

ABSTRACT

Digital Health (DH) has the potential to transform healthcare in Low- and Middle-Income Countries (LMICs) like Uganda by improving access, enhancing security, and reducing costs. Despite this promise, Uganda's health system faces numerous DH challenges, including fragmentation, duplication of efforts, lack of interoperability among systems, and concerns regarding data security and privacy. These challenges can partly be attributed to lack of a standardised DH ecosystem. Enterprise Architecture (EA), which promotes a systems-thinking approach to digitalisation, is a vital approach to standardisation. Thus, the main goal of this study was to leverage the EA approach to facilitate the standardisation of DH across Uganda's health system. It focused on four objectives: (1) *determining the EA approach and framework that is applicable to standardise the DH ecosystem across Uganda's health system*, (2) *establishing the EA requirements for standardising the DH ecosystem across Uganda's health system*, (3) *designing an EA framework to facilitate the standardisation of the DH ecosystem across Uganda's health system*, and (4) *validating the designed framework*. The study adopted a pragmatism research paradigm and utilised the Design Science Research methodology to create a Digital Health Enterprise Architecture Framework (DHEAF), anchored on TOGAF 9.2 and aligned with the WHO-ITU eHealth model. A landscape analysis of Uganda's DH ecosystem identified key issues related to governance, human resources, data quality, system interoperability, and infrastructure, which led to the derivation of 58 EA requirements. These requirements were validated by DH stakeholders in Uganda's health system and over 85% affirmed their relevance and importance in guiding the development of an EA framework for DH. The DHEAF was designed and refined through three stakeholder workshops using the Delphi technique, involving Enterprise Architects, ICT specialists, Policymakers, DH practitioners, and Health informaticians. Validation by this diverse group confirmed that over 80% viewed DHEAF as comprehensive, adaptable, and user-friendly, capable of standardising DH interventions across Uganda's health system. The DHEAF shows promise for broader application in similar LMIC contexts. Future research should explore integrating emerging technologies such as Artificial Intelligence (AI), Machine Learning (ML), and the Internet of Things (IoT). Additionally, studies should examine the impact of DHEAF on health policies and regulations in Uganda and develop policy recommendations to support its adoption and implementation.