

ABSTRACT

Syntactic interoperability data standards are vital for the seamless exchange and effective utilization of healthcare information within contemporary health systems. This study focuses on contextualizing these standards to advance digital healthcare in Uganda, aligning with the World Health Organization's (WHO) strategic framework for 2020-2025. This framework aims to overcome gaps across six building blocks to achieve the Sustainable Development Goal of good health and well-being by enhancing health information systems for improved patient care continuity. Contextualized syntactic interoperability standards are essential for ensuring that patient data is consistently collected, processed, shared, and stored in compatible formats, thereby facilitating interoperability across diverse healthcare environments.

Uganda's healthcare system faces unique challenges that impede effective health data utilization, such as the absence of standardized data formats, inadequate technical infrastructure, and insufficient data governance policies. Additional barriers include a shortage of skilled personnel, a weak data use culture, limited resources, poor data quality, complacency, limited political will, and inadequate leadership. Existing data interoperability standards, which are predominantly designed for developed countries, often fail to address Uganda's specific needs due to differing levels of health information management maturity.

This study addresses a critical literature gap by presenting a pragmatic approach to contextualizing syntactic interoperability data standards specifically for Uganda, contrasting with successful contextualizations in other countries. A systematic three-phase methodology was employed: First, a descriptive cross-sectional survey identified essential Health Information Exchange (HIE) standards using Design Science Research (DSR) methodologies, including brainstorming, systems review, and literature review. Second, standards were developed based on these requirements, covering areas such as patient identification, health information exchange registries, medical imaging management, system digitization, security, privacy, and capacity building. Third, these standards underwent rigorous face-validation by technical experts from the Ministry of Health's digital health technical working group, ensuring their relevance to Uganda's context.

Validated standards were reviewed by digital health stakeholders using a tool developed by HIIRETWG to assess their relevance and usability. Aligning with global frameworks, the contextualized standards aim to enhance data use, improve patient care, support innovation, and strengthen the efficiency and interoperability of Uganda's healthcare system.