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CONFERENCE OF EUROPEAN STATISTICIANS**

**EUROPEAN COMMISSION  
STATISTICAL OFFICE OF THE  
EUROPEAN UNION (EUROSTAT)**

**ORGANISATION FOR ECONOMIC COOPERATION  
AND DEVELOPMENT (OECD)  
STATISTICS DIRECTORATE**

**UNITED NATIONS  
ECONOMIC AND SOCIAL COMMISSION  
FOR ASIA AND THE PACIFIC (ESCAP)**

**Meeting on the Management of Statistical Information Systems (MSIS 2013)**  
(Paris, France, and Bangkok, Thailand, 23-25 April 2013)

## **DRAFT REPORT**

Prepared by the UNECE secretariat

1. The Joint UNECE/Eurostat/OECD/ESCAP Meeting on the Management of Statistical Information Systems (MSIS) was held in Paris, France, and Bangkok, Thailand from 23 to 25 April 2013. Participants from the following countries attended the meeting in Paris: Argentina, Australia, Azerbaijan, Bulgaria, Canada, Croatia, Estonia, Finland, France, Germany, Iceland, India, Ireland, Italy, Malta, Mexico, Netherlands, New Zealand, Norway, Poland, Republic of Korea, Russian Federation, Serbia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom. The European Commission was represented by Eurostat. Representatives from the following international organizations also attended: Institute for Statistics of the United Nations Educational, Scientific and Cultural Organization (UNESCO), International Labour Organization (ILO), Food and Agriculture Organization of the United Nations (FAO), Organisation for Economic Co-operation and Development (OECD), International Monetary Fund (IMF), World Bank and Bank for International Settlements (BIS).
2. The agenda of the meeting (WP.1) consisted of the following substantive topics:
  - (i) Architecture;
  - (ii) Streamlining statistical production;
  - (iii) Innovation;
  - (iv) Collaboration;
  - (v) Panel discussion on modernizing statistical production – speeding up the process through Plug and Play architecture.
3. Mr. Rune Gløersen (Norway) was elected Chairman of the meeting. The preparation of the substantive work was organized by: Messrs Robert McLellan (Canada) and Matjaz Jug (New Zealand) for Topic (i); Ms. Christine Wirtz (Eurostat) and Mr. René Piché (IMF) for Topic (ii); Messrs Trevor Fletcher (OECD) and Joe Parsons (United States of America) for Topic (iii); and Messrs Marton Vucsan (Netherlands) and Carlo Vaccari (Italy) for Topic (iv). Mr. Robert McLellan (Canada) was Organizer/Chair of the Panel discussion on Modernizing statistical production – speeding up the process through Plug and Play architecture.
4. Mr. Steven Vale (UNECE) opened the meeting and welcomed participants. Particular attention was drawn to the innovation this year of holding the MSIS meeting in two locations simultaneously – Paris, France and Bangkok, Thailand.

5. Mr. Paul Schreyer, Deputy Director of the Statistics Directorate, at the Organisation for Economic Co-operation and Development (OECD) gave a keynote presentation on the High-Level Group for the Modernisation of Statistical Production and Services (HLG). He considered that the topics of the meeting fit nicely into the broader areas and preoccupations of the HLG in the field of statistical information technology. New sources of data, new actors and new expectations impact how we work and how we organize our work.

6. Mr. Rune Gløersen welcomed participants at both sites. He thanked the Organizing Committee and the OECD, UNECE and UN-ESCAP secretariats for their efforts. There were many logistical challenges that both sites had to deal with. He said that the meeting focuses on common initiatives, frameworks and standards, and looked forward to hearing about initiatives in these areas.

7. Ms. Rikke Munk Hansen in Bangkok mentioned that the co-organization of this event showed that this is a global initiative, and that common challenges exist between the regions. This allows us to look for common solutions and develop a common vision for the future of official statistics.

## **RECOMMENDATIONS FOR FUTURE WORK**

8. Participants to the meeting identified the following topics for future work (see also mind-map on last page):

Topic (i): Organizational culture:

- (a) Skills;
- (b) Big Data;
- (c) Open Data;

Topic (ii): Relationships with stakeholders:

- (a) Methodologists;
- (b) Partnerships with other national statistical offices;
- (c) Community outreach;
- (d) Success stories;
- (e) Impact on the organization;
- (f) Other standards: Statistical Data and Metadata Exchange (SDMX); data documentation initiative (DDI)

Topic (iii): Collaboration tools/activities:

- (a) Proof-of-concepts;
- (b) Practical sharing examples;
- (c) Engagement activities;

Topic (iv): Governance:

- (a) Of the components;
- (b) Of Plug and Play.

9. In his closing remarks, the Chairman thanked the Organizing Committee including members from the United States who were not able to attend and noted that this had been a very fruitful meeting. He thanked UNECE and ESCAP for their efforts in organizing the meeting in two sites. He addressed special thanks to OECD for hosting the meeting and providing excellent facilities. Finally, he thanked participants for their active participation which allowed us to see all aspects of the challenges faced in this field.

10. On behalf of all participants, the UNECE secretariat thanked the Chairman for his able guidance throughout the meeting.

11. The representative of Ireland announced that his office is willing to host the next session of MSIS from 14 to 16 April 2014 at Dublin Castle, Dublin, Ireland, where these topics will be addressed.

**FURTHER INFORMATION**

12. The conclusions reached during the discussion of the substantive items of the agenda are contained in the Annex. All background documents and presentations for the meeting are available on the website of the UNECE Statistical Division.

**<http://www.unece.org/stats/documents/2013.04.msis.html>**

**ADOPTION OF THE REPORT**

13. The participants adopted the draft report before the Meeting adjourned.

## ANNEX

**SUMMARY OF THE MAIN CONCLUSIONS REACHED DURING THE MEETING ON THE MANAGEMENT OF STATISTICAL INFORMATION SYSTEMS (MSIS 2012)****Topic (i): Architecture**

Session Organizers/Discussants: Robert McLellan (Canada) and Matjaz Jug (New Zealand)

Papers by: Australia, Canada, Mexico and Eurostat

1. The papers presented under this topic covered the development and use of different layers of architecture to help manage change within statistical organizations. This topic has been given extra visibility by the recent initiatives of the High-Level Group for the Modernization of Statistical Production and Services (HLG).
2. The presentation from Australia focused on building organizational capability to support a “plug and play” approach. They have big plans to transform the production of statistics, but little money, so they are redirecting all available funding to support transformation. A combination of service-oriented architecture, enterprise architecture and enterprise solutions provides a good framework to support their goals. It is also important to transform organizational culture, capabilities and mind-sets. Good partnerships between IT and transformation teams are essential and international collaboration can be very helpful.
3. Eurostat presented the architectural aspects of the European Statistical System Vision Infrastructure Programme, which focuses on standards-based and collaborative modernization of production systems. Common solutions and shared services are envisaged, based on interoperability standards and common metadata. Business cases have been developed around improving data re-use and process efficiency. A strong governance framework is essential. Issues identified include the need for culture change, new skills, a focus on business outcomes, and balancing the principle of subsidiarity with the development of federated systems.
4. The Canadian presentation discussed the use of enterprise architecture to accelerate modernization. This is based on a service-oriented approach, leveraging international standards and collaboration opportunities. At the same time there is a move towards shared services across government. Enterprise architecture can help to give structure to major organizational changes. The development of a “plug and play” approach should have a strong user focus, producing tools that users need. This should lead to a new generation of sharable tools.
5. The presentation from Mexico showed how the GSBPM is being used as a basis for transformation, with both processes and organization structures being more aligned to the GSBPM. They are developing common tools to be used by many areas within the organization. They will design modules aligned to GSBPM, but this is difficult because current systems are not aligned in this way and they are good systems. They will be replaced step-by-step by new building blocks that comply with the architecture, and will help to adapt to new technologies. Standardization facilitates collaboration and sharing, so the work of the HLG is seen as very important.
6. The summary by the Session Organizers highlighted the increasingly common problem of the need for transformation without any increase in budget, which means that short-term pain is often necessary to realize long term gains. It is necessary for architecture initiatives to capture attention by delivering something that has an impact, and the need for new skills should not be underestimated.
7. The UNECE secretariat presented an overview of the Common Statistical Production Architecture project. A Sprint session was held at Statistics Canada in Ottawa from 8 – 12 April 2013 which resulted in a v0.1 of the architecture. The aim is that it will serve as an industry architecture for statistical organizations. By adopting this common reference architecture, it will be easier for each organization to standardize and combine the components of statistical production, regardless of where the statistical services are built.

8. Points raised in the discussion included:

- The challenges of culture change: It may be easier to change legacy applications than legacy people! To change hearts and minds, it is useful to tell a story about how the future is different for different people.
- Organizations tend to naturally seek stability, which can be a challenge.
- New roles are needed, including data scientists. These roles are not necessarily bound to organizational structures, favouring virtual and cross-functional teams.
- How to map to GSBPM? The Russian Federation requested that the UNECE Secretariat organize practical seminars and workshops on the implementation of GSBPM.

### **Topic (ii): Streamlining statistical production**

Session Organizer/Discussant: Christine Wirtz (Eurostat)

Papers by: China, Estonia, New Zealand (2), Thailand, Eurostat, ILO, IMF, and in the Bangkok session: Cambodia, India, Kazakhstan and Republic of Korea

9. Many interesting presentations were made in both Bangkok and Paris on the issues concerning the streamlining of statistical production. The presentations concerned the activities of both national and international statistical organizations.

10. Statistics Estonia presented their work on efficiency gains in the Population and Housing Census using a mixed-mode approach with web collection and personal interviews, as well as administrative data to pre-fill questionnaires. Following the success of the census, web collection will become the main data collection method for surveys on individuals. Other changes include greater use of computer-assisted telephone interviewing (CATI); implementation of generic office-wide software for other functions than data collection and reuse of data within the statistical office. Future challenges to address are the wider use of administrative and commercial data.

11. The Statistical Office of Thailand presented their application of the GSBPM through the draft statistical business process model and good statistical practice (GSP) guidelines. The draft model; process maps and work flows, and draft GSP are under development. There are more sub-processes and detail in each process in GSBPM than in their existing statistical business process model, and some GSBPM terms are difficult to translate into Thai. In the near future they will create an enterprise architecture by finalizing the draft statistical business process model integrated with a statistical metadata system. They will also consider the implementation of the GSIM, and stressed the value of having a common language and standards across the whole world.

12. The National Bureau of Statistics of China (NBS) of China presented their online reporting system (ORS). The ORS is one of four major programmes, including: Business Register; integrated questionnaire for enterprises; data collection and processing software; and online reporting system. The ORS is a data collection system, allowing respondents and enumerators to submit raw data directly to a National Data Management Centre via the Internet. The data can then be shared by all statistical organisations, at different levels in the hierarchy. Since February 2012 more than 700,000 enterprises submit their raw data directly to NBS via this system. In the next phase they aim to add online reporting for statistical surveys in other sectors of the economy.

13. Statistics New Zealand presented an update on their migration from Legacy systems to more generic, common systems. The aims are standard and generic end-to-end processes, more disciplined data management and the implementation of an enterprise-wide technical architecture. Identifying the full scale of the End User Computing environment is a major challenge. The Legacy Mitigation Programme is well under way and scheduled for completion in 2016. Some legacy systems are being run on “museum” platforms until they can be replaced. The emphasis is gradually moving from mitigating risks to realising business benefits.

14. The IMF presented their top-to-bottom way of dealing with their statistics. One of the findings in relation to the financial crisis was that there is a lack of data. The IMF anticipate to be faced with a four-fold increase in data demands in a 5-year period while maintaining the same level of staff resources. They aim to meet the rapidly increasing demands for more data and metadata products by developing a model that is scalable, increase the timeliness of data and metadata delivery through an increased efficiency of data and metadata collection, processing and content delivery, and reduce the incidence of data and metadata errors through improved validation. A prototype for balance of payments was given as an example.
15. Eurostat presented their efforts in streamlining and innovation within two projects: Re-engineering the Agriculture and Fisheries Statistical Production Processes and Harmonizing and Consolidating the National Accounts Production Systems. For the first project the main outputs were the definition of a to-be state for the statistical process and the application of that process in all domains. For the National accounts project, the objective was documentation and IT analysis of the NA production process, followed by harmonization and consolidation. The next steps are to capitalize on established structures, harmonize data flags, and switch to SDMX-ML format for data exchanges.
16. The second New Zealand presentation gave more of a methodology view of their transformation programme. The Stats 2020 business plan establishes that change is essential to ensure continued relevance. This change is based around four strategic priorities (Leadership, Value, Transformation and Sustainability), and focuses on improving efficiency. It is based on the idea of a range of standard platforms rather than one (big) IT solution. Significant gains were seen through the use of standardized concepts, processes, methods, infrastructure and systems. The medium-term challenge is to design an organizational structure to best exploit these gains. A more collaborate approach between IT, subject matter experts, methodologists and configuration managers is considered to be very efficient.
17. The representative of ILO presented the lessons his organization learned in streamlining their data compilation and dissemination. It was necessary to change the procedures from a topic to a country-centric approach and to move towards more timely and comparable data. The considerations that led to the technical solution were described, and the valuable help received from the official statistics community in sharing experiences was acknowledged. The current status is that coverage has increased and quality has improved, but there is still more work to do.
18. Points raised in the discussion included:
- Collaboration between different specializations within statistical organizations is essential. The role of “Methodology architect” has been identified as potentially important in some organizations.
  - The skill set needed is changing, with a growing requirement for a combination of subject-matter and IT perspectives. Change management and data advocacy skills are important. It is necessary to work with the human resources experts within organizations to manage these changes.
  - Standardization is not only a technical issue. It must be accepted by users. It is important to show users that changes will deliver clear benefits for them. Direct communication with individual users can help, but is very time-consuming. A clear vision and road-map to implementation are useful communication tools.
  - Quality assurance should be built in to statistical architectures, but the focus should be on producing outputs that are “fit for purpose”, based on user needs, rather than “gold-plated perfection”. A system of quality gates at different points in the statistical business process can help.
  - There can be tension between business demands for extra functionality and a corporate standardization strategy. Identifying all aspects about what is used and really relevant in streamlining statistical production requires using multiple sources of information and seems to benefit from an iterative approach.

- Whether it is possible to have a generic end-to-end system for all types of statistical production seems to depend on the diversity of domains at stake. It may be necessary to have different systems for processes based on micro and macro data.
- Multi-year transformation programmes need careful management, as the environment is constantly changing. It is important to have evolving enterprise architecture to enable the organization to leverage new opportunities through technology. Goals, requirements and solutions should be reviewed on a regular basis.

### **Topic (iii): Innovation**

Session Organizer/Discussant: Trevor Fletcher (OECD)

Papers by: Australia, Netherlands, Philippines, Poland, Republic of Korea, Slovakia, Spain and Asian Development Bank

19. This topic explored several different aspects of innovation, including providing infrastructures and creating organizational structures to encourage innovation and collaboration, new methods, tools and data sources.
20. The presentation by the Netherlands outlined the drivers for innovation, the model for exploring innovative ideas to find ones that will deliver value, and the creation of a physical infrastructure to encourage innovation. A number of examples were given of ideas that are being explored under the innovation programme in the Netherlands, including web scraping, mobile telephone position data, and traffic loop data. Innovation requires a culture change to accept that it is OK for some ideas to fail.
21. The Polish statistical office presented their plans for structural reorganization to improve efficiency and move towards a more process-oriented approach. They have a conceptual model of the functioning of official statistics, supplemented by an integrated statistical business process model (ISBPM) which is compatible with the GSBPM. The model combines processes, tools and organization structure with a central knowledge base. They plan to move fully to the new model in 2017/18.
22. The Australian presentation considered the information infrastructure for business transformation. The aims are to facilitate new outputs, improve efficiency and increase re-use at all levels. Two initiatives were presented, Statistical Workflow Management (SWM), and the Metadata Registry and Repository (MRR). SWM provides business process management and governance, and is being used to test the use of DDI and SDMX within those processes. MRR provides a central store (the repository), with a searchable catalogue (the registry), to support metadata-driven statistical production.
23. The presentation from Spain outlined the introduction of a more efficient editing and imputation strategy within the corporate data collection system. The goal is to streamline the editing process, minimizing resources whilst ensuring sufficient quality. An interval distance editing function was presented. This approach is being tested in a pilot, and the initial results look promising.
24. The Statistical Office of the Philippines presented their experiences of using document imaging systems. Harnessing computer power and speed in converting images to electronically usable census data, would allow shorter processing and more timely results. However, the accuracy of automatically extracted hand-written data from survey and census forms was not acceptable. A hybrid solution using optical capture of text when text is provided in separate boxes for each character, combined with a “key from image” approach has given good results, and is suitable for census processing.
25. The Asian Development Bank has developed an online tool using C-cube (coordination, collaboration and communication). Based on Lotus Quickr developed by IBM, C-cube is a basic tool that provides an online space for working groups and communities. Initially it was developed by the ADB to facilitate knowledge sharing of Communities of Practice, but it is also used to support a range of statistical activities such as major publications and events (International Comparison Program, Agricultural and Rural Statistics and Key

Indicators for Asia and the Pacific). It permits the exchange of highly sensitive and confidential data between ADB and national counterparts. C-cube has changed the way ADB interacts with their statistical partners and data providers.

26. The Statistical Office of the Republic of Korea presented their pilot projects for the use of Big Data from both the public and private sectors. One example concerns the use of social media data to inform policy making regarding adolescents. New systems and processes are being developed to use Big Data, and governance issues are very important. They plan to expand the use of Big Data to other domains.

27. Points raised in the discussion included:

- How to decide whether to buy or build new tools – this can depend on the degree of customization needed for external solutions.
- Colectica provides some functionality for data and metadata management based on DDI, but its usefulness would be enhanced if the official statistics community could agree a generic DDI profile.
- New skills are needed in the areas of assembly and configuration of processes to support workflow management initiatives.
- Registries and repositories could support “machine to machine” approaches to process management.
- Creating an innovation culture requires some investment to set up processes and facilities, staff resources are also needed, as well as a budget for ongoing software and hardware requirements, but the benefits could be much greater.
- Some countries do not have physical facilities, but have schemes to encourage innovative ideas. Organizations were encouraged to share information about how they encourage and manage innovation.
- Based on experiments so far, it is likely that Big Data will require new methods and infrastructures, and new ways of defining and measuring quality.
- There is not yet a standard definition of Big Data. Volume, velocity and variety are key features.
- Approximately 20% of participants indicated that their organizations were currently working with Big Data.
- Veracity was proposed as a fourth key feature of Big Data.
- The HLG has released a paper on “What Does Big Data mean for Official Statistics” (available on the UNECE wiki). A new group on data collection has created a wiki as well that includes case studies and strategies on the use of Big Data.
- A study group between ISTAT and three universities is looking at IT issues for Big Data. The results can be shared through the UNECE wiki.
- A classification of types of Big Data is needed.
- It may make more sense to move processes to where the data are, rather than the other way round.
- The approach presented by the Philippines is available to other countries on request.
- Standardization could both facilitate and restrict innovation, depending on the circumstances.
- Changing organizational culture to encourage innovation is a major challenge and should be discussed by human resources experts.

#### **Topic (iv): Collaboration**

Session Organizers/Discussants: Marton Vuicsan (Netherlands) and Carlo Vaccari (Italy)

Papers by: Hong Kong (China), Netherlands, ESS Sponsorship on Standardization, OECD.Stat User Group, ESCAP, ECE and Sharing Advisory Board

28. This session discussed sharing and collaboration issues. The MSIS and predecessor group meetings have moved from being places for an exchange of views to platforms for real collaboration. The link between the two sites for this meeting illustrates this point.

29. Statistics Netherlands gave a presentation on the use of Big Data for official statistics, giving a definition of Big Data as “Data so big that it becomes awkward to work with”. Examples of work to assess the feasibility of using Big Data in the Netherlands include the use of traffic loop detection data for transport



statistics, mobile telephone position data for population movements, and social media messages as a means of measuring sentiment. The results are mostly positive, and more work is planned.

30. The Government Statistical Service of Hong Kong, China gave a presentation on the implementation of a collaborative platform in their office. Their approach is based on a similar C-cube platform to that presented by the Asian Development Bank. The result has been improved connection and collaboration between colleagues in different parts of the organisation. The platform is also used for managing processes, workflow and knowledge. The workplace is changing to a workspace, allowing people to connect from anywhere, enhancing organizational competency and knowledge transfer.

31. Statistics Netherlands gave a presentation on behalf of the European Statistical System Sponsorship on Standardization, on the work of that group. A formal definition of a standard, based on the ISO definition, was proposed. A layout for an inventory of ESS normative documents was made, and a model for life-cycle management of standards was developed. Further work is planned to complete the inventory and refine the architectural framework. A forward-looking feedback workshop is scheduled for May. The main goals of this workshop are to seek feedback on what the Sponsorship has achieved so far and formulate a set of recommendations (both strategic and operational) to promote further standardization.

32. The OECD provided an update on the .Stat User Group which is a group of organizations interested in co-producing and co-developing state-of-the-art Statistical Information Systems through multilateral collaboration. Nine organizations are currently involved in this group, with others interested in joining. The systems development work is continuous. Recently the focus has been on adding open data web services. Governance is being enhanced, including an option for providing funding, and a strategic 5-year development plan.

33. UN-ESCAP made a presentation on the establishment of a Strategic Advisory Body for the Modernization of Statistical Production and Services in the Asia and Pacific region, including a supporting network of experts. Two overarching goals for statistical development in the Asia and the Pacific region were set: to ensure that by 2020 all countries in the region have the capability to provide an agreed basic range of population, economic, social and environment statistics, and to create a more adaptive and cost-effective information management environment for national statistical institutions through stronger collaboration and effective modernization efforts. Challenges include diverse levels of development and knowledge of modernization concepts and tools. Quality improvement is an expected benefit in the short-term.

34. The UNECE provided an update on developments from the High-Level Group for the Modernization of Statistical Production and Services (HLG). The HLG commissioned a project in early 2012 to develop the Generic Statistical Information Model (GSIM). Version 1.0 was delivered at the end of the year. For 2013 there are two projects, the Common Statistical Production Architecture project, which had already been presented, and the Frameworks and Standards for Statistical Modernization project, which is concerned with standards implementation and integration. The governance structure of expert groups is being changed to improve efficiency, facilitate more cross-domain activities, and better support the implementation of the HLG vision.

35. The Chair of the Sharing Advisory Board reported on the activities and results of the Board during 2012-13. Information on open data, software for record linkage, and cooperation models for software development has been posted on the MSIS Wiki. A number of tasks were proposed to be included in the work plan of the new Modernization Committee on Production and Methods.

36. In his summary of the session, the Session Organizer asked how can we collaborate on Big Data? Many initiatives and groups are involved in collaboration. It would be good to start using our standards and adopt plug and play architecture in our institutions. We need to enhance communication and collaboration to allow virtual teams to work together across the globe. We are changing our ways of working, the new governance structure for activities overseen by the HLG will be created and coordination between the four modernization committees needs to be enhanced. How can the MSIS group contribute most effectively in this new structure?

37. Points raised in the discussion were the following:

- This is an ideal time to start collaborating on Big Data, as we don't yet have systems in place. An architecture for Big Data is needed, as well as collaboration with the wider information industry.
- The GSIM is being used as a basis to streamline statistical production, but it is not limited to official statistics, and could be a basis for cooperation with the private sector.
- How feasible is Big Data for real statistical production. How to extract the data we need from a huge data set?
- Statistical organizations have traditionally focused on producing consistent time series, but increasingly there is also a need for short-lived measures that address a phenomenon in a country when it happens. We need a more strategic view of the sort of outputs we should be producing.
- Experience gained in the use of administrative sources may be helpful for Big Data.
- We have common issues in the use of Big Data, so we need mechanisms to work together to find solutions. This should be a priority issue for the HLG.
- It is important to take a multidisciplinary approach to Big Data, currently different groups are all looking at this issue from their own perspectives.
- The UNECE group on data collection has developed a wiki to share information and case studies.
- Agreeing a common classification of the different types of Big Data should be an early priority.
- We need a concrete project to produce specific statistics from Big Data, and to find real solutions.
- A virtual task team should be set up to define the issues and formulate a clear project proposal, which would be passed to the HLG.

**Topic (v): Panel discussion on Modernizing statistical production – speeding up the process through Plug and Play architecture**

Organizer/Chair: Rob McLellan

Panellists: Jean-Marc Museux (Eurostat), Robert McLellan (Canada), Jakob Engdahl (Sweden) and Matjaz Jug (New Zealand) and Barteld Braaksma (Netherlands)

38. The HLG is sponsoring a project to develop a Common Statistical Production Architecture (CSPA), with the expectation that statistical organizations can collectively define an architectural framework and collaborative workspace that will enable them to co-develop and share key statistical components resulting in accelerated transformation and reduced cost. This work stream officially launched in February 2013, and a first architectural “sprint” was held in Ottawa, Canada, on 8-12 April with participants from Australia, New Zealand, Canada, Italy, Mexico, UK, Sweden, Eurostat, Netherlands, and UNECE. This resulted in version 0.1 of the architecture, which has been released for comments.

39. In a complementary fashion, the Statistical Network currently has a project addressing Business Architecture, an initiative to establish a common approach to NSO business architecture that is an important component of a holistic plug and play architectural framework. The participants in this activity are Australia, Norway, Canada, New Zealand, and Italy.

40. Statistical organizations are moving forward on transforming their business and their products, and Big Data represents a potentially important future data source that will require new techniques and infrastructure. This means that a shared plug and play architecture that enables collaborative development and shared components presents an important opportunity for statistical organizations to work together to incorporate Big Data in their production portfolios.

41. Panelists addressed the question – “Plug and play architecture and collaborative development will allow us to accelerate our Big Data programs by ...”. The panel discussion followed a Pecha Kucha format.

42. Key points raised by panelists and other participants included:

- There are several options for dealing with Big Data, ranging from ignoring it to changing our whole business model to focus on Big Data use. A solution somewhere between these extremes is more

likely, and a “plug and play” architecture would provide an essential basis for a collaborative approach.

- We have to deal with Big Data to keep our relevance, and a collaborative approach can reduce the risk. We need to share tools, ideas and skills, including beyond official statistics, for example with industry and academia.
- The standard USB plug is simple to use, but the technical specification runs to over 500 pages. The CSPA will probably be similar.
- We may have to process Big Data in external environments (e.g. the cloud), so it may not always be possible to use a “plug and play” approach.
- The main initial challenges in dealing with Big Data are both methodological and technical.
- The Generic Statistical Information Model (GSIM) should help to give structure to unstructured data.
- Eurostat is coordinating a common architecture initiative within the European Statistical System, based on the CSPA, which will provide a framework for dealing with Big Data.
- Big Data will require a case by case, opportunistic approach, and, at least initially, could be seen as a complementary source rather than a replacement for more traditional sources.
- Processing time needs to be improved. Taking over a year to produce census results is no longer acceptable. We should aim for real-time processing, as is increasingly the case in the commercial sector.
- The fact that Big Data are often not stored permanently is an issue because resulting statistics may not be reproducible, which has implications for quality management.
- The size of Big Data should not be a major issue as storage and processing capabilities are constantly increasing.
- We need to identify and develop the knowledge and skills necessary to use Big Data. New skill-sets will be needed.
- Legal and licensing issues need to be addressed, particularly regarding consistency of data supply.
- Big Data provides an opportunity for the CSPA project to deliver useful outputs where nothing currently exists.
- We should examine why some existing products (Blaise, PC-Axis, Canceis, Dotstat etc.) have been successfully shared. Some have a clear owner and licensing model, whereas others have a more collaborative approach. Governance is an essential factor.
- To be sharable, components must fit business needs and the “plug” must not be too complicated.
- Barriers to re-use include:
  - Timing: different transformation programmes have different deadlines for component development
  - Culture: moving from building to meet own requirements to building to share
  - Trust: will partners continue to deliver?
  - Support: who is going to maintain shared components?
  - Governance: how to manage collaboration?
  - Technology: adaptors may be needed to allow use of components on different platforms
  - Standards: national government standards may not always align with international statistical industry standards.

**Brainstorming on future work for next year's meeting:**

