United Nations Educational, Scientific and Cultural Organization

UNESCO INSTITUTE FOR STATISTICS

SUSTAINABLE DEVELOPMENT GOALS

GPE Transforming Education

Efficiency and Effectiveness in Choosing and Using an EMIS

4 QUALITY EDUCATION

Guidelines for Data Management and Functionality

Main Areas Covered in The Guide

- Notion of “buyer’s” and “user’s” guide
- Working definition of EMIS
- EMIS Architecture

- Buyer’s Guide
    - Key components of an EMIS
    - How the SDG 4 Indicators have changed the scope of EMIS
    - *EMIS Functionality and Standards*

- User’s Guide
    - *EMIS Production Life Cycle*

Preliminaries

- Notion of “buyer’s” and “user’s” guide

- Guide uses the notion of an EMIS unit deciding what functionalities to acquire
  - And hence what may be useful standards of functionality
  - This is the “buyer’s guide” aspect

- Once acquired, the EMIS unit must decide how best to use them
  - This is the “user’s guide” aspect

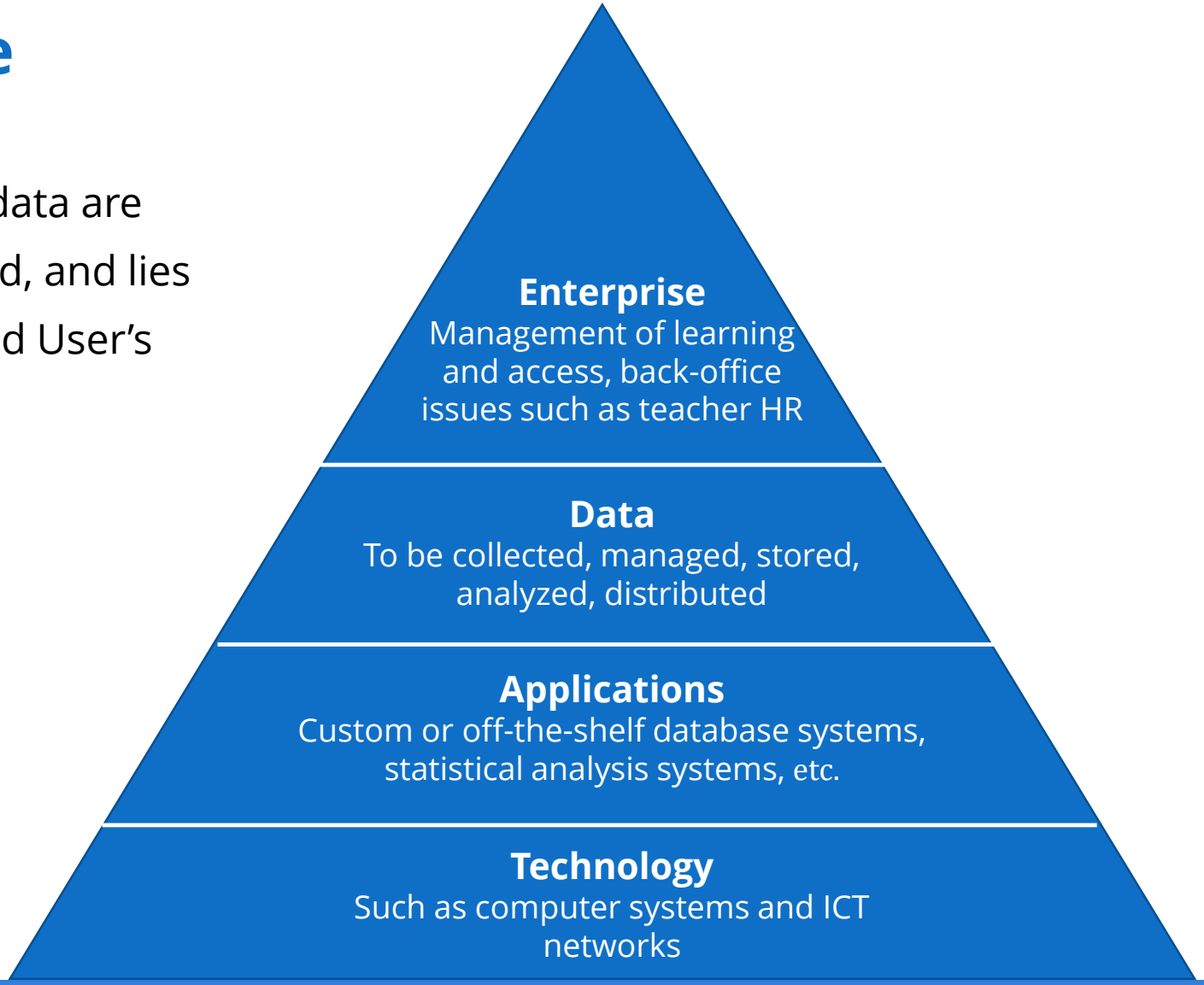
- This is only a narrative device, no unit literally “buys” an EMIS

- EMIS is actually a complex ecosystem and part of an architecture

EMIS Architecture

Underpins the way in which data are collected, stored and reported, and lies at the heart of the Buyer's and User's Guides.

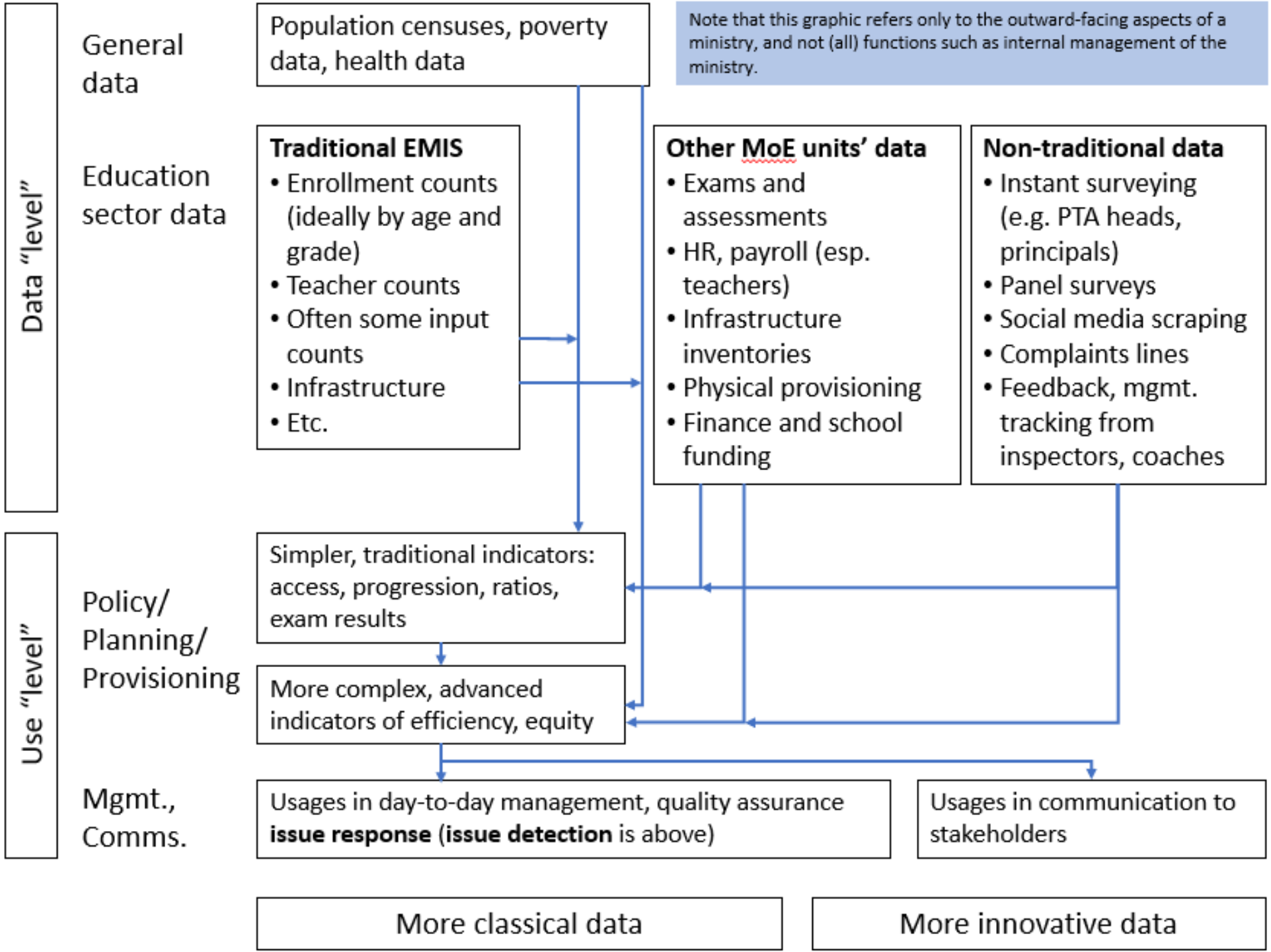
Should respond to the overall **enterprise architecture** –that of a typical ministry.



EMIS Architecture – in detail

- Just to provide an overall picture

(Next slide)


Data "level"
Use "level"
General data
Education sector data
Policy/ Planning/ Provisioning
Mgmt., Comms.
Population censuses, poverty data, health data
Note that this graphic refers only to the outward-facing aspects of a ministry, and not (all) functions such as internal management of the ministry.
Traditional EMIS
• Enrollment counts (ideally by age and grade)
• Teacher counts
• Often some input counts
• Infrastructure
• Etc.
Other MoE units' data
• Exams and assessments
• HR, payroll (esp. teachers)
• Infrastructure inventories
• Physical provisioning
• Finance and school funding
Non-traditional data
• Instant surveying (e.g. PTA heads, principals)
• Panel surveys
• Social media scraping
• Complaints lines
• Feedback, mgmt. tracking from inspectors, coaches
Simpler, traditional indicators: access, progression, ratios, exam results
More complex, advanced indicators of efficiency, equity
Usages in day-to-day management, quality assurance issue response (issue detection is above)
Usages in communication to stakeholders
More classical data
More innovative data

Buyer's Guide Aspects

- The Buyer's Guide takes a comprehensive view of the **standards** and **functions** that occur in key layers of the EMIS architecture.
- The Guide is complete, but we cannot give all the details here.
- A rough idea is provided here in the next few slides.
- For the full detail see the Guide itself and especially Section 5, at: http://emis.uis.unesco.org/buyers-and-users-guide/

Data Collection Layer

AGGREGATED LEVEL AND UNIT-LEVEL

- **Directory**
- **Unique Identifier**
- Questionnaire Design
- Baseline Data Transfer
- Barcoding
- Data Entry
- Data Entry: Technology
- Data Entry: **Quality Assurance**

Data Collection Layer - 2

SOME GENERAL ISSUES

- System Type Choices
  - **Operational Transactional Processing (OTP) System**
  - **Learner Tracking System**
  - **Aggregated Data Collection System**

Definition
Advantage
Disadvantage

- Application Software Choice
  - Custom made and self-developed
  - Off-the-shelf system
- Operating Systems
- Training: System provides training support.

Data Management and Storage Layer

- Database Types Choice
  - Flat File System
  - Single User System
  - Multi-users System
- Database Management
- Software Types Choice
  - Open-source
  - Propriety Software
- Web-based system
- Data Storage
- Data Warehousing
- Security and Confidentiality
- Interoperability and Data Integration
- Imputation
- Web Hosting
  - Cloud hosting
  - Self-hosting
  - Software as a service(SaaS)

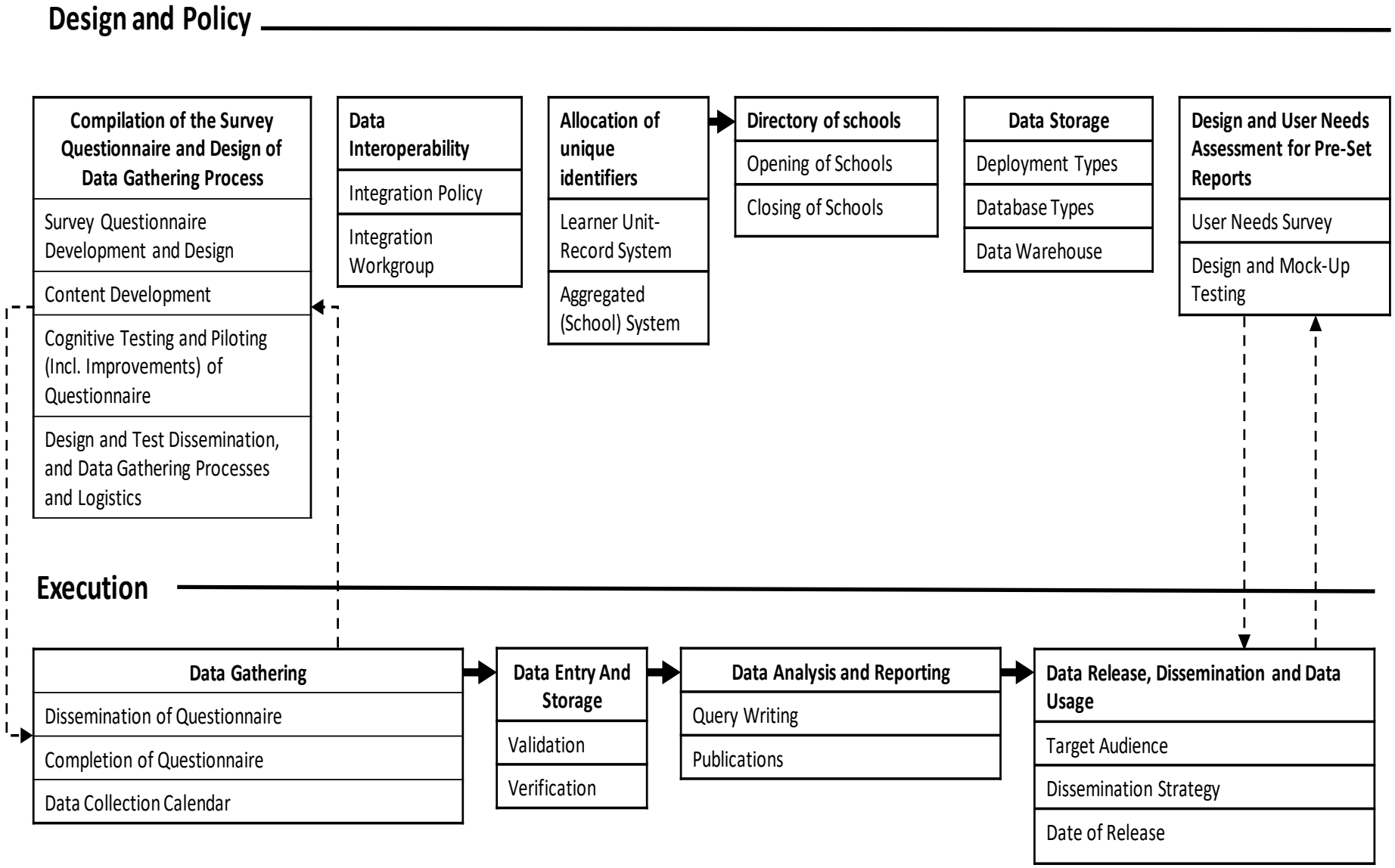
Data Reporting and Analysis Layer

- Online Analytical Processing (OLAP)
- Dashboard
- Query Writing and Reporting:
  - Operational Reporting
  - Self Service Reporting
  - Parametric Reporting
  - Ad Hoc Queries

The User's Guide

- Takes a comprehensive view of the processes that occur in each layer of the EMIS architecture.
- These processes are the EMIS production life cycle, as depicted in next Figure
- The User's Guide uses the EMIS production life cycle as a lens to determine all the key activities in the data collection and usage processes at all levels, from national to sub-national to schools.

EMIS Production Life Cycle



Details see next few slides

EMIS production Life Cycle

- **Compilation of the survey questionnaire (design and development): processes**
  - The design of the questionnaire
  - Content development of the survey questionnaire
  - The dissemination of the survey questionnaire
  - The completion of the survey questionnaire
  - **Data collection calendar**
- **The allocation of unique identifiers**
  - The learner unique identification system
  - Unique identifier system for institutions

A single, non-duplicated number that is assigned to every learner or to every school. It is important that this identifier is consistent and accurate over time.

EMIS production Life Cycle - 2

- **The maintenance of the directory (register) of schools**
- **Data Entering**
  - Verification
  - Validation
- **Data Storage**
  - Deployment Type
  - Database Types
  - Data warehouse
- **Data Interoperability**
  - Develop data sharing strategy
  - Establish a formal working group

Data integration generally means linking different data sources through the use of a common field across a collection of data sources .

EMIS production Life Cycle - 3

- **Data Analysis and Reporting**
  - Query Writing and Reporting
  - Publications
- **Data Release, Data Dissemination and Data Usage**
  - Data Release and Data Dissemination
  - Data Usage

Improvement Requests from May 2020 Consultation

- More description of the overall enterprise architecture and how data architecture fits (see two next slides)
- Include more of a future orientation for the technology, especially software, cell phone and internet options, social media
- Include more background on general good practices for data for the SDGs and SDG4
- But make clear that the main purpose of the Guide is not about global reporting
- Importance of data policy
- Touch upon covid19

THANK YOU

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