

Implementation Strategy

A data-driven implementation strategy which leverages the innovations of the data revolution, balanced with a pragmatic approach to capacity building processes for evidence-based planning

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Data Revolution

In 2016 a High Level Panel appointed by the UN Secretary-General reported:

“Better data and statistics will help governments track progress and make sure their decisions are evidence-based; they can also strengthen accountability. This is not just about governments. International agencies, CSOs and the private sector should be involved. A true **data revolution** would draw on existing and new sources of data to fully integrate statistics into decision making, promote open access to, and use of, data and ensure increased support for statistical systems. ”¹

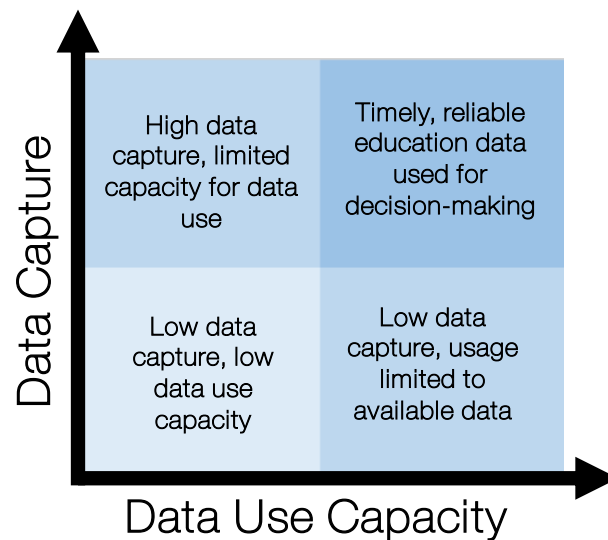
The data revolution is fast-paced, transformative, and pervasive. Expectations are high for the data revolution to respond to the demands for complex development issues to be addressed with better data production and use. There is hope that these rapidly emerging information technologies will promote transparency and accountability. At the centre of this revolution is the fact that timely and reliable data is essential to achieving the 2030 Agenda for Sustainable Development.

Data Revolution and the Education Sector

There are wide-ranging debates about the use of new information technologies in the education sector. At one extreme, there are the techno-enthusiasts with the giddy utopian perspective that technology will ‘fix’ everything. And, at the other extreme, the more conservative education practitioners with a more pragmatic view of how education systems may adapt to technological change, more slowly, one step at a time. The challenge is to find sustainable middle ground between these two extremes, and move ahead with data-driven strategies that are appropriate and effective. While implementing software solutions to

¹ United Nations Secretary General's High Level Panel Report on the Post-2015 Development Agenda, p. 23.

capture and manage education data, it is equally important to build the capacities within the education system to use the data at all levels.



Monitoring Education Indicators

Ministries of Education are mandated to promote system-wide coherence and coordination on sustainable education policies. In so doing, these ministries need to translate the commitment of “ensuring that no one is left behind” into concrete and practical tools for SDG 4 monitoring that fit into the broader context of national education development strategies. This implies to take into account and benefit from existing processes, standards, and tools while, at the same time, breaking from the business-as-usual approaches by harnessing emerging information technology with innovations that transform the capabilities of government entities to address the demands of the 2030 Agenda.

There is a need to link the political commitment to the 2030 Agenda, within the framework of national development plans linked to the technical level of evidence-based education policy monitoring. Many countries have shared concerns on capacity gaps in data and analytics. There is a need to mobilize stakeholders to participate in education indicator monitoring, including national government, local government, civil society, academia, corporates, and research institutions.

OpenEMIS

The OpenEMIS² initiative is designed to build on existing systems, and to gradually improve them with practical solutions, one step at a time. In one country context, the system can be configured to automate the paper-based annual census, while in another country, the system can be configured to monitor the daily progress of individual students: their attendance, behaviour, and performance. In other contexts, it may be used by a ministry to manage human resources. OpenEMIS can be connected to existing data collection tools to provide data analytics to decision-makers for improved education policy monitoring.

There are high expectations that technology-enabled education management information systems (EMIS) will be the key to driving positive changes in the education system. In reality,

² www.openemis.org

a strong EMIS is only part of the solution. The new technology must be supported by new approaches to organizational behaviour and change management. Each level of the education system must be supported with adapted capacity development programmes to be able to effectively manage and use these new IT tools. Feedback loops need to be put in place to ensure that the data is not only produced, but redistributed and in the hands of decision-makers at the right time and place.

Engagement Strategy

The mode of engagement for the development and implementation of tools for education indicator monitoring aims to provide effective and sustainable data management innovations. This is in response to the increasing demand for open data and open source software technologies to leverage global and national investments in data collection for better development outcomes through evidence-based decision support. To be successful and sustainable, the national education system needs to own both the EMIS and the data produced by the system. The open source model underlying OpenEMIS enhances national ownership and control over both the system and the data, while also encouraging national OpenEMIS adaptations and innovations to be shared with other countries.

The aim is to improve public access to nationally owned education data and to improve data literacy through accurate and concise metadata, describing the meaning of education data in clear and simple terms, as well as through the flexible presentation of data to facilitate different kinds of analysis. The objective is to make it easier to discover, analyse and visualize meaningful relationships and patterns in education data sets, with the ultimate goal of improving planning, policy formulation and decision-making.

Development Strategy

The strategy is to embrace a collaborative approach of open source software development of tools for education indicator monitoring. Under this software development methodology, the source code will be available under open source license to analyze, change and improve its design over time. The prevailing sentiment of this methodology is one of optimism and transparency: the hope and promise that when communities of users and developers from all around the world work together, there will be measurable improvements in evidence-based action for the benefit of all of society.

The strategy is for the development of education indicator monitoring tools to be distributed under an open source software license in order to:

- Ensure that all contributions to the development of the tools are consistent with the overall requirements of national development needs and UN global monitoring requirements, particularly the need to monitor disaggregated education indicator data;
- Ensure that investments made in software development and enhancements are shared with all countries using these monitoring tools;
- Provide full ownership of the software to each country opting to use the tools for education monitoring;
- Provide a mechanism for oversight and guidance of the software design process with the flexibility for countries to add customized modules while maintaining global standards for common data reporting, under the Open Source Common Development and Distribution License³, which ensures all contributions to the system will be shared with all countries using the system.

³ See <http://opensource.org/licenses/CDDL-1.0>

This strategy for the development of education monitoring tools provides an efficient model for countries to share the costs of the development of the modules of the system among all stakeholders of the system. When one country or donor develops a new feature or module for the system, the new software will be reviewed, tested and if appropriate, integrated into the system such that all countries may benefit at no additional cost.

Implementation Principles

The key underlying implementation principles of the system are:

- An evidence-based approach which uses reliable data to inform human development planning and policy-decision processes through the strengthening of existing national information systems;
- National leadership with full participation and engagement of national and global stakeholders in diagnosis, formulation and implementation sector-wide education frameworks;
- Alignment of SDG 4 monitoring within the overall national and global development goals and objectives, such as national development plans;
- Technical assistance provided to countries, as needed, in developing effective and robust information systems and data collection tools, through the use of open source, generic and cost-effective IT tools;
- Interoperability of OpenEMIS with other government databases to enable the secure exchange of key information across different systems, such as linking with the civil registry database to ensure the validity of personal information, as well as identify potential out-of-school children;
- Support the transition from traditional one-way data reporting from education institutions toward one that: (i) strengthens the capacity of education institutions to manage and use their own data, and (ii) facilitates two-way communication and information exchange, such as between education institutions and regional education authorities;
- An exit strategy which results in a sustainable, government-owned education monitoring system integrated with robust decision-support, and with the management of the system transferred to key government departments without dependencies on external technical support.

Integration Strategy

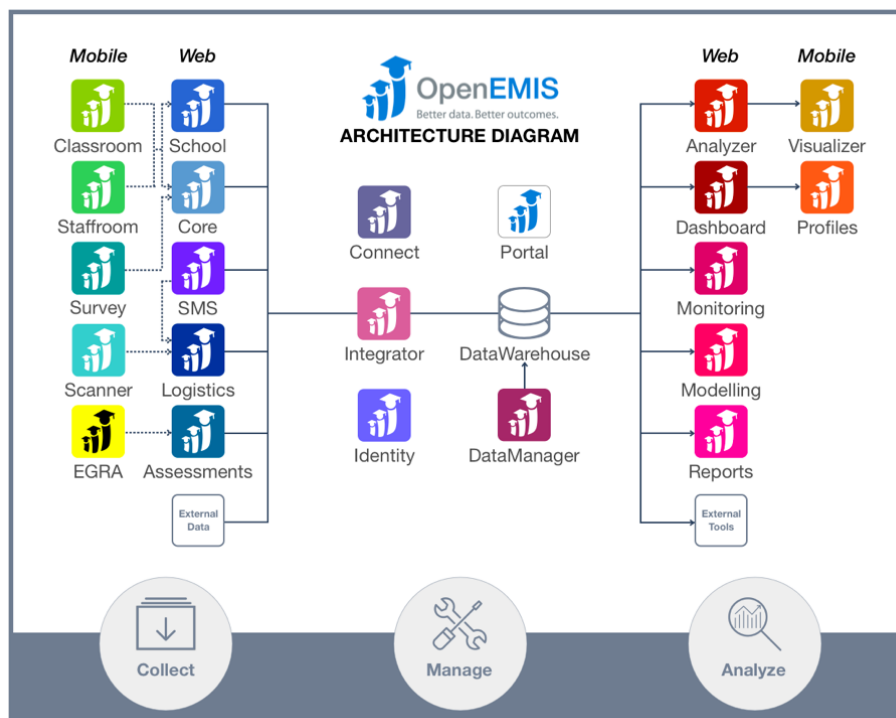
OpenEMIS has been designed as a loosely coupled, tightly integrated suite of applications, to be deployed to meet the needs of the Education Authority. OpenEMIS has a number of applications that can be collectively or independently integrated into an existing EMIS. The **OpenEMIS Analyzer** and **OpenEMIS Dashboard** applications can be used to extract data from an existing EMIS to generate a data dashboard with tables, graphs and maps. The **OpenEMIS Monitoring** application can be used to track progress against the goals and objectives of the national education development plan – drawing from indicators produced from the EMIS.

OpenEMIS can be adapted to country-specific contexts, requirements, and available ICT infrastructure, for example:

- In countries where data collection is largely **paper-based**, OpenEMIS can facilitate the process of digitization of paper-based data collected from schools at different administrative levels, as well as facilitate and improve the processes of data integration, aggregation, reporting, visualization and analysis.
- In countries seeking to gradually **transition to electronic data collection** from education institutions, OpenEMIS can facilitate this process through a hybrid solution

of offline and cloud-based data collection and management, while still benefiting from OpenEMIS data analytics.

- In countries with an **existing cloud-based EMIS** which collects detailed information from education institutions, individual OpenEMIS modules can be integrated with the existing EMIS to complement existing functionality. Solutions provided by OpenEMIS modules include identification of out-of-school children by cross-checking enrolment records with other government databases, monitoring of children at risk of dropping out, administration and management functions for education institutions, human resources management including teacher professional development, automated generation of national and SDG 4 indicators, tracking of textbook deliveries, monitoring of inclusive education, and automated generation of dashboards and visualizations. Inclusion in the OpenEMIS network also has the added benefit of access to updates (new modules and innovations), which are made available for free.
- In countries with a fragmented information system, consisting of a collection of databases in different ministries or education levels, OpenEMIS can offer a powerful solution for integration of sub-sector monitoring frameworks into a common reference framework, allowing for sector-wide approaches in strategic planning and management of the education sector.



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