

Automated Health Information Systems Interoperability Maturity Assessment Tool

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Executive Summary

In 2017, ICF worked under MEASURE Evaluation to develop a health information systems (HIS) interoperability maturity toolkit. The toolkit comprises an HIS maturity model, a maturity model assessment tool, and a users' guide. The maturity model concept is used to measure the ability of an organization or government entity, such as a ministry of health (MOH), to continuously improve in a specific discipline until it reaches the desired maturity. The toolkit was developed collaboratively with the Digital Health and Interoperability (DH&I) working group of the Health Data Collaborative (HDC). The toolkit is now available in hardcopy format for use by countries. DH&I working group members and MEASURE Evaluation expect the toolkit to be routinely reviewed and updated based on recommendations from users. Although the toolkit provides valuable data to help countries strengthen their HIS, the hardcopy format can be cumbersome to use, and assessment results may not be consistent across countries. For example, different people in the same assessment may answer the questions differently, data analysis may be time consuming or erroneous, and it may be difficult to compare results between rounds of assessments. To ease the process of assessment, data analysis, and presentation, and to promote consistent assessment approaches across users and countries, there is a need to automate the assessment tool. ICF is proposing to convert the maturity model and assessment tool into a free, downloadable application that users can use to enter data (responses) during the assessment. The application will then collate the responses and produce a color-coded results dashboard. This output will simplify the results interpretation, thereby setting the stage for action-planning.

Consortium

ICF was the lead partner in the development of the HIS interoperability maturity toolkit, which provides the foundation on which this product will be built. ICF proposes to work collaboratively with the DH&I working group to ensure that the process benefits from a wide spectrum of country representatives, donors, and international development organizations who are members of the working group. ICF is uniquely positioned to lead this product development because it is part of the MEASURE Evaluation team responsible for maintaining the HIS interoperability maturity toolkit. ICF has extensive experience in helping the governments of low- and middle-income countries (LMICs) implement and standardize their national HIS, particularly through work on routine health management systems such as DHIS 2.

Project Description

HIS Interoperability

HIS in LMICs is characterized by disparate information systems that limit the generation of sufficient and quality data for decision makers. The many fragmented information systems collect data to support specific health programs or services. Decision makers would benefit immensely from data collected through these systems to support their decision making process, but the current systems and practices fall short.

Because of their fragmented nature, these systems cannot effectively exchange data or be harnessed to realize the benefits for which the data were collected. Due to the lack of efficient data management processes, data collection, consolidation, and reconciliation become expensive and laborious. This results in poor data quality and reliability. For example, one piece of data is collected multiple times by different people and fed into different disjointed information systems. But this problem is not entirely a computer systems issue. It stems from the inability of

organizations and individuals to come together and develop standards on which to exchange and use the data they generate. To achieve this, organizations and individuals need an appropriate governance mechanism and agreed-upon rules for data collection and exchange. The right number of staff with the right skills are needed to sustain this process. Only after governance and human resources issues have been resolved can technology be meaningfully deployed to promote the goals of HIS interoperability.

HIS Interoperability Maturity Toolkit

Against this backdrop, MEASURE Evaluation, in collaboration with the World Health Organization's HDC, developed an HIS interoperability maturity toolkit. This toolkit was developed in 2017 and comprises a maturity model, an assessment tool, and a users' guide.

The maturity model concept is used to measure the ability of an organization or government entity, such as an MOH, to continuously improve in a specific discipline until it reaches the desired level of development or maturity.[1] The greater the maturity, the stronger the system and the more likely it is to withstand interruptions, such as changes in staff, fluctuations in funds, changing data needs, or the effects of rapidly evolving technology. The HIS interoperability maturity model addresses the components that are critical to interoperability: technology, leadership and governance of the HIS, and human resources

The HIS interoperability maturity toolkit is designed for ministries of health, their implementing partners, and other stakeholders to identify the key domains for interoperability and levels of maturity that they aspire to reach. This toolkit is now available to countries for use, and several of them have shown enthusiasm in applying it, including Kenya, Tanzania, Ethiopia, and Ghana. DH&I members also support the toolkit. Some partners are already starting to build additional toolkit components. Wide adoption of this open-source toolkit and a growing global community of practice behind the tool are early signs of transforming this toolkit into a global public good.

MEASURE Evaluation, in collaboration with the HDC, has developed an HIS interoperability maturity toolkit for countries in low-resource settings:

- To identify the domains and subdomains for HIS interoperability and stages of their development toward maturity
- To assess and understand where they are on the path to interoperability of their HIS
- To use the results of the assessment to plan, prioritize, and coordinate resources for the support of a strong, responsive, and sustainable national HIS
- To monitor, evaluate, and report on all or individual components of HIS interoperability

MEASURE Evaluation (2017) HIS Interoperability Toolkit Users' Guide

Interoperability Assessment Tool

As stated above, one of the components of the HIS interoperability maturity toolkit is the assessment tool. The assessment tool contains a list of questions for measuring the status of each of the subdomains and domains of interoperability of HIS. The objective of the assessment tool is to measure the readiness of an HIS for interoperability by measuring various critical subdomains and domains. Countries can use results from this assessment to plan for the implementation of HIS activities, which can help them achieve a strong and interoperable national HIS.

The toolkit can be downloaded and printed for use from <https://www.measureevaluation.org/resources/tools/health-information-systems-interopability-toolkit>.

Interoperability Assessment Tool Automation

To improve the ease of conducting the assessments and analyzing the results, ICF proposes to automate the assessment tool and make it electronically available for download. An automated tool will reduce errors inherent in paper forms by building skip-patterns. Automation will help ensure consistency of assessment across users and countries. The automated tool should be downloadable and usable on computers or mobile devices as a public good. Users can then enter responses to the questions into the automated tool in real-time, and after completing the assessment, the system would generate results by each of the subdomains, domains, and overall for the country.

Results would be packaged in an easy-to-understand format, preferably using color-coding techniques to show areas in which the country is strong, areas that need marginal improvement, and areas that need increased focus. Over time, there will be a community of practice that can further adapt the tool to meet the unique needs of countries or programs and train users.

ICF and Collaborators

ICF is a partner in MEASURE Evaluation and was heavily involved in the development of the HIS interoperability maturity toolkit. ICF worked with MEASURE Evaluation partners and engaged Kenya and Ghana HIS stakeholders to ensure that the content, context, and format of the toolkit was suitable for LMICs. In addition, the toolkit development was a joint deliverable with the DH&I working group of the HDC. We plan to work with the HDC at every stage of the development process for the automated assessment tool. The HDC brings together a wide array of countries, donors, and international development organizations. ICF is a strong proponent of the nine Principles for Digital Development^[2] and will adhere to those principles in developing this digital product. Among the prime principles expected to be followed in this product development are Designing with the User, Being Collaborative, Building for Sustainability, and Ensuring Privacy and Security.

[1] Carvalho, J.V., Rocha, A., & Abreu, A. (2016). Maturity models of healthcare information systems and technologies: A literature review. *Journal of Medical Systems*, 40 (6), 131. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/27083575>.

[2] The Principles for Digital Development (<https://digitalprinciples.org/>) are nine “living” guidelines designed to help digital development practitioners integrate established best practices into technology-enabled programs.