UNICEF DASH-SDMX

Open source application to build configurable SDMX-enabled dashboards

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The current situation

- There is huge demand for data visualization and the requests are increasing
- Data is changing fast, and deadlines are tight!
- Sometimes we just need to embed a simple chart in a page to support a “story”
- There could be no capacity to use PowerBI, Tableau… in some teams

The current situation (2)

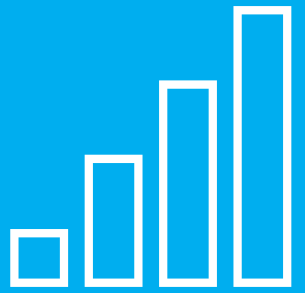
- We have PowerBI, Tableau, R or other custom solutions which are difficult to reproduce dynamically and repeatedly.
- Is staff, time and capacity available to maintain the dashboards?
- The data is available in SDMX format and accessible using the APIs, can we take advantage of that?
- Can we get rid of intermediate formats and processing?

The need

- A solution that allows simple dashboards to be created quickly
- No need to deeply understand SDMX
- Fetch data from the APIs to avoid local copies
- Fast to configure and deploy
- Multi-Project/Tenant (we have several country and regional offices)
- Easy to embed in a public facing web page

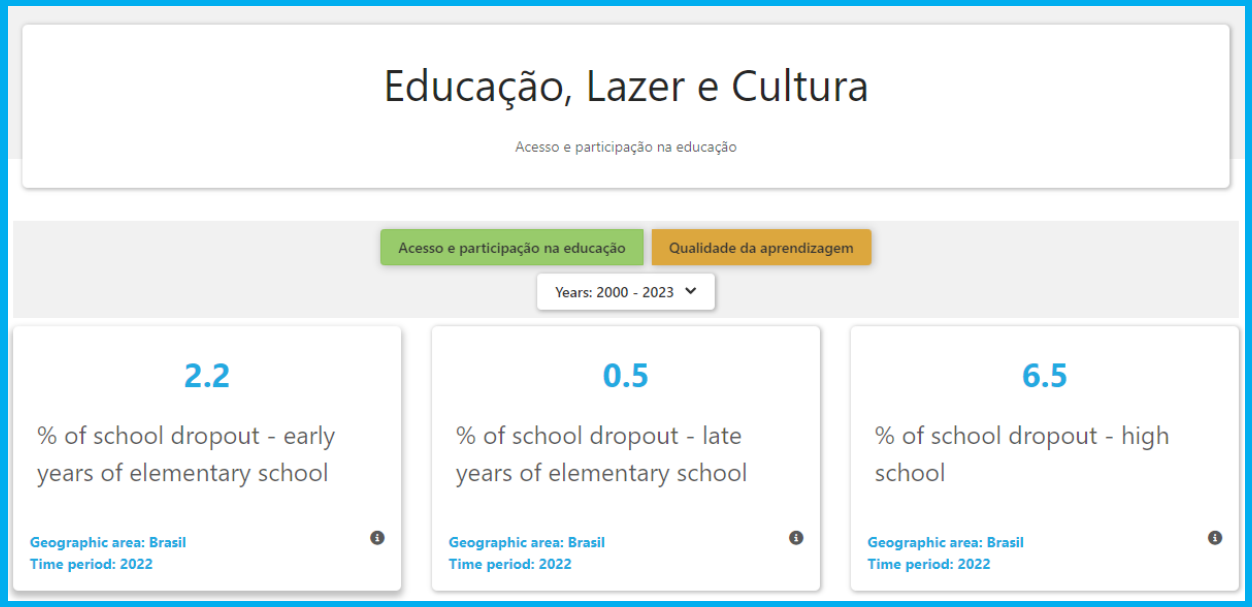
The solution

- An application that connects data and charts
- The user defines the “slice” of data he wants to visualize and the type of chart/map.
- The application generates one or more widget
- Data is dynamically pulled from the SDMX registry



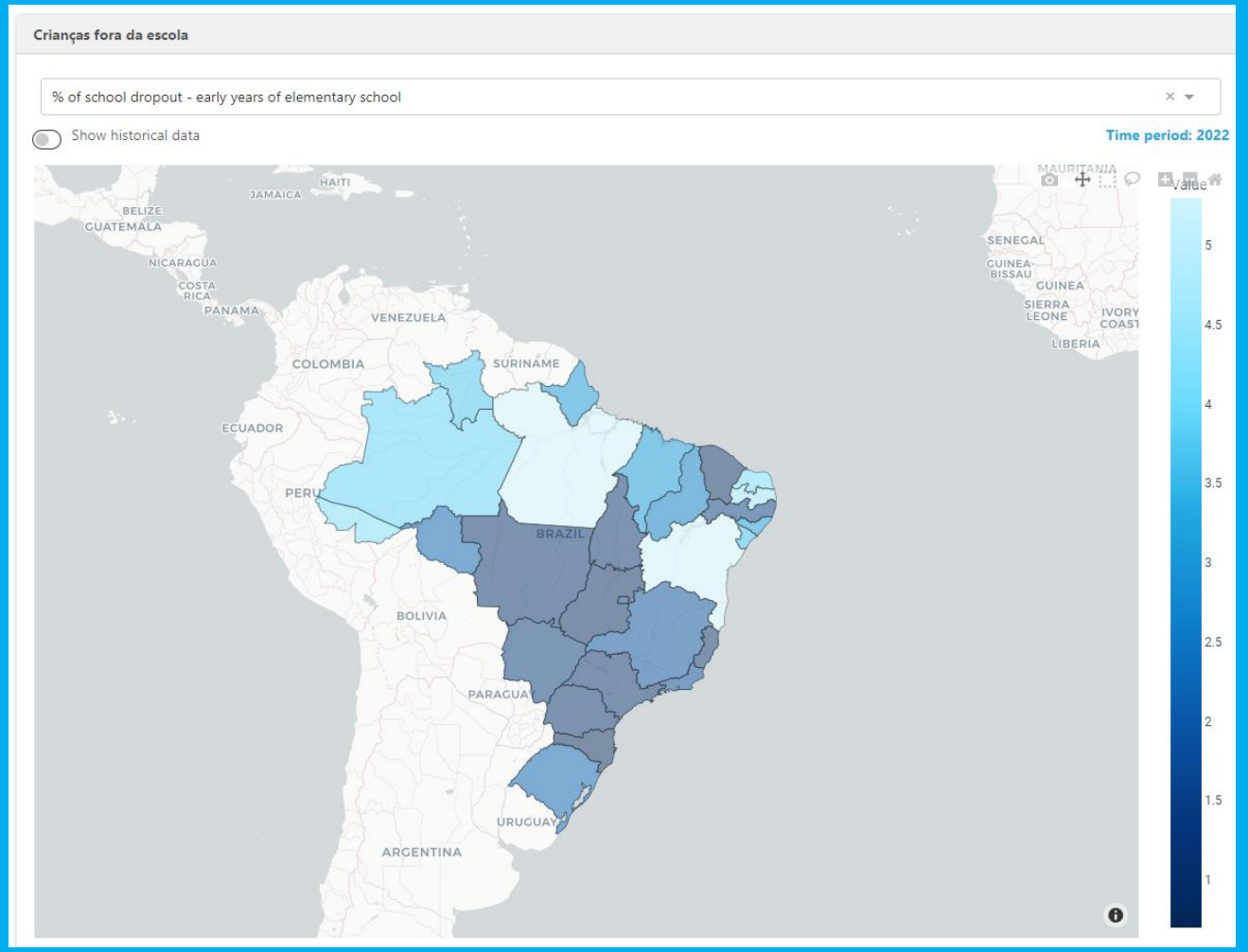
The application’s frontend: Title, Subsections and Cards

- Page title and sub-sections (if needed)
- Cards: they show a single value
- Components are arranged in rows, any component can be shown on any row or column
- The page can contain any number of elements



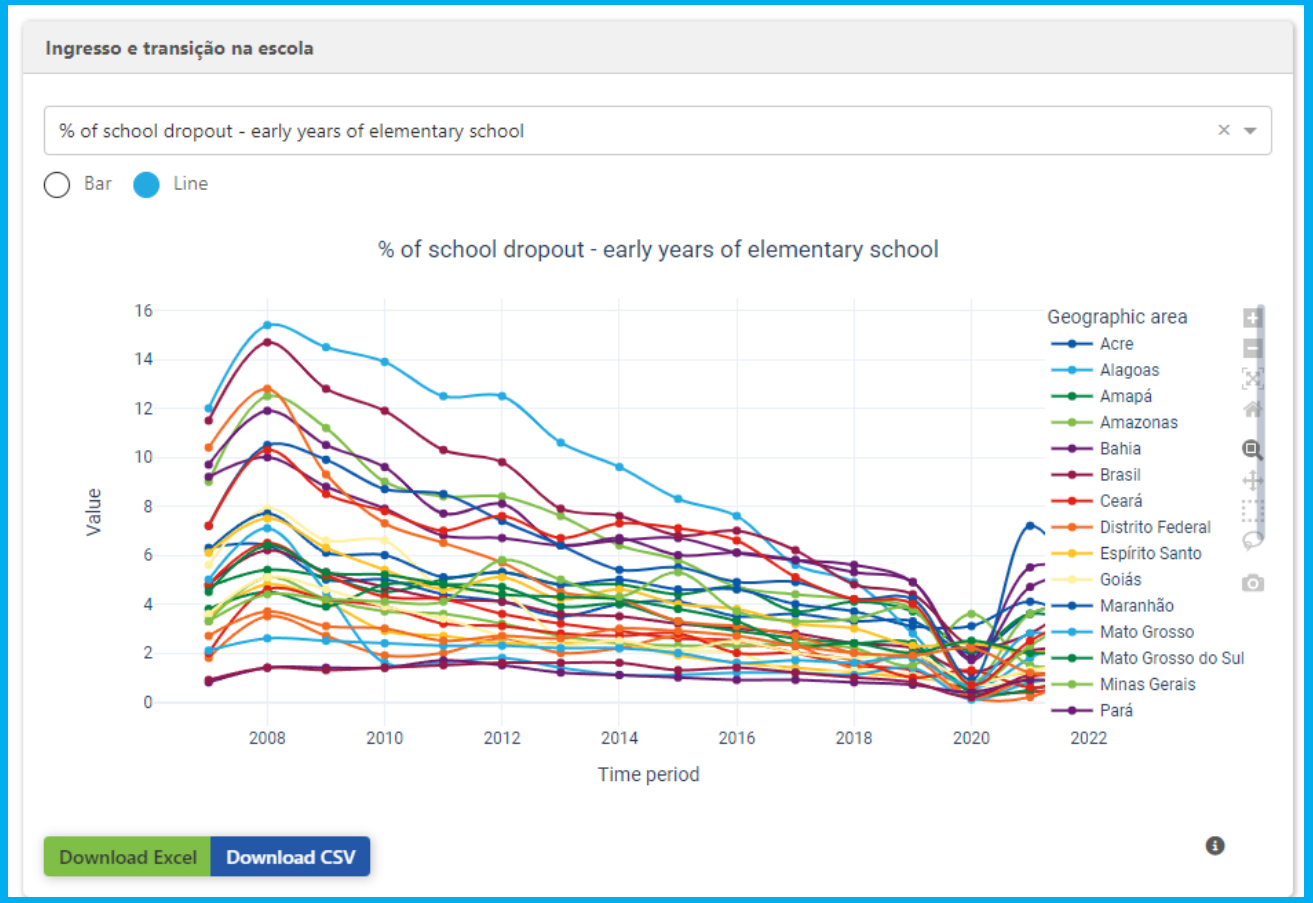
The application’s frontend: Map

- Can show a single year or play through a time series



The application’s frontend: Charts

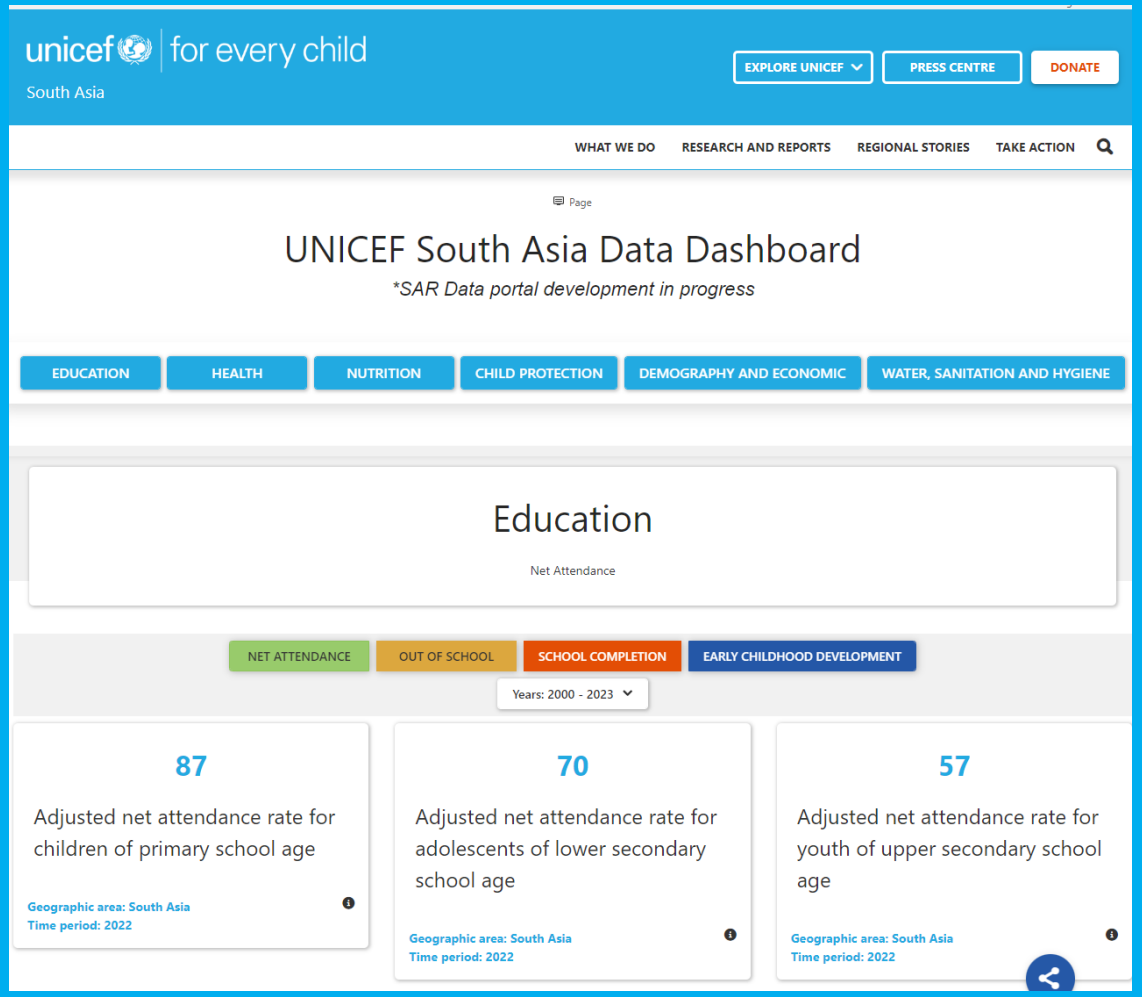
- Shows a Bar or a line chart.
- It can be easily extended to handle additional chart types



Embedding the dashboard in another page

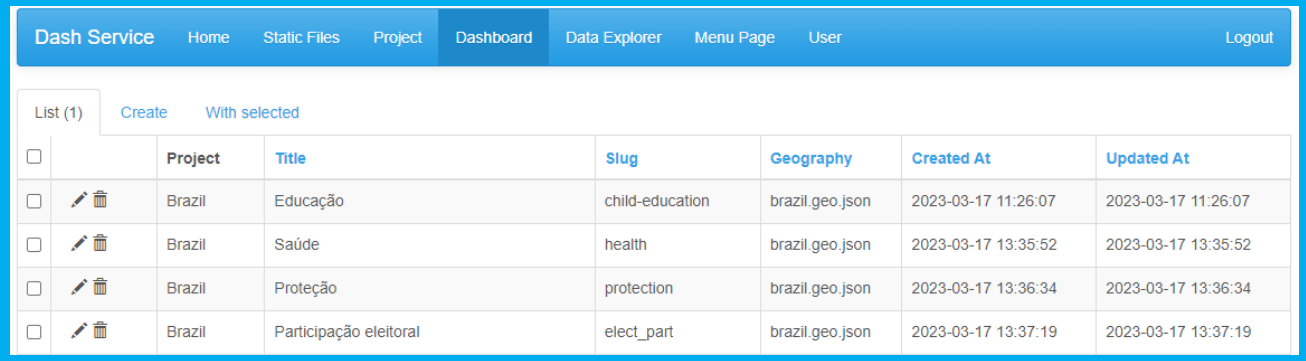
- The dashboard can live independently or can be embedded in an existing page

- In the example the dashboard is embedded in data.unicef.org

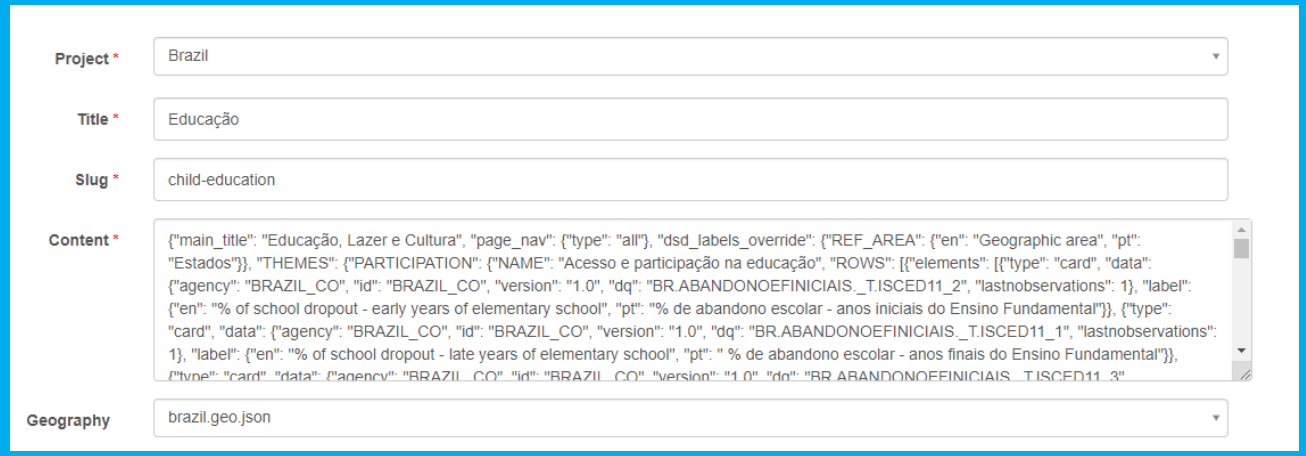


The application’s backend (needs refinement)

- The dashboard is configuration driven
- The backend tool allows to create new projects and pages.
- Configuration files contain the SDMX data query and how to show the returned data (data query + chart type → Render)



Project	Title	Slug	Geography	Created At	Updated At
Brazil	Educação	child-education	brazil.geo.json	2023-03-17 11:26:07	2023-03-17 11:26:07
Brazil	Saúde	health	brazil.geo.json	2023-03-17 13:35:52	2023-03-17 13:35:52
Brazil	Proteção	protection	brazil.geo.json	2023-03-17 13:36:34	2023-03-17 13:36:34
Brazil	Participação eleitoral	elect_part	brazil.geo.json	2023-03-17 13:37:19	2023-03-17 13:37:19



The technology

- Based on well know, widely spread open-source tools and libraries
- Developed using Python and Pandas
- The visualization engine is based on Plotly-Dash (https://plotly.com/)
- Easily extensible to add more chart types (https://plotly.com/python/)

Next steps

- Json is quite easy to understand but we need a more user-friendly interface to configure the dashboard
- Consider SDMX annotations when rendering the blocks

Summary

- An easily extensible engine that “understands” SDMX and renders charts and maps
- Fast to define
- Low maintenance as data is pulled in real-time
- Can live as a stand-alone component or embedded in a “Hosting” page
- Based on well known technologies