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Standards-first approaches to building open data systems:

The UNICEF experience

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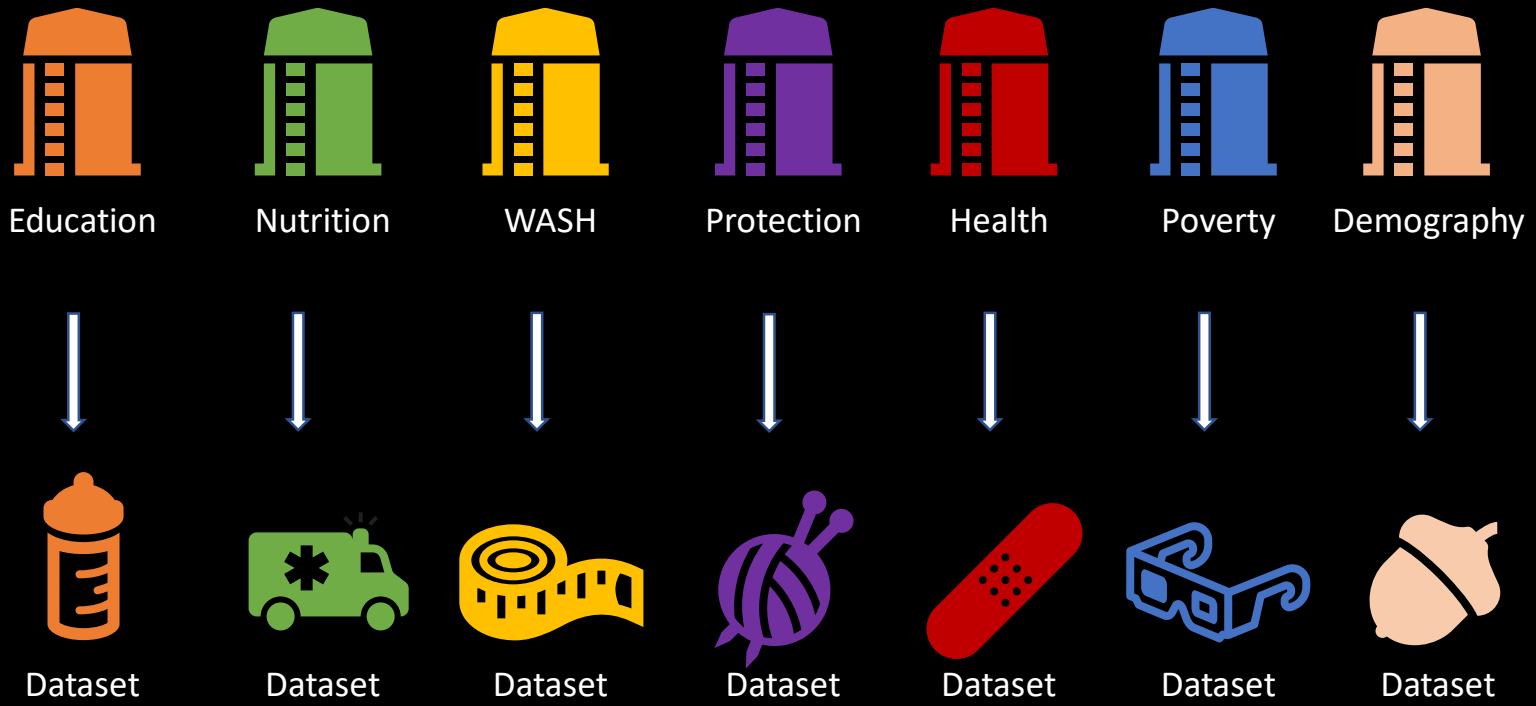
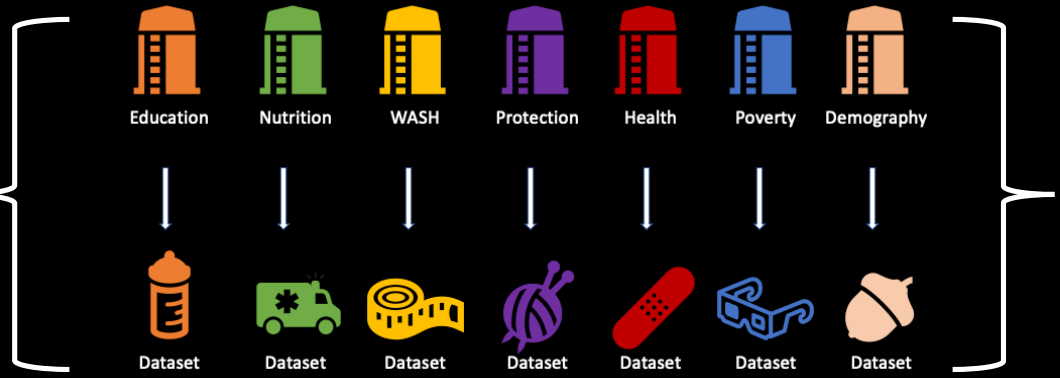
Where we were a couple of years ago…



A “Wild Wild West” of approaches: R, STATA, SPSS, Python, Excel

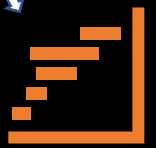


Data sources lying around all over the place.

Lots of manual processes

Dashboards
(Tableau, Shiny PowerBI)

Websites
(data.unicef.org, childmortality.org, countdown2030)



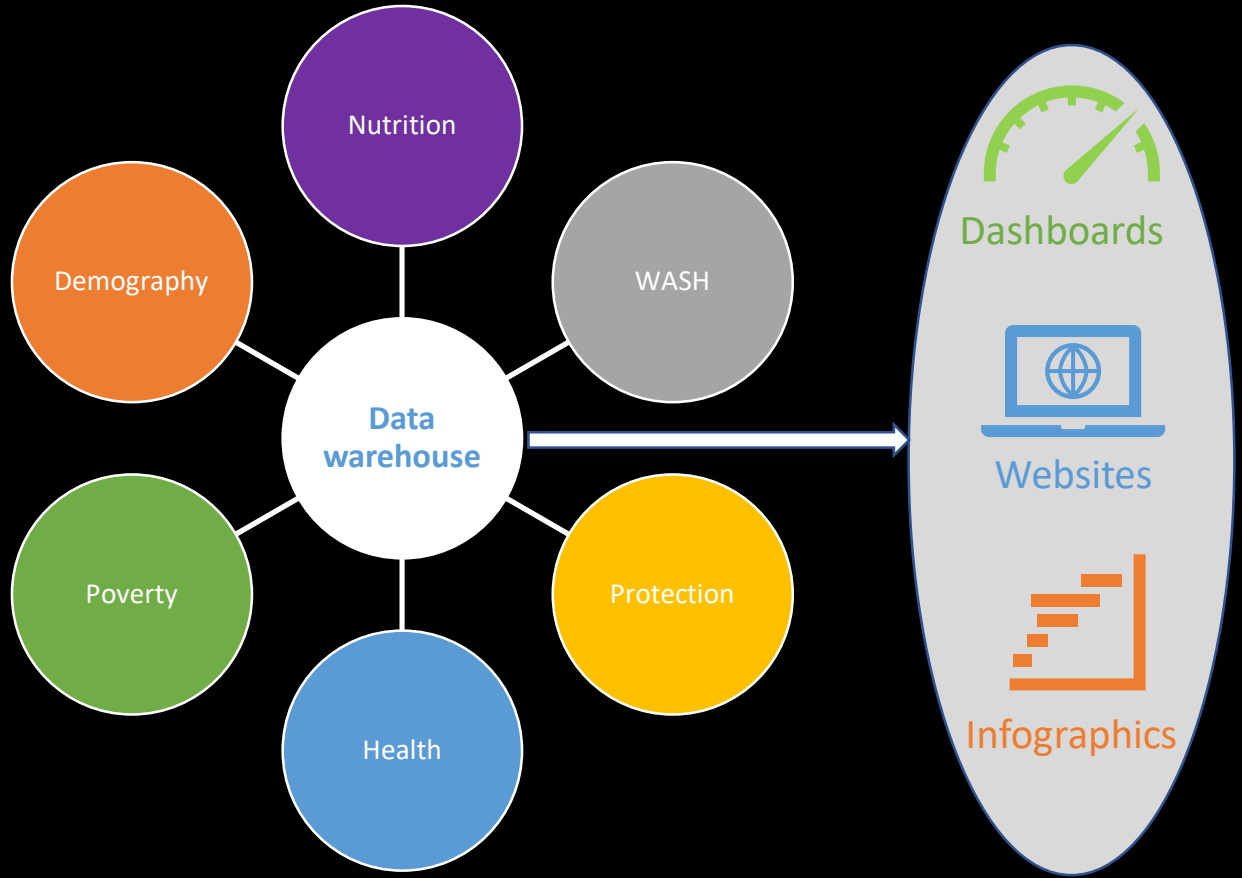
Infographics
(Infogram, Canva, Excel)

Where we wanted to be…

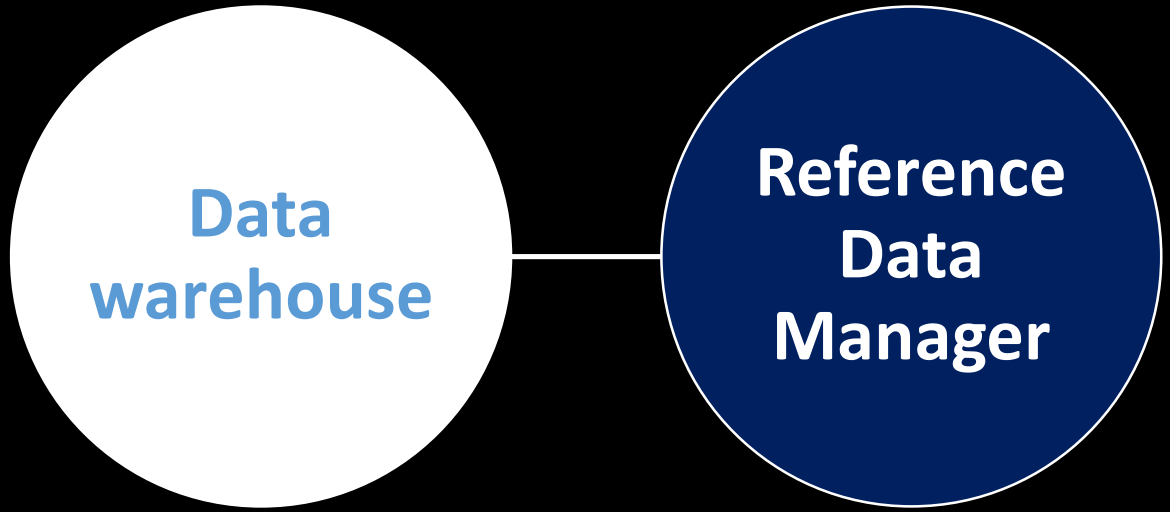
A single shared place to store all of our raw, semi-/un-structured source data and metadata.

Where we wanted to be…

Data and structures in a single, PUBLIC shared place.



Where we wanted to be…



Ref data and Ref metadata in a single shared place.

And of course, we wanted a robust set of standards to help maximize the “ilities”

- Usability
- Comparability
- Exchangeability
- Maintainability
- Versionability
- Reusability
- and so on…

So we made some choices

- Standards
  - SDMX for our data and reference data
  - DDI for our raw data sources
- Processes
  - Standardize reference data in code lists
  - Reuse existing community code lists
  - Reuse code lists across data structures
  - Publish once, push to many channels
- Tools
  - Joined the SIS-CC community to share tools
  - Deployed SDMX-compliant data warehouses (.Stat & Fusion)
  - Implemented a Reference data manager (bespoke system)
  - Deployed a DDI-compliant Data Catalog (World Bank NADA)

What's working today?

- Source Data Catalog
  - Midstream on our reboot using DDI-compliant NADA. Great product!
  - 1000's of raw data sources.

- Indicator Data Warehouse (IDW)
  - Virtually all of our indicator data on the state of women and children are now hosted in an SDMX-compliant registry
  - Millions of indicator data points for hundreds of indicators across 65 dataflows and 13 technical sectors.
  - Fully implements the SDMX standard .

- Reference data and metadata manager (RDM)
  - Bespoke system in operation and steadily gaining metadata.
  - Public API makes it easy for anyone to access.

What's working today?

- Data Consultations
  - Bespoke tool CONSULT, for conducting UNICEF and SDG consultations with global partners. Pulls from IDW and the RDM.

- Publication channels
  - We feed a number of sites and dashboards dynamically from single source IDW using REST APIs and Web Data Connectors. More are on the way!
    - https://data.unicef.org/dv_index/
    - https://childmortality.org/
    - https://profiles.countdown2030.org/#/ds
    - https://data.humdata.org/organization/unicef-data
    - https://data.unicef.org/resources/data-to-inform-the-covid-19-response/

What did existing standards and tools NOT help us solve?

- SDMX
  - Has an overly complex model for Reference Metadata, and tool support for reference metadata is poor.
    - We had to build our own solution, the RDM.
  - Lack of Code List inheritance means we often create new code lists that extend existing code lists, but must do so informally.
  - Time-series centric cube model leads (in our case) to:
    - Sparse and partially intersecting cubes that
    - Create terrible data discovery and comparability challenges,
    - The fact that our survey-centric data are mostly NOT time-series (i.e. w/regular periodicity) compounds this problem.
    - We had to deploy a search engine and build indexes to overcome these issues.
      - The pubic facing tool for this is a work-in-progress.

What did existing standards and tools NOT help us solve?

- Working System
  - Neither SDMX nor DDI nor any of their associated tools do much to overcome a central business process challenge, the need for a statistical working system.
  - We have begun cracking this area by first attacking microdata harmonization.
  - It's probably the hardest area, and so of course, we saved it for last…☺

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Thank You / Yves Jaques / yjaques@unicef.org

Thanks for listening!