

SYNOPSIS

**STRENGTHENING IMMUNIZATION SYSTEMS: EVALUATING ANMOL 2.0 AND
DIGITAL HEALTH INTEGRATION IN INDIA**

Dissertation submitted to



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Proposed Title: Strengthening Digital Immunization Ecosystem: A Study On Health System Integration and Data Interoperability in Anmol 2.0

(a) Introduction

India's healthcare system is undergoing a digital transformation aimed at improving the delivery and monitoring of public health services. ANMOL 2.0, a mobile application under the National Health Mission (NHM), allows Auxiliary Nurse Midwives (ANMs) to register and track immunization and maternal-child health data at the point of care. Despite its promise, ANMOL functions in parallel with other digital platforms such as the RCH Portal, MCTS, HMIS, and the newer Ayushman Bharat Digital Mission (ABDM), resulting in disconnected systems. This lack of integration limits the potential for real-time data use, continuity of care, and comprehensive reporting.

(b) Review of Literature

Scholarly research emphasizes the importance of interoperable health systems to improve patient tracking, data quality, and policy planning. Countries like Estonia and the USA have demonstrated how standardized platforms can enable integrated care. In India, while national frameworks like the National Digital Health Blueprint (NDHB) and ABDM have laid the groundwork, implementation challenges persist. Literature also points to the need for common data standards such as HL7 FHIR and robust governance models to bridge gaps between digital health platforms.

(c) Theoretical/Conceptual Framework

This study draws on two key frameworks:

- WHO Health System Building Blocks, particularly the 'health information system' component.
- Interoperability Maturity Model, which assesses levels of technical, organizational, and semantic alignment between systems.

These frameworks help analyze how effectively ANMOL communicates with other digital health tools and where improvements are needed.

(d) Research Gap

While India has launched several initiatives to digitize health services, there is limited empirical research on how ANMOL 2.0 interfaces with other platforms like HMIS and

ABDM in everyday use. Gaps also exist in understanding how frontline users, such as ANMs, interact with these systems and the implications of partial or non-existent integration.

(e) Research Questions

1. To what extent does ANMOL 2.0 integrate with RCH Portal, HMIS, MCTS, and ABDM?
2. What are the operational and technical barriers to seamless data exchange?
3. How does the current level of interoperability affect immunization reporting and service delivery?
4. What role can ABHA IDs and QR-based identifiers play in improving system linkage?

(f) Research Objectives

- Examine the current state of data linkage between ANMOL 2.0 and national health databases.
- Identify technical, administrative, and infrastructural issues affecting interoperability.
- Explore the potential for integrating ABHA IDs into immunization workflows.
- Recommend scalable solutions to improve data exchange and system efficiency.

(g) Methodology

Design: Qualitative case study

Data Sources:

- In-depth interviews with ANMs, data officers, and health IT personnel
- Observational visits to health facilities
- Review of policy documents and system manuals

Instruments: Semi-structured interview guides, data flow diagrams

Analysis: Thematic coding and system mapping

Stakeholder Engagement & Data Collection Strategy

To capture ground-level insights on the usage, integration, and challenges associated with ANMOL 2.0, a structured stakeholder questionnaire was developed. The questionnaire comprises ten focused questions designed for frontline health workers, including Auxiliary Nurse Midwives (ANMs), Medical Officers in Charge (MOICs), and data entry operators. These questions explore system usability, interoperability awareness, technical

barriers, ABHA ID integration, and suggestions for improvement. Responses from stakeholders across five health blocks (Burhanpur, Nimbola, Shahpur, Nepanagar, and Khaknar) will be thematically analysed to identify patterns and inform evidence-based recommendations. This field-based approach enriches the study with real-world perspectives that complement the policy and system review.

(h) Plan of Analysis

Collected data will be analysed using qualitative thematic analysis. System integration diagrams will be developed to visualize data flows and identify bottlenecks or redundancies. A SWOT analysis will also be conducted to evaluate the operational readiness and future integration potential of ANMOL with ABDM.

(i) Tentative Chapter Plan

1. Introduction – Context, rationale, and problem statement
2. Overview of ANMOL 2.0 and Related Platforms
3. Literature Review – Global and Indian perspectives on HIS integration
4. Theoretical Framework and Research Gap
5. Research Methodology
6. System Architecture and Data Flow Mapping
7. Field Insights and Data Analysis
8. Discussion and Comparative Analysis
9. Recommendations for Policy and Practice
10. Conclusion – Summary and future directions
11. References and Annexures

Conclusion

The integration of ANMOL 2.0 with national digital health systems like HMIS, RCH Portal, MCTS, and ABDM holds significant promise for enhancing India's immunization infrastructure. Streamlined data interoperability can eliminate redundancies, ensure real-time service tracking, and support data-driven decision-making at all levels of the health system. This study will provide insights into current integration levels, identify existing gaps, and suggest feasible strategies to improve the alignment of ANMOL with India's evolving digital health ecosystem.

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