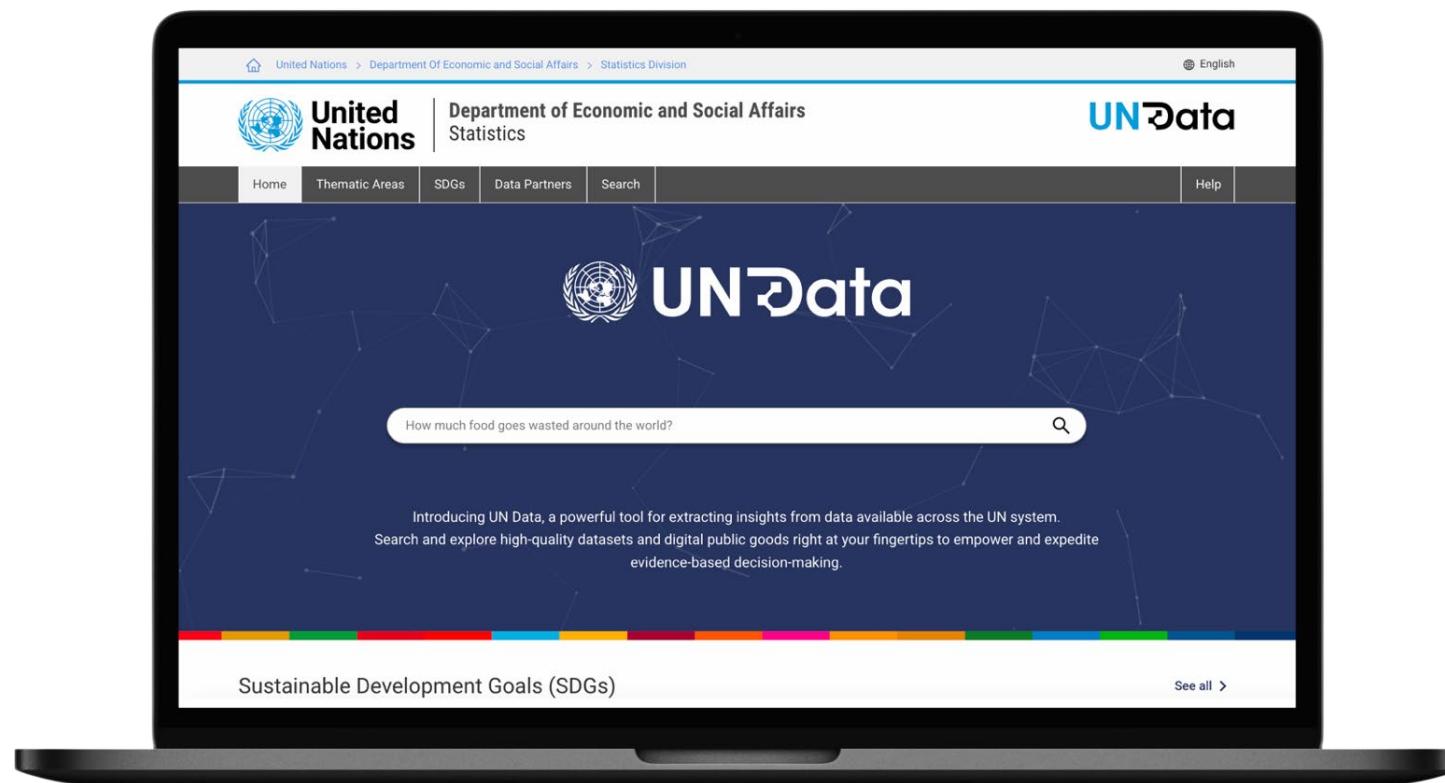
- **UN Global Platform:** A secure, collaborative cloud environment that provides access to NSOs to advanced analytic environments and scalable computing resources for data science and big data projects.
- **UN Data:** A common platform that integrates data from across the UN system, making it AI-ready and easily accessible through advanced search, visualization, and APIs.
- **Caliper @UNGP:** Joint initiative with the FAO providing a unified, web-based platform making statistical classifications machine-readable and interoperable.



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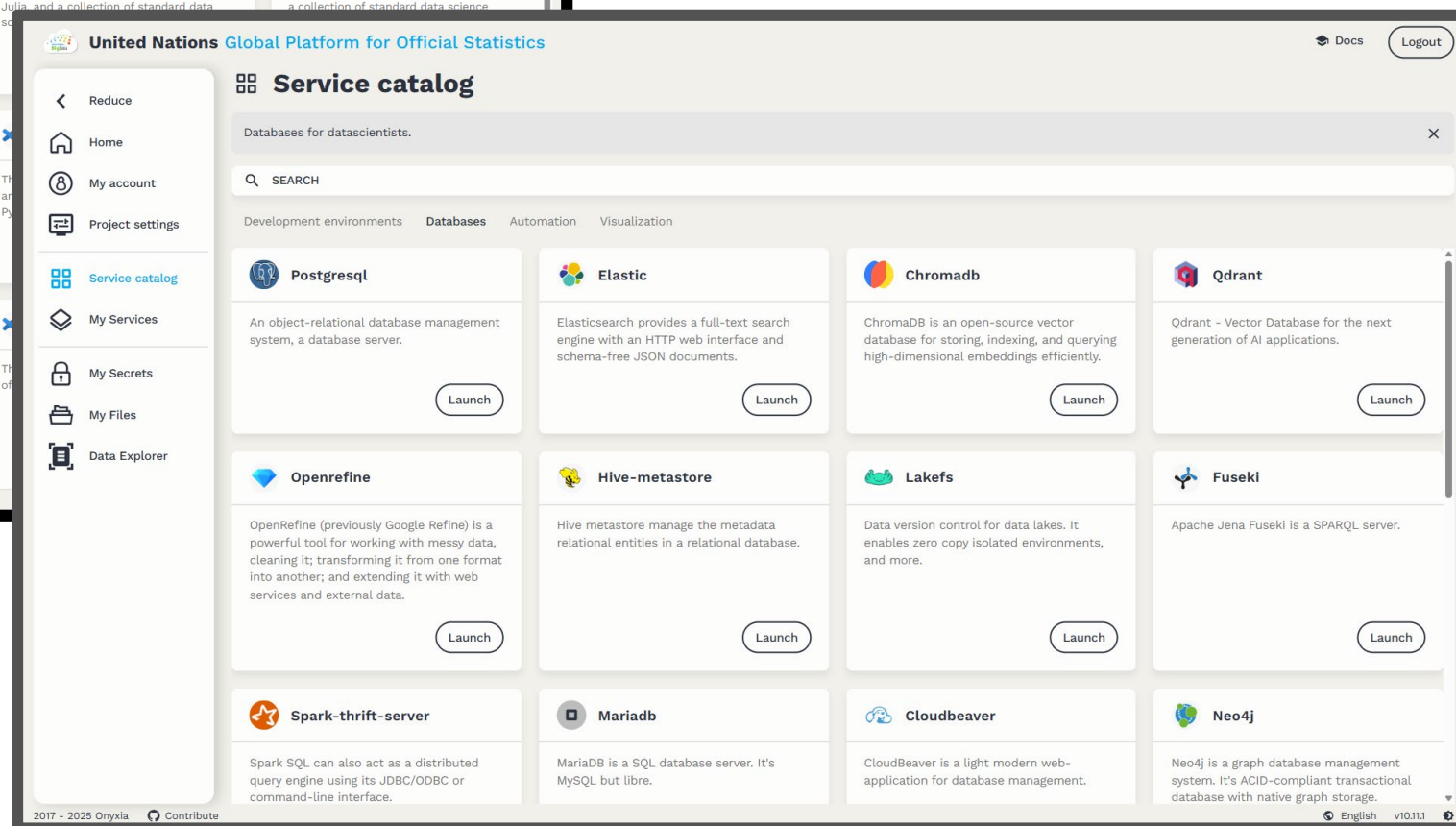
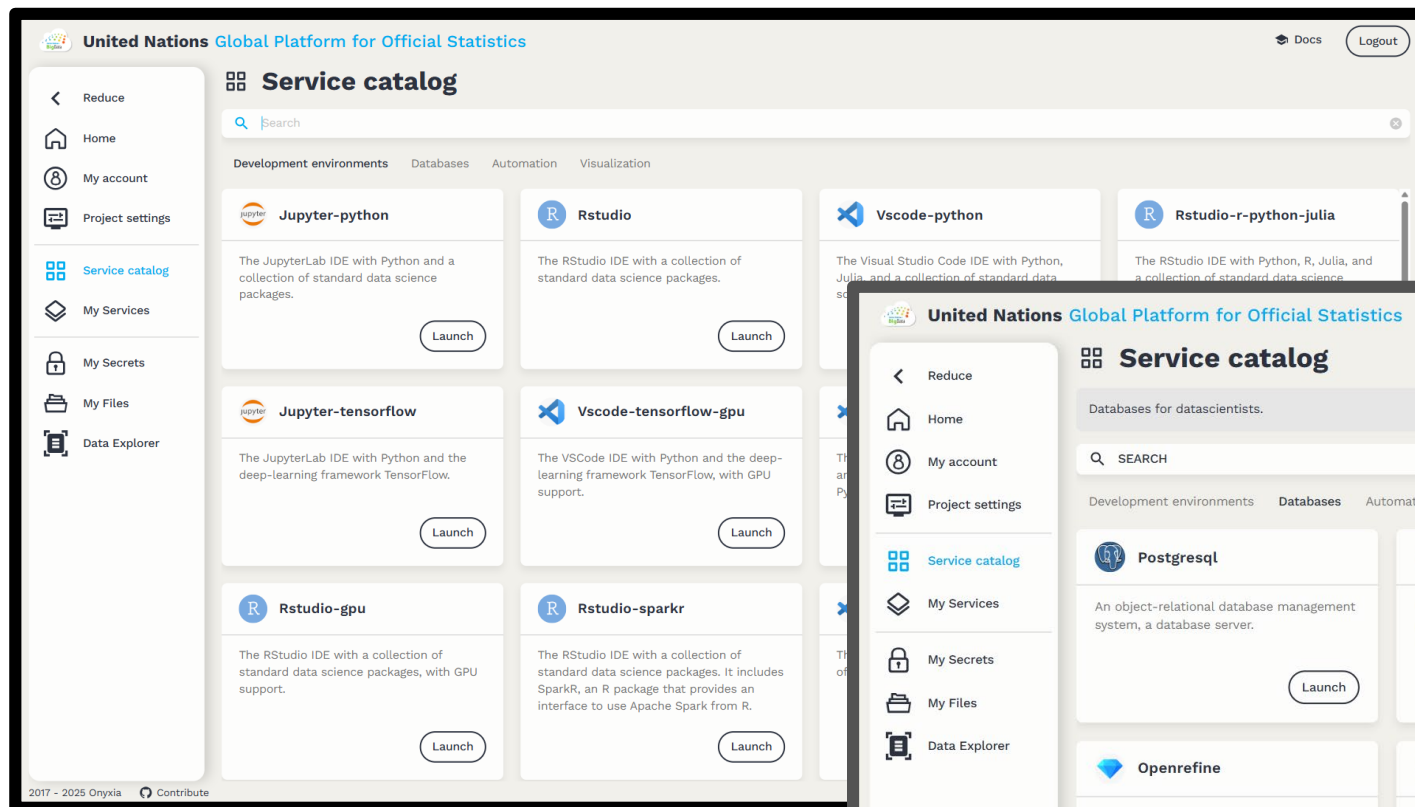
UN Data Modernization



Website:

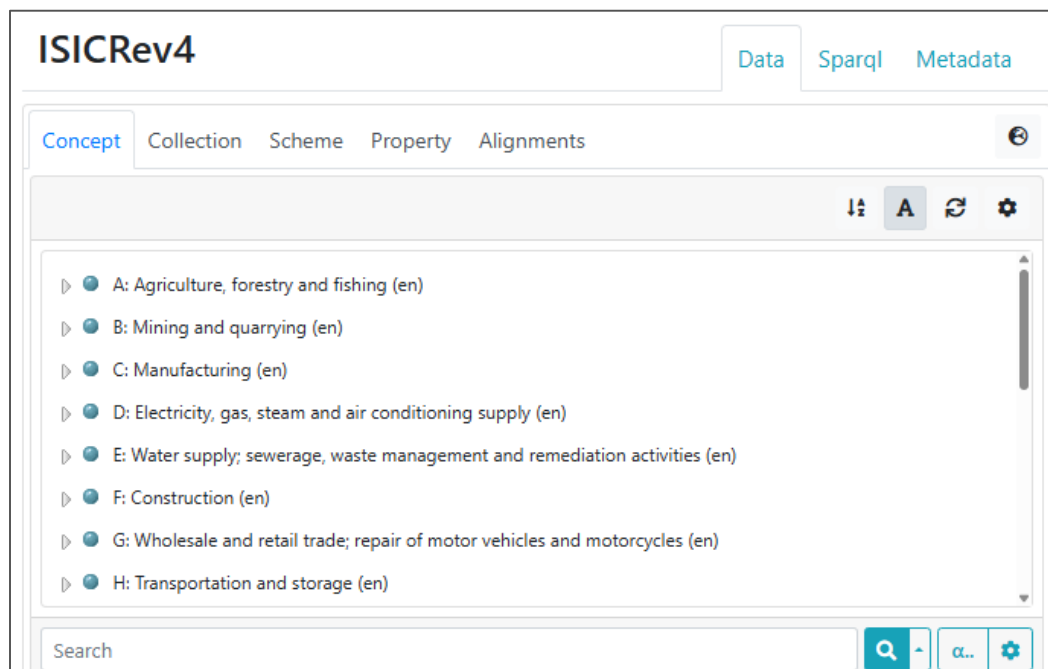
<https://unstats.un.org/UNSDWebsite/undatacommons>

UN Global Platform



<https://datalab.officialstatistics.org/>

Caliper



Publishing classifications as LOD unlocks new capabilities for NSOs:

- Programmatic integration of standards into data pipelines
- Development of tools for automation of data validation and auto-coding
- Direct API access for seamless integration into analytical workflows and applications.
- Machine-readable concepts and definitions to power advanced AI and Retrieval-Augmented Generation (RAG) systems.

<https://caliper.integratedmodelling.org/caliper/browse/showvoc/#/datasets/ISICRev4/data>



Strategic priorities for modernization of official statistics through digitalization

- Break down the IT / business divide
- Embrace user-centric design and user engagement
- Target high-potential domains and processes
- Consolidate product lines
- Build tech skills
- Focus on institutional capacity
- Sustainability: Consider total cost of ownership
- Promote agility
- Simplicity

Conclusion

- Digital transformation is a prerequisite, not an option
- NSOs need to embrace innovation to remain relevant in the era of AI and big data
- Modernization roadmaps should focus on people first, then on technology
- Trust, transparency, and collaboration are the foundations