Ministry of Health and Social Services

Directorate: Pharmaceutical Services

Division: National Medicines Policy Coordination

EDT Scope Of Work

1. Background

The Namibian Pharmaceutical Services Directorate, under the Ministry of Health and Social Services (MoHSS), has been striving to improve patient care and medication management across decentralized facilities. To address the challenges of manual data synchronization, inefficiencies in dispensary stock management, and inconsistencies in patient medication dispensing and reporting, MoHSS is implementing a web based Electronic Dispensing Tool (EDT). This tool will modernize and streamline healthcare operations, especially in rural and underserved regions, by automating key functions in patient management, medication dispensing and reporting.

The EDT will be a critical enabler in Namibia's healthcare sector by integrating data collection, management, and reporting capabilities, thus improving healthcare delivery and ensuring that vital medicines are consistently available to patients. It will operate in both online and offline environments, ensuring continuity of services in regions with poor internet connectivity. The tool will also facilitate data synchronization between decentralized facilities and a central national server facilitating the tracking of patients whenever they wish to access services and providing a robust, secure, and accessible system for all stakeholders involved in patient care.

2. General Requirements

The Electronic Dispensing Tool (EDT) will be re-designed to streamline and automate the management of patient health profiles and medication dispensing. It will enable healthcare facilities to manage patient information, dispense medications accurately, handle dispensary inventory effectively, and synchronize data between decentralized sites and a central server. Key features of the EDT will include:

- Functionality in both online and offline environments.
- Centralized data synchronization to ensure consistent record-keeping and patient tracking.
- Integration of role-based access control for secure and compliant operations.
- Real-time or scheduled synchronization between sites with varying levels of connectivity.
- Interoperability with FESC for stock data exchange and automated uploads of reports to dashboard for pharmaceutical information.
- Interoperability with the PMIS Dashboard.

3. Objectives

- Automation and Simplification: Streamline processes like patient registration, medication dispensing, dispensary stock management, and appointment scheduling.
- Offline Functionality: Ensure the tool can function effectively even in areas with limited or no internet connectivity.
- Data Synchronization: Centralize and synchronize patient and inventory records across all facilities.
- Efficiency Enhancement: Improve healthcare provider efficiency by providing easy access to data and automating routine tasks.
- Develop interoperability with the Facility Electronic Tool and the dashboard for pharmaceutical information
- Develop and implement a SMS reminder system for chronic patients

4. Key Stakeholders

- Ministry of Health and Social Services (MoHSS)
- Healthcare facilities (decentralized sites)
- Pharmacists and dispensers
- Patients
- IT support teams
- Central data administrators
-

5. Business Needs

- Efficient and secure patient record-keeping.
- Accurate and comprehensive stock management.
- Reliable offline functionality with scheduled data synchronization.
- Compliance with regulatory standards for health information and data management.
- Role-based access control to ensure data security.

6. Key Benefits

- Faster and more accurate patient care and medication dispensing.
- Reduction in manual paperwork and associated errors.
- Enhanced reporting and data analysis capabilities.
- Improved management of healthcare products and resources.

7. Software Models

The EDT will be deployed in two models:

- National EDT Portal: Serving as the central data warehouse for metadata and synchronized data from offline facilities.
- EDT Application (Site-Level): Used for patient and stock management, functioning entirely offline with local data storage. Data will be uploaded when internet connectivity is restored, or manually as needed.
- The existing EDT database structure will be maintained, eliminating the need for data migration.

8. Functional requirements

This section lists the core processes across the in-country supply chain levels and details the functional requirements for each responsible entity and users.

AREA	KEY FEATURES
Welcome Dashboard	• Displays key metrics (patients served, products dispensed, stock levels, etc.). • Overview of current dispensing activities and alerts.
Patient Management	• Allow adding a new patient with a specific profile. These treatment profiles are earmarked: General, Chronic (HIV/AIDS, TB Preventative Therapy (TPT), Cardiovascular conditions, Family Planning Commodities, Endocrine Conditions, Kidney and Urological disorders, Mental Health, Musculoskeletal Disorders, Respiratory conditions), PEP, PrEP. • Ensuring patient record uniqueness

	• Allow management of existing patient demographics and treatment history • Allow to change profile and transfer patients between sites (Push/Pull, Auto transfer-in) • Generate and manage patient appointments • Allow the offline app to search patients in EDT portal & download them if necessary • Searching of patient record (local and national database) • Allow Adherence tracking • Allow Appointment scheduling • Allow Regimen/status changes
Requisition/Order	• Allow facilities to submit periodic orders to FESC electronically (API integration) and manually • Automatic calculation of order quantity based on available balance and min/max principle
Receiving	• Allow receiving of issued data from FESC electronically (API integration) and manually • Verification of electronically received stock data from FESC • Prevention of receiving the same invoice more than once
Inventory Management	• Product list import from Pharmaceutical Information Dashboard to national EDT portal (NEP) • Product list sync downstream to HFs (Pull from NEP) • Monthly dispensary stock take entry on EDT • Periodic stock take and ad-hoc cycle count • Maintain stock by FEFO • Adjustment of stock due to expiry, other loss, transfer, return

Dispensing	• Medicines selection for dispensing (NEP)
	• Allow Real-time dispensary stock management
	• Calculate adherence based on pill coverage
	• Allow Dispensing of other pharmaceuticals
	• Reversing dispensing transactions
	• Dispensing e-prescription received from DHP
	  o Allow auto-creation of dispense records based on prescription posting
	  o Streamlining e-prescription dispensing for both in-patients and outpatients in liaison with DHP development team

Synchronization	• Synchronize data between decentralized facilities and a central server.

	• Provide real-time or scheduled synchronization for offline facilities. • Product list sync downstream to HFs

Daily & Monthly Reporting	• Develop daily stock status reports for automated upload to the dashboard for pharmaceutical information
	• For each treatment profile – various reports will be required based on user needs (roughly 5 reports will be defined for each treatment profile).
	• Allow closing a month, which will generate the monthly ART report in Excel format and upload to the pharmaceutical dashboard automatically
	  o Standardized reporting as per the ART reporting template
	  o Automated filling of ART reporting template

Operational Reports	• User Audit report and Statistics Report
	• Standardized reporting as per the ART reporting template
	  o Automated filling of ART reporting template
	• Build in Facility reporting module
	  o ARV stock-related reports – dispense trend of top N products, transaction reports
	• Patient-related reports – like patient breakdown by regimen/protocol, MMD related reports, missed appointments, LTFU, report on lab tests, adherence
	• Additional reporting for other chronic conditions and essential medicines
	• Allow Reporting on the dispensing of items on the AWARE classification
	• Allow Reporting on dispensing interventions
	• All reports should be filtered by a single facility, district, region, or national summary
	• Reports should be exportable to Excel

SMS reminders	• Allow patient enrolment into the existing SMS service (API integration) • Create Front-end View for patient enrollment into the SMS service, including options for opting out of SMS service
Administration	• Allow to import product metadata from PMIS portal • Activate/deactivate products based on requirements at the dispensing point • Allow product management using both Pack Size and UoI • Allow user registration and management of roles and permission • Allow importing facility metadata from NEP portal

	• Allow import of other metadata – regimens, dosage regions, towns, client status etc. from PMIS portal • Allow User administration • Allow Authentication and authorization
Interoperability	• Allow interoperability with existing Pelebox Service using API integration • Allow interoperability with external Electronic Medical Records (EMR) systems • Inter-operability with PMIS Dashboard and FESC

9. Technical Specifications or Constraints

- Front-end: Develop front-end with latest Long-Term Support (LTS) version of Angular or React framework. The front-end must be designed to consume APIs from the back-end, treating them as services to enable a modular and maintainable architecture.
- Back-end: Develop server-side logic using the latest Long-Term Support (LTS) version of ASP.NET with Web API, using C# as the primary language. Design the back-end to expose APIs (end-points) consumed by the Angular/React front-end, ensuring seamless interaction. Use Entity Framework is for object-relational mapping (ORM).
- Database: Use Microsoft SQL Server 2019+ for database management, providing reliable and scalable data storage.
- Interoperability: Use RESTful APIs and GraphQL for efficient data exchange between system modules and with external systems, supporting JSON and XML formats.
- Unified Data Repository: Implement a central database designed for real-time consistency to support data integrity and minimize duplication across the system.
- Data Synchronization: Provide offline capabilities with automatic data synchronization, ensuring continuous operation and data consistency in low-connectivity environments.
- Microservices and Containerization: Apply a modular microservices architecture with containers (e.g., Docker, Kubernetes) to enable flexible scaling and independent updates for system components.
- Enhanced UI/UX: Design a responsive, user-friendly interface using modern frameworks (e.g., React, Angular) and Material Design principles for consistency and ease of use.
- Advanced Analytics and Reporting: Offer interactive dashboards and real-time visualizations, with downloadable reports in formats like Excel, PDF, and CSV.
- Role-Based Access Control (RBAC): Implement detailed RBAC using access and refresh tokens to manage user roles and permissions securely. For sensitive operations or applications requiring enhanced security, consider adding multi-factor authentication (MFA) to further control access.
- Open Source: Leverage open-source tools to ensure cost-effectiveness, flexibility, and access to community-driven enhancements.
- Agile and DevOps: Use Agile and DevOps for continuous integration and delivery (CI/CD), ensuring fast iteration with automated testing and deployments.

- Data Security and Compliance: Secure data with end-to-end encryption (e.g., TLS 1.3, AES-256), and ensure compliance with data protection standards (e.g., GDPR, HIPAA), including audit trails and data anonymization.

10. Deliverables

- EDT software development project plan.
- Requirements specification (functional, non-functional, user needs, constraints, expected outputs).
- Design document, technical specifications, deployment plan.
- Integration and user acceptance test plan and test cases.
- User manual and administrator guide.
- Working source code, including code documentation.
- Data dictionary
- Technical documentation