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DHIS2 and e-TB Manager Interoperability: Creating a Stronger Digital Health System in Bangladesh

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INTRODUCTION

Having necessary health data available at every level of the health system contributes to better decision making, which ultimately leads to better health outcomes. In recent years, many activities, investments, and digital innovations have been adopted to strengthen the health information system (HIS) in Bangladesh. The transition from paper-based to electronic reporting has generated significant interest among stakeholders and created opportunities for innovation in the health sector.¹ As part of this digital evolution, the Ministry of Health and Family Welfare (MOHFW) introduced the District Health Information System–version 2 (DHIS2) as the national HIS platform in 2009 and has been using it since 2011. This has guided other vertical programs to adopt it for their data management and reporting purposes. However, ensuring the compatibility of different data systems to link with the national HIS tool through an interoperability framework and bringing synergy among them in adherence to health data standards is challenging.

The MOHFW and the US Agency for International Development (USAID)-funded Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program believe that interoperability can strengthen the HIS by reducing paperwork and reporting time, enhancing the quality and use of data, and ultimately cutting financial costs. However, the MOHFW faces significant barriers in leveraging the right solutions to ensure interoperability for existing digital health initiatives and data systems in Bangladesh. Integration is a complex process and requires significant time, cost, and attention to the potential challenges to maximize its benefits.

Interoperability is the ability of different information systems to communicate, exchange data, and use the information that has been exchanged. Today, interoperability is not just a common buzzword. It is a holistic concept deeply embedded in efficient implementation efforts of digital health initiatives in low- and middle-income countries.

BACKGROUND

In 2015, at the request of the Directorate General of Health Services (DGHS), SIAPS, which is implemented by Management Sciences for Health (MSH), undertook a comprehensive mapping exercise of the existing HIS tools in the country (e.g., DHIS2, Supply Chain Management Portal, e-TB Manager) to review their scopes and performances and explore opportunities to integrate/link the tools to improve efficiency. The assessment included a deep dive into the DHIS2 platform to assess the system's capacity, robustness, data security, and interoperability and strongly recommended that the country continue using DHIS2 for data aggregation, analysis, and reporting, with a caution that overload of individual patient data should be avoided.²

This recommendation triggered a thoughtful consideration to integrate the standalone [e-TB Manager](#) with DHIS2 so that patient summary data become available through DHIS2 for indicator reporting and decision making.

A QUICK LOOK AT DHIS2 AND E-TB MANAGER

DHIS2

DHIS2 is an open source platform that collects and stores aggregated summary data on a monthly basis from a wide range of health systems across the nation; it also generates reports. The Management Information System (MIS) unit of the DGHS introduced DHIS2 in hospitals and health offices from the national to the subdistrict level. The MIS unit also established a national data warehouse to streamline the vertical data repository silos through an interoperable and standardized framework. DHIS2 is firmly established in the DGHS. The data have become more comprehensive and readily available for use, and the quality of data has improved. A set of

dashboards is being developed in the DHIS2 system with the easy-to-use integrated tools for managers and planners at the different levels to monitor and evaluate their health program as well as improve health service delivery.

e-TB Manager

e-TB Manager is a web-based patient management tool that captures data across all aspects of TB control and management, including information on presumptive and confirmed patients, medicines, laboratory testing, diagnosis, treatment, and outcomes.³ The National Tuberculosis Control Program (NTP) has been using e-TB Manager since 2010. It is currently being used in 218 of the 488 subdistricts in the country, including all multidrug-resistant TB sites in Bangladesh, and has a database of 258,596 individual cases (as of July 17, 2017).

THE SIAPS APPROACH IN DEVELOPING INTEROPERABILITY FOR DHIS2 AND E-TB MANAGER

To confirm that DHIS2 and e-TB Manager are interoperable, SIAPS collaborated with HISP Bangladesh on a master facility and data structure mapping for these systems. The tools were linked appropriately, and interoperability was developed through a standard web application programming interface using hypertext transfer protocol to ensure data flow from one to another. This followed a standard integrated health information architectural framework (figure 1) that allows the NTP to push summary data from e-TB Manager to DHIS2 and generate World Health Organization-approved quarterly reports on case findings of TB (TB10), treatment results of TB patients registered 12 to 15 months earlier (TB11), and sputum conversion of pulmonary TB patients at 2 to 3 months who were registered 3 to 6 months earlier (TB12).

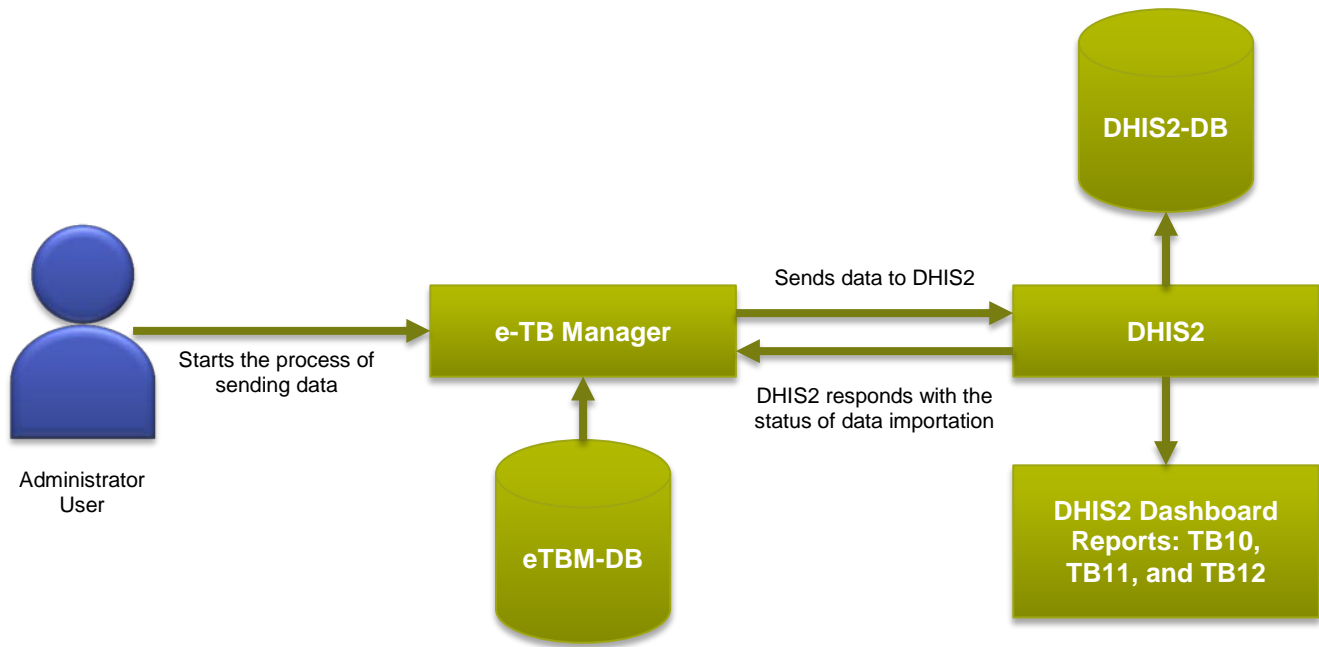


Figure 1. Architectural structure of the e-TB Manager to DHIS2 data flow

After the interoperability feature was added, the NTP joined SIAPS and the USAID-funded Challenge TB Program (also implemented by MSH) to test and roll-out DHIS2 nationally for TB reporting.

CONCLUSION

The MOHFW and SIAPS are staying on top of the changing landscape of interoperability through careful planning and smart partnerships and are confident that digital innovations could pave the way for a reliable and secure transfer of data. This high-demand interoperability will guide the MOHFW to foster efficiency, data transparency, utilization, and accountability. As the quality of this data utilization improves, so too will the quality and coordination of patient care. DHIS2 is now

embracing an overarching platform that can aggregate information from contrasting systems like e-TB Manager and integrate the data so it can be accessed by both data producers and users.

¹ Khan MAH, Ferdous J, Sayem ASM, Kibria MG, Talukder L, Parvez MM, Anwar I. 2017. HIS Revolution in Bangladesh: A Journey from Data to Decision.

² Steen A, Kabir MH, Kibria M, Duarte K, 2015. Bangladesh Health Information Systems Mapping Analysis. Submitted to the US Agency for International Development by the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. Arlington, VA: Management Sciences for Health.

³ Kibria MG, Zahedul I. August 2016. Implementation of an Electronic Recording and Reporting Tool in the National Tuberculosis Control Program in Bangladesh: Way Forward Towards Sustainability. Submitted to the US Agency for International Development by the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. Arlington, VA: Management Sciences for Health.

ABOUT SIAPS | The Systems for Improved Access to Pharmaceuticals and Services (SIAPS) program works to assure access to quality pharmaceutical products and effective pharmaceutical services through systems-strengthening approaches to achieve positive and lasting health outcomes. SIAPS is funded by the US Agency for International Development (USAID) and is implemented by Management Sciences of Health.

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