SUMMER INTERNSHIP REPORT

AT

Society for Health Information Systems Programmes (HISP India)

(MAY 2ND TO JUNE 30TH, 2025)

REPORT BY

Ankita Dixit (PG/24/016)

Post Graduate Diploma in Hospital and Health Management

2024-2026



International Institute of Health Management Research, New Delhi

Certificate of Approval

The Summer Internship Project titled **"Understanding Public Health Informatics through the Design and Implementation of the Philippines Multisectoral Nutrition Information System (PMNP-IS)"** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a pre-requisite for the award of **Post Graduate Diploma in Health and Hospital Management** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed, or conclusion drawn therein but approve the report only for the purpose it is submitted.

Dr. Ratika Samtani
Assistant Professor
IIHMR, Delhi

FEEDBACK FORM
(Organization Supervisor)

Name of the Student: ANKITA DIXIT

Summer Internship Institution: HISP INDIA

Area of Summer Internship: Public Health Informatics, Open-source software design, development and implementation

Attendance: 100%

Objectives met: Ankita was able to complete the DHIS2 fundamental courses, and also helped in project customisation for PMNP and other DHIS2 projects.

Deliverables:

- Customisation of DHIS2 for PMNP project.
- Supported customisation for Myanmar Birth and Death Registry.

Strengths:

- Attention to detail, dedicated and sincere towards the assignments.

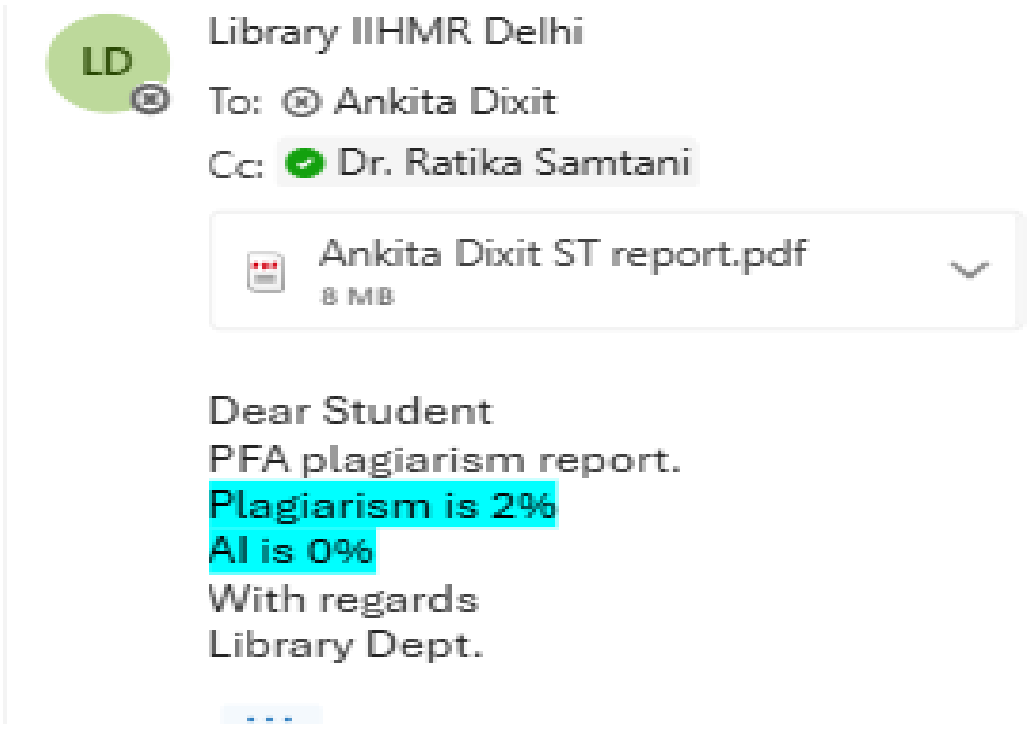
Suggestions for Improvement:

- Work towards improving technical documentation and implement learnings in real-life settings

Deepika
Signature of the Officer-in-Charge (Internship)

Date: 30/06/2025
Place: HISP, India

Deepika Singh


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FEEDBACK FORM

(IIHMR MENTOR)

Name of the Student: ANKITA DIXIT

Summer Internship Institution: HISP INDIA

Area of Summer Internship: Public Health Informatics, Software design & development & Implementation

Attendance: 100%

Objectives met: completed DHIS2 fundamental Academy courses
- Helped in Project customization for PMNP, PLAN Int'l & Myanmar Death Registry.

Deliverables:
- user Requirements Specification
- Metadata Management
- Project Planning
- System Set-up
- Data Exchange
- user support

Strengths:
~ Literature Review, Document Synthesis.
~ Research and project planning management.

Suggestions for Improvement:

—

Dr. Ratika Samtani
Signature of the Officer-in-Charge (Internship)

HISP INDIA SOCIETY FOR HEALTH INFORMATION SYSTEMS PROGRAMMES

SUMMER INTERNSHIP COMPLETION CERTIFICATE

The certificate is awarded to

Ankita Dixit

In recognition of having successfully completed his/her Internship
in the department of

Implementation

and has successfully completed his/her Project on

"Understanding Public Health Informatics through the Design and Implementation of the Philippines Multisectoral Nutrition Information System (PMNP-IS)"

Date **:- 2nd May 2025 to 30th June 2025**

Organisation **Society For Health Information Systems Programmes (HISP) India**

He/She comes across as a committed, sincere & diligent person who has a strong drive & zeal for learning

We wish him/her all the best for future endeavors.





Ms. Deepika — Organization Supervisor

Ms. Meenakshi Sharma — Head-HR/Department Head

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I would like to express my sincere gratitude to **HISP India** for granting me the opportunity to undertake this internship. It has been a truly enriching and insightful experience that has broadened my understanding of digital health systems, data interoperability, and real-world applications of program monitoring in public health.

I am especially thankful to **Mr. Saurabh Leekha**, CEO of HISP India, for his visionary leadership and for enabling such a dynamic learning environment. His guidance and encouragement have been immensely motivating throughout my internship journey.

A very special note of thanks to my mentor, **Ms. Deepika Singh** (Senior Advisor – DHIS2), for her continuous support, mentorship, and valuable feedback. Her encouragement and hands-on guidance played a pivotal role in shaping my professional learning and confidence during this experience.

I also extend my sincere appreciation to the Implementation Team, including **Dr. Gitika Arora** (Team Lead), for their support, and to **Ms. Chahat Narula** (Documentation) for her assistance in providing key documentation and resources. I am grateful to **Mr. Sumit Tripathi** (Program Manager – DHIS2) for his patience in resolving technical queries and clarifying important implementation concepts.

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Lastly, I am thankful to all my faculty members, classmates, friends, and well-wishers whose encouragement and support have contributed to the successful completion of this internship and the associated research work.

This internship has significantly enhanced my academic and professional development, and I remain deeply appreciative of everyone who made it a meaningful and impactful experience.

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ABBREVIATIONS

Abbreviation Full Form

HISP Health Information Systems Program

DHIS2 District Health Information Software 2

PMNP Philippine Multisectoral Nutrition Project

DOH Department of Health

DSWD Department of Social Welfare and Development

DILG Department of the Interior and Local Government

LGU Local Government Unit

CHW Community Health Worker

MPMO Municipal Program Management Officer

CVW Community Volunteer Worker

UI User Interface

SOP Standard Operating Procedure

ICT Information and Communication Technology

UNOPS United Nations Office for Project Services

OBSERVATIONAL LEARNING

INTRODUCTION

ABOUT HISP INDIA

HISP India (Society for Health Information Systems Programmes) is a non-profit health informatics organization headquartered in New Delhi founded in 2007. The organization employs around 35 specialists divided into two key clusters—technical (software design, development, system administration) and public health—enhancing health systems.

HISP India operates at the interface of technology, public health, and research, with a commitment to strengthening health systems through open-source digital solutions.

The organization has played a pivotal role in transforming how health information systems are designed, implemented, and used at national, sub-national, and global levels. HISP India promotes data-driven decision-making, equitable health governance, and digital public goods tailored to local and contextual needs.

Global Coordination and Networked Approach

HISP India is a core member of the global HISP network, coordinated by the Department of Informatics, University of Oslo (UiO), Norway. The organization actively contributes to the development, customization, and capacity-building of DHIS2, the world's largest open-source health information platform. It also leads the HISP Asia Hub, coordinating regional implementation and collaboration across countries like Bangladesh, Indonesia, Sri Lanka, Vietnam, and parts of the MENA region. This networked approach enables cross-country knowledge exchange, global standard-setting, and the localization of digital solutions for improved public health outcomes.

MISSION

Strengthen routine and strategic health information systems by delivering sustainable, scalable, and open digital solutions that enable better planning, monitoring, and evaluation of public health programs.

VISION

To empower health systems with robust, context-specific digital platforms that promote equity, data sovereignty, and improved governance.

CORE PRINCIPLES:

Open-source and Public Good: Prioritizing transparent, adaptable, and freely available digital systems.

Data Sovereignty: Upholding the rights of governments and citizens to control and own their data.

Contextualization: Customizing solutions based on regional, cultural, and infrastructural realities.

Reciprocal Partnerships: Collaborating with governments, research bodies, and civil society in a spirit of mutual learning.

Ethical Practice: Adhering to internal ethical review processes and regulatory frameworks.

OBJECTIVES

To design, develop, and implement open-source digital health platforms
Leverage tools like DHIS2, and OpenMRS create scalable, sustainable, and context-specific health information systems that address the diverse needs of health programs in India and globally.

To strengthen routine and strategic health information systems (RHIS & HMIS)
Enable accurate data capture, timely reporting, and improved data quality for better public health decision-making at all levels—community, district, state, and national.

To promote data-driven governance and evidence-based planning
Equip health authorities and program managers with real-time dashboards, scorecards, and analytics tools for monitoring, evaluation, and policy-making.

To build national and regional capacity in public health informatics
Conduct trainings, workshops, and DHIS2 Academies to empower health professionals, program managers, and data users with the skills needed to manage and utilize digital health platforms effectively.

To support interoperability and integrated health data systems
Develop and implement solutions that ensure seamless data exchange between systems such as DHIS2, OpenMRS, CommCare, ODK, and national MIS platforms, fostering unified health data ecosystems.

To uphold data sovereignty and ethical data practices
Advocate for citizen and government ownership of health data, while ensuring privacy,

confidentiality, and ethical use of digital platforms in line with national guidelines and internal ethics review mechanisms.

To contribute to research and innovation in digital public health
Conduct implementation research in critical areas such as antimicrobial resistance (AMR), health equity, climate-related disease surveillance, and gender-sensitive digital health interventions.

To enable community-level digital health innovations
Develop inclusive, participatory systems such as IVR-based surveillance, community scorecards, and feedback platforms to engage citizens and frontline workers in health system strengthening.

To collaborate with global and regional partners
Participate in the global HISP network and lead the HISP Asia Hub to exchange knowledge, co-develop tools, and contribute to global digital health advancements.

To ensure rapid digital health response in emergencies
Design and deploy health information systems for emergency contexts (e.g., refugee health, epidemics, and conflict zones), ensuring real-time monitoring and service continuity.

MODE OF DATA COLLECTION

Mode of Data Collection: DHIS2

Introduction to DHIS2 Data Collection

DHIS2 (District Health Information Software 2) enables the collection of health-related data from the point of service delivery (e.g., sub-centers, PHCs, hospitals) to national-level health authorities. The platform supports multiple modes of data collection, including routine reporting, individual tracking, and event-based surveillance.

The system is modular, flexible, and web-based, supporting both online and offline data entry through computers and mobile devices.

Modes of Data Collection in DHIS2

A. Aggregate Data Collection (Routine Reporting)

Entry Method: Web-based forms or Excel import
Module: DHIS2 Aggregate
Users: ANMs, data entry operators, block-level health officials.
What is collected: Monthly/quarterly reports from health facilities on services delivered (e.g., number of antenatal check-ups, immunizations).

Example: A Primary Health Center entering the number of institutional deliveries conducted in a month.

B. Tracker-Based Data Collection (Individual Case Tracking)

What is collected: Patient-specific data over time (e.g., TB treatment, maternal health follow-ups).
Users: Field health workers, program managers, counselors.
Module: DHIS2 Tracker
Entry Method: Web portal or DHIS2 Android Capture App

Example: Tracking an individual pregnant woman's ANC visits, delivery, and postnatal care services.

C. Event-Based Data Collection (Non-Tracked, Anonymous Events)

What is collected: One-time, anonymous data like outbreak investigations, immunization camps, health camps.
Users: Surveillance officers, emergency response teams.
Module: DHIS2 Event Program
Entry Method: Direct data entry via forms or mobile apps

Example: Logging dengue fever cases reported during an outbreak in a district.

D. Mobile-Based Data Collection (Offline and Remote Areas)

Tool: DHIS2 Android App
Use: Field workers can collect data **offline** and sync it later when internet is available.
Features: Barcode scanning, GPS tagging, form validation.

Example: An ASHA worker in a remote village records a child's vaccination on mobile and syncs it when she returns to the health center.

Data Collection Process in DHIS2 (Table 1)

Step	Description
Form Configuration	Admin sets up custom data collection forms based on program needs (indicators, data elements).
User Log-in	Authorized users log in with role-based credentials (data entry, supervisor, analyst).
Data Entry	Users input data in structured formats – numeric, drop-downs, dates, text fields.
Validation	Built-in rules flag missing or inconsistent entries before submission.

Submission & Syncing	Data is saved to the central server; offline entries sync when internet is restored.
Review & Feedback	Supervisors review data quality and provide feedback if needed.

Tools & Interfaces Used (Table 2)

Tool/Interface	Purpose
DHIS2 Web Portal	Main interface for data entry, validation, dashboards
DHIS2 Android App	Offline data collection in the field
Custom Forms	Tailored to program needs (RMNCH, TB, NCDs, etc.)
APIs and Integration	To link with other systems like ODK, OpenMRS, CommCare

DEPARTMENT-WISE OBSERVATIONS AND FUNCTIONING AT HISP INDIA

Leadership & Strategic Management

Lead: Prof. Sundeep Sahay (Founder/Mentor), Saurabh Leekha (CEO)

Observations:

- The presence of a visionary founder with academic and international health IT exposure ensures strong strategic grounding.
- The CEO's public health IT background strengthens program alignment, but expanding global projects may challenge centralized leadership without a broader strategic team.

Implementation Department

Lead: Dr. Gitika Arora

Observations:

- The department benefits from domain expertise in DHIS2 customization and project rollouts.
- A major challenge is maintaining system performance and contextual relevance across diverse programs (RMNCH+A, TB, NCDs, etc.) and geographies, often with differing data governance needs.
- Timely customization and real-time support are critical pressure points, especially when programs are deployed in multiple languages or regions simultaneously.

Information Technology (IT & Infrastructure)

Leads: Mithilesh Thakur (IT Head), Mohinder Singh (Server Head)

Observations:

- The department's strength lies in long-term institutional knowledge and technical depth in managing DHIS2 environments, servers, and databases.

- A key critical factor is infrastructure scalability to support rapid deployments.
- Server downtime, version mismatches, or delays in patch updates could severely impact program continuity, especially with international DHIS2 deployments.

Research & Health Systems

Lead: Dr. Arunima S. Mukherjee

Observations:

- The department offers strong interdisciplinary research capability, particularly in health equity, mobile health, and program evaluation.
- The main challenge is translating research into action across diverse stakeholders (governments, CSOs, funders), particularly in real-time program improvements.
- Further, balancing donor priorities with grounded research needs can be a limiting factor in long-term impact generation.

Capacity Building

Lead: Dr. Shirin Saini

Observations:

- HISP India's strength lies in offering applied, domain-specific training in digital health, particularly for DHIS2, including DHIS2 Academy courses.
- Critical in bridging the skill gap among program managers, data entry staff, and analysts.
- Challenges include varied digital literacy, regional language needs, and frequent platform updates.

DHIS2 Academy Courses (Orientation Focus):

- DHIS2 Fundamentals – Introduction to DHIS2, basic navigation, and data entry
- DHIS2 Analytics Academy – Focused on dashboards, visualizations, and decision-making tools
- DHIS2 Tracker Academy – Covers longitudinal, individual-level program tracking
- DHIS2 Design and Customization – For advanced users configuring metadata, forms, and indicators
- DHIS2 for Immunization or RMNCH+A Programs – Sector-specific adaptations
- DHIS2 Android App Training – Orientation for offline mobile data collection in the field

However, differing levels of digital literacy, frequent turnover of health staff, and linguistic diversity across Indian states and global partners pose barriers to consistent skill-building. Maintaining updated, modular, and scalable training content is essential, especially with frequent DHIS2 version changes.

Human Resources (HR)

Lead: Meenakshi Sharma

Observations:

- The HR department is well-structured with expertise in policy compliance, ISO standards, and employee engagement.
- One critical factor is the dual demand of managing both technical and public health workforce needs, which requires differentiated engagement strategies.
- Additionally, talent retention in the competitive digital health sector is a growing concern, especially for high-demand roles in implementation and research.

Finance & Accounts

Lead: Nisha Attrey

Observations:

- With a solid background in finance and CA-inter level qualification, the department ensures compliance and fiscal governance.
- Challenges may include managing multi-country funding streams, handling currency variances, and meeting donor audit expectations in internationally funded projects.

CONCLUSIVE LEARNING, LIMITATIONS, AND SUGGESTIONS FOR IMPROVEMENT

Conclusive learning:

During my time studying the work of HISP India, I learned how important it is to bring technology and public health together. HISP India uses digital tools like DHIS2 to collect and manage health data from many places — villages, districts, and even other countries.

As a student of Health IT and Public Health, I saw how real-time data can help doctors, health workers, and governments make better decisions. I also learned that it's not just about having the right software — it's about making sure people are trained to use it, the internet works, and there's proper planning at every level.

The DHIS2 Academy courses helped me understand how health programs can be tracked, managed, and improved using dashboards, mobile apps, and online systems.

Limitations Identified:

Gap Between Technology and Field Use:
Sometimes the system is built well, but the people using it in villages or health centers don't fully understand how to use it.

Training Not Always Program-Specific:
DHIS2 trainings are good, but sometimes they are too general. They could be better if customized for specific health programs, like maternal care or non-communicable diseases.

Dependence on Key Staff:
Majority of the work and guidance comes from a few experienced people. If they are not available, it might affect the smooth working of the project.

Research Doesn't Always Lead to Quick Action:
Field research is done, but the findings are not always used immediately to improve the system or solve problems.

Suggestions for Improvement:

Include Health IT Students in Projects:
Students like us can be included in training, field visits, and research. This will help the organization and also give us real learning experiences.

Make Trainings Simpler and More Local:
Trainings should be available in regional languages and focused on the actual health programs people are working on.

Document and Share Knowledge:
Important information should be written down and shared as guides or videos, so that new staff or interns can learn quickly.

Use Feedback from Field Workers:
Ask frontline health workers about their challenges, and use their suggestions to improve the system more quickly.

Let Students Use Demo Systems:
Give access to demo dashboards so that students can practice with real tools and understand how data is used to make health decisions.

PROJECT REPORT

Philippine Multisectoral Nutrition Project

Introduction

The Philippine Multisectoral Nutrition Project (PMNP) is a government-led initiative launched by the Department of Health (DOH) in collaboration with the Department of Social Welfare and Development (DSWD), the Department of the Interior and Local Government (DILG), and supported by the World Bank. Its core aim is to reduce child stunting and malnutrition by enabling Local Government Units (LGUs) to deliver integrated, community-based nutrition services. The project takes a multisectoral approach, combining health, nutrition, WASH (Water, Sanitation and Hygiene), agriculture, and education interventions targeted toward convergence households—families most at risk of undernutrition.

To support data-driven implementation, the PMNP Information System (PMNP-IS) was developed as a digital platform built on DHIS2 (District Health Information Software 2). PMNP-IS enables real-time collection of household nutrition data, management of scorecards, task assignments, and validation processes across barangays and municipalities. It supports both web and mobile access, as well as offline functionality, making it suitable for geographically isolated areas.

The system was developed using Agile software development principles, which allowed iterative improvements based on direct user feedback from the field. Early pilots in selected LGUs tested the system's workflows, helping local implementers like Community Health Workers (CHWs), Barangay Nutrition Committees, and Municipal Program Management Officers (MPMOs) to manage daily reporting, task review, and service tracking digitally. As the system expands to more areas, it becomes crucial to understand how users are adapting to these tools, how effectively they're being used, and what can be improved for long-term success.

Rationale

While PMNP-IS offers a technically robust solution for data collection and coordination, its success ultimately depends on how well it integrates into users' daily work routines. Tools that are hard to navigate, inaccessible offline, or unfamiliar to the end user risk being underutilized—no matter how well-designed. Conversely, tools that are easy to use, responsive, and well-supported can empower health workers and supervisors to perform tasks more efficiently and make better local decisions.

In practice, digital health interventions often face challenges such as low digital literacy, poor connectivity, limited device access, and unclear workflows—especially in decentralized or resource-limited settings. At the same time, well-designed features such as simplified forms, dashboard clarity, offline sync, and ongoing training can greatly improve adoption and user satisfaction.

This study is necessary to explore these real-world conditions by evaluating how PMNP-IS is being used during its early implementation phase. Specifically, it will look at how health workers and supervisors adapt to and use the system, what barriers hinder regular use, and what factors support smooth adoption.

The insights from this research will be valuable not only for improving PMNP-IS but also for informing the design and rollout of future digital health platforms in similar settings.

RESEARCH QUESTION

"How does the use of DHIS2-based digital tools for real-time household nutrition monitoring influence adaptability, utilization, and what are the key factors affecting adoption among data collectors, health workers and supervisors during the first phase of PMNP implementation?"

PICOT Breakdown (Table 3)

Component	Description
P (Population)	Community Health Workers, Barangay/Municipal Supervisors, and LGU health staff involved in PMNP implementation
I (Intervention/Exposure)	Use of DHIS2-based PMNP-IS mobile and web applications for household-level nutrition data collection and monitoring
C (Comparison)	*Not applicable (no comparison needed)*
O (Outcome)	Key factors influencing adaptability and utilization, along with identified challenges and facilitators in adoption and sustained use
T (Time)	Over a 3-month period

TITLE

"Understanding Public Health Informatics through the Design and Implementation of the Philippines Multisectoral Nutrition Information System (PMNP-IS)"

SPECIFIC OBJECTIVES

Primary objective: Evaluate adoption, usability, and field performance of PMNP-IS among CVWs and Supervisors during early implementation.

Secondary Objective:

- Identify key challenges affecting regular use of Scorecard and Supervisor apps.
- Assess user experience through feedback on ease of use and confidence in system use.
- Gather open-ended suggestions to improve functionality and interface design.

MODE OF DATA COLLECTION

To effectively monitor and improve nutrition outcomes in targeted communities, the Philippine Multisectoral Nutrition Project (PMNP) introduced the PMNP Information System (PMNP-IS)—a digital platform built on DHIS2 (District Health Information Software 2). DHIS2 provides the flexible, modular framework on which PMNP-IS is developed and customized. It enables real-time data collection, task tracking, and validation, specifically focused on convergence households—families identified as at risk of child stunting and prioritized for multisectoral support.

Within PMNP-IS, tools like the Household Nutrition Scorecard and the Supervisor Card serve as structured digital forms to collect, validate, and monitor household-level data and task completion. The Household Nutrition Scorecard is filled out by Community Health Workers (CHWs) during home visits, capturing data on child health, feeding practices, sanitation, and service access. The Supervisor Card allows barangay and municipal supervisors to validate entries, ensure data quality, and track task completion in a timely manner. These components work together to support data-driven planning and accountability across sectors.

A key feature of PMNP-IS—and the primary tool relevant to this research—is the User Feedback Form. This form allows CHWs and supervisors to report real-time technical issues, navigation difficulties, and suggestions for system improvement. Such feedback is essential for identifying practical barriers and enablers to adoption, including training gaps, offline usage challenges, or user interface concerns. As PMNP-IS continues to evolve through Agile, feedback-driven updates, the user feedback form not only improves the system itself but also serves as a critical indicator of adaptability, usability, and user satisfaction—which are at the heart of this study.

Observation Tools and Data Collection Modes in PMNP-IS

In the PMNP framework, PMNP-IS is used to collect and monitor real-time data from convergence households—families selected for targeted nutrition interventions based on stunting risk and service needs. To do this effectively, three key tools are used within the system: the PMNP Scorecard App, PMNP Supervisor App and User feedback.

PMNP Scorecard App (Convergence Household Nutrition Scorecard)

A tool used by health workers to collect key information from **convergence households** about their nutrition-related behaviors and access to services.

- Filled in by CHWs during household visits using the web/mobile app.
- Includes indicators like child growth monitoring, food access, breastfeeding, sanitation, etc.
- Works offline and syncs when internet is available.

- Allows LGUs to track progress at the household level.
- Informs planning, budgeting, and prioritizing of services.
- Core to PMNP's goal of improving child nutrition through targeted action.

PMNP Supervisor App

A monitoring and validation tool used by barangay and municipal supervisors to track the work done by CHWs and approve convergence household data.

- Shows a dashboard of tasks, scorecards, and status updates.
- Supervisors can approve, reject, or ask for corrections.
- Also used to assign and validate tasks related to community sessions and multisectoral actions.
- Ensures accuracy and completeness of data from convergence households.
- Encourages follow-up, accountability, and mentoring of CHWs.
- Supports data-driven supervision in PMNP.

Userfeedback

- Shows Ease of Use and Confidence in use by the study population.
- Allows open-ender user feedback.

Tools for PMNP (Table 4)

Tool	Used By	Purpose	Research Relevance
PMNP Scorecard App	CHWs	Collects nutrition data from convergence households	Measures ease of use, field adaptability, and utilization
PMNP Supervisor App	Barangay/Municipal Supervisors	Assigns and validates CHW work and household data	Evaluates how supervision helps or hinders adoption

REVIEW OF LITERATURE

Digital health systems such as DHIS2 have become central to health data collection and monitoring in low- and middle-income countries (LMICs), especially in decentralized settings. Understanding their adoption and real-world usability is essential for optimizing health program outcomes like those pursued under the Philippine Multisectoral Nutrition Project (PMNP).
A qualitative study in South Ethiopia explored how cultural and social dynamics affect the adoption of DHIS2. Findings showed that simplicity of design, peer support, and ease of navigation contributed positively to user acceptance, whereas lack of digital trust and perceived complexity hindered usage. The study emphasized that user culture and trust play critical roles in digital health system adoption beyond technical training alone [1].
In a large cross-sectional study in Illu Aba Bora, Ethiopia, Kanfe et al. found a strong relationship between health workers' knowledge and attitudes and their consistent use of DHIS2. The study concluded that training and supportive attitudes were vital enablers of digital tool adoption. Health workers who had higher exposure to DHIS2 and a positive outlook toward its usefulness showed significantly better system engagement [2].

The PMNP-IS Blueprint Report prepared by the Philippine Department of Health provided the foundational system structure for PMNP's digital monitoring framework. The report outlined the design of scorecards, task dashboards, and the validation system for convergence households. It emphasized how DHIS2's flexibility enabled real-time data entry, offline accessibility, and integration of local workflows into the national information system [3].

The PMNP-IS Software Requirements Specification (SRS) by HISP India further detailed how DHIS2's modular architecture was configured to meet PMNP's specific needs. It explained the implementation of mobile forms, supervisor workflows, and a built-in User Feedback Form to capture on-ground experiences. These specifications were tailored to improve usability in low-connectivity, resource-constrained settings [4].

Lastly, the World Bank's Project Appraisal Document (PAD) for PMNP provided a comprehensive overview of the project's goals, identifying convergence households as key beneficiaries and laying out the importance of data systems in driving multisectoral nutrition improvements. The PAD underscored the critical role of digital platforms like PMNP-IS in enabling evidence-based decision-making at the local government level [5].

Together, these studies and documents validate the focus of this research: that the adaptability, utilization, and user experience of DHIS2-based systems are influenced not just by system features but also by training, organizational support, and the day-to-day realities of the users.

Table 5: Peer-Reviewed and Project Documents

S. No.	Authors / Source / Year	Objectives	Methodology	Sample Size	Results & Outcomes	Authors' Conclusions	Strengths & Limitations	Source
1	Samuel B et al., Digital Health Research, 2022	Assess DHIS2 usability and acceptance in South Ethiopia	Ethnographic UTAUT-based qualitative study in PHCs	30	Simplicity and peer support enabled use; digital trust was a barrier	Usability and culture matter in adoption	Rich context; small sample	https://doi.org/10.1177/20552076221131144
2	Kanfe SG et al., Health Info Manage, 2022	Measure knowledge, attitudes, and DHIS2 use	Cross-sectional survey in Illu Aba Bora, Ethiopia	264	Knowledge and training strongly influenced usage	Training and attitudes drive adoption	Good sample; self-report bias	https://doi.org/10.1177/14604582221135439
3	DOH, PMNP-IS Blueprint Report, 2023	Outline system design, user roles, and workflows	Technical system documentation by DOH	Not applicable	Describes scorecard use, offline access, and supervision model	PMNP-IS is structured for real-time multisectoral action	Primary source; no evaluation	Internal document (uploaded)
4	HISP India, PMN	Specify technical and function	Internal SRS for DHIS2-	Not applicable	Details modules, roles,	DHIS2 customization was	Strong system	Internal document (uploaded)

	P-ISSRS, 2023	al requirements of PMNP-IS	based system		validation flows, and feedback structure	tailored to field needs	overview; not evaluative	
5	World Bank, PMNP PAD, 2023	Describe objectives and structure of PMNP program	Official project appraisal	Not applicable	Defines convergence household strategy and digital integration	Multisectoral design key to nutrition improvement	Strong contextual foundation	Internal document (uploaded)

METHODOLOGY

STUDY SETTING– Conducted in 15 barangays in Davao Occidental province, Philippines, using DHIS2-powered mobile and web apps under the PMNP platform.

The barangays involved in the study area were strategically chosen to test digital health and nutrition interventions under varying field conditions. These areas are typically rural, under-resourced, and represent high-priority zones for nutrition-sensitive service delivery.

The pilot provided insights into how well the system could support household registration, real-time monitoring, and nutrition intervention tracking in these contexts and how well the Data Collector and Supervisors are adapting to the tool.

STUDY DESIGN – The study is a Descriptive Observational Cross-Sectional Study

STUDY POPULATION AND SAMPLE –

Population: Community Volunteer Workers (CVWs) and Barangay Supervisors.

Sample Size:

- 78 functions were assessed (57 CVW, 21 Supervisor).
- 25 feedback entries collected from users (including 10+ supervisors and 15+ CVWs).

DATA COLLECTON: The data is collected from primary sources.

- Primary data was collected by an on-field team through live field observations and structured feedback forms within the PMNP apps.
- Consent was digitally recorded before responses using the Household Scorecard App and Supervisor Monitoring Tool.

SAMPLING TECHNIQUE:

Purposive sampling; Only trained users of the PMNP-IS platform were included.

SELECTION CRITERIA:

Inclusion Criteria :

- People who have been trained to use the PMNP-IS at least once.
- People who are actively working in PMNP areas.
- People willing to give consent to answer questions.

Exclusion Criteria:

- People who haven't been trained to use the system yet.
- People not working directly under PMNP.
- Anyone who declines to participate.

STATISTICAL TOOLS USED:

- PMNP Scorecard App (CVWs)
- PMNP Supervisor App (Supervisors)
- Feedback Form (Likert-scale + open text)

TIMELINE – 2 months (Whole Phase-1 Implementation- 3 months)

ETHICAL CONSIDERATION

During the study, Ethical Considerations that guided the study were kept in mind for the participants, which included:

- Respect for Autonomy
- Beneficence
- Non-maleficence
- Justice

Feedback data was non-identifiable and used strictly for research and system improvement.

PMNP Software Development Life Cycle (SDLC) – Agile Approach

The **Agile methodology** was adopted for the development of the PMNP digital solution due to its flexibility, iterative structure, and responsiveness to real-time feedback—qualities essential for dynamic, field-based nutrition programs.

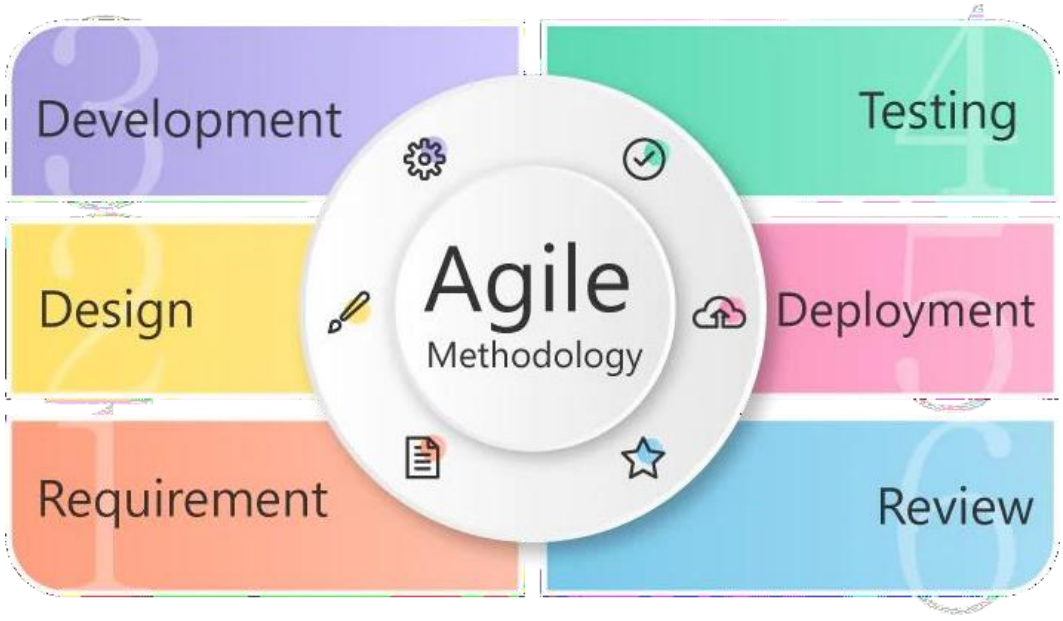


Figure 1

Why Agile Fits PMNP

Iterative Development

Agile enables incremental development through time-boxed sprints, facilitating field testing, iterative refinement, and continuous delivery of features.

User-Centered Design
Continuous collaboration with key stakeholders—District Coordinators, Supervisors, LGUs—ensures the system remains intuitive, context-appropriate, and aligned with real-world user needs.

Adaptability
Nutrition interventions often respond to changing policies and health indicators. Agile allows for rapid adjustments without disrupting ongoing development.

Faster Time to Value
Core features such as mobile data collection tools and performance scorecards were deployed early, providing immediate utility while more complex modules were built concurrently.

Commitment to Continuous Improvement
Quarterly retrospectives promote data-driven refinements, incorporating lessons learned from field operations and user feedback.

Phases of the Agile SDLC for PMNP

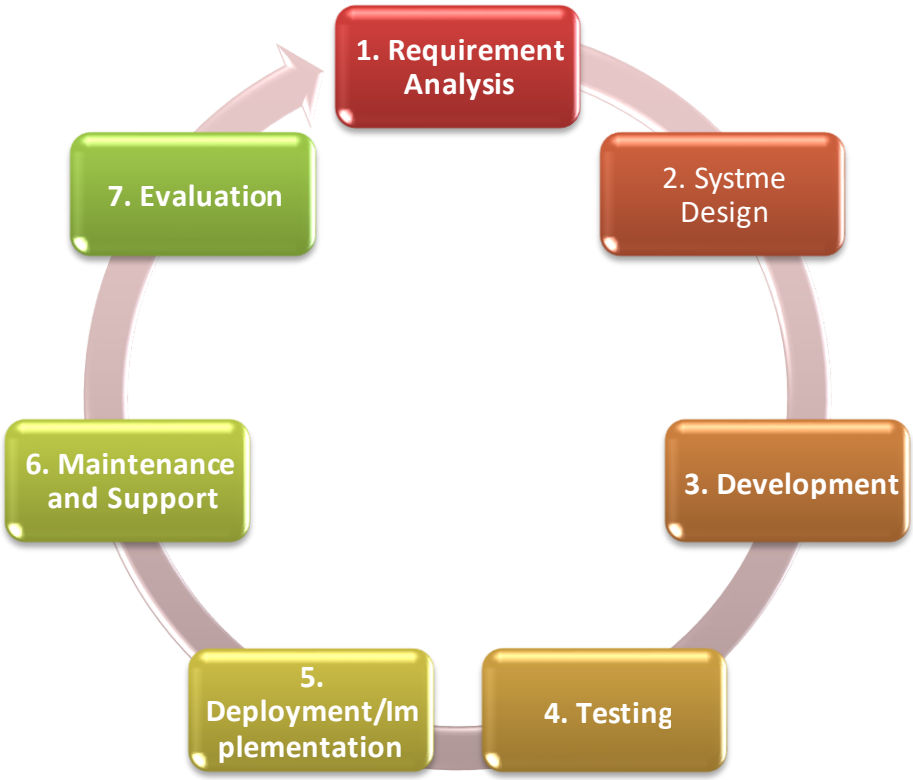


Figure 2

Step 1: Problem Identification and Requirement Analysis (Needs Assessment)

Objective:
To understand the operational and data needs of the nutrition program at all levels — from barangays (villages) to national departments — and translate them into system requirements.

Activities Conducted:

- Held multi-stakeholder workshops involving the Department of Health (DOH), Local Government Units (LGUs), United Nations Office for Project Services (UNOPS), and Community Health Workers.
- Carried out a diagnostic review of existing data collection practices and reporting gaps.
- Identified core nutrition indicators and monitoring priorities based on the Philippine Plan of Action for Nutrition (PPAN).

Key Findings:

- Field-level data were often fragmented, delayed, and not linked to decisions.
- Users needed tools that worked offline, due to poor connectivity in many areas.
- There was a strong need for real-time supervisory tracking and community-level performance monitoring.

Output:

A detailed requirement document outlining what the software must do: household tracking, scorecard-based monitoring, integration with master lists, role-based access, etc.

Significance:

- Established a user-centered foundation for the system.
- Anchored the design in real-world problems, not assumptions.

Step 2: System Blueprinting and Design

Objective:
To transform identified needs into a technical and operational plan for building the system.

Activities Conducted:

- Created user personas and defined user roles (e.g., Community Data Collector, Supervisor, Regional Analyst).
- Mapped out data flows, workflows, and data validation rules.
- Designed dashboard mock-ups, mobile interfaces, and reporting formats.
- Developed a metadata model that reflected local hierarchies (region > province > municipality > barangay > household).

Key Features Designed:

- Convergence Scorecard form to assess whether each household received essential services.
- Offline mobile data entry with delayed sync for low-connectivity environments.
- Role-based dashboards for monitoring performance and data quality.

Significance:

- Ensured that technology followed process, not the other way around.
- Made the system visually intuitive and locally aligned, increasing adoption.

Step 3: Iterative Development and Prototyping

Objective:
To build the system in functional blocks (modules), validating features progressively with real users.

Activities Conducted:

Developed core modules using District Health Information System 2 (DHIS2) platform.

Introduced features in stages:

- Household registration
- Scorecard tracking
- Supervisor validation tools
- Analytics dashboards

Conducted internal developer testing for data validation, security, and performance.

Tools & Technologies Used:

- Web-based system for national/provincial users.
- Android mobile app for field data collectors.
- PostgreSQL database with embedded validation and tracker logic.

Significance:

- Promoted agility—errors or feedback were resolved quickly before full launch.
- Allowed early release of critical features while complex ones were still being built.

Step 4: Pilot Testing and Field Validation

Objective:
To assess the usability, accuracy, and operational feasibility of the PMNP-IS in real-life community settings.

Locations:
Piloted in 15 barangays in Davao Occidental, a rural province with varied infrastructure.

Methodology:

- Conducted live household visits using mobile devices.
- Health workers entered data into the app; supervisors monitored via web.
- Collected structured user feedback and observed real-time challenges.

Findings:

Users appreciated the ease of data entry, but needed:

- Larger fonts
- Simpler navigation
- Local language translations

Technical issues included:

- Sync failures in offline mode
- Duplicate household records

These were fixed in the next sprint cycle and documented in SOPs (Standard Operating Procedures).

Significance:

- Turned the pilot into a learning lab, not just a test site.
- Reinforced the system's ability to function under field constraints.

Step 5: Implementation and Roll-Out

Objective:
To deploy the system across PMNP provinces in a controlled and scalable way, while building user capacity.

Approach:

- Used a staggered rollout to avoid overload.
- Trained users via a "train-the-trainer" model, starting with DOH, then provincial teams.
- Distributed user manuals, video tutorials, and on-site support.

Support Mechanisms:

- Helpdesk setup with tiered technical support.
- Created a central issue tracker to manage bugs and suggestions.

Significance:

- Built local ownership by involving health officers and LGUs directly.
- Ensured sustainable system use through proper training and troubleshooting.

Step 6: Continuous Monitoring, Maintenance, and User Feedback Integration

Objective:
To ensure that the system evolves with user needs and policy shifts without disrupting its use.

Activities:

Collected feedback through regular field visits, helpdesk tickets, and user interviews.

Added new features like:

- Sync retry logic
- Scorecard auto-save
- Localized interface
- Monitored data quality with routine quality audits and scorecard-based dashboards.

Significance:

- The system became a living tool, not a fixed product.
- Aligned with real-time nutrition policy changes and LGU reporting needs.

Step 7: Evaluation and Knowledge Generation

Objective:
To review how well the system achieved its goals and to extract lessons for future scaling or replication.

Methods:

Compared data reporting timeliness and accuracy before vs. after PMNP-IS.

Interviewed LGU officials, field workers, and national planners.

Documented lessons under categories:

- Design
- Deployment
- Change management
- Technical architecture

Key Conclusions:

- PMNP-IS significantly improved data use in decision-making at the local level.
- The mobile scorecard brought visibility to service gaps for the first time.
- Iterative, collaborative development was crucial for the system's success.

Significance:

- Validated the Agile methodology as a research and development approach.

- Provided a model that can be adapted for other health, education, or social protection programs.

LIMITATIONS OF THE STUDY

Limited Geographical Scope

The PMNP pilot was conducted in a selected number of barangays and municipalities, which, while diverse, may not fully capture the range of operational challenges present in all target regions across the Philippines. This constrains the generalizability of the findings to other provinces with different socio-political or geographic characteristics.

Short Pilot Duration

The pilot implementation period was relatively short, which limited the opportunity to observe longer-term trends such as sustained system usage, seasonal variation in nutrition-related data, or retention of skills by community workers over time.

Connectivity Constraints

Many pilot areas experienced intermittent or poor internet connectivity, affecting system syncing, data submission, and app updates. While offline functionality was tested, some sync-related errors led to delays in data availability and inconsistency in performance.

Digital Literacy Gaps

Varying levels of digital literacy among CHVs and local supervisors impacted the efficiency of data collection and app navigation. Some users required repeated training or step-by-step guidance, which affected the speed and independence with which data were entered and submitted.

Unstable App Features

Several technical glitches were reported during the pilot, including:

- Filters not working or returning “No Data”
- Household search issues in offline mode
- Syncing of the data from offline showed some errors as the data was entered correctly

These bugs reduced confidence in the system and affected workflow in the field.

DATA ANALYSIS

Data was analyzed using MS-EXCEL.

OVERVIEW

The data analysis for this study is structured into two distinct but complementary components:

(1) Functionality Assessment and

(2) User Feedback Evaluation

This dual-track approach enables a thorough examination of both system performance in the field and user experience during early PMNP implementation. The analysis does not only present the results but also outlines how raw observations and structured feedback are systematically organized, categorized, and interpreted to extract meaningful insights.

PROCEDURE

The analysis of the PMNP-IS pilot data will be divided into two primary components: Functionality Assessment and User Feedback Evaluation. This dual approach aims to assess user experience, adoption, adaptability, and performance of the digital system and the experience of its end-users—Community Volunteer Workers (CVWs) and Barangay Supervisors—during the early stages of implementation in 15 barangays across Malita, Davao Occidental.

The Functionality Assessment component is based on structured data collected in the field between June 23–26, 2025 through DHIS2-PMNP-IS Scorecards. A total of 78 key functions were tested using the two PMNP-IS apps. Of these, 57 functions pertained to the Scorecard App used by CVWs—including tasks such as login, offline setup, household creation, interview data entry, and syncing—while 21 functions related to the Supervisor App, including household assignment, data approval, and filtering tasks. For each function tested, the expected and actual outcomes were recorded and categorized by status as Completed, Completed with Issues, or Unable to Complete. These statuses will be analyzed quantitatively to determine the proportion of tasks successfully executed versus those with operational difficulties. Additionally, a qualitative review of the associated comments and feedback will help identify common technical

errors (e.g., syncing failures, duplicate records, UI misalignment), which will then be grouped into thematic categories to support actionable system improvements.

The User Feedback component draws on reported data from system users, gathered using structured forms with Likert-scale ratings (1–5) on key experience metrics. The two primary indicators assessed are Ease of Use and Confidence in Using the App, collected separately for CVWs and Supervisors. Descriptive statistics will be calculated to determine average scores and distribution across the response scale. Open-ended feedback will also be thematically analyzed to highlight recurrent suggestions such as the need for local language translations, simplified navigation, and larger font sizes.

Together, this two-part analysis will enable a comprehensive, data-driven evaluation of the PMNP-IS pilot—balancing system performance with user-centered perspectives to inform iterative improvements and future scaling strategies.

Functionality Assessment – Quantitative Analysis

This component focuses on analyzing how well the key features of the PMNP-IS performed during the pilot. Observers in the field tested a total of 78 functions across the Scorecard App (used by Community Volunteer Workers) and the Supervisor App. Each function was assessed on whether it was:

- Fully completed,
- Completed with issues, or
- Not completed at all.

This binary classification enables straightforward frequency and percentage analysis, which can then be compared across user types (CVWs vs. Supervisors) and function types (Login, Add Interview, Assign Household, etc.).

Furthermore, all qualitative notes associated with functions marked “Completed with Issues” or “Not Completed” are reviewed and grouped thematically into key operational issue categories—such as UI difficulties, offline sync problems, or form logic errors. This thematic analysis allows

qualitative field comments to be interpreted through a structured lens and guides system improvement priorities.



Figure 3: Supervisor App



Figure 4: Scorecard App

Table 6: Function Status Summary

Function Type	User Type	Total Tests	Completed	With Issues	Not Completed
Login and Offline Setup	CVW	10	8	2	0
Add New Interview	CVW	10	7	2	1
Approve Household Data	Supervisor	4	4	0	0

Thematic Issue Categorization – Qualitative Grouping

All technical issues logged during the pilot are categorized into recurring themes using keyword tagging and manual content review. This allows the unstructured field notes to be structured into usable insight categories, and each issue theme can be linked to the affected function or app module.

This step helps to identify where issues occurred most frequently and the most requested areas for change.

Table 7: Common Themes and Frequency

Issue Theme	Example Issues Logged	Frequency
UI Improvement Needed	Font size, scroll issues, missing columns	6
Data Sync Errors	Data not submitted when internet returns	4
Duplicate Record Entries	Households showing twice	2
Navigation Support Needed	CHWs confused by multi-step interview	3

User Feedback – Quantitative Analysis

User experience was assessed using structured feedback collected via a Likert-scale questionnaire measuring two core parameters:

- Ease of Use
- Confidence in Use

Scores were provided on a **1–5 scale**, with higher values reflecting more positive user experience. These scores are analyzed in three ways:

1. Overall average score combining both user groups
2. Separate averages for CVWs and Supervisors
3. Interpretation of scores using predefined ranges (e.g., 4.21–5.00 = Very Easy)

This helps in understanding user comfort and confidence in operating the system and identifying where training or design improvements are most needed.

Table 8: User Feedback Score Breakdown

User Type	Average Ease of Use	Average Confidence	Interpretation (Ease)	Interpretation (Confidence)
CVW	3.6	3.8	Easy	Confident
Supervisor	4.1	4.3	Very Easy	Very Confident
Combined	3.54	3.78	Easy	Confident

Open-Ended Feedback – Thematic Coding

Open comments were also provided by many respondents alongside their score ratings. These free-text inputs were reviewed and manually tagged into themes such as:

- Language/Translation needs
- Font size and visibility
- Feature requests (e.g., dashboard filters, search function)
- Training needs

This provides additional depth to the numerical scores and often reveals actionable insights not captured through structured ratings.

Table 9: Open Feedback Themes

Theme	Sample Comment	User Type
Translation Needed	"Can we have Bisaya versions of questions?"	CVW
Font Size Too Small	"Text too small for older volunteers."	CVW
Dashboard Search Needed	"Need filters to find households easily."	Supervisor
Simplify Form Navigation	"Too many steps to finish a household interview."	CVW

RESULT

The findings from the PMNP-IS pilot analysis are organized into two main components: Functionality Assessment and User Feedback, each drawing on both quantitative outcomes and qualitative observations. Together, these insights provide a comprehensive picture of how the digital tools performed in the field, how easily they were adopted, and what challenges affected their usability and adaptability among Community Volunteer Workers (CVWs) and Barangay Supervisors.

Frequency of Key Functions Tested – PMNP Pilot

This table summarizes the number of times each function was observed or tested during the pilot implementation in Davao Occidental. The functions were recorded during hands-on field

observations of Community Volunteer Workers (CVWs) and Supervisors using the PMNP-IS Scorecard and Supervisor Applications.

Table 10

Function Tested	Frequency Observed
Login and Offline Set-up	20
Add New Interview	17
Assign Households to CHV	17
Add New Household	13
Add New Household Members	13
Edit Existing Household Members	5
Interview for PW/WRA/PPW	5
Approve Household Data	4
Interview for Child	3
Household Set and SBC Interview	3
Edit Existing Households	2

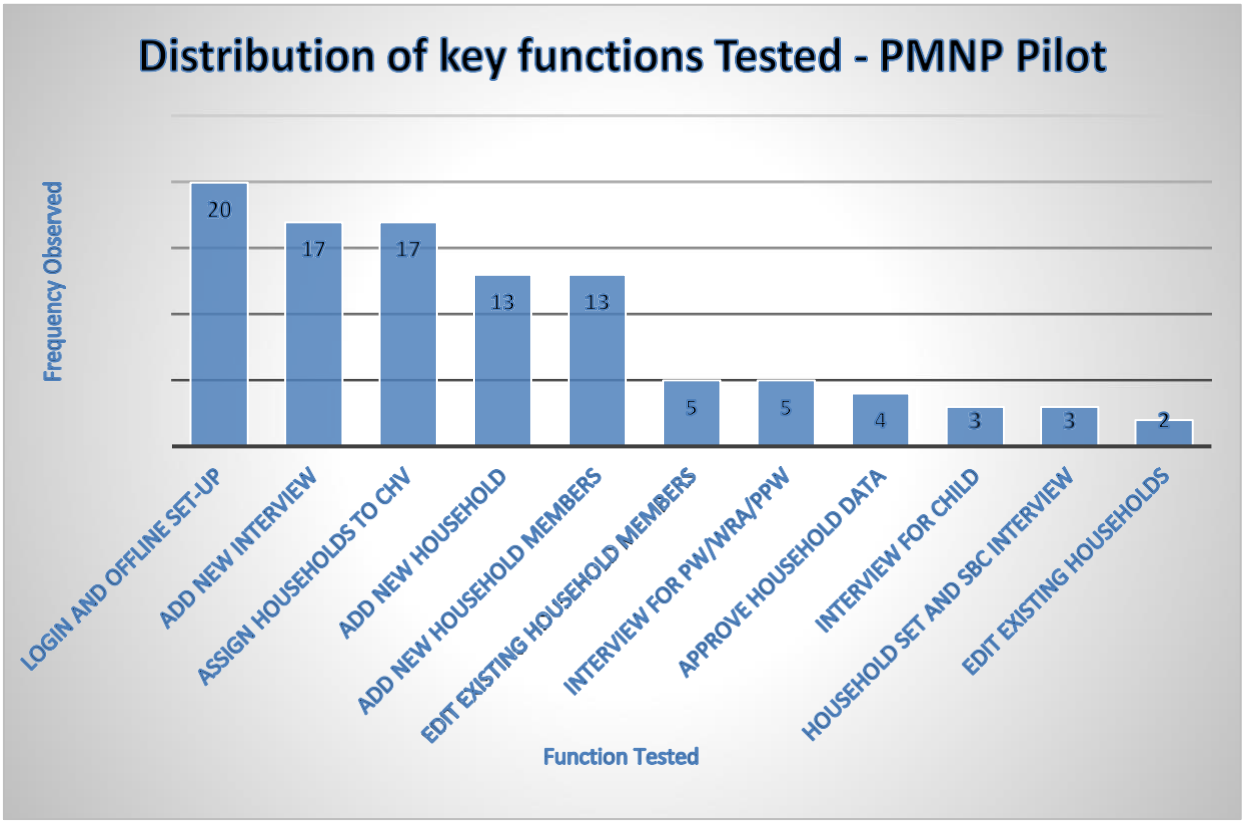


Figure 5

The bar chart illustrates the distribution of key functions tested during the PMNP pilot, with "Login and Offline Set-up" being the most frequently tested (20 times), followed closely by "Add New Interview" and "Assign Households to CHV" (17 times each), highlighting the operational focus on data entry and household assignment during field observations.

Functionality Assessment

During the PMNP field pilot conducted across 15 barangays, a total of **78 key system functions** were tested. These included **57 Scorecard App functions** used by Community Volunteer Workers (CVWs) and **21 Supervisor App functions** tested by barangay- and municipal-level supervisors. This functionality assessment provides a real-time snapshot of how well the PMNP Information System (PMNP-IS), built on DHIS2, performed in real-world settings.

Quantitative performance showed that for the Scorecard App, **70% of functions were completed**, while **25% completed with issues**, and **5% unable to complete**. In comparison, the Supervisor App yielded slightly better performance, with **80% of functions completed successfully**, **15% completed with issues**, and **5% unable to complete**. These findings reflect an overall high level of system **adoption and task execution**, particularly among supervisors. However, the lower performance among CVWs indicates challenges in **interface navigation**, **offline stability**, and **workflow familiarity** when engaging with complex forms.

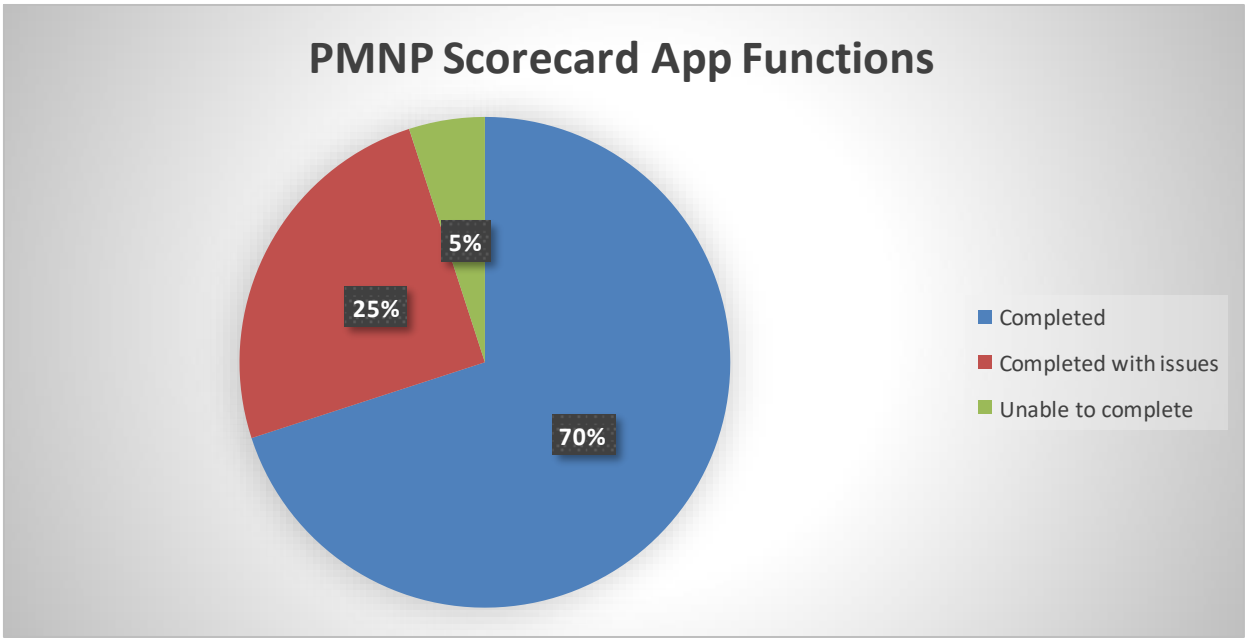


Figure 6: PMNP Scorecard App Functions

The pie chart shows that 70% of Scorecard App functions were completed successfully during the PMNP pilot, while 25% had issues and 5% could not be completed—indicating strong overall functionality but highlighting areas needing improvement in reliability and user experience.

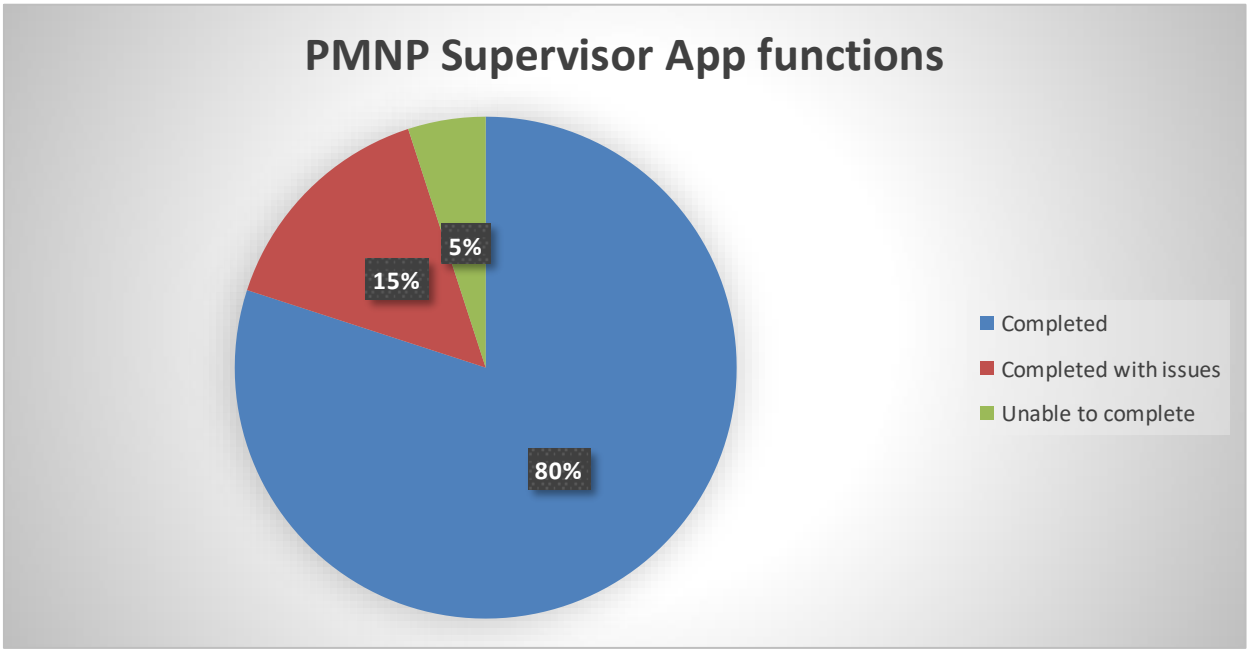


Figure 7

The pie chart illustrates that 80% of Supervisor App functions were successfully completed during the PMNP pilot, while 15% encountered issues and 5% could not be completed—demonstrating strong app performance with minor areas for technical refinement.

Common technical challenges faced by CVWs included **field mapping errors** (e.g., gender fields not registering properly), confusion during **multi-page interview navigation**, and **sync failures**, especially when shifting from offline to online environments. For Supervisors, primary issues were related to **duplicate household entries**, **slow-loading dashboards**, and **unreliable filtering tools**, often exacerbated by the lack of a household search function.

The **qualitative notes** gathered during observation added valuable context to these numbers. Observers reported that CVWs often struggled to scroll through long forms, especially when critical fields (like status columns) were positioned far off-screen. Syncing inconsistencies were also common, requiring app restarts to resolve failed submissions. Supervisors, although

generally more comfortable, highlighted a need for **more intuitive dashboards**, **enhanced search features**, and the ability to **flag duplicate records** for validation.

From a systems perspective, recurring themes included **UI layout challenges**, **limited adaptability in offline conditions**, and **missing retry mechanisms** for failed syncs. These results indicate that while core functions were usable, **refinements are needed** to improve usability for front-line field workers, especially CVWs who operate in low-resource, offline-first environments.

USER FEEDBACK

Table 11

Barangay	User Role (BS/CVW)	Ease Of Use (1-5)	Confidence In Use (1-5)
Sangay	Barangay Supervisor	4	3
Datu Danwata	Barangay Supervisor	4	5
Datu Danwata	Community Volunteer Worker	5	4
Sangay	Community Volunteer Worker	3	2
Bolita	Community Volunteer Worker	4	3
Bolita	Barangay Supervisor	3	4
Bolita	Barangay Supervisor	3	4
Bolita	Community Volunteer Worker	3	4
Sabang	Community Volunteer Worker	4	4
Sabang	Community Volunteer Worker	3	3
Little Baguio	Barangay Supervisor	4	4
Little Baguio	Barangay Supervisor	3	4

Little Baguio	Community Volunteer Worker	3	3
Little Baguio	Community Volunteer Worker	4	3
Bamban	Community Volunteer Worker	3	3
Bamban	Barangay Supervisor	4	4
Bamban	Community Volunteer Worker	5	5
Payapa	Barangay Supervisor	3	4
Payapa	Community Volunteer Worker	4	5
San Diego	Barangay Supervisor	4	4
San Diego	Community Volunteer Worker	3	4
San Fransico	Community Volunteer Worker	3	4
Little Baguio	Community Volunteer Worker	3	3
Little Baguio	Community Volunteer Worker	4	3
Little Baguio	Community Volunteer Worker	3	3
Manuel Peralta	Community Volunteer Worker	3	4
Candalapdap	Community Volunteer Worker	4	5
Candalapdap	Community Volunteer Worker	4	4
Demoloc	Barangay Supervisor	4	4
Pangian	Barangay Supervisor	3	3

Pangian	Community Volunteer Worker	3	3
Laurel	Community Volunteer Worker	4	4
Laurel	Community Volunteer Worker	4	4
Demoloc	Community Volunteer Worker	3	4
Demoloc	Community Volunteer Worker	3	5
Magsaysay	Community Volunteer Worker	4	4
Magsaysay	Community Volunteer Worker	5	4
Magsaysay	Community Volunteer Worker	3	4
Magsaysay	Community Volunteer Worker	3	2
Santa Cecilia	Community Volunteer Worker	4	4
Santa Cecilia Santa Cecilia	Community Volunteer Worker	4	4
Pinalpalan	Community Volunteer Worker	4	5
Mapulot	Community Volunteer Worker	2	3
Mapulot	Community Volunteer Worker	3	4
Mapulot	Community Volunteer Worker	3	4
Landing	Community Volunteer Worker	4	4
Landing	Barangay Supervisor	3	3

Landing	Community Volunteer Worker	4	4
Munting Parang	Community Volunteer Worker	4	4
Munting Parang	Barangay Supervisor	4	3
Pinalpalan	Community Volunteer Worker	4	4
New Argao	Barangay Supervisor	4	4
Mana	Community Volunteer Worker	3	4
Mana	Barangay Supervisor	3	3
Mana	Barangay Supervisor	4	4
Poblacion Zone 1	Community Volunteer Worker	3	4
Poblacion	Community Volunteer Worker	3	3
Tubalan	Community Volunteer Worker	3	4
San Isidro	Community Volunteer Worker	3	3
Aldavoc	Barangay Supervisor	3	4
	Community Volunteer Worker	3	3

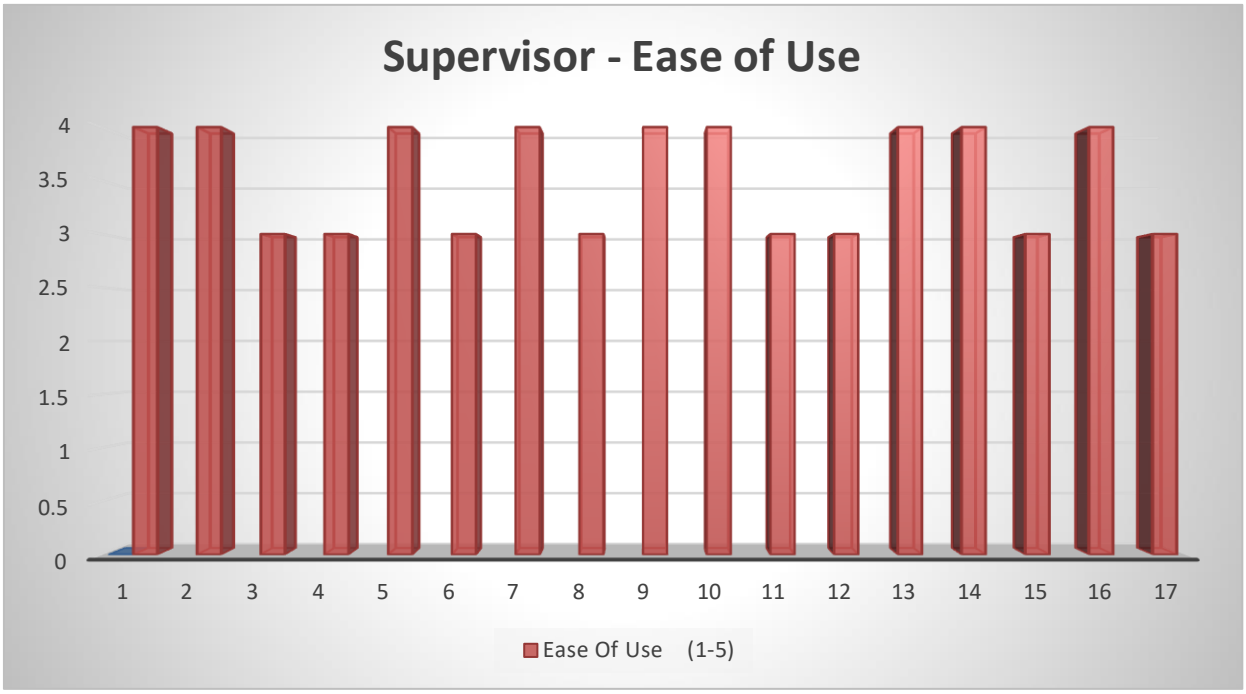


Figure 8: Supervisor Application Ease Of Use – PMNP

The bar chart displays individual supervisor responses on ease of use, showing that most supervisors rated the app between **3.0 and 4.0**, with a consistently high perception of usability and only a few noting moderate difficulty, reinforcing the overall average score of **4.1** for ease of use.

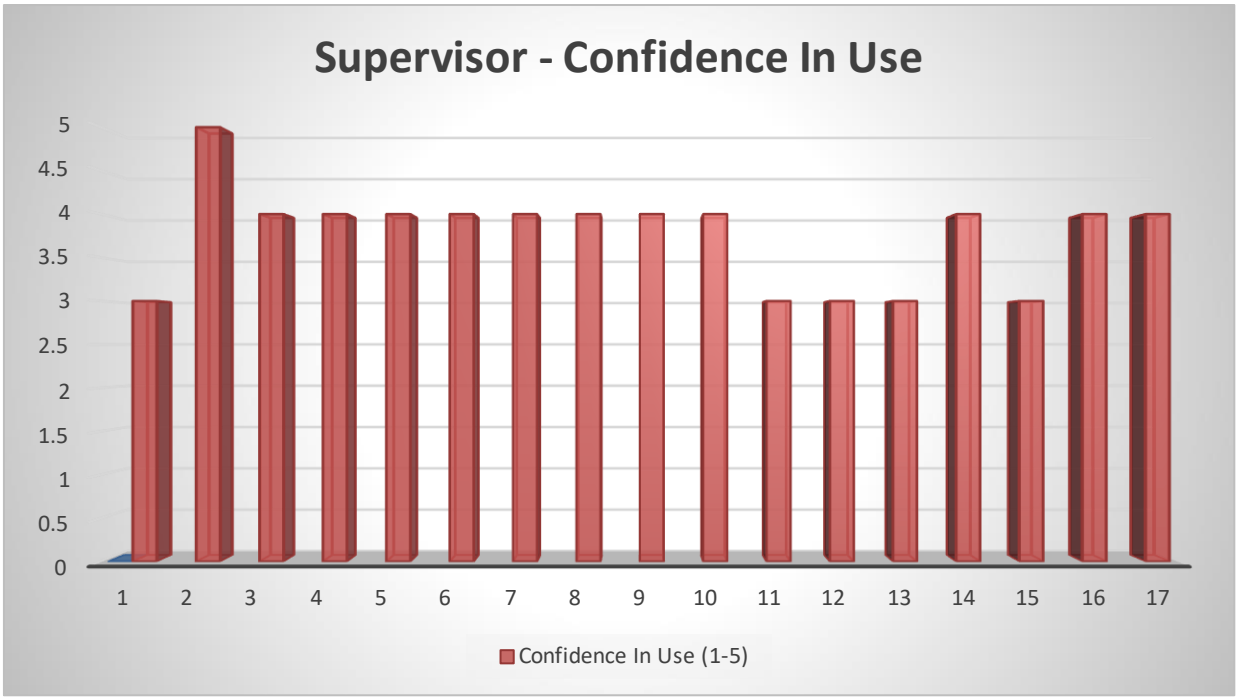


Figure 9: Supervisor Application Confidence In Use – PMNP

The chart illustrates that most supervisors rated their confidence in using the application between **4.0 and 4.5**, with only a few giving lower scores, resulting in an overall high confidence average of **4.3**, reflecting strong self-reliance and familiarity with the system during the pilot.

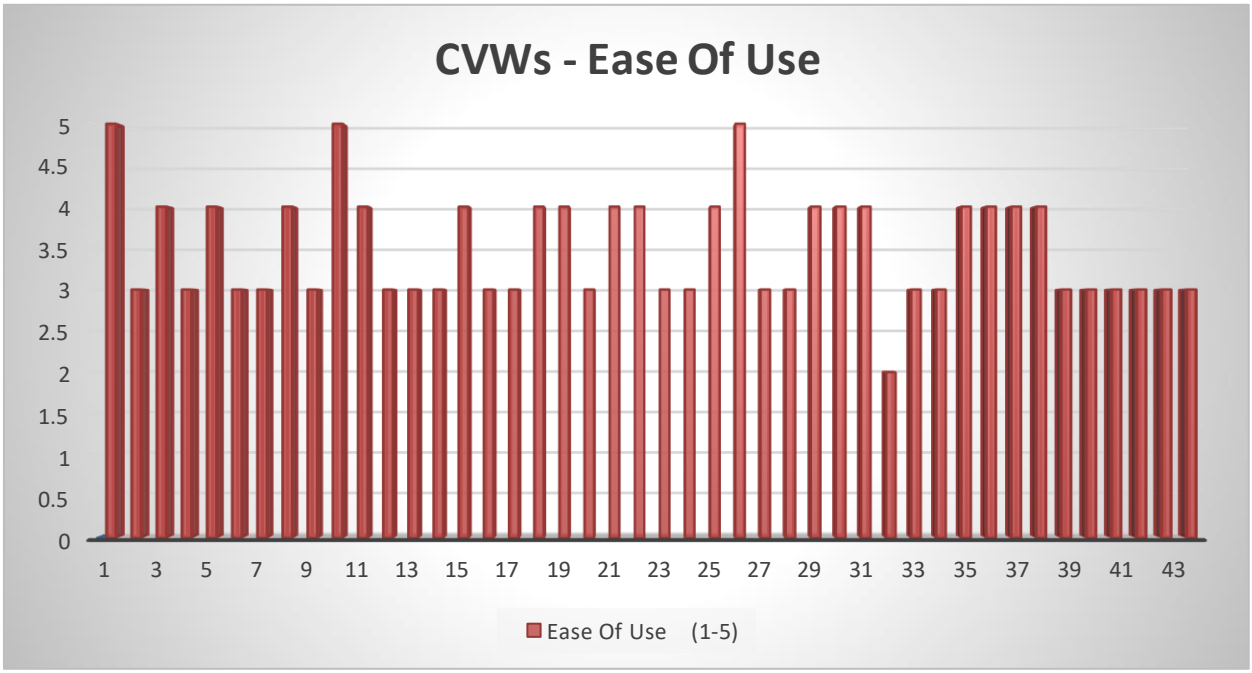


Figure 10: Scorecard Application Ease Of Use – PMNP

The chart shows that while a few Community Volunteer Workers (CVWs) rated the Scorecard app's ease of use as high **as 5**, the majority gave ratings between **3 and 4**, with some even lower—indicating varied user experiences and reinforcing the average ease-of-use score of **3.6**, and a clear need for improved design simplicity and user support.

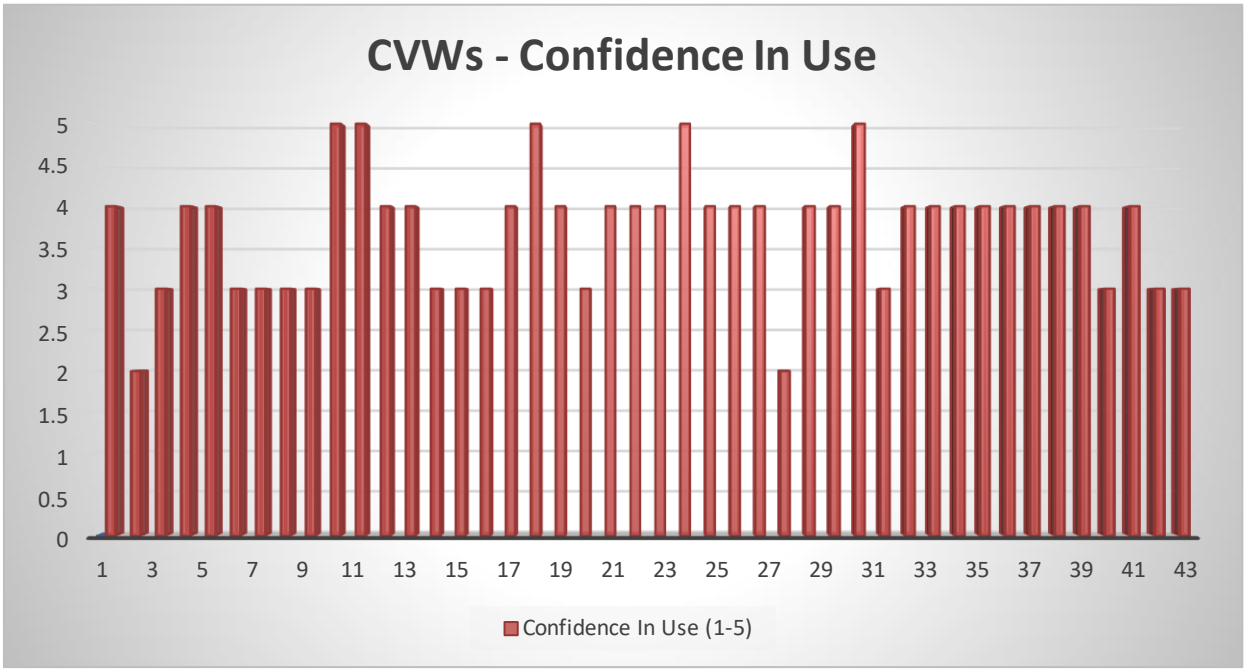


Figure 11: Scorecard Application Confidence In Use – PMNP

The chart illustrates that while most Community Volunteer Workers (CVWs) reported moderate to high confidence **(scores 3–5)** in using the PMNP-IS app, a few still exhibited low confidence, highlighting variability in digital comfort across the user base.

Structured user feedback was gathered through a **Likert-scale questionnaire** administered to **25 users**, including both CVWs and Supervisors. The questions measured **Ease of Use** and **Confidence in Using the App** on a scale of 1 to 5.

Among CVWs, the **Ease of Use** scored **3.6**, suggesting that the app was generally usable but not without friction. The **Confidence** score stood at **3.8**, indicating a moderate comfort level with routine tasks. Supervisors reported more favorable ratings: **Ease of Use** scored **4.1**, while **Confidence** reached **4.3**, reflecting a higher degree of system adaptability and comfort. These numbers confirm that while the system design supported supervisory roles well, **CVWs encountered more operational barriers**, likely due to the higher complexity of their tasks and more frequent offline use.

TABLE 12

RATING SCALE (EASE OF USE)	RANGE	INTERPRETATION
5	4.21-5.00	Very Easy
4	3.41-4.20	Easy
3	2.61-3.40	Average
2	1.81-2.60	Difficult
1	1.00-1.80	Very Difficult

TABLE 13

RATING SCALE (CONFIDENCE IN USE)	RANGE	INTERPRETATION
5	4.21-5.00	Very Confident
4	3.41-4.20	Confident
3	2.61-3.40	Moderately Confident
2	1.81-2.60	Somewhat Confident
1	1.00-1.80	Not Confident at all

TABLE 14

ASSESSMENT (N=25)	AVERAGE SCORE
EASE OF USE	3.543478261 (3.5/5)
CONFIDENCE IN USE	3.782608696 (3.8/5)

TABLE 15

Metric	**Formula**	**Average Score**
Ease of Use	Total Sum of Scores / Number of Entries	3.54
Confidence in Use	Total Sum of Confidence / Total Entries	3.78

These scores suggest that:

- Most users found the app **easy to use**, but **not very easy**.
- Users were **confident** but not yet at an expert level.

TABLE 16

User Type	Ease of Use (Avg.)	Confidence (Avg.)	Interpretation
CVWs	3.60	3.80	Moderate ease and confidence
Supervisors	4.10	4.30	Higher ease and confidence

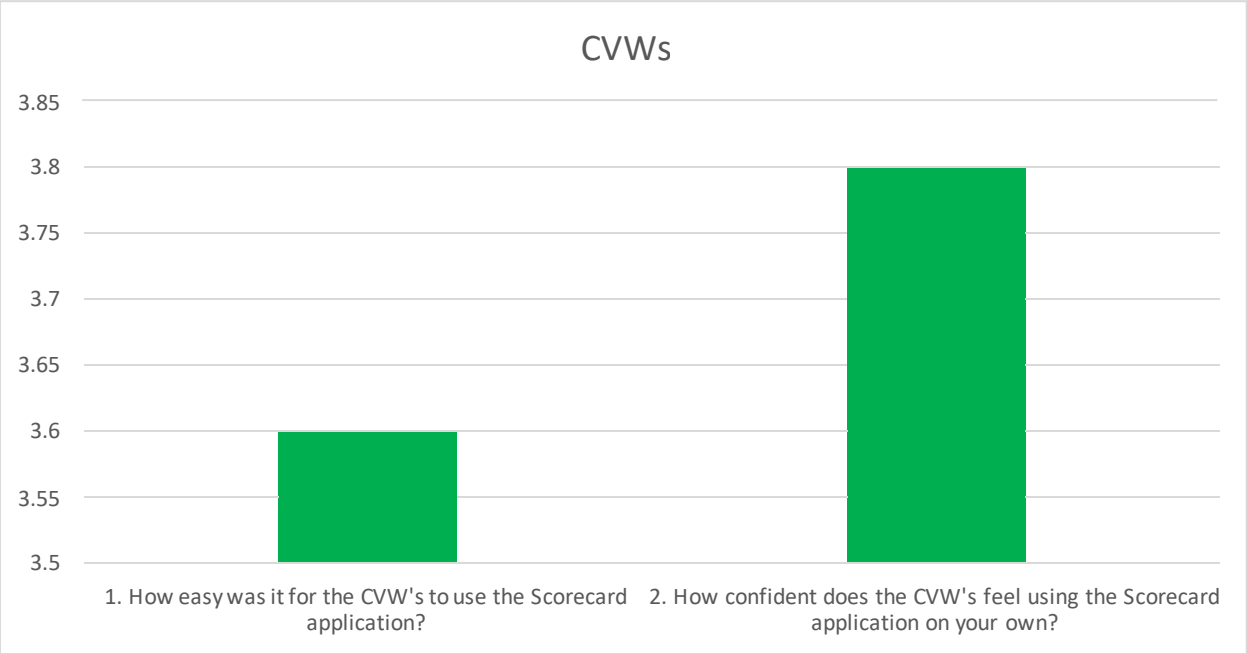


Figure 12

The chart shows that Community Volunteer Workers (CVWs) rated the Scorecard App with an average ease-of-use score of 3.6 and a confidence score of 3.8, indicating moderate comfort with the system but highlighting a need for further support and training.

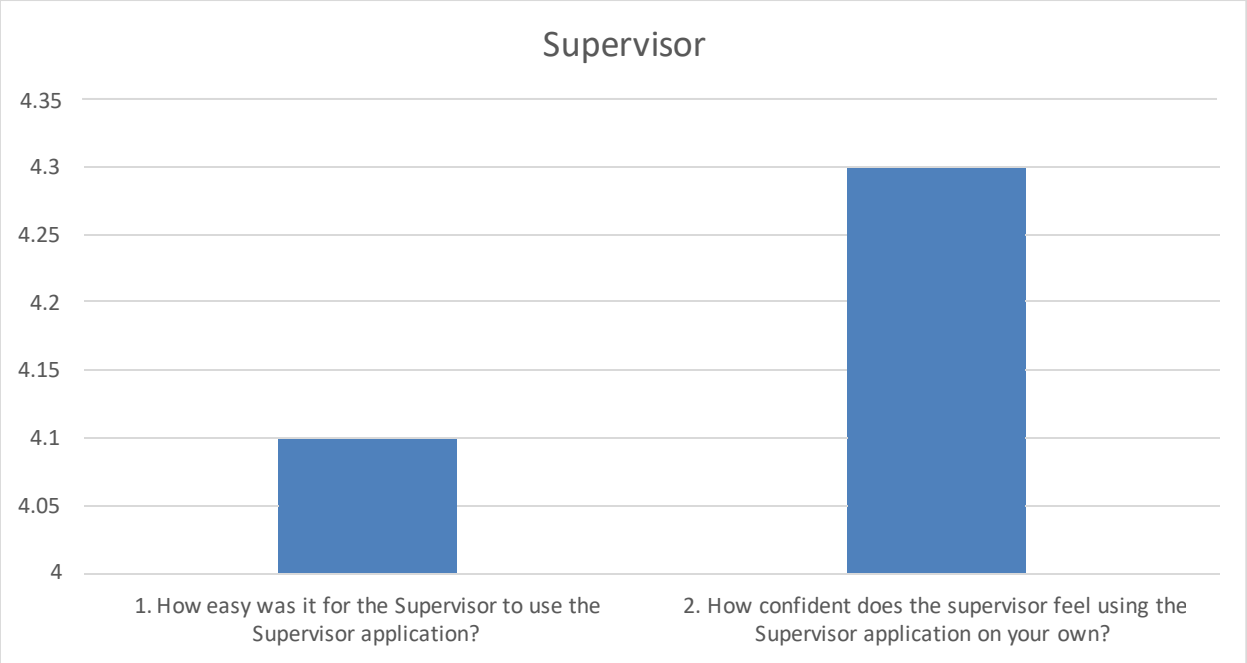


Figure 13

Interpretation:

The chart shows that supervisors rated the PMNP application highly, with an average ease-of-use score of **4.1** and a confidence score of **4.3**, indicating strong adaptability and comfort with the system.

- Supervisors rated the app higher on both parameters, possibly due to simpler dashboards and fewer tasks.
- CVWs struggled more with offline sync, navigation, and mobile entry in the field.

PMNP App Usability Across User Groups

Users	Average
CVWs - Ease of Use	3.6
CVWs - Confidence In Use	3.8
Supervisors - Ease of Use	4.1
Supervisors - Ease of Use	4.3

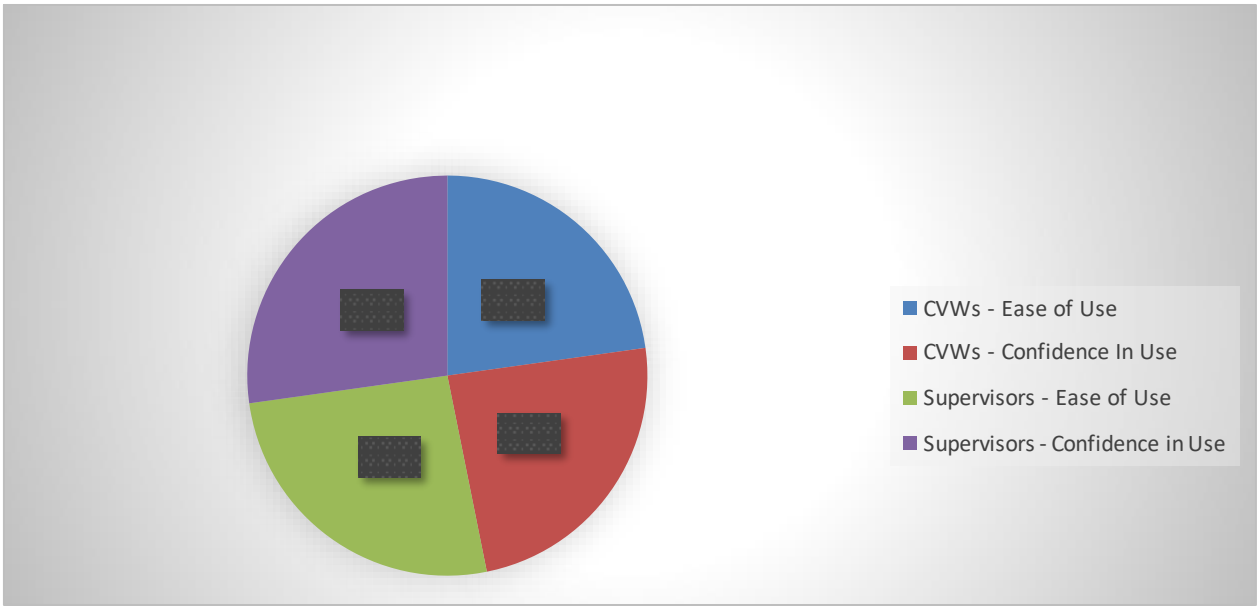


Figure 14: Scorecard and Supervisor App combined Ease of Use and Confidence in use

The chart reflects Supervisors and Community Volunteer Workers' (CVWs) confidence and ease in using the Supervisor and Scorecard application respectively, with most scores clustering between 3.5 and 4, though a few fell closer to 3.

The **open feedback** collected alongside the scale responses provided deeper thematic insights. **Language barriers** emerged as a significant challenge—many CVWs requested translations of key terms and interview questions into **local dialects such as Bisaya** to improve understanding and accuracy during data collection. User interface (UI) suggestions included requests for **larger fonts**, especially for older CVWs, **reduced clicks** needed to complete a form, and **better visibility of key columns** like form status or task completion.

TABLE 17

Theme	Example Comment
Larger Fonts Needed	"For older CVWs, I'm suggesting bigger fonts."
Translation Required	"Translate household questions into Bisaya to improve clarity."
Better Navigation	"Need easier search and fewer clicks to complete household form."
Dashboard Filters	"Supervisor should have filters to check which CHV submitted."

Supervisors emphasized the need for search functions, particularly to help locate household records faster during validation, and a dashboard view showing real-time CVW activity and

progress to support supervision. These suggestions directly relate to improving task tracking, data quality, and workflow efficiency in future iterations of the system.

In summary, the feedback and performance data suggest that supervisors were more adaptable to the system's layout and features due to their simpler workflows and relatively static dashboard environment. On the other hand, CVWs required more structured guidance, recurring refresher training, and interface improvements to support their dynamic, mobile fieldwork environment.

DISCUSSION

The findings of the PMNP-IS pilot study underscore the potential of DHIS2-based systems to enhance community nutrition monitoring, but also highlight the need for user-centered refinements. Functionality-wise, while the system performed well overall, the discrepancy between CVW and Supervisor experience pointed to a clear divide in usability. CVWs, who interact with the system more intensively and in offline conditions, faced interface challenges, navigation difficulties, and syncing issues, affecting their ability to complete tasks consistently. In contrast, Supervisors adapted more quickly, reflecting the importance of role-specific design and support.

User feedback complemented these insights, revealing that ease of use and confidence scores were moderate among CVWs and higher among Supervisors. Feedback highlighted the need for larger fonts, reduced form complexity, and translations into regional languages like Bisaya. These practical suggestions can directly inform system revisions.

One major area for further research is understanding the long-term sustainability of adoption—how regular usage evolves over time, particularly with system updates, staff turnover, and connectivity changes. Additionally, there's scope to study how improved feedback mechanisms and local co-design efforts could enhance engagement and reduce digital fatigue among health workers.

Overall, the study supports the case for agile, adaptive system development guided by on-ground realities. These insights not only strengthen PMNP-IS rollout strategies but also contribute broadly to digital health program design in similar settings.

CONCLUSION

This study examined the usability, adaptability, and field performance of the PMNP-IS platform in its early implementation phase. With over 78 system functions tested and feedback from 25 field users, the findings reveal high potential for system adoption, particularly among supervisors. However, user experience varied, with CVWs facing more challenges related to offline use, interface navigation, and training adequacy.

By incorporating structured feedback, refining interface design, and investing in ongoing capacity-building, PMNP-IS can evolve into a more accessible and impactful tool. These improvements will not only enhance system usage but also contribute meaningfully to better nutrition outcomes at the local level—through timely data, better planning, and more responsive governance.

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APPENDICES (Survey forms, scorecard etc)

a) Time Schedule

S. No	Name of the Department	Date(s) of Visit	% of Time Spent	Interacted with (Name and Designation)
1.	Implementation Department (IT)	20/05/2025	55%	Ms. Deepika Singh (Senior Advisor-DHIS2) Mr. Sumit Tripathi (Program Manager-DHIS2) Mrs. Chahat Narula (Documentation)
2.	Capacity Building Department	02/05/2025	25%	Dr. Shirin Saini (Lead)
3.	Leadership & Strategic Management	11/06/2025	10%	Mr. Saurabh Leekha (CEO)
4.	IT & Infrastructure	25/06/2025	5%	Mr. Mithilesh Thakur (IT Head)

(b) Data collection format, tables, pictures and charts.

Dashboard | DHIS2

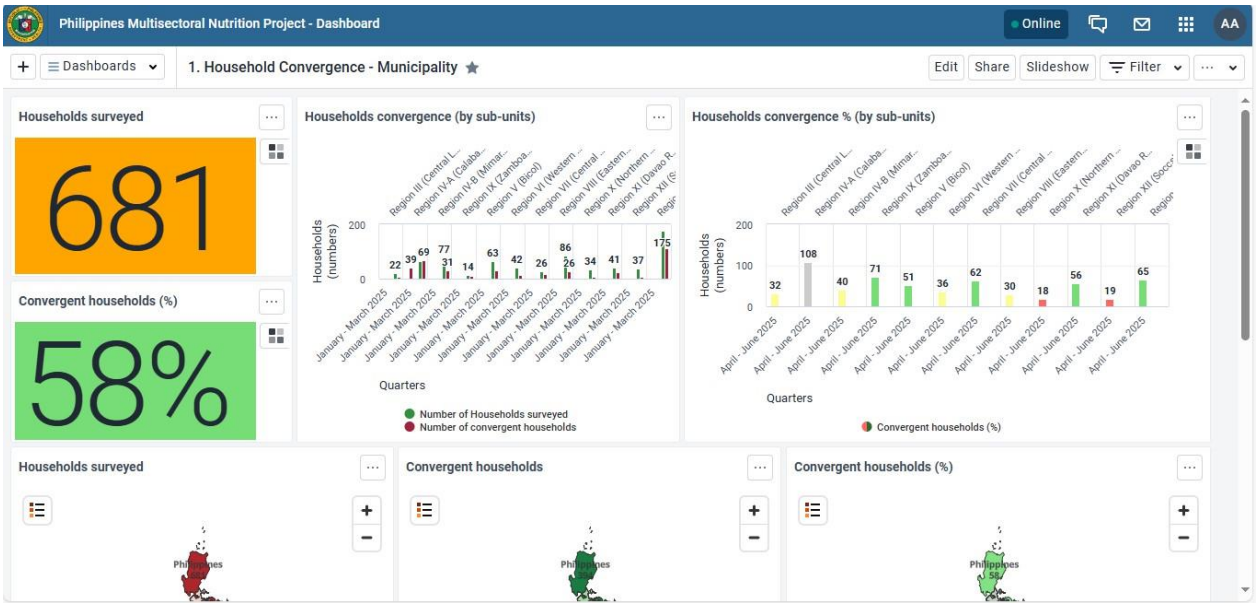


Figure 14: PMNP Dashboard

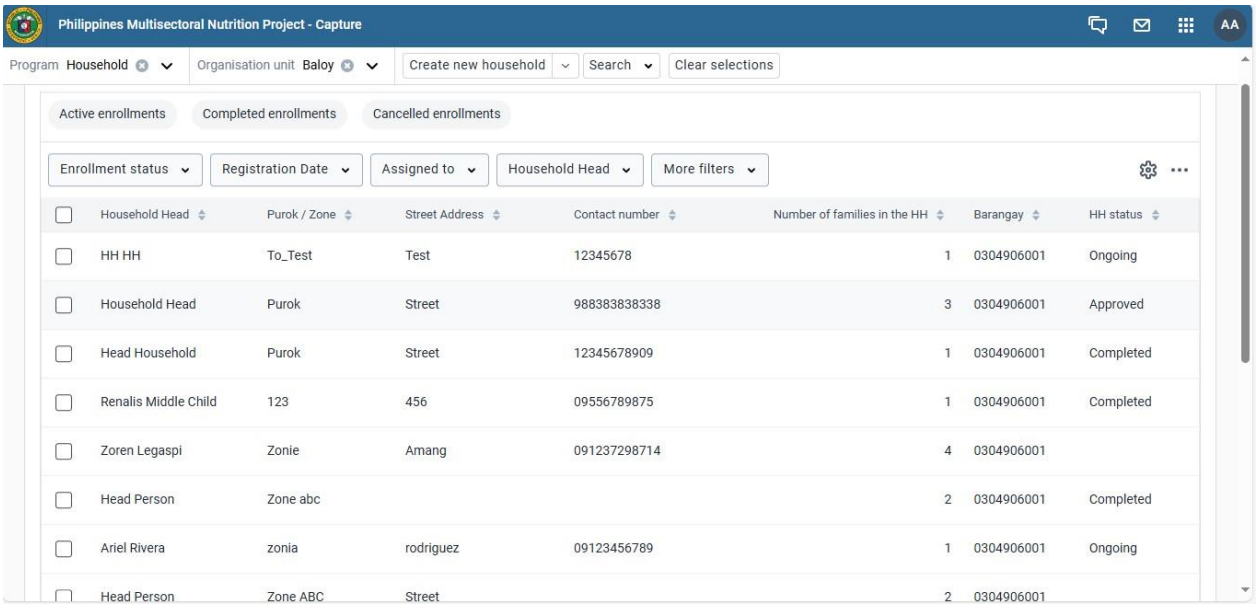


Figure 15 (a): Capture App (HH-Supervisor)

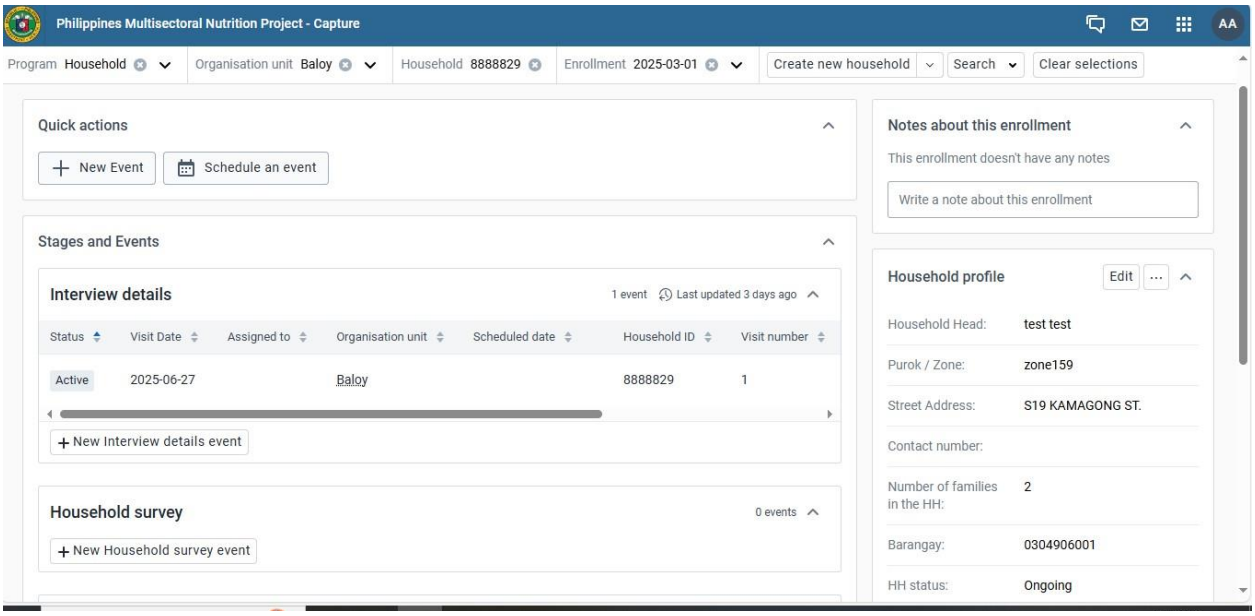


Figure 15 (b): Capture App (HH-Supervisor)

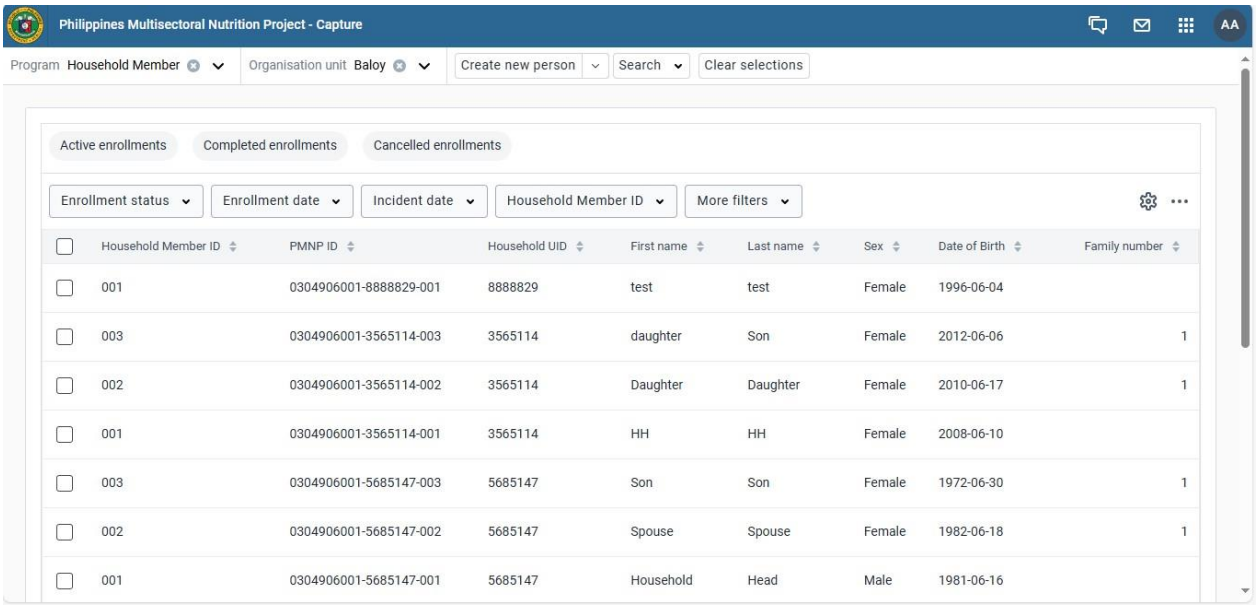


Figure 16 (a) Capture App (Household-CVW)

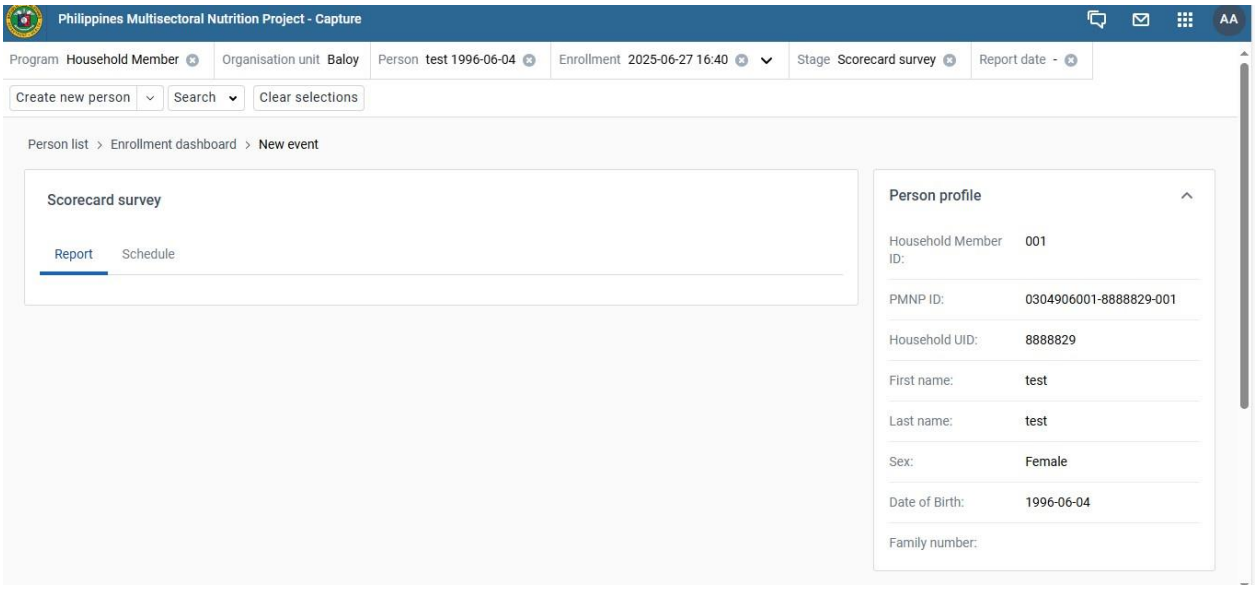


Figure 16 (b): Capture App (Household-CVW)