

Smart Assistance to ASHA Workers

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Abstract: *The Smart Health Recorder for ASHA Workers is a digital healthcare platform designed to support Accredited Social Health Activists (ASHAs) in managing beneficiary information and performing routine healthcare activities efficiently. The system replaces traditional paper-based record keeping with a centralized digital platform for beneficiary registration, electronic health records, maternal and child healthcare tracking, home visits, surveys, referrals, reminders, and reporting. ASHA workers can securely access the system using mobile number-based OTP or PIN authentication and maintain beneficiary profiles containing demographic and healthcare information. The system enables the recording of symptoms, diagnosis, medicines, visit history, medical reports, pregnancy details, antenatal care visits, immunization schedules, child growth, and follow-up activities. Automated reminders and alerts help ASHA workers track important healthcare activities and reduce missed follow-ups, while the referral module supports timely communication with healthcare facilities during emergency situations. A dashboard provides daily, weekly, and monthly summaries of beneficiaries, high-risk cases, referrals, and field activities. The proposed system aims to improve healthcare data management, reduce manual workload, enhance monitoring, and support timely community healthcare delivery, particularly in rural and resource-constrained areas*

Keywords: ASHA Workers, Healthcare Management System, Digital Health, Electronic Health Records (EHR), Maternal and Child Health, Beneficiary Management, Health Monitoring, Referral Management, Mobile Health (mHealth), Rural Healthcare

I. INTRODUCTION

ASHA workers play an important role in connecting communities with primary healthcare services, particularly in rural and underserved areas. They regularly visit households, register beneficiaries, support pregnant women and children, conduct health surveys, provide basic healthcare guidance, monitor treatment and immunization activities, and refer patients to appropriate healthcare facilities when necessary. However, many of these activities may depend on paper-based records or manually maintained information, which can make data retrieval, updating, monitoring, and reporting time-consuming and difficult[1].

The Smart Health Recorder for ASHA Workers is proposed as a digital solution to improve the management of healthcare activities performed by ASHA workers. The system provides a centralized platform through which ASHA workers can securely log in and manage beneficiary information, electronic health records, maternal and child health data, home visits, surveys, referrals, reminders, and reports. Beneficiaries can be registered with their demographic details and linked to the respective ASHA worker, village, sub-center, and Primary Health Centre (PHC)[2].

The system maintains electronic health records containing information such as previous visits, symptoms, diagnosis, chronic diseases, medicines, prescriptions, and medical reports. A dedicated maternal and child healthcare module enables monitoring of pregnancy registration, antenatal care visits, expected delivery dates, vaccination, nutrition supplements, child immunization, growth monitoring, and possible malnutrition cases. The home visit and survey module allows ASHA workers to digitally record field activities and observations[3].



Another important feature is the Reminder and Alert Module, which generates notifications for upcoming immunizations, ANC visits, medicines, and follow-ups. The Referral and Emergency Module supports the creation of referrals by automatically retrieving beneficiary information and recording the reason for referral and selected healthcare facility. The reporting and dashboard module summarizes beneficiary and field-activity data, helping ASHA workers and authorized healthcare administrators monitor performance and identify high-risk or pending cases[4]. The proposed system aims to reduce paperwork, improve accessibility and accuracy of healthcare records, simplify field-level data collection, and support timely healthcare follow-up. By combining digital record management, automated reminders, referral support, and activity-based reporting, the system provides a structured and scalable approach for strengthening community healthcare management and supporting ASHA workers in their day-to-day responsibilities[5].

II. LITERATURE ANALYSIS

Several studies have highlighted the importance of digital health interventions in empowering ASHA and community health workers (CHWs) to improve rural healthcare delivery. Parmar (2021) emphasized the need for m-health technologies to enhance ASHAs' efficiency and digital literacy, enabling better outreach and health monitoring in rural areas. Jadhav (2026) demonstrated that digitalization of ASHA workflows through mobile applications improves data accuracy, realtime monitoring, and service efficiency. Mangal (2023) showed that tablet-based e-health training significantly enhanced ASHAs' skills in screening, health education, and managing non-communicable diseases. Similarly, Hariprasad (2025) developed a mobile application for population-based cancer screening, which improved CHWs' data collection, referral management, and early cancer detection in rural communities. Collectively, these studies underscore that mobile and digital health solutions, coupled with proper training, can strengthen ASHA and CHW capacity, improve healthcare outcomes, and support real-time monitoring and decision-making in underserved areas.

TABLE I.: LITERATURE WORK

Author and Year	Methods	Future Scope
Kajal Parmar, Central University of Himachal Pradesh (2024)	Comparative analysis of m-health interventions (voice calls vs SMS) Literature review on e-health and m-health adoption; focus on Smart Health Recorder for ASHA Workers' role in rural healthcare	Emphasizes training Smart Health Recorder for ASHA Workers in digital health technologies to improve efficiency; mobile-based interventions (voice calls, SMS, apps) can enhance maternal and child health tracking, data recording, and communication with doctors; future work should focus on increasing literacy, addressing rural connectivity, and designing user-friendly m-health solutions for low-literacy populations.
Jadhav, D.K., Hajare, M., Jadhav, R., Mulla, S., & Bhasar, S. (2026)	Review of digital applications and mobile health tools used by Smart Health Recorder for ASHA Workers; analysis of efficiency, data accuracy, and real-time monitoring in rural healthcare	Development of simple, secure, userfriendly, and integrated digital systems for Smart Health Recorder for ASHA Workers; improve connectivity, provide training, and strengthen public healthcare delivery; enhance transparency and decision-making in rural health management



Mangal 2023	Prospective observational cohort study; Smart Health Recorder for ASHA Workers in two villages of Rajasthan were trained to use a tablet-based web application for screening, diagnosis, and health education on non-communicable diseases; in-depth interviews and group discussions evaluated usability and effectiveness	Scaling up digital training programs for ASHAs across rural India; integrating ehealth applications for broader primary care services; improving digital literacy among grassroots health workers; promoting environmental benefits by reducing paper usage; expanding women's empowerment and skill development through technology
Hariprasad, R., Chalga, M.S., Kedar, A., Kumar, V., Gola, S., Tapkire, R., & Kannan, R., 2025	Applied research and pilot study; developed an Android-based mobile application and web portal for population-based cancer screening; 199 CHWs trained to collect data, screen individuals, and manage referrals.	Scaling the application for wider population-based cancer screening across rural India; integrating with national health programs; training more ASHA/CHWs; enhancing usability and analytics for early cancer detection; evaluating long-term impact on morbidity and mortality

III. WORKING METHODOLOGY

1. User Authentication & Profile Module

The User Authentication and Profile Module provides secure access to the application for Smart Health Recorder for ASHA Workers. During registration, the ASHA worker enters her mobile number and required identification details. The system verifies the mobile number using an OTP or allows authentication using a PIN after successful registration. Once authenticated, the system retrieves the ASHA worker's profile from the database, including ASHA ID, village, sub-center, PHC linkage, and assigned role. Role-based access control ensures that users can access only the features permitted for their role. The login session is securely maintained, and the user can update permitted profile information when required.

2. Beneficiary Registration Module

The Beneficiary Registration Module allows Smart Health Recorder for ASHA Workers to register villagers under their care. The worker enters details such as name, age, gender, category, mobile number, address, and optional Aadhaar information. The system validates the entered information and checks for possible duplicate beneficiaries using available identifying details. After successful validation, a unique Beneficiary ID is generated and the information is stored in the database. The registered beneficiary is then linked to the concerned ASHA worker, village, sub-center, and PHC, making future visits and health records easier to manage.

3. Electronic Health Record (EHR) Module

The EHR Module maintains a centralized digital health record for every registered beneficiary. When an ASHA worker conducts a visit or provides healthcare assistance, details such as symptoms, health observations, diagnosis, chronic diseases, medicines, previous visits, and follow-up information are entered into the system. Documents such as medical reports and prescriptions can also be attached to the beneficiary's record. Each new visit creates a time-stamped entry rather than replacing previous information, allowing authorized users to view the beneficiary's complete health history and monitor changes over time.



4. Maternal & Child Health Module

The Maternal and Child Health Module specifically manages healthcare information related to pregnant women, mothers, and children. For a registered pregnant beneficiary, the ASHA worker records pregnancy registration, expected delivery date (EDD), antenatal care (ANC) visits, TT/Td vaccination, nutrition supplements, and other relevant observations. For children, the system maintains immunization schedules, growth measurements, and nutritional status. The application compares recorded information with predefined schedules and identifies missed or upcoming healthcare activities. If abnormal growth or possible malnutrition is detected based on configured criteria, the case can be marked for follow-up or referral.

5. Home Visit & Survey Module

The Home Visit and Survey Module enables Smart Health Recorder for ASHA Workers to digitally record their daily field activities. Before or after visiting a beneficiary's home, the worker selects the beneficiary and records the visit date, purpose, observations, services provided, and visit outcome. Government health surveys can also be completed through predefined digital forms. If GPS functionality is enabled and permission is granted, the system can record the approximate location associated with the visit. The stored information can later be used to monitor completed visits, pending visits, survey progress, and ASHA field activities.

6. Referral & Emergency Module

The Referral and Emergency Module is used when a beneficiary requires medical attention beyond the services available through the ASHA worker. The worker selects the beneficiary, and the system automatically retrieves available patient information from the EHR. The worker then enters the referral reason, urgency level, symptoms or observations, and selects the appropriate hospital or health facility. A referral record is generated with a unique reference number. Where SMS functionality is available, referral information or instructions can be sent to the beneficiary or concerned healthcare contact. The referral status can subsequently be updated to track whether the beneficiary reached the referred facility.

7. Reminder & Alert Module

The Reminder and Alert Module automatically generates reminders based on dates and healthcare schedules stored in the database. For example, the system can calculate upcoming ANC visits, child immunizations, medicine schedules, and follow-up dates. A background scheduling process checks pending reminders and creates notifications when their scheduled time is reached. Notifications can be stored locally on the device so that previously scheduled reminders can be displayed even when internet connectivity is temporarily unavailable. When network connectivity is available, the system can synchronize updated schedules and notification status with the central server.

8. Reports & Dashboard Module

The Reports and Dashboard Module converts stored healthcare and field-activity data into useful summaries. After authentication, the system retrieves data related to the logged-in ASHA worker and displays indicators such as total beneficiaries, pregnant women, children, completed home visits, pending follow-ups, high-risk cases, referrals, and recent activities. The system can generate daily, weekly, and monthly reports by filtering records according to date, beneficiary category, village, or activity type. These reports help Smart Health Recorder for ASHA Workers and authorized healthcare administrators monitor field performance, identify pending activities, and support healthcare planning and decision-making.

Overall Working Flow

ASHA Worker Login → OTP/PIN Verification →

Dashboard → Beneficiary Registration → EHR Creation → Home Visit/Data Collection → Maternal & Child Health Tracking → Reminder/Alert Generation → Referral if Required → Database Synchronization → Reports & Dashboard



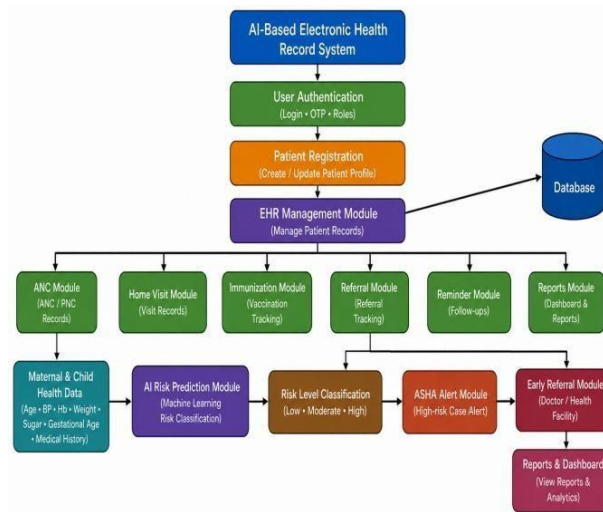


Figure 1. Data Flow Diagram

IV. RESULTS AND DISCUSSION

The developed Smart Health Recorder for ASHA Workers provides a digital platform for managing beneficiary health information, field activities, maternal and child healthcare, referrals, reminders, and reporting. The system reduces dependence on manual registers and improves the availability and organization of healthcare information.

The User Authentication and Profile Module provides secure access through mobile number and OTP/PIN authentication, while role-based access ensures that only authorized users can access specific functions. The Beneficiary Registration Module allows Smart Health Recorder for ASHA Workers to digitally register villagers and maintain their basic demographic information. This helps reduce duplicate records and makes beneficiary information easier to retrieve during subsequent visits. The Electronic Health Record (EHR) Module maintains beneficiary health information such as medical history, symptoms, diagnosis, medicines, previous visits, and uploaded medical documents. The Maternal and Child Health Module helps Smart Health Recorder for ASHA Workers monitor pregnancy-related information, ANC visits, expected delivery dates, immunization schedules, nutrition supplements, child growth, and possible malnutrition cases. This provides a structured way to identify upcoming healthcare activities and beneficiaries requiring attention. The Home Visit and Survey Module enables Smart Health Recorder for ASHA Workers to record field visits, survey responses, observations, and services provided. The Referral and Emergency Module simplifies the referral process by automatically retrieving beneficiary information and generating referral records with the reason for referral and selected healthcare facility. The Reminder and Alert Module helps ensure that important activities such as immunization, ANC visits, medicine intake, and follow-ups are not missed. Local notifications can continue to function when internet connectivity is temporarily unavailable. The Reports and Dashboard Module provides daily, weekly, and monthly summaries of beneficiaries, home visits, high-risk cases, referrals, and pending activities. These reports help Smart Health Recorder for ASHA Workers and authorized healthcare administrators monitor activities and make informed decisions. Overall, the system improves data accessibility, record management, healthcare follow-up, field-work monitoring, and communication between Smart Health Recorder for ASHA Workers and healthcare facilities.

Discussion

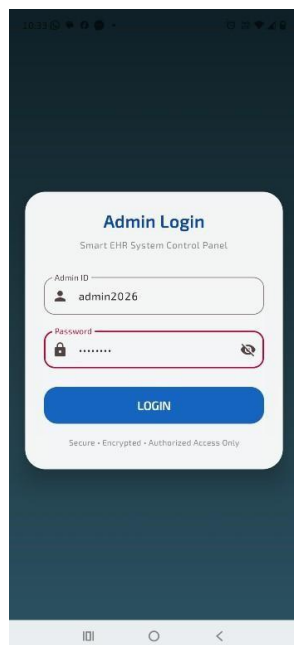
The results indicate that digitizing ASHA-related healthcare activities can make routine field operations more organized and efficient. Instead of maintaining separate paper records, beneficiary information can be maintained in a centralized digital system and reused across multiple modules. Automated reminders can improve follow-up activities,



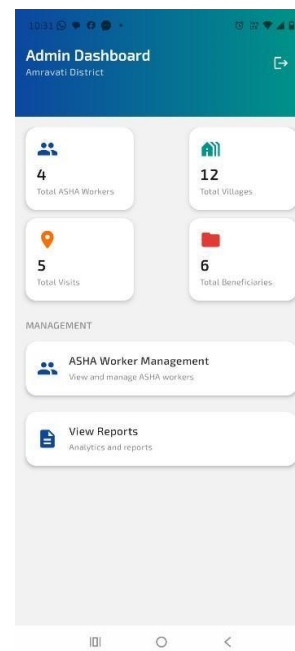
while dashboards provide a quick overview of the current workload and high-priority cases. However, practical deployment may face challenges such as poor internet connectivity in rural areas, limited digital literacy, device availability, data privacy, and the need for proper training. Therefore, offline functionality, simple user interfaces, secure authentication, data backup, and continuous technical support are important for successful implementation. Overall, the proposed system provides a scalable foundation for improving digital healthcare management and supporting Smart Health Recorder for ASHA Workers in delivering timely and organized community healthcare services.



Home Page

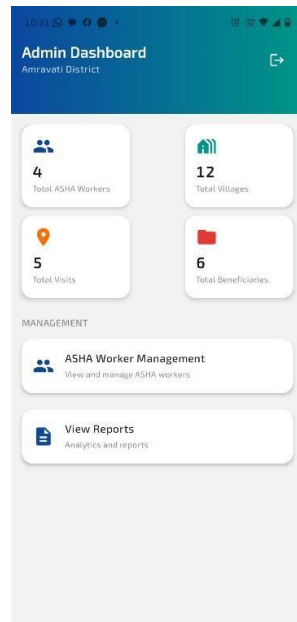


Admin Login page User Login

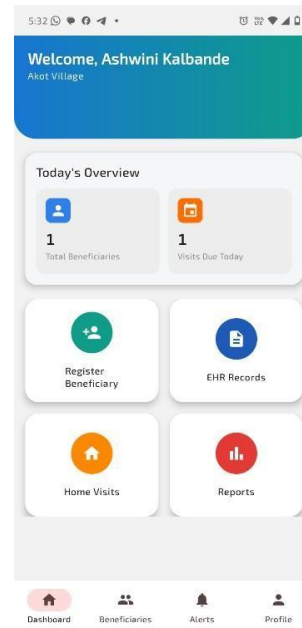


Admin Dashboard page

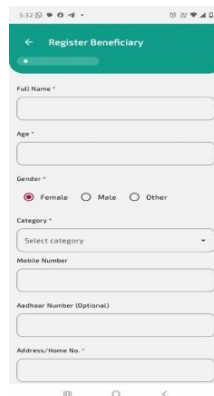




User Dashboard page



Register Beneficiary page



Register Beneficiary page

V. CONCLUSION

The Smart Health Recorder or EHR for ASHA Workers is a healthcare domain application designed to digitize beneficiary health records and improve primary healthcare services in rural areas. The primary purpose of this project is to provide Smart Health Recorder for ASHA Workers with a secure, reliable, and user-friendly platform for beneficiary registration, electronic health record management, maternal and child healthcare monitoring, home visits, referrals, reminders, and report generation. The system is developed using Flutter, Python FastAPI, and Microsoft SQL Server, following a 3-tier architecture for better scalability and maintainability. It implements rolebased authentication, OTP/PIN verification, CRUD operations, search and filtering functionality, data validation, and dashboard analytics for efficient data processing and decision-making. The application also ensures data security, high performance, and



scalability, while supporting future integration with ABHA and ABDM to strengthen India's digital healthcare ecosystem.

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