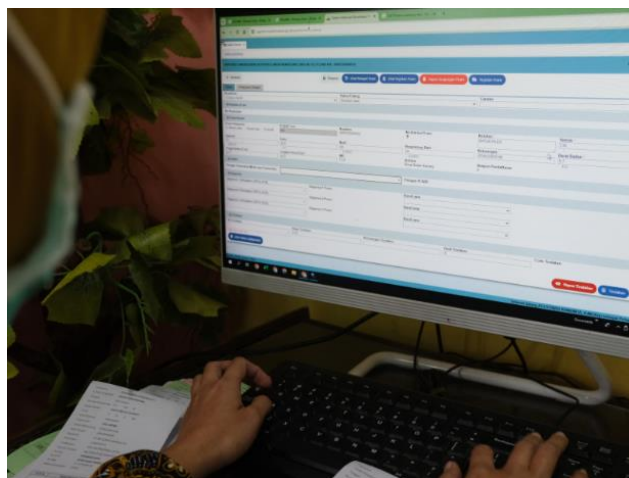


Easing health workers' data entry burden using an interoperability mediator in Indonesia

Background

To contribute toward improving the quality of health services, the Ministry of Health of the Republic of Indonesia embarked on its [digital health transformation](#) in 2021. At the center of this transformation is SATUSEHAT, a standards-based data exchange and analysis platform that improves access and availability of health data at all levels of Indonesia's health system. The SATUSEHAT platform enables data exchange among health applications across different health program areas to ensure that policy makers, managers, health workers, and individuals have the health data they need to support quality health services.

As part of Indonesia's digital health transformation, the MOH is requiring that health facilities use electronic medical records (EMR) at all health facilities in the country. While EMR has benefits, health workers found themselves entering the same data into different health information systems (HIS) for specific health programs (like TB and maternal and newborn health) at national, provincial, and district levels. This resulted in valuable time that should be spent with patients being spent on redundant data entry—requiring extra effort and taking time away from patient care.



A health worker completes data entry in the health facility's Electronic Medical Record (EMR).
Photo credit: Dwi Prafitria, JSI

Country Health Information Systems and Data Use (CHISU) is USAID's flagship data and information systems program aimed at strengthening host country capacity and leadership to manage and to use health information systems to improve evidence-based decision-making. www.chisuprogram.org

Human resources for information and technology specialists in the health sector are limited, and while SATUSEHAT was developed to address this issue, the workload is going to increase before it can decrease. This is because the platform requires that data from these applications conform to a newer interoperability standard called Fast Healthcare Interoperability Resource (FHIR), which HIS specialists have to apply to connect with SATUSEHAT.

USAID's Country Health Information Systems and Data Use (CHISU) program has worked closely with the MOH's Center for Data and Information and Technology (PUSDATIN) and Digital Transformation Office (DTO) to develop an interoperability mediator for SATUSEHAT. The interoperability mediator transforms the data received from the participating systems into the FHIR format, which can then be processed by SATUSEHAT—allowing health facilities to send data from their EMR to the SATUSEHAT platform. It also serves as a mechanism for health information systems dedicated to specific health programs to connect to SATUSEHAT to receive their data, which reduces the time health workers spend on data entry and improves data quality.

Steps Taken

To develop the SATUSEHAT interoperability mediator, CHISU established a process to ensure engagement of subject matter experts, policy and regulation bodies, system users, and information technology staff.

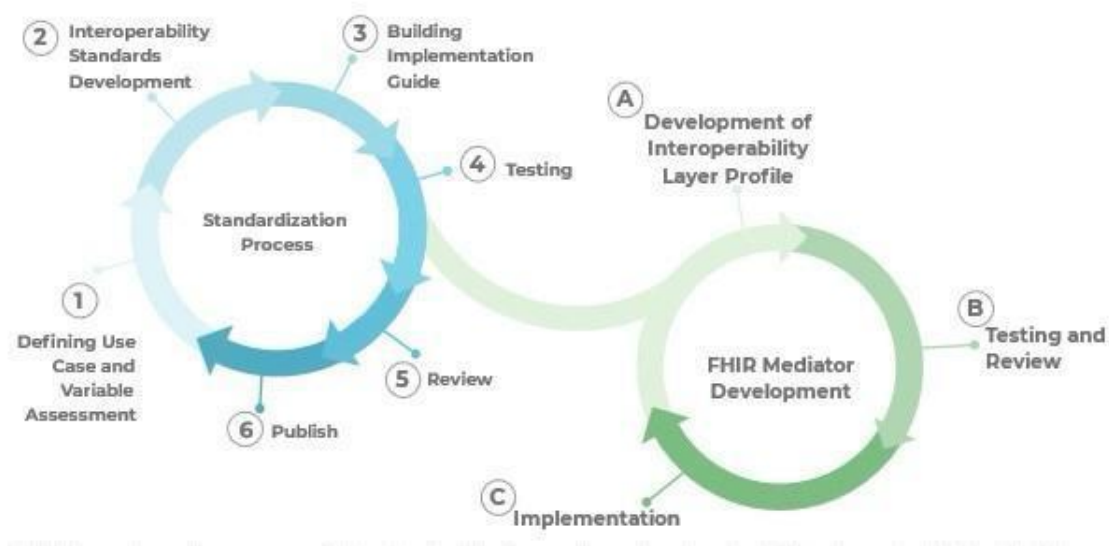


Figure 1. This figure shows the process of data standardization and how the standards are implemented in the mediator.

Figure 1 shows how CHISU worked with the various stakeholders to define the use case, data standard, and documentation. The mediator was then developed following these steps:

1. Development of an interoperability layer profile

We first developed program code tailored to the function and procedure for each health program, such as TB and antenatal care (ANC). This interoperability layer profile translates the health program format into the standard FHIR format used by SATUSEHAT—enabling interoperability among health facilities’ EMRs, SATUSEHAT, and other national health programs’ information systems. We also developed unit tests for each component to ensure the output produces the required data.

2. Testing and review

The interoperability layer profile needed to be tested for performance, security vulnerabilities, and usability. In this step, we conducted end-to-end testing, which is a comprehensive test carried out onsite according to the health system’s actual reporting flow. This includes load (performance) and security testing. The tests provided information to further improve the interoperability layer profile so that the health facilities’ EMR could use it subnationally.



CHISU staff guide a health worker during onsite interoperability mediator testing at one of the health facilities. Photo credit: Dwi Prafitria, JSI

3. Implementation

Implementation included guiding, monitoring, and evaluating the interoperability layer profile, including improving the existing health program modules in the profile. Through this process, CHISU, PUSDATIN, and the Directorate of Disease Prevention and Control (P2PM)’s National Tuberculosis Program (NTP) developed and piloted the SATUSEHAT interoperability mediator. This pilot focused on use of the SATUSEHAT interoperability mediator as a bridge transforming data from these health facilities’ EMR into a standardized format used by SATUSEHAT that allows data exchange between the information systems. Once connected to the mediator, health workers can input data on a person with TB symptoms solely into the EMR, and then the mediator standardizes and automatically sends the data to SITB and SATUSEHAT. This streamlined approach covers data recording for people with presumed TB and will subsequently encompass laboratory tests and treatment outcomes.

Results + Next Steps

Using the three-step process, PUSDATIN and P2PM (in collaboration with CHISU) completed the SATUSEHAT interoperability mediator. The head of PUSDATIN, Tiomaida Seviana, stated that the mediator helps to strengthen interoperability at national and subnational levels.

“The mediator acts as a transition mechanism for existing applications and simplifies them to connect to SATUSEHAT, which is one of the most crucial points in digital health transformation,” said Seviana. “We hope this event can be the beginning of concrete actions to strengthen standardization, interoperability, and data analysis at both national and subnational levels.”

Now, the SATUSEHAT interoperability mediator supports the process of sending data from the health facilities’ EMR to SATUSEHAT and SITB in a faster and more efficient manner.

“The SATUSEHAT interoperability mediator benefits us in data entry because, with only one-time entry to the EMR, the data is sent to both SATUSEHAT and SITB,” said Ibu Novi Kusri, TB Program Manager, District Health Office Jombang. “It also helps us retrieve the necessary data, thus eliminating the possibility of missing data. This is very important as we need the correct data to determine the next action plan and decision making.”

The SATUSEHAT interoperability mediator has had immediate impact by improving tracking of presumed TB cases and reducing the data entry burden for health workers. Health workers now only need to enter TB-related data in the health facility EMR for the data to be simultaneously sent to SATUSEHAT and SITB—reducing their data entry burden and improving data availability.

Interoperability has reduced the amount of time health workers spend on data entry by up to **51 percent**, from **8 minutes and 48 seconds** to **4 minutes and 21 seconds**, which allows them to have more time to provide essential health services.

While the initial use of the mediator focused on TB data, the SATUSEHAT interoperability mediator can now be expanded to include data from other health programs captured in the health facility EMR. The longer-term vision is to scale up use of the mediator nationwide and expand interoperability to include laboratory tests and, eventually, treatment outcomes for all health areas.



The launch of the SATUSEHAT interoperability mediator in Jombang District, East Java on March 8, 2024, which was attended by Tiomaida Seviana, Head of PUSDATIN; Agus Rahmanto, Deputy Chief DTO; and Stephanie Watson-Grant, CHISU Deputy Project Director. Photo credit: Dwi Prafitria, JSI



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