Statistical Architecture Models

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Introducing UNECE Statistics
Introducing the HLG-MOS

- High-level Group for the Modernisation of Official Statistics
- Created by the Conference of European Statisticians in 2010
- Strategic vision for modernisation
- Annual projects in priority areas
- Activities are voluntary and demand driven
The story so far
The GSBPM

Quality Management / Metadata Management

<table>
<thead>
<tr>
<th>Specify Needs</th>
<th>Design</th>
<th>Build</th>
<th>Collect</th>
<th>Process</th>
<th>Analyse</th>
<th>Disseminate</th>
<th>Evaluate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Identify needs</td>
<td>2.1 Design outputs</td>
<td>3.1 Build collection instrument</td>
<td>4.1 Create frame &amp; select sample</td>
<td>5.1 Integrate data</td>
<td>6.1 Prepare draft outputs</td>
<td>7.1 Update output systems</td>
<td>8.1 Gather evaluation inputs</td>
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<tr>
<td>1.2 Consult &amp; confirm needs</td>
<td>2.2 Design variable descriptions</td>
<td>3.2 Build or enhance process components</td>
<td>4.2 Set up collection</td>
<td>5.2 Classify &amp; code</td>
<td>6.2 Validate outputs</td>
<td>7.2 Produce dissemination products</td>
<td>8.2 Conduct evaluation</td>
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<tr>
<td>1.3 Establish output objectives</td>
<td>2.3 Design collection</td>
<td>3.3 Build or enhance dissemination components</td>
<td>4.3 Run collection</td>
<td>5.3 Review &amp; validate</td>
<td>6.3 Interpret &amp; explain outputs</td>
<td>7.3 Manage release of dissemination products</td>
<td>8.3 Agree an action plan</td>
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<tr>
<td>1.4 Identify concepts</td>
<td>2.4 Design frame &amp; sample</td>
<td>3.4 Configure workflows</td>
<td>4.4 Finalise collection</td>
<td>5.4 Edit &amp; impute</td>
<td>6.4 Apply disclosure control</td>
<td>7.4 Promote dissemination products</td>
<td>8.4 Finalise data files</td>
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<td>1.5 Check data availability</td>
<td>2.5 Design processing &amp; analysis</td>
<td>3.5 Test production system</td>
<td></td>
<td>5.5 Derive new variables &amp; units</td>
<td>6.5 Finalise outputs</td>
<td>7.5 Manage user support</td>
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<tr>
<td>1.6 Prepare business case</td>
<td>2.6 Design production systems &amp; workflow</td>
<td>3.6 Test statistical business process</td>
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<td>5.6 Calculate weights</td>
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<td>5.7 Calculate aggregates</td>
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<td>5.8 Finalise data files</td>
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What is the GSBPM?

- **Generic Statistical Business Process Model**
- It shows the different steps needed to produce official statistics
- It provides standard terminology to help statistical organisations
  - Modernise statistical production processes
  - Share methods and components
Structure of the Model (1)

Process

Phases

Sub-processes

(Descriptions)
Key features

- Not a linear model
  - Sub-processes are not followed in a strict order
  - It is a matrix, through which there are many possible paths
The GAMSO

- Strategy & leadership
- Capability management
- Corporate support
- Production
What is the GAMSO?

- **Generic Activity Model for Statistical Organisations**
- Released in 2015
- It extends and complements the GSBPM by adding other activities needed to support statistical production
Uses of GAMSO

- Resource planning
- Measuring costs
- Assessing readiness to implement different aspects of modernisation
- Supporting risk management systems
- Implementing enterprise architecture
- Measuring and communicating the value of statistical modernisation activities
What is the GSIM?

- **Generic Statistical Information Model**
- A reference framework of information objects:
  - Definitions
  - Attributes
  - Relationships
- It gives us standard terminology
- It aligns with relevant implementation standards such as DDI and SDMX
GSIM and GSBPM

- GSIM describes the information objects and flows within the statistical business process.

**Input**
- Any GSIM Information Object(s) (e.g. Data Set, Variable)
- Process parameters

**GSBPM**
Sub-process

**Output**
- Transformed (or new) GSIM Information Object(s)
- Process metrics
110 information objects!
Clickable GSIM
Other relevant standards

Implementation standards

Conceptual model

GSIM

DDI

SDMX

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What is the CSPA?

• A template architecture for official statistics

• A set of standard specifications for new statistical components (services) that can be used in a modular way

• A new way of developing statistical tools, with sharability as a design feature, not an afterthought
Problem statement:

Specialised business processes, methods and IT systems for each survey / output

Collect → Process → Analyse → Disseminate

Survey A

Survey B
Applying Enterprise Architecture
... but if each statistical organisation works by themselves ...
... we get this ...
.. which makes it hard to share and reuse!
… but if statistical organisations work together to define a common statistical production architecture …
… sharing is easier!
Key Message

- We all have to modernise our statistical production systems
- The marginal cost of doing this in a way that supports collaboration and complies with CSPA is relatively low
- The potential savings from the CSPA approach are high
Statistical Modernization Community

• Launched in 2016
• Open to all statistical organisations who endorse “Statement of Intent”
• No fee, but expectation to contribute
• Partners benefit from collaboration and sharing
• Four main principles:
  – Openness
  – Flexibility
  – Participation
  – Pragmatism
Get involved!
Anyone is welcome to contribute!

More Information

- HLG-MOS Wiki: www1.unece.org/stat/platform/display/hlgbas
- LinkedIn group: “Modernising official statistics”
Human Resources Management for National Statistical Offices in the Post-2015 Period

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What will happen to our resources?

- Now
- Future
Why?

- Increased automation of processing
- Electronic data collection
- New data sources
- Sharing tools, methods and data

Result: New capabilities will be needed
Capability Management

- A **capability** is the ability to perform or achieve certain actions or outcomes

- Capability represents the intersection of capacity and ability
Capabilities: Organisational level

Capabilities require a combination of people, processes, methods, systems and standards
Activities, processes, capabilities

- An activity is something we do
- A process is how we do it
- Capabilities are what allow us to do it
Capability Framework

- Business Capabilities Model developed by ESS Enterprise Architecture Task Force
  - “summarizes the key capabilities required for producing official statistics. It provides a framework to view which capabilities are already sufficiently present … versus those on which development effort is needed”
ESS Capability Model

**Strategy Management**
- Mainten. & consol. of strat. relations
- Strategic Planning
- Policy definition
- PPM and budget def.

**Statistical Production Management**
- New statistics development
- Statistical Data collection
- Statistical Processing
- Statistical Dissemination
- Statistical Design
- Information Resources Management
- Statistical Analysis
- Quality Assessment, Control & Improv.

**Corporate Support Management**
- Quality Mgt.
- Legal framework Mgt.
- Security Mgt.
- IT Management
- Administrative Information Mgt.
- Human Resource Mgt.
- Procurement Mgt.
- Financial Mgt.
Maturity by Capability
Capabilities: Individual level

Challenge: To match individual capabilities with organisational need

- Do our staff have the capabilities we need?
  - Now
  - In the future
- If not, develop or hire?
- Do we use the existing capabilities of our staff effectively?
Capabilities: Team level?

- Do individuals have all required capabilities?
- Define and develop capabilities at team level
Big Data: Team-level capabilities

- Specialist knowledge and expertise
- Team work
- Statistical/IT Skills
- Interpersonal and communication
- Innovation and contextual awareness
- Delivery of results

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Summary

- Identifying and developing the right
  - individual
  - team
  - organisational

capabilities is key to statistical modernisation