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Work of the High-level Group for the Modernisation of Official Statistics

Report on the work of the High-Level Group for the Modernisation of Official Statistics

Prepared by the Secretariat and the High-Level Group for the Modernisation of Official Statistics Executive Board

Summary

The paper provides a summary of the outcomes of the work of the High-Level Group for the Modernisation of Official Statistics (HLG-MOS) in 2023. Document ECE/CES/2024/10 describes the plans for 2024. At the February 2024 meeting, the CES Bureau reviewed and approved both documents.

The Conference of European Statisticians is invited to review and approve the outcomes of work in 2023 and plans for 2024 presented in ECE/CES/2024/10.

I. Introduction

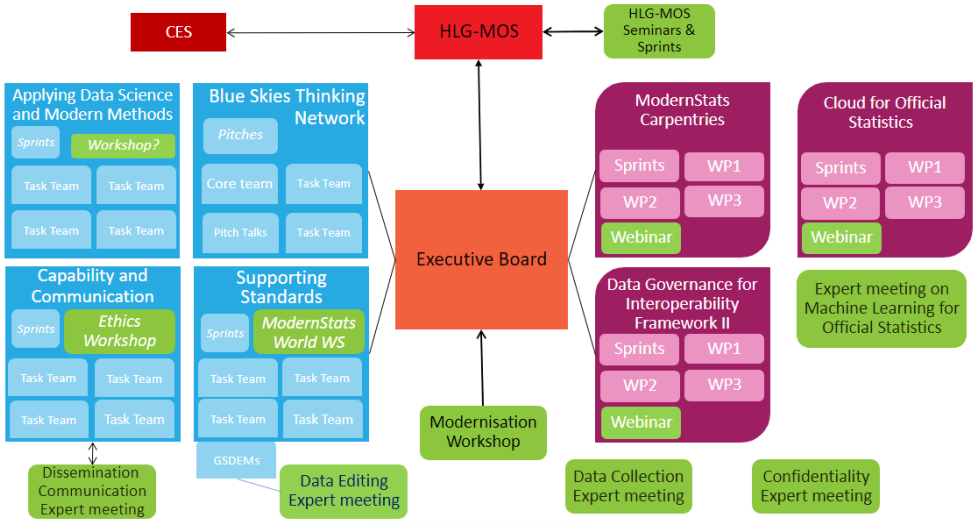
1. This report summarizes the activities and results under the work programme of the High-Level Group for the Modernisation of Official Statistics (HLG-MOS) in 2023.

A. High-Level Group for the Modernisation of Official Statistics work structure

2. HLG-MOS was established by the Conference of European Statisticians (CES) to advance the modernization of official statistics. It is led by Chief Statisticians of thirteen organizations who set the vision, mission, and priority topics and approve the work programme. The Executive Board of HLG-MOS was set up to continuously monitor the progress and provide strategic direction in line with the HLG-MOS vision and mission to sustain innovation.

3. The HLG-MOS annual work programme normally consists of two–three projects, four modernization groups and several expert meetings. A schematic overview of the groups, projects, and meetings active under HLG-MOS (as of 2023) is presented in the figure below. About 250 experts participated in 2023 under the umbrella of HLG-MOS through projects, modernization groups, task teams or organizing committees of expert meetings. Expert meetings and workshops were attended by over 500 people.

Overview of the HLG-MOS work structure in 2023



B. Developments in 2023

4. Since the establishment of HLG-MOS in early 2010, the landscape of modernization and innovation for official statistics has changed significantly. The accelerated pace of technological advancements with global impacts requires statistical organizations to identify what is relevant for official statistics and find the common solutions even more quickly to stay relevant. In response to the growing recognition of the pivotal role of innovation, a culture of innovation and modernization is more widespread than ever in the official statistics community, leading to various initiatives to coordinate (e.g., United Nations Data Science Leader's Network, ESSnet Innovation Network). The success of HLG-MOS also meant that there were more requests from the community to work on emerging topics as well as a higher expectation for delivery.

5. In 2023, there was an unprecedented surge of interest in artificial intelligence (AI), sparked by the release of large language model-based services such as ChatGPT. As the interface is based on language – one of the most natural means of communication – the speed of adoption was also unparalleled, compelling statistical organizations to move and adapt

quickly to the new technology as well. The AI technology was also demonstrated to be a tool capable of accelerating the transitioning from propriety software to open-source which is another significant trend in recent years. However, as it often happens with new technology in its early stage, an individual organization finds itself with only limited resources to navigate the full potential of the technology on its own. This makes pooling experiences and knowledge from different organizations invaluable to facilitate the adoption of the new technology.

6. Another trend observed in 2023 was a stronger interlinkage among different lines of work in HLG-MOS. For example, the Blue Skies Thinking Network and the Advanced Data Science and Modern Methods Group were brought together through a common interest in AI; and there was a large overlap between the Supporting Standards Group and Data Governance Project through common emphasis on standards (more details in Sections II and III). The Executive Board and the United Nations Economic Commission for Europe (UNECE) Secretariat strived to ensure the necessary connections were made to create synergies and avoid duplication of efforts.

II. Projects

7. The HLG-MOS projects work on emerging technologies and ideas, normally with a fixed time frame of 1–2 years. For 2023, three projects were selected by HLG-MOS: i) Cloud for Official Statistics; ii) Extension for Data Governance Framework for Interoperability; and iii) ModernStats Carpentries (phase two of the 2022 Meta Academy Project).

A. Cloud for Official Statistics project

8. The cloud is revolutionizing the way statistical organizations operate, providing flexible and scalable solutions to meet their IT needs. Therefore, adoption of cloud offers the potential for directly contributing to modernizing statistical production, and complements themes explored previously under HLG-MOS, such as big data, machine learning and privacy preservation.

9. The project was led by John Conway (Central Statistics Office (CSO) Ireland), managed by Claude Julien (UNECE Project Manager – consultant engaged by UNECE). It brought together 22 participants from 14 national and international organizations. The project team produced a comprehensive report "Cloud for Official Statistics" exploring five main themes related to the usage of cloud as follows:

(a) **Cloud service and deployment models**: exploration of the different types of cloud service models and services available, and decision on which ones are suitable for organizations in specific contexts. The theme reviews types of cloud services, such as Infrastructure as a Service (IaaS) and Platform as a Service (PaaS), Software as a Service (SaaS), as well as different deployment models such as Hybrid Cloud, Public Cloud and Private Cloud;

(b) **Cloud procurement**: set of considerations needed relating to the procurement of cloud services, assessing areas such as intellectual property, migration to another provider, vendor lock-in, exit strategy, and terms and conditions;

(c) **Cloud adoption**: challenges and important points to consider when adopting the cloud. The theme reviews perspectives of indigenous and minority people on cloud, public perception, data sovereignty, challenges relating to convincing an organization's executive board to approve the use of cloud services, the impact of cloud use on the official statistics brand;

(d) **Cloud security and privacy**: considerations relating to the use of cloud which may enhance or inhibit its adoption across statistical organizations due to risks to access or misuse of data;

(e) **Cloud capacity and competencies**: skillsets needed for the utilization of cloud, staff retraining efforts needed, the challenge for public sector organizations in a

competitive marketplace for cloud skills, and the importance of sharing knowledge between organizations.

10. A hybrid sprint was held in September, hosted by the Statistical Office of the Republic of Serbia (SORS) in Belgrade. Project experts participated either in-person or online. The presence of experts at the sprint was beneficial in intensifying collaboration and creating an effective team dynamic. The active participation of other experts online throughout the sprint was also very appreciated and productive.

11. The team conducted two webinars. The first webinar, held in September, aimed to pin down most of the content of the project, provide an overview of the project and its content to a broader audience, including non-project members, and seek input from the audience. The webinar was well received and achieved most of its objectives. The second webinar took place in November. As a project wrap-up webinar, it presented the main recommendations on each cloud adoption theme and discussed the needs and potential actions for the future.

12. It is important to note that the project team experienced high turn-over (e.g., two out of five project subgroup leads moved to other organizations throughout the year). This highlighted the challenges in retaining cloud adoption expertise in statistical organizations, especially those who are among the first government departments to adopt cloud technologies.

B. Data Governance Framework for Statistical Interoperability project

13. With statistical organizations increasingly engaging with new data sources (e.g., big data, administrative registers) and accelerating efforts in sharing and reusing data, the governance and management of data have become crucial. The interoperability across different data assets and metadata can greatly facilitate data exchange and help statistical organizations address new data needs (e.g., through data integration) more effectively.

14. The “Data Governance Framework for Statistical Interoperability” project (2022–2023) aimed to provide a point of reference for the discussion regarding the interoperability in the context of statistical organizations’ work. It also aimed to introduce tools that may help to create the conditions inside organizations to align the different statistical programmes which, in turn, contribute to improving the capacity to build an interoperable data and metadata platform.

15. The project was led by Juan Muñoz (National Institute of Statistics and Geography (INEGI), Mexico) and Carlo Vaccari (UNECE Project Manager – consultant engaged by UNECE), and 17 members from 11 national and international organizations participated in the work. The resulting report “Data Governance Framework for Statistical Interoperability (DAFI)” contains following elements:

(a) **Analysis of problems** demonstrating the critical importance of having a system that supports efficient exchange of data and describing potential stages in the production process where the non-interoperability risks might arise;

(b) **Core terms and related concepts** that could facilitate the communication and collaboration in the fields of data governance and interoperability. The concept of interoperability was examined in detail with four facets of interoperability (e.g., semantic, structural, syntactic, system), which collectively form a foundation that allows to exchange information in an effective and efficient way;

(c) **Set of data governance components** needed to achieve statistical interoperability, namely, roles, governance bodies, standards, technologies and legal policies, with examples and country use cases;

(d) **Recommendations** on how to improve interoperability in statistical organizations and national statistical systems such as adaptation of open standards and culture change.

16. Given the important role of standards highlighted through the project, there was a close connection with the Supporting Standards Group. This interlinkage was not just

because ModernStats models such as the Generic Statistical Business Process Model (GSBPM) and the Generic Statistical Information Model (GSIM) were featured substantially as part of important standard sets in the discussions throughout the project. It also stemmed from the recent activities of the Standard Group that have been geared towards using implementation standards such as the Statistical Data and Metadata eXchange (SDMX) and the Data Documentation Initiative (DDI), which generated discussion on increasing interoperability among the standards. The overlap of membership between the project team and the Standards Group contributed to ensuring the connection, and efforts for the interoperability will continue in the Standards Group in 2024.

C. ModernStats Carpentry project

17. The project has strong links to the modernization efforts given that for any innovation to be integrated in the organizations, it first needs to be accepted and used by their staff. The growing pace of change also implies a stronger need to modernize the way trainings are designed and carried out.

18. Drawing from the lessons learned from the 2022 Meta Academy Project,[1] the project explored a "Carpentries" model (non-profit organization that was set up to build capacity in data skills) as a way to share training methodology in the official statistics community and create learning content together.[2] The Carpentries business model addresses several of the needs identified in the Meta Academy Project in the following ways: i) a common understanding of the training needs, a shared methodology or a pedagogic approach to create learning content; ii) a forum or community for 'academy managers' or 'trainers'; and iii) a forum and method to ensure that training content and delivery evolve with the industry.

19. The project was led by Eric Anvar (Organisation for Economic Co-operation and Development (OECD)) as well as Kate Burnett-Isaacs and Jonathan Wylie (Statistics Canada), and 24 members from 9 national and international organizations participated in the project. In 2023, the project was carried out in two work packages:

(a) **ModernStats Carpentry curriculum** focused on repurposing the existing Carpentries content for the development of Carpentries lessons for the context of statistical organizations on three open-source tools: Python, R and Git. Python for Official Statistics Carpentry Lesson was collaboratively developed by multiple statistical organizations. It is planned to complete the Python lesson by early 2024.

(b) **ModernStats Carpentry business model** explored main questions arising from Carpentries models through a series of meetings including one with representatives from Carpentries: i) how to incentivize trainers to embrace the Carpentries framework; ii) is Carpentries IP model acceptable for a public organization?; iii) how the governance of "ModernStats" Carpentries would look like; iv) are statistical organizations comfortable becoming direct Carpentries members; and v) what is the most realistic approach? While the feedback from organizations who became the Carpentries members was positive, the question of incentivizing staff to follow the format and structure of the Carpentries model and some administrative hurdles remain.

[1] See project home page, especially benchmarking activities under the work package 1.

[2] The Carpentries is a non-profit organization that was set up with the mission to build global capacity in essential data and computational skills for conducting efficient, open and reproducible research. Members of the Carpentries can organize and run their own training workshops through Carpentries platform. Support is provided by certified instructors to ensure quality training. There are fees charged for training of trainers but sharing training workshops but participation in training is free.

III. High-Level Group for the Modernisation of Official Statistics white paper – Large Language Models for Official Statistics

20. The capabilities of AI have made a significant leap forward in the last few years with the advance of large language models (LLMs) and there is a growing recognition of the transformative potential of LLMs in the statistical community.

21. To respond to this challenge, two HLG-MOS modernization groups – the Blue-Skies Thinking Network and the Applying Data Science and Modern Methods Group – started an initiative to draft a white paper on LLMs in the context of official statistics. The drafting team kick-started its work in August and the white paper "LLMs for Official Statistics" was released in December 2023.

22. The paper aimed to establish a common understanding on LLMs by exploring implications and opportunities for official statistics. The paper also includes practical implementation examples from various national and international organizations on use cases such as SAS to R translation, statistical classification system updates, report generation, natural languages-based data search and editing of metadata which demonstrate that opportunities from LLMs are not just theoretical, but very much real. The paper was written by 23 contributors from 13 national and international organizations with a lead editor, Cathal Curtin from Statistics New Zealand.

23. Given the rapid pace of change in the field of AI, pooling experiences and knowledge from different organizations is invaluable to navigate the full potential of LLMs. A proposal on generative AI, an advanced AI system that encompasses LLMs, was made for HLG-MOS Project for 2024 to continue the exploration on AI.

IV. Modernization groups

24. The HLG-MOS modernization groups were established to provide continuous support to the cross-cutting pillars that are important for modernizing statistical organizations such as standards, frameworks, communications and human resources. Unlike the HLG-MOS project, the modernization group operates in a longer term, but activities under each group (organized through task teams or subgroups) change every year to address the most urgent needs in the respective working area, thus continuing the modernization and staying current on the innovative fronts.

25. The groups select an overall chair, and additional chairs are selected for the various task teams and subgroups. The chairs of the groups provide bimonthly updates to the Executive Board that regularly reflects on the structure and the areas of work of the modernization groups, and evaluates whether the groups are aligned with the key priorities identified by HLG-MOS.

26. Groups have monthly virtual plenary meetings. The task teams typically meet virtually at least once a month. The groups may organize sprint workshops to expedite the work. The UNECE wiki and other platforms such as GitHub are used to collaborate and coordinate the work. Secretariat support is always provided by UNECE. As with all activities under HLG-MOS, participation is on a voluntary basis and anybody from the official statistics community who is interested in any part of the activities is encouraged to join. Participation in the modernization groups provides unique development and networking opportunities outside a national setting.

27. The activities of the modernization groups in 2023 are briefly described below.

A. Applying Data Science and Modern Methods Group

28. The Applying Data Science and Modern Methods (ADSaMM) Group was launched in early 2022, reflecting the increasing importance of new data sources and methods for the compilation of official statistics. The group aims to go beyond conceptual frameworks for data science and modern methods, identifying concrete opportunities to further modernize

business processes of statistical organizations. The group consists of 41 members from 19 national and international organizations. The group was chaired by Gary Dunnet from Statistics New Zealand.

29. Based on the expertise and interest of the members, three topics were prioritized for the 2023 cycle out of the eight suggested. Task teams were established to address these topics. The group met once a month, and additionally, the various task teams gathered monthly or, if necessary, more frequently.

(a) **Understanding and selecting models**: Statistical organizations aim to modernize with new methods and Machine Learning (ML) models alongside existing statistical approaches. Fragmented knowledge across disciplines poses challenges in method selection, validation and implementation. In 2023, the task team worked on a classification of statistical methods and investigated LLMs as "methodological advisors" with a focus on linking with existing standards. The task team produced two deliverables: a framework for algorithms/methods and guidance on LLM use for methodological advice.

(b) **Accelerating the implementation of ML-based solution in data editing**: ML holds significant potential for enhancing efficiency by complementing or replacing traditional methods, as well as improving quality in ways challenging for traditional methods to achieve. However, numerous barriers hindering statistical organizations from implementing ML methods for editing are non-methodological. The task team's objective has been to identify these barriers and offer guidance on how to avoid and overcome them. The final deliverable encompasses discussions and advice on addressing the identified issues, along with a compiled set of use cases gathered during the task team activity.

(c) **International framework on responsible AI for official statistics**: The widespread use of AI and ML has highlighted the importance of ethics, privacy, fairness and legality. The task team aimed to establish a unified standard for the responsible design, development and implementation of AI-based solutions within national statistical organizations (NSOs). The primary goal was to ensure alignment with ethical and human-centric perspectives in the rapidly evolving AI environment. Deliverables[3] include a guidance document with core principles, an assessment tool (checklist) for evaluating responsible AI implementation, and a review/audit process description for ensuring responsible AI practices.

B. Blue Skies Thinking Network

30. The Blue Skies Thinking Network (BSTN) is the ideas factory of the HLG-MOS ModernStats community. The network provides a platform where members can share innovative ideas and look for partners to explore how new innovations can benefit statistical organizations. To allow for innovations, space is also given to out-of-the-box thinking. The objective of BSTN is to explore new ideas in line with the HLG-MOS vision, evaluate proposals for HLG-MOS projects and, where needed, do short time-boxed follow-up studies. The network has a core group and short-term task teams to investigate new ideas and opportunities through short evaluation supported by the Executive Board.

31. The network was led by the innovation manager Barteld Braaksma from Statistics Netherlands. At the current time, the core group consists of 24 members from 12 NSOs and 2 international organizations and meets once a month on average.

32. BSTN reviewed various pitch presentations during the year. These are a type of mini-sprints, in which members and guests can present briefly an idea or a project in the area of innovation and modernization. The core group and invited experts give suggestions for how they could be refined or elaborated. The pitches made in 2023 covered topics such as data collection (surveys playbook, survey integration, smart surveys, and removing barriers to alternative sources and new technologies in official business surveys), use of AI (Generative Pretrained Transformer (GPT) model, advancing responsible AI), digital twins, and resource sharing (innovation compass and expert database). Among these, the pitch on

[3] Link to be available on the HLG-MOS wiki by the end of January.

GPT led to the development of the LLM white paper mentioned above and a project proposal on generative AI.

33. Other activities conducted under the network in 2023 were:

(a) **Open-source adoption**: Many statistical organizations are striving to shift from proprietary software to open-source software to better adopt modern methods, utilize market skillsets and capitalize on efficiencies of modern technology. The purpose of this activity was to share lessons learned and best practices, and attempt to establish common approaches within the international community to help with respective open-source adoption strategies and implementation programmes. A series of monthly workshops was held to explore topics that are foundational for open-source adoption such as stakeholder buy-in, governance, security and infrastructure. The open-source topic was also discussed at the seventy-first CES plenary session which again highlighted the high-level of interest in the topic among many statistical organizations. While the initial plan of the open-source adoption activity was put on hold during summer due to the departure of the activity lead, the topic is planned to be further investigated as an HLG-MOS project in 2024.

(b) **Digital twins**: The topic of digital twins had seen a renewed interest with application use cases more strongly related to statistical organizations emerging. In July, Statistics New Zealand presented a pitch at BSTN for using digital twins to improve data collection cost modelling. To explore interest among broad statistical community, a webinar on digital twins was organized in September, wherein it was noted that the long-term aim is to progress from a tool that only tests design decisions to one that can also be used for planning and monitoring. The aim for BSTN in 2024 regarding this topic will be to follow up on the state of works throughout the year.

(c) **Non-probabilistic surveys**: The purpose of the activity has been to investigate the feasibility of using a non-probability survey to generate sufficiently reliable population estimates. In this regard, CSO Ireland carried out a parallel run of their ICT survey in first and second quarter, were a non-probability (NP) panel was used as a frame to draw a matched sample (matched to their census frame) to conduct a test version of the survey. They had a 46 per cent response rate to the NP survey, yielding a larger sample (about 2,300) compared to regulatory survey (about 1,300). The analysis of the NP survey is yet to be completed, but the initial findings would suggest that even after applying methods to adjust for the fact that this was a NP sample, there still appears to be a bias in the results. It is hoped that the work will be completed early in 2024, after which a report will be created, and the results presented to BSTN.

34. The group remains ready to evaluate activity and project proposals submitted from the statistical community. More details about the network can be found on the public BSTN wiki page.

C. Capability and Communication Group

35. The Capability and Communication Group is responsible for aspects of human resource management, training and communication in statistical organizations. The emphasis in 2023 was on ethics, particularly data ethics, communication of price statistics during inflation crisis and how to make work in NSOs more efficient.

36. During 2023, 45 colleagues from 18 national and international organizations participated in the group and its task teams. The group meets once a month and additionally, the different task teams and their subteams meet monthly or if needed, more frequently. The group was led by Anna Borowska from Statistics Poland and Elaine O'Mahoney from CSO Ireland, who joined in the second half of the year. Each task team again has a chair assigned. The various activities conducted in 2023 can be grouped into three streams as below:

(a) **Ethical leadership**: The task team: (i) worked on the detailed analysis of the survey results that were conducted in 2021; (ii) prepared the first proposal on the integration of ethics in the Generic Activity Model for Statistical Organizations (GAMSO) and GSBPM; (iii) started work on a reference book on ethics, focusing on common vocabulary and ethical dilemmas; (iv) started preparation for the Workshop on Ethics in Modern Statistical

Organizations, scheduled to take place on 26–28 March 2024. The Ethical Leadership task team was also responsible for organizing the CES Seminar on "Data Ethics – a key enabler of social acceptability" (28 June, Paris, France). The seminar was organized by Canada and the United Kingdom of Great Britain and Northern Ireland, and it included a number of presentations and a panel discussion. The panel was composed of representatives of Albania, Canada, Poland and the United Kingdom. Presentations and other documents are available from the UNECE website: https://unece.org/statistics/events/CES2023.

(b) **Market research, digital marketing, and communication strategies**: The task team developed a paper based on the Strategic Communication Framework produced by an HLG-MOS project (2018–2019), focused on communication during inflation crisis. The inflation crisis served as a chance for NSOs to engage with a broader audience, emphasizing professional independence and fundamental principles of official statistics. Leveraging various communication channels, including traditional and digital media, becomes crucial in delivering tailored messages to diverse user groups. The results can be viewed in its paper "Communication during inflation crisis – analysis based on strategic communication framework".

(c) **Future of work**: The task team focused on the following areas of work: (i) recruitment and onboarding; (ii) reaching youth; and (iii) equality, diversity and inclusion. The team prepared a generic growth model for complex organizational themes. They also prepared toolkits on how this model could be used within NSOs, providing guidelines and instruction for a workshop to customize the growth model for a specific theme and determine current and desired situation and action in NSO. Output of the team could be viewed in its final document "A generic growth model for complex organizational themes".

D. Supporting Standards Group

37. The Supporting Standards Group is responsible for the maintenance and development of the ModernStats models. These are modernization models and standards of HLG-MOS developed to describe statistical activities (GAMSO), processes (GSBPM), information (GSIM), and production architecture (Common Statistical Production Architecture – CSPA), as well as more recent models addressing data architecture (Common Statistical Data Architecture – CSDA) and a core ontology (Core Ontology for Official Statistics – COOS) to integrate these models. The goal of the group is to develop, enhance, integrate, promote, support and facilitate implementation of the range of standards needed for statistical modernization.

38. The group was initially chaired by Zoltán Vereczkei from Statistics Hungary until June 2023, before being formally taken over Flavio Rizzolo from Statistics Canada in August 2023. Beside the monthly plenary group meetings, task teams had meetings on a frequent basis, with each task team having one or two chairs assigned to it. The main group consists of 23 experts from 9 NSOs and 5 international organizations, and additional colleagues have collaborated in the various task teams.

39. The main activities and outcomes of the group and its task teams in 2023 were:

(a) **GSIM revision**: GSIM is one of our flagship models and the changes made are expected to help statistical organizations kick-start the implementation of GSIM. The first round of revision was made by the GSIM revision task team, based on feedback from GSIM users (collected in March 2022) as well as other task teams under the Supporting Standards Group such as on Linking GSBPM-GSIM (2021). In summer 2023, a CES consultation on the revised model took place. Feedback was received from several countries via a revision repository, and processed by the secretariat in consultation with leading GSIM revision team members. The new version of GSIM (version 2.0) was released in a dedicated GitHub page, with an updated GSIM User Guide in the pipeline. Compared to the earlier version 1.2 of GSIM, the main changes included remodelling of the GSIM exchange group to better separate what happens during design and implementation of information collection and dissemination tools; refactoring the GSIM structure group using real use cases (e.g., quality reporting), updating nomenclature (e.g., renaming of GSIM classes "Transformable Input" to "Core Input" to reflect non-transformable inputs such as registers; changing the term

"information object" to "information class"), definitions, explanatory text, associations and cardinalities. More details can be found in the GSIM v2.0 GitHub repository.

(b) **GSBPM/GAMSO revision**: GAMSO and GSBPM are two of the most used of the ModernStats models, and their revision is essential to ensuring their relevance to statistical organizations. In early 2023, feedback and inputs about GSBPM and GAMSO were collected and compiled in a revision repository. The revision team started a review of this feedback for the GSBPM phases from "Evaluate", going backwards to "Build". Revisions arising from this feedback have included modification of subprocess explanations, for example, to clarify how geospatial information and ML models can be accommodated, and making it more apparent that GSBPM is not specific to survey data. A consensus has also been reached to rename the "Collect" phase to "Acquire". This work is on-track to be completed in 2024, as planned.

(c) **SDMX/DDI/GSBPM**: This activity is aimed at providing descriptions of how SDMX and DDI could be used in carrying out tasks within each GSBPM subprocess. This is important because those embarking upon the modernization of their statistical production systems may find it unclear as to which aspects of production might be best served by DDI and/or SDMX. The team has developed descriptions of DDI and SDMX artefacts that are relevant to each GSBPM subprocess, and are finalizing diagrams that indicate the coverage of SDMX and DDI with regards to their relevance to individual subprocesses.[4] The team is aiming to finalize the document containing this material by the end of January 2024, with the addition of introductions to SDMX and DDI in the context of GSBPM. Towards the end of the year, it became increasingly clear that it is difficult to conclude discussions satisfactorily about the relationship between SDMX and DDI without examining in more detail how they relate to each other at the level of information classes (rather than GSBPM subprocesses), and this has motivated the activity proposal for 2024 to examine the use of SDMX, DDI as well as the Validation and Transformation Language (VTL), which is becoming a standard in its own right, independent of SDMX, for implementing GSIM.

(d) **Integrated view of the ModernStats models**: The Supporting Standards Group devoted time within its plenary meetings examining an integrated view of the models, following a common logic and structure for the discussions, which presented the GAMSO, GSBPM and GSIM models from this perspective. The theme of integration has been carried over to the proposals for 2024 activities, which address the aim of integration in different ways, such as the proposed work on COOS, as well as on using implementation standards (SDMX, VTL and DDI), which involves the mapping of information elements between standards.

(e) **ModernStats community webinars**: With the aim of boosting the visibility of the work on ModernStats models, a series of webinars has been started, bringing together international experts in the statistical organizations to facilitate the exchange of knowledge and experience in using these models. The first one in April 2023 focused on "Modernizing Management Systems" while another in December focused on Linked Open Data and FAIR[5] principles. These webinars, labelled "Community of Interest", will continue next year.

40. According to the global survey reported at the fifty-fourth session (2023) of the United Nations Statistical Commission, GSBPM is "now widely used by countries, with more than 80 per cent of countries having implemented it in their national statistical offices".[6] While the ModernStats models are widely used in the European region, the adoption of the models is still in progress in many other countries. To further promote and raise awareness of their role in the broad modernization agenda, presentations were made in relevant events, including two sessions organized at the International Statistical Institute (ISI) Conference (Ottawa, Canada), as well as a "High-Level Seminar on Modernization for the European Neighbourhood Policy East and Central Asia Countries" (Riga, Latvia), a webinar organized by the Statistical, Economic and Social Research and Training Centre for Islamic Countries (SESRIC), and a mission to Georgia to support their implementation of GSBPM. Planning has taken place for

[4] Link to be available on the HLG-MOS wiki by the end of January.

[5] Findable, accessible, interoperable, and reusable.

[6] Item "National quality assurance frameworks" E/CN.3/2023/16 Background Document "NQAF questionnaire results".

an in-person meeting in the fringes of the Conference on Smart Metadata for Official Statistics (COSMOS) in April, and the next ModernStats World Workshop in October 2024.

V. Expert meetings and workshops

41. Under the auspices of HLG-MOS, expert meetings and workshops are regularly organized in several substantive areas, namely, collection, editing, confidentiality and dissemination / communication. Ad hoc and one-off meeting may be organized on emerging topics and issues related HLG-MOS projects and activities of the year. Expert meetings and workshops have a 24-month cycle for in-person meetings. In the alternate year, online meetings can be organized.

42. The focus of the meetings and workshops is always on innovative developments and modernization. The topics and sessions are aligned with the mission, vision and priority topics of HLG-MOS. Where relevant, the meetings are also used to receive input on HLG-MOS activities, and to share the works. A key output of these events is the identification of areas for future work and collaboration among organizations.

43. In 2023, the following expert meetings and workshops were held (in chronological order):

(a) **HLG-MOS meeting (26 February 2023, New York)**: The HLG-MOS members expressed a strong appreciation of the 2022 achievements and the commitment of the Executive Board to monitoring and guiding various HLG-MOS activities while coordinating with other initiatives. During the meeting, the growing importance of retaining talents and upskilling staff was highlighted. It was underscored that to stay ahead of the curve and at the cutting-edge, HLG-MOS should focus not only on technological aspects but also on advancing ambitiously on several modernization fronts in parallel.

(b) **Machine Learning for Official Statistics Workshop (5–7 June, Geneva)**: The workshop comprised three sessions: (i) ML applications; (ii) Quality aspects of ML in official statistics; and (iii) Toward system-wide transformation of statistical production. Various examples of ML application were presented, while the production session highlighted an overall progression in ML maturity across statistical organizations. The meeting was the first in-person meeting for data scientists and methodologists working on ML under the umbrella of HLG-MOS since COVID-19, offering a valuable platform for networking and discussion. The workshop was attended by 54 participants from 22 countries, 6 international organizations as well as academia. All workshop materials including the meeting report are available on: https://unece.org/statistics/events/ML2023.

(c) **Expert Meeting on Statistical Data Collection (12–14 June, online)**: The meeting was organized around three sessions on (i) Respondents as assets; (ii) Paradata and data collection techniques; and (iii) Process efficiency management. A total of 35 presentations were made during 3-day online meeting, and 174 participants from 33 countries and international organizations, academia, national governmental bodies, and non-profit organizations attended. Areas for future work identified include hiring and maintaining field staff, and sharing general-purpose collection / processing strategies between agencies. All meeting materials including the meeting report are available on https://unece.org/info/Statistics/events/DC2023.

(d) **Expert Meeting on Statistical Data Confidentiality (26–28 September, Wiesbaden, Germany)**: The meeting had six sessions on (i) Innovative approaches in granting access to microdata; (ii) Producing useful microdata files; (iii) Challenges in publishing safe tables and maps; (iv) Risk assessment: Privacy, confidentiality, and disclosure vs utility; (v) Output checking in research data centres; and (vi) Other emerging issues, including a discussion on the topics for future work. There were 105 participants from 23 countries, 4 international organizations and 16 research and academic institutions and private sector. All meeting materials including the meeting report are available on https://unece.org/info/Statistics/events/SDC2023.

(e) **Expert Meeting on Dissemination and Communication of Statistics (11–13 October, Lisbon)**: The significance of communication is drawing more and more

attention among statistical organizations not just for individual statistical outputs / products, but also for building brand and conveying the values of official statistics to users. The increasing competition for public attention as well as rapid changes in communication technologies also compel statistical organizations to embrace and integrate innovative approaches in communication. In this background, the meeting was organized around four sessions on (i) Building trust and brand; (ii) Engaging with hard-to-reach audience; (iii) Innovation in communications; and (iv) Measuring the effectiveness of communication. The meeting featured a total of 31 substantive presentations and was attended by 102 participants from 31 countries and 5 international organizations and private sector. All meeting documents are available on the UNECE website: https://unece.org/info/Statistics/events/DissComm2023.

(f) **HLG-MOS Workshop on the Modernization of Official Statistics (21 and 22 November, Geneva)**: The workshop is the end-of-year gathering to share outcomes of the HLG-MOS projects, modernization groups and meetings, and plan for the next year. In addition to this, two new elements were introduced in 2023. Firstly, a session on generative AI showcased presentations from statistical organizations as well as private sector. Secondly, an innovation radar session was added to spotlight other international initiatives on innovation and modernization for synergies and collaboration. There was a side event organized for the cloud project and an Executive Board meeting to follow up on discussions from the workshop and reflect on the HLG-MOS work programme for 2024. The workshop was attended by 80 representatives from 27 organizations. All meeting documents are available from the UNECE meeting website: https://unece.org/statistics/events/HLG2023.

VI. Communication and coordination

44. With fast-paced developments in the field, it has become even more important to disseminate and communicate the works effectively so that the results can reach the right audience and be shared further in the community. As part of effort to improve **communication**, "Modernization of Official Statistics" LinkedIn page was created under the official UNECE corporate page in May. It has been used for announcing various events (e.g., expert meetings, webinars), promoting outputs, informing about ongoing work, and equally importantly, acknowledging and appreciating the members of the ModernStats community who devoted their time and efforts to contribute to the HLG-MOS activities. The page currently has more than 1,000 followers with a high level of engagement.

45. The HLG-MOS activities were also coordinated with other international organizations working on the modernization of official statistics (e.g., Eurostat, OECD, United Nations Statistics Division). **Coordination** and linkages with international activities in similar areas were made through cross-membership between the various groups. The UNECE Secretariat and Executive Board met with representatives of other international modernization initiatives to further coordinate and align the activities.

46. The work of HLG-MOS is facilitated by many statistics wiki spaces, web pages, GitHub repositories and other platforms to collaborate and share information. For example, the UNECE Secretariat is managing and maintaining about fifty different public and restricted wiki sites available for collaborative purposes or for sharing output from HLG-MOS activities. While the wiki platform is still valuable for collaboration, it has been observed that its function as a communication channel (e.g., sharing outputs) is becoming unreliable due to service interruptions caused by security issues. Therefore, contents on the wiki are being migrated to a more stable platform (e.g., official UNECE website) for the provision of materials in a more stable way.

47. Most of the output of the work done under HLG-MOS is shared publicly on the above-mentioned platforms. To further promote the outputs, some of them are released in a form of **official UNECE publications**. In 2023, "Synthetic data for official statistics – A starter guide" (January 2023) and "Role of brand management, marketing and crisis communication for statistical organizations" (October 2023) were released.