ANNEX A. TECHNICAL REQUIREMENTS FOR THE DEVELOPMENT/CUSTOMISATION OF A NUTRITION-FOCUSED ELMIS IN TAJIKISTAN

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ACRONYMS

Term	Explanation
API	Application Programming Interface
BP100	Ready-to-use therapeutic food (compressed biscuits for severe acute malnutrition treatment)
CSV	Comma-Separated Values (file format)
COTS	Commercial Off-The-Shelf (software solutions)
DB	Database
DBMS	Database Management System
DHIS2	District Health Information System, version 2
DIIG	Digital Implementation Investment Guide (WHO)
DoB	Date of Birth
DPG	Digital Public Good
EMR	Electronic Medical Record
EHR	Electronic Health Record
eLMIS	electronic Logistics Management Information System
FAQ	Frequently Asked Questions
FEFO	First-Expired, First-Out (inventory principle)
FHIR	Fast Healthcare Interoperability Resources (HL7 standard)
F-75	Therapeutic milk formula F-75 (used in treatment of SAM)
F-100	Therapeutic milk formula F-100 (used in treatment of SAM)
GIS	Geographic Information System
GS1	Global Standards 1 (international supply chain standards for product identification)
GUI	Graphical User Interface

Term	Explanation
HMIS	Health Management Information System
HL7	Health Level Seven International (interoperability standards body)
ICT	Information and Communication Technology
IdP	Identity Provider
IMAM	Integrated Management of Acute Malnutrition
JSON	JavaScript Object Notation (data format)
KBps	Kilobits per second (used for connectivity requirement, ≥128 kbps)
KPI	Key Performance Indicator
MFA	Multi-Factor Authentication
MNP	Micronutrient Powder
MoHSPP	Ministry of Health and Social Protection of the Population (of Tajikistan)
MAM	Moderate Acute Malnutrition
MUAC	Mid-Upper Arm Circumference (indicator of malnutrition)
NFRQ	Non-Functional Requirement (identifier in requirements traceability)
OAuth2	Open Authorization 2.0 (standard for secure authentication)
OIDC	OpenID Connect (authentication standard built on OAuth2)
OLTP	Online Transaction Processing
ORS	Oral Rehydration Solution
PII	Personally Identifiable Information
PHC	Primary Health Centre
PWA	Progressive Web Application
QoS	Quality of Service
RBAC	Role-Based Access Control

Term	Explanation
REST	Representational State Transfer (API architectural style)
RPO	Recovery Point Objective
RTO	Recovery Time Objective
RD4C	Responsible Data for Children (UNICEF principles)
SAM	Severe Acute Malnutrition
SLA	Service Level Agreement
SSO	Single Sign-On
TLS	Transport Layer Security
ToR	Terms of Reference
UID	Unique Identifier
UNICEF	United Nations International Children's Fund
UAT	User Acceptance Testing
WHO	World Health Organization
WCAG	Web Content Accessibility Guidelines
WASH	Water, Sanitation and Hygiene
Z-score	Standardised score used to assess nutritional status (weight-for-height, height-for-age, etc.)

1. BACKGROUND

Tajikistan continues to face a significant burden of malnutrition, with 14% of children under five stunted, 6% wasted (1.6% severely wasted), and over one-third anaemic. Micronutrient deficiencies among women of reproductive age remain widespread, with iron and folate deficiency contributing to poor maternal and newborn outcomes. These challenges are compounded by food insecurity, suboptimal child feeding practices, and persistent shortages of life-saving therapeutic foods and supplements.

The Government of Tajikistan has placed nutrition high on its national development agenda. The Multisectoral Action Plan for Nutrition 2021–2025 calls for improved governance, coordinated multi-sectoral action, and reliable information systems to monitor and manage nutrition programmes. The UNICEF Country Programme for Tajikistan explicitly supports the Government in strengthening systems for the delivery of high-impact nutrition interventions, with a focus on supply chain reliability, accountability, and integration across health services.

Despite these commitments, the current logistics system for nutrition commodities is largely paper-based and fragmented. The Republican Paediatric Centre acts as the central storage and distribution hub, with intermediary facilities such as Integrated IMCIs and district hospitals cascading supplies to primary health centres. Stock management relies on handwritten ledgers, non-standardised forms, and paper slips requiring physical signatures. Data are aggregated manually, with limited validation and no systematic integration with service delivery records.

As observed during UNICEF's 2025 Technical Assistance mission, this arrangement results in major visibility gaps:

- Stock-outs are detected only when services are disrupted, and expired products are often discovered too late due to the absence of batch and expiry tracking.
- Risks of data falsification and misuse have been reported, particularly in rural facilities where records remain vulnerable to manipulation.
- Redistribution between districts occurs informally and is not systematically documented.
- Weak connectivity, unreliable power supply, and limited digital equipment at health facilities further undermine reliability.

These inefficiencies compromise the availability of critical nutrition commodities such as F-75, F-100, BP100, micronutrient powders (MNPs), zinc, iron, ORS, and MUAC tapes, which are essential for the treatment and prevention of child malnutrition.

To address these systemic weaknesses, the Government of Tajikistan, with UNICEF support, has committed to establishing a Nutrition-focused electronic Logistics Management Information System (eLMIS). The eLMIS will provide a centralised, digital platform to:

- Ensure real-time visibility of stock levels, requisitions, and commodity flows;
- Improve accountability through batch/expiry tracking, FEFO logic, audit trails, and digital requisitions;
- Enable accurate forecasting and planning by integrating logistics and service delivery data (e.g., MUAC screenings, SAM treatment caseloads, vitamin A distribution);

- Reduce wastage and stock imbalances via alerts, redistribution tools, and monitoring dashboards;
- Support health workers with digital job aids and training materials for correct use of therapeutic foods and supplements.

This initiative is aligned with UNICEF's Digital Health Principles, the WHO Digital Implementation Investment Guide (DIIG), the WHO Classification of Digital Health Interventions, and the Digital Transformation Handbook for Health Supply Chain Architecture, ensuring openness, sustainability, and scalability. It will also be designed to interoperate with Tajikistan's broader digital health ecosystem, including DHIS2-based HMIS, e-Perinatal, and Tandurusti.tj, and to comply with Tajikistan's data protection regulations and international standards (e.g., GDPR, HL7 FHIR, GS1).

By strengthening nutrition supply chains through digitalisation, the eLMIS will play a pivotal role in reducing malnutrition-related mortality, ensuring uninterrupted access to essential nutrition commodities, and contributing to Tajikistan's progress towards SDG 3.

2. PURPOSE AND OBJECTIVES OF THE PROJECT

2.1. Purpose

The Nutrition-focused eLMIS is being established to strengthen Tajikistan's national nutrition supply chain and address systemic inefficiencies caused by paper-based and fragmented logistics practices. It must provide a centralised, digital platform for the management of therapeutic and preventive nutrition commodities, enabling real-time visibility, accountability, and data-driven decision-making across all levels of the health system.

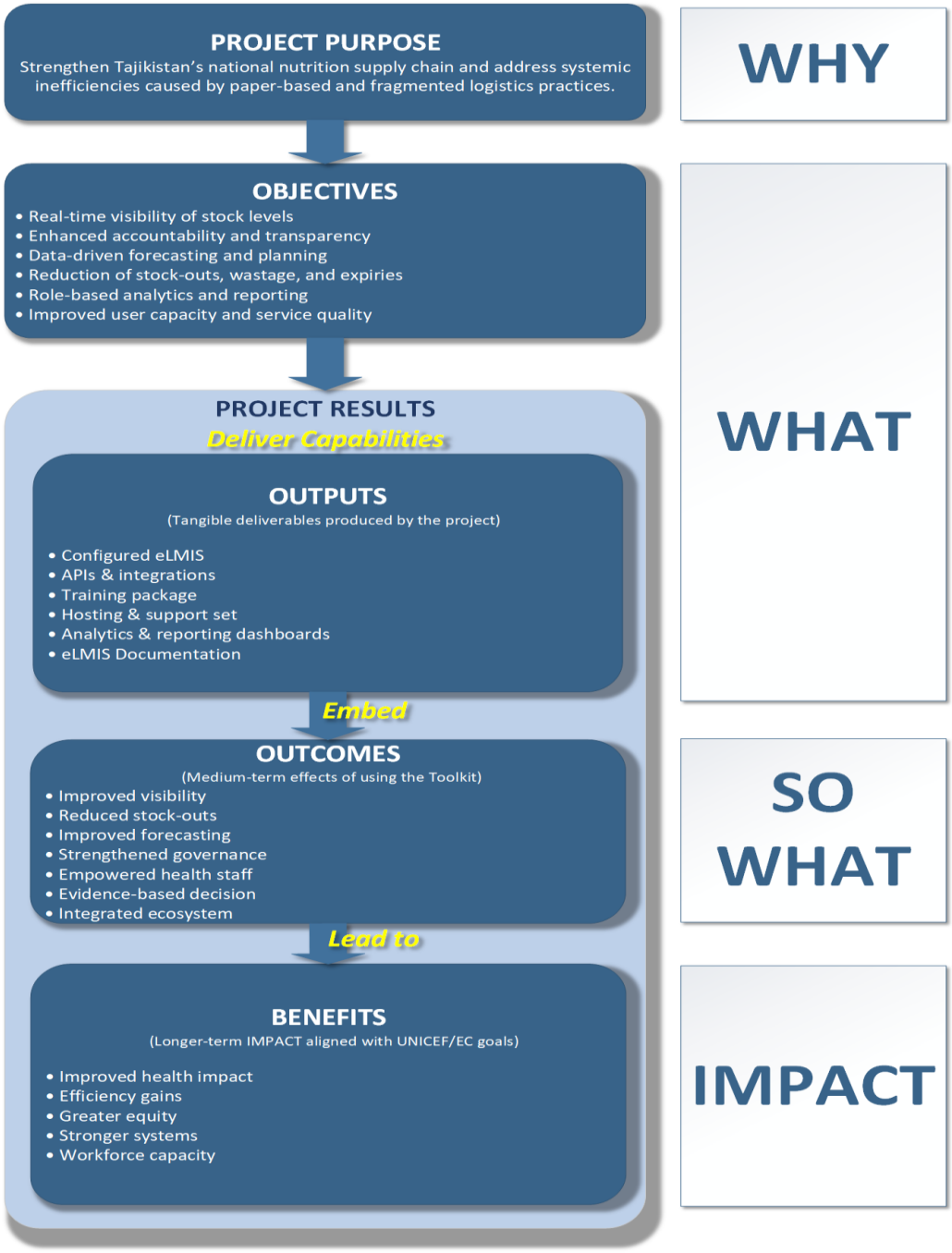


Figure 1. Project Results Chain

2.2. Objectives

The eLMIS initiative is expected to achieve the following:

- **Real-time visibility of stock levels** across central, regional, district, and facility levels to improve availability of life-saving nutrition commodities.
- **Enhanced accountability and transparency** in stock management through batch and expiry tracking, FEFO logic, digital requisitions, audit trails, and chain-of-custody logging.
- **Data-driven forecasting and planning** by integrating stock and consumption data with service delivery indicators (e.g., SAM caseloads, MUAC screenings, vitamin A distribution).
- **Reduction of stock-outs, wastage, and expiries** via automated alerts, redistribution tools, and proactive monitoring.
- **Offline-first access** allowing health facilities with weak or no internet connectivity to record and synchronise data reliably.
- **Integration with national digital health systems** (DHIS2, Tandurusti.tj, and future CDM/EMR tools) to strengthen interoperability and ensure cohesive health information flows.
- **Role-based analytics and reporting**, including dashboards, KPIs, and GIS visualisation, to support evidence-based decision-making at all levels.
- **Improved user capacity and service quality** through embedded training materials and digital job aids (e.g., preparation of F-75/F-100, use of MUAC, distribution of MNPs).

3. EXPECTED RESULTS

3.1. Project Outputs

The direct deliverables of the project are the tangible products and services created during implementation that include:

- A fully functional, nutrition-focused eLMIS configured/customised to Tajikistan's needs, including modules covering stock management, requisition and distribution, batch and expiry tracking, forecasting and planning, reporting and analytics, alerts, and embedded training/guidelines.

- **Offline-first, multilingual interfaces** in Tajik, Russian and English for central, district, and facility users.
- **Integration adapters/APIs** with DHIS2-based HMIS, Tandurusti.tj, and other potential national information systems.
- **User capacity-building package** including training-of-trainers, user manuals, multimedia job aids, and digital resource libraries.
- **Hosting, security, and support setup** within the MoHSP national data centre, with DR/backup, access controls, and monitoring.
- Technical documentation, source code, and handover package ensuring sustainability and ownership by MoHSP.

3.2. Outcomes

The outcomes represent the expected changes in behaviour, practices, or capacity resulting from the use of the system (eLMIS) and other project outputs mentioned above:

- **Improved visibility and accountability** across the nutrition supply chain, with real-time stock data accessible at all levels.
- **Reduced stock-outs and expiries** through proactive alerts, redistribution mechanisms, and FEFO-based stock rotation.
- **Improved forecasting and supply planning**, integrating service delivery and anthropometric data (MUAC, Z-scores) into demand estimates.
- **Strengthened governance and oversight**, with digital audit trails, role-based access, and anomaly detection reducing falsification risks.
- **Empowered health workers**, supported by digital job aids and training embedded in the eLMIS, improving correct preparation and use of therapeutic foods and micronutrient supplements.
- **Evidence-based decision-making**, supported by dashboards, KPIs, and GIS mapping for facility managers, MoHSP, and development partners.
- **Integration of nutrition logistics into the broader health information ecosystem**, enabling linkages with maternal and child health data and supporting multisectoral nutrition monitoring.

3.3. Benefits

The benefits represent the broader, longer-term improvements that result directly or indirectly from the project, aligning with MoHSPP and UNICEF's strategic goals:

- **Health impact**: uninterrupted availability of essential nutrition commodities improves treatment outcomes for children with SAM, reduces malnutrition-related mortality, and prevents complications linked to micronutrient deficiencies.
- **Efficiency**: reduced wastage, expiry, and duplication of orders lead to cost savings and better use of donor/government resources.
- **Equity**: improved distribution visibility ensures commodities reach remote and underserved populations more consistently.
- **System strengthening**: digitalisation of nutrition logistics contributes to Tajikistan's broader digital health transformation, aligning with the Multisectoral Action Plan for Nutrition and UNICEF's digital health principles.
- **Capacity development**: health workers gain skills in digital tools and supply chain management, supporting professional growth and institutional resilience.

3.4. Disbenefits

Disbenefits are certain negative impacts that will arise even if the project is successful:

- **Increased workload during transition:** During the initial rollout, health workers will face higher reporting and data entry demands as they adapt from paper-based to digital processes.
- **Long-term cost of ownership:** Hosting, maintenance, and support, administration services will create recurring financial commitments for MoHSP, requiring sustainable budget allocation beyond donor funding.

4. KEY STAKEHOLDERS

4.1. Project Interests

This project is structured around three key interests: **Commissioning, User, and Supplier**.

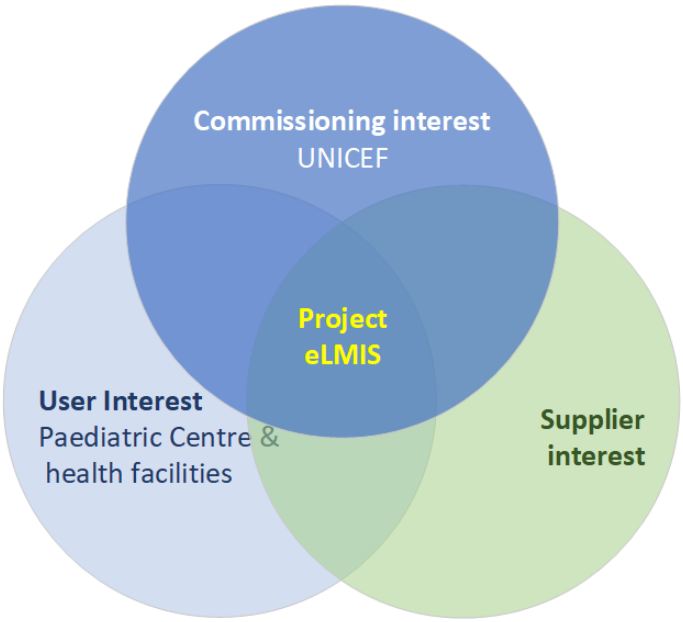


Figure 2. Project Interests

The **Commissioning interest** is represented by UNICEF, which is commissioning and financing the development of the nutrition-focused eLMIS, ensuring that the solution remains justified in terms of strategic value, cost-effectiveness, and alignment with UNICEF's programme priorities and the Multisectoral Action Plan for Nutrition 2021–2025.

The **User interest** is led by the Republican Scientific and Clinical Centre of Paediatrics and Child Surgery of Tajikistan (Paediatric Centre), as the primary institutional owner and beneficiary of the system. This interest extends to the wider group of health workers across hospitals, IMCIs , district facilities, and primary health centres, who will use the eLMIS to manage nutrition commodities and improve service delivery.

The **Supplier interest** will be represented by the vendor contracted through an open competitive process, responsible for the design, development/customisation, testing, and support of the eLMIS solution. In addition, the Agency for Medical Statistics and Information under the MoHSPP will act as a supporting supplier, providing hosting and operational infrastructure at the national data centre. This tripartite structure ensures balanced oversight, with each interest safeguarding its respective priorities—value for money, usability and sustainability, and technical delivery.

4.2. Identified Stakeholders

The Nutrition-focused eLMIS initiative involves the following stakeholders, each of whom may impact, be impacted by, or perceive themselves as being impacted by the implementation of this project:

- **UNICEF** – Commissions and finances the project; ensures alignment with Country Programme priorities and donors. Additionally, through ECARO (Health and Nutrition Section, Supply Division) UNICEF provides technical guidance, standards, and procurement support. Impacted through global coherence and showcasing best practice.
- **Ministry of Health and Social Protection of the Population (MoHSPP)** – Policy owner and regulator; ensures system aligns with national health strategy. Impacted by gaining stronger governance, accountability mechanisms and efficiency in supply planning. The MoHSPP is expected to use the eLMIS to forecast and monitor micronutrients, SAM treatment supplies. It is also expected that the Ministry will ensure ongoing budget for hosting, support, and maintenance.
- **Republican Scientific and Clinical Centre of Paediatrics and Child Surgery (Paediatric Centre)** – Primary institutional owner; manages central nutrition stock and reporting. Impacted by efficiency and visibility gains, but also by responsibility for using and sustaining the system.
- **Agency for Medical Statistics and Information** – Manages hosting, operations, and long-term sustainability of the eLMIS in the data centre. Impacted by increased responsibility for technical infrastructure.
- **PHC System Facilities** – Use the eLMIS for requisitions, reporting, and distribution. Impacted by improved visibility, but need training and support, including Rural Health Centres and Health Points – enter stock data; benefit from improved planning but may feel burdened during transition.
- **Centres of Integrated Management of Childhood Illnesses (IMCIs)** – regional, district and municipal hubs distributing commodities; impacted by easier reporting and monitoring, but also required to adopt new workflows.
- **Child Hospital Facilities** – enter stock data; benefit from improved planning but may feel burdened during transition.
- **Healthcare workers (family doctors, nurses, paediatricians, pharmacists, nutrition focal points)** – Direct users; empowered through better tools, but impacted by additional workload during rollout.
- **Community health workers / patronage nurses** – May capture outreach distribution (MNPs, Vit A); impacted by introduction of digital tracking instead of manual tally sheets.
- **Children, mothers, caregivers, families** – Indirect beneficiaries; impacted positively through better availability of nutrition commodities.

- **Development & Implementing Partners** such as WHO, World Bank, WFP, UNFPA, GIZ, ADB, who may provide technical and financial support in the future to nutrition and supply chains. Impacted by improved accountability and data access for programme monitoring.
- **Selected Vendor (Supplier)** – Responsible for development/customisation, deployment, training, and support. Impacted by need to adapt solution to Tajikistan's offline, multilingual context.
- **Telecommunication providers (mobile operators, ISPs)** – Ensure connectivity; impacted by demand for better coverage at health facilities.

4.3. RACI Matrix

Table 1. RACI Matrix – Nutrition-focused eLMIS in Tajikistan

Key Activity	UNICEF	MoHSPP	Paediatric Centre	AMSI	Selected Vendor	Healthcare Workers / Health Facilities	Development Partners
Project initiation & requirements analysis	A/R	C	C	C	–	C	C
System design & architecture	A	C	C	C	R	I	I
System development / customisation	A	C	C	C	R	I	I
Testing & quality assurance (UAT)	A	C	R	C	R	R	I
Training & capacity building	A	C	R	R	R	R	I
Deployment & rollout	A	C	R	R	R	R	I
Hosting, operations & technical support	I	C	I	A	R	I	I
Monitoring, evaluation & reporting	A	C	R	C	C	R	C
Sustainability & financing	C	A	R	C	I	I	C

Explanation:

- **R (Responsible):** Does the work to complete the task.
- **A (Accountable):** Ultimately answerable for the correct and thorough completion of the deliverable or task.
- **C (Consulted):** Provides input based on expertise; two-way communication.
- **I (Informed):** Kept up-to-date on progress; one-way communication.

5. SCOPE OF WORK

5.1. Required Activities and Deliverables

#	Stage	Activities	Deliverables
1.	**Inception and Detailed Planning**	• *Activity 1.1:* Conduct kick-off meeting with UNICEF, MoHSPP, Paediatric Centre, and stakeholders to validate objectives, scope, and project governance model. • *Activity 1.2:* Review existing documentation about the supply chain processes, forms, and reporting flows. • *Activity 1.3:* Prepare detailed work plan and methodology.	D1: Inception Report including validated requirements, refined Project Plan.
2.	**Detailed System Design**	• *Activity 2.1:* Conduct detailed technical design validation workshops; • *Activity 2.2:* Translate the eLMIS technical requirements into detailed specifications demonstrating their implementation on the vendor's proposed platform and technology stack, including system architecture, data model, integration points, and server resources requirements and other technical aspects;	D2: SRS and SDS documentation approved by UNICEF.
3.	**System Development / Customisation**	• *Activity 3.1: Develop*/customise the eLMIS solution in line with approved design. • *Activity 3.2:* Implement system modules for stock management, requisitioning, batch/expiry tracking, forecasting, reporting, and analytics and interoperability. • *Activity 3.3:* Configure role-based access, audit trails, alerts, dashboards, multilingual UIs.	D3: Prototype versions; D4: Configured eLMIS modules; D5: Technical documentation (system manuals, installation guides, API specs).

#	Stage	Activities	Deliverables
		• *Activity 3.4:* Prepare technical documentation.	
4.	**Testing**	• *Activity 4.1:* Conduct integration, performance, and security testing. • *Activity 4.2:* Facilitate User Acceptance Testing with UNICEF and Paediatric Centre representatives. • *Activity 4.3:* Address feedback and finalise system.	D6: Testing documentation according to section *11.6. Testing Documentation* D7: Tested and validated eLMIS.
5.	**Training and Capacity Building**	• *Activity 5.1:* Develop and deliver ToT programme. • *Activity 5.2:* Produce user manuals, multimedia job aids, and e-learning resources. • *Activity 5.3:* Conduct training sessions for administrators, health workers, and data clerks.	D8: Training package (manuals, job aids, e-learning materials). ToT sessions delivered.
6.	**Deployment and Rollout**	• *Activity 6.1:* Install and configure eLMIS in the production environment for use at national, regional, and facility levels. • *Activity 6.2:* Support phased rollout, including migration of baseline stock data. • *Activity 6.3:* Provide source code and full handover documentation. • *Activity 6.4:* Establish helpdesk and support mechanisms during rollout.	D9: Operational eLMIS deployed in production; D10: Source code as per *Annex B* and handover package including related documentation as per *Annex C*.
7.	**Technical Maintenance and Support**	• *Activity 7.1:* Establish SLAs, escalation procedures, and helpdesk. • *Activity 7.2:* Provision of post-implementation services (warranty, maintenance and support) as per the service specification.	D11: SLA framework and provided post-implementation services

5.2. Inclusions and Exclusions

5.2.1. Inclusions

The scope of this assignment explicitly includes the following:

- Detailed analysis and requirements validation of existing nutrition supply chain processes, forms, and reporting flows at national, regional, district, and facility levels.

- Design, development/customisation, configuration, and deployment of a nutrition-focused eLMIS that meets the functional and non-functional requirements specified in this ToR and its annexes.
- Integration with relevant national digital health and information systems, including DHIS2-based HMIS, Tandurusti.tj, and other platforms as applicable.
- Training and capacity building, including ToT, end-user training, and the production of user manuals, job aids, and e-learning resources in Tajik, Russian, and English.
- Hosting and technical operations setup within the data centre, including configuration of security controls, backup and disaster recovery (DR), and performance monitoring.
- Provision of technical documentation and source code, ensuring full transfer of intellectual property rights to UNICEF/MoHSPP.
- Establishment of support mechanisms, including SLAs, escalation procedures, and a helpdesk function during rollout and warranty period.
- Handover and sustainability planning, including a final report with lessons learned, sustainability plan, and recommendations for future enhancements.

IMPORTANT: The Supplier shall deliver a complete, turn-key solution. If the proposed solution relies on any commercial software, platforms, or components that require purchase of licenses, the Tenderer shall:

- Include the full cost of all required licenses in the financial proposal;
- Provide such licenses on a perpetual basis in the name of the MoHSPP;
- Ensure that no additional or hidden costs will be incurred by UNICEF or MoHSPP during implementation, operation, or post-implementation phases;
- Guarantee that there are no subscription-based, recurring, or third-party library licensing fees required for the functioning of the eLMIS solution;
- Provide a written confirmation that the system can operate fully under the licenses delivered, without requiring further procurement of software rights after project completion.

Open-source or free-to-use components (e.g. DPGs such as OpenLMIS, DHIS2, etc.) may be proposed, provided the Tenderer ensures compliance with their licensing terms and confirms that no hidden costs or obligations exist.

5.2.2. Exclusions

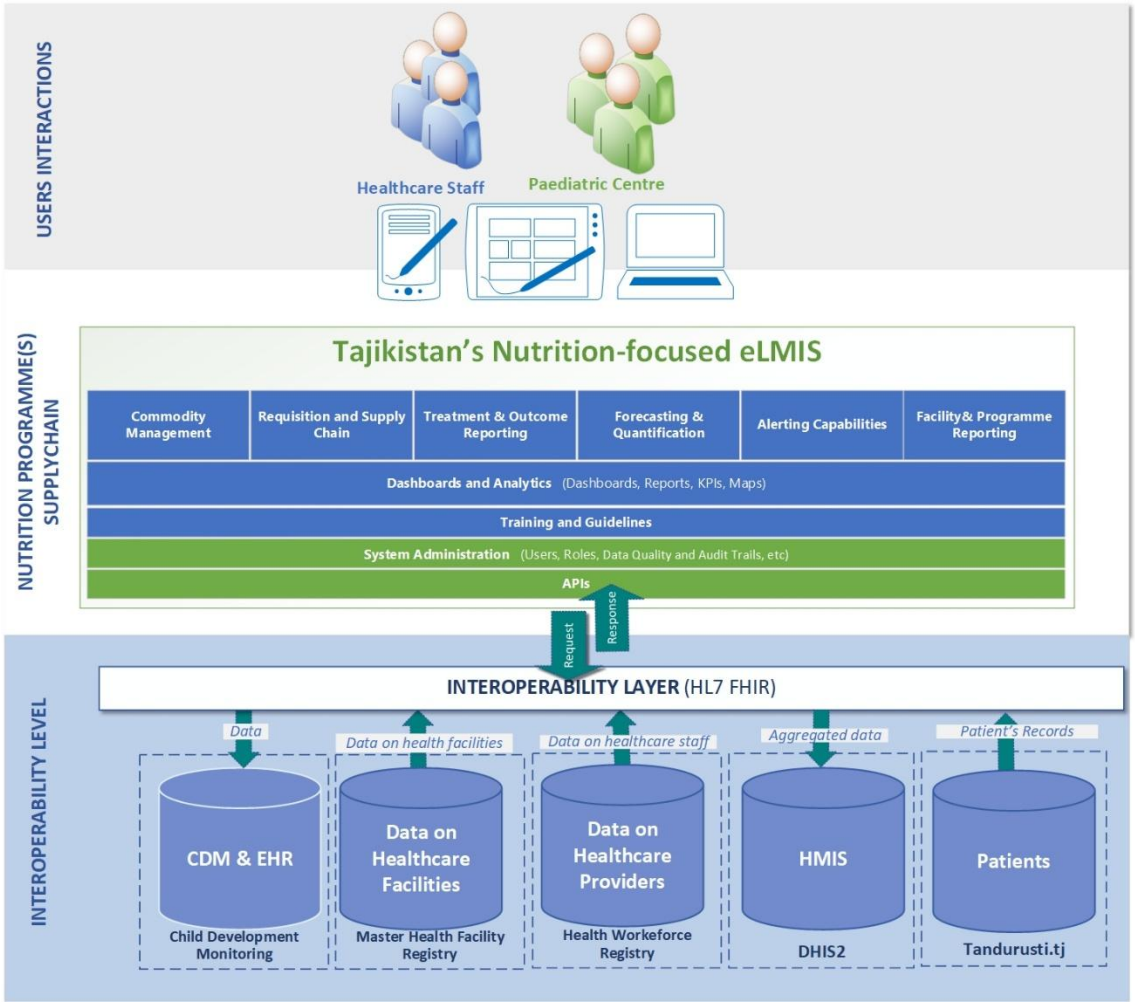
The following activities are outside the scope of this assignment:

- Procurement of hardware, connectivity, or power equipment such as computers, tablets, servers, generators, internet connections, SIM cards. While technical specifications may be recommended by the Supplier, such a potential procurement will be managed separately.
- Ongoing financing of recurrent costs beyond the warranty and support period defined in the contract (e.g., internet/data plans, hosting electricity costs, staff salaries).
- Nutrition programme service delivery itself (diagnosis, treatment, distribution of commodities) — the Supplier is responsible for providing digital tools, not for implementing clinical/nutrition services.
- Policy reform or regulatory drafting beyond what is required to integrate the eLMIS into existing national frameworks.
- Long-term system operations and staffing after the warranty period. The Supplier will provide a handover and sustainability plan, but day-to-day operations will be the responsibility of MoHSPP and its designated institutions.
- Development of unrelated modules outside nutrition commodity logistics (e.g., modules for non-nutrition pharmaceuticals, vaccines, or general hospital administration), unless explicitly requested as add-ons during the project and agreed through change control procedures.

6. eLMIS Architecture

In line with UNICEF's global commitments and international best practices, this project remains open to any viable approach, including DPGs, COTS systems or bespoke/custom-built solutions. The architecture described in this document is intended to establish guiding principles and minimum expectations, and does not limit or preclude any category of solution. The selected vendor is therefore encouraged to assess and propose the most suitable option—whether DPG, COTS, bespoke, or hybrid—that can be adapted to the Tajikistan context and deliver sustainable, secure, and interoperable results.

The Nutrition-focused eLMIS shall be designed following modern international standards and best practices in health and logistics information systems. The architecture must be modular, flexible, and scalable, enabling future extensions to additional nutrition commodities, workflows, or geographic coverage without major system re-engineering. While the system is expected to follow Service-Oriented Architecture or Microservices principles, the final decision on the technical design shall be determined during the implementation stage based on the selected vendor's solution, provided it meets the requirements outlined in this ToR.



6.1. Architectural Principles

The eLMIS architecture shall adhere to the following guiding principles:

- **Modularity and Reusability** – System modules must function independently yet integrate seamlessly, allowing components to be reused or replaced.
- **Interoperability** – Compliance with HL7 FHIR, OpenHIE, GS1, and other international standards to enable data exchange with national digital health systems, and other national registries.
- **Scalability and Performance** – Capable of handling national-level transaction volumes (stock movements, patient treatment records, reporting) with low latency.
- **Security and Privacy** – Implementation of role-based access control, audit logging, encryption in transit and at rest, and alignment with national legislation and international data protection standards.
- **Extensibility** – Designed to incorporate potential additional modules (e.g., maternal nutrition, or general health commodities) as needed.
- **Resilience and Availability** – High availability (≥99.5%), backup and recovery mechanisms, disaster recovery plan.

6.2. Architectural Layers and Components

The eLMIS shall include at least the following layers and components:

6.2.1. Presentation Layer

The presentation layer of the eLMIS will serve as the primary interface between end users and the system. It must be intuitive, user-friendly, and tailored to the needs of different user groups operating at national, regional, district, and facility levels. Access will be provided through a web-based platform, enabling policy makers, programme managers, supply chain officers, and other authorised users to carry out their functions from standard browsers without the need for specialised software installation.

To ensure inclusivity and usability at the point of service delivery, the system must also provide a mobile application (Android/iOS). This mobile interface should be optimised for health facilities with limited or intermittent internet connectivity, allowing data entry, stock updates, and patient case management to be carried out offline. Synchronisation with the central server must occur automatically once connectivity is restored, ensuring continuity of operations in rural and hard-to-reach areas.

In line with the linguistic diversity of Tajikistan and international programme requirements, the user interface must support multilingual functionality, with at minimum Tajik, Russian, and English. Users should be able to easily switch between languages without loss of context or data. The system must also conform to usability and accessibility standards, presenting clear dashboards, visualisations, and navigation flows that minimise training needs and maximize adoption across different cadres of staff.

6.2.2. Application/Service Layer

At the core of the eLMIS lies the application and service layer, which delivers the system's functional capabilities and ensures that all nutrition logistics and treatment processes are effectively supported. This layer must be designed in a modular way, with each service addressing a distinct business function while remaining interoperable with other modules. Such modularity will enable flexibility in implementation, phased roll-out, and ease of future extension.

The Commodity Management module will allow users to record and monitor the complete lifecycle of nutrition commodities, including procurement, receipt, stock balances, internal transfers, distribution, and wastage. It will support visibility across central, regional, and facility levels, ensuring that critical items such as F-75, F-100, BP100, micronutrient powders (MNPs), zinc, ORS, and iron supplements are tracked accurately.

The Facility Reporting module will facilitate timely submission of data from health facilities, covering consumption, requisitions, and stock status reports. Automated validation rules will ensure data quality, and consolidated reports will feed into higher-level dashboards for programme managers and decision-makers.

The Treatment and Outcome Recording module will focus on the patient care dimension, capturing data on children receiving therapeutic and preventive nutrition interventions. It will record individual treatment episodes, type and dosage of commodities provided, and outcome indicators such as recovery, defaulter, or transfer.

The Supply Chain Monitoring will provide real-time visibility of the commodity pipeline, with alerts for potential or actual stock-outs, expiries, and low stock thresholds. This will help managers take corrective actions in a timely manner and reduce the risk of treatment disruption.

The Dashboard and Analytics module will offer real-time monitoring and decision-support tools. Users will be able to access KPIs, track trends over time, and generate customisable reports. Data visualisations will make it easier to identify bottlenecks and take evidence-based actions.

The User and Role Management module will ensure that access to the system is aligned with responsibilities, applying role-based access control, authentication, and permissions management.

In addition, a workflow engine will underpin the application services, supporting automated processes such as approvals, requisition routing, and notifications. This will streamline operations, reduce administrative burdens, and enforce compliance with established procedures.

6.2.3. Integration & Interoperability Layer

The integration and interoperability layer will ensure that the nutrition-focused eLMIS does not operate in isolation, but rather becomes a fully embedded component of Tajikistan's wider health information ecosystem. This layer will provide the technical foundation for data exchange and system-to-system communication, enabling the eLMIS to interact seamlessly with both national and international platforms.

The system must expose standards-based APIs, including REST/JSON interfaces and support for widely adopted health information exchange standards such as HL7 FHIR. By adhering to these standards, the eLMIS will remain vendor-neutral and adaptable to evolving global interoperability frameworks.

Interoperability will be critical for linking the eLMIS with the MoHSPP's DHIS2-based HMIS. Where a National Health Data Exchange platform is introduced, the eLMIS must be prepared to integrate with it, ensuring consistency across the country's health data systems.

Through this integration and interoperability framework, the nutrition-focused eLMIS will ensure that critical data on commodity flows, patient outcomes, and programmatic indicators can be aggregated, shared, and acted upon across the health sector and with key partners.

6.2.4. Data Management Layer

The data management layer will form the backbone of the nutrition-focused eLMIS, ensuring that all data captured by the system is stored, organised, and made available in a reliable and efficient manner. At its core, the system shall be built upon a central relational database with an optimised schema that reflects both stock management workflows and patient case management needs. The database must be capable of supporting high transaction volumes across multiple facilities while maintaining consistency, accuracy, and performance.

To ensure uniformity and reduce duplication, the system shall include Master Data Management functionality. This will establish a single source of truth for key reference data such

as health facilities, geographic locations, users, and nutrition commodities (e.g., F-75, F-100, BP100, micronutrient powders, zinc, ORS, iron). Consistent master data across all modules will be essential for interoperability with external systems and for generating accurate national-level reports.

For higher-level monitoring, evaluation, and planning, the architecture must also provide a data warehouse component. This will allow the consolidation of transactional data into a structure optimised for analytics, enabling historical trend analysis, forecasting, and performance monitoring. By separating analytical processing from day-to-day operations, the data warehouse will ensure that real-time system performance is not compromised, while still providing rich insights for decision-makers.

Together, these components will provide a robust, scalable, and future-ready data foundation that supports both the operational needs of facilities and the strategic needs of policymakers and development partners.

6.2.5. Security & Compliance Layer

The security and compliance layer will safeguard the integrity, confidentiality, and availability of the eLMIS, ensuring that sensitive health and logistics information is fully protected in line with national legislation and international standards..

Authentication and authorisation must be enforced through modern, standards-based mechanisms such as OAuth2 or OpenID Connect. The system should also allow for possible integration with the MoHSPP identity provider, enabling single sign-on (SSO) and centralised user account management.

All data exchanges, both internal and external, must be protected through end-to-end encryption using TLS 1.2 or higher, while data at rest must also be encrypted to guard against unauthorised access.

The system shall maintain a comprehensive audit trail of all transactions, ensuring that every activity—from commodity movements to treatment records and user actions—is logged with appropriate metadata such as timestamps and user identifiers. This will enable effective monitoring, accountability, and potential investigation if needed.

Finally, the eLMIS must be developed and operated in compliance with Tajikistan's data protection rules and aligned with international standards. This includes ensuring that personal and sensitive health information is processed lawfully, transparently, and with appropriate safeguards for data minimisation, retention, and subject rights.

6.2.6. *Infrastructure and Deployment Layer*

The infrastructure and deployment layer will provide the technical foundation on which the nutrition-focused eLMIS operates. Hosting arrangements must comply with the Government of Tajikistan's regulations as well as UNICEF's policies on data protection. The system will be deployed in MoHSPP's data centre.

To ensure scalability and efficient resource use, the eLMIS should support modern deployment practices such as containerisation. Technologies like Docker and Kubernetes may allow the system to be packaged into modular units, making it easier to scale services up or down in response to workload, and simplifying updates and maintenance without disrupting operations.

The deployment model must also guarantee business continuity and resilience. Automated backup mechanisms will ensure that data is regularly secured, while a robust disaster recovery plan must be in place to protect against loss of service.

6.3. Future-Proofing

The nutrition-focused eLMIS must be architected with a forward-looking perspective, ensuring that the investment made today continues to deliver value as needs evolve and technologies advance. The system shall be capable of supporting an incremental roll-out, beginning with pilot implementations in two districts of Tajikistan and progressively scaling to regional and national coverage without disruption or the need for major redesign.

The architecture should enable federated data exchange, allowing regional warehouses, district offices, and facility-level systems to interoperate smoothly with the national platform. This flexibility aims to ensure that the eLMIS can function effectively in a diverse infrastructure environment, accommodating both centralised and decentralised workflows.

In line with global best practices in digital health and supply chain management, the system must also be extensible to advanced functionalities. Future enhancements may include the integration of predictive analytics and AI/ML models to improve demand forecasting, optimise stock distribution, and reduce wastage.

Finally, the eLMIS should be designed with the capability to connect with other digital health platforms beyond nutrition logistics. This includes potential integration with e-Perinatal referral system, EMR/EHR systems, ensuring that nutrition data can contribute to and benefit from a more holistic view of child and maternal health.

7. SYSTEM ACTORS

7.1. Key Actors and Their Roles

User Role	Level	Key Responsibilities in eLMIS
Storekeeper / Pharmacist	Facility	Record receipt, storage, and distribution of nutrition commodities (F-75, F-100, BP100, MNPs, zinc, ORS, iron); manage digital stock cards; monitor expiries; submit stock status reports.
Clinician / Nurse (SAM/MAM focal point)	Facility	Enter treatment and outcome data for malnourished children; record MUAC, Z-score, therapeutic food provided, and treatment outcomes; digitize patient registers.
Facility Manager / Director	Facility	Review and approve requisitions; monitor facility-level dashboards (consumption, stock-outs, treatment outcomes).
District Logistics Officer	District	Consolidate requisitions from facilities; manage district-level storage and distribution; review stock balances; generate district reports.
Regional Supply Chain Officer	Regional	Oversee distribution to districts; monitor pipeline visibility; ensure equitable allocation of supplies; review regional stock status.
Regional Nutrition Programme Officer	Regional	Monitor treatment outcomes across districts; supervise nutrition programme performance; identify areas for corrective action.
MNH and Nutrition Managers **(Paediatric Centre)**	National	Review national dashboards and KPIs; oversee stock-out alerts and treatment trends; prepare reports for national and international stakeholders. Validate treatment data; monitor programme indicators; provide feedback on data quality and performance to facilities. Advise on programme monitoring.
System Administrator	Cross-cutting	Configure and maintain system infrastructure; manage user accounts and access rights; ensure system performance and availability.

User Role	Level	Key Responsibilities in eLMIS
		Support data validation and correction; maintain consistency of master data (facilities, users, commodities); assist with advanced reporting. oversee data flows from eLMIS to national systems.

8. INSTRUCTIONS FOR ENSURING REQUIREMENTS TRACEABILITY

To ensure traceability of the requirements, this document adopts consistent naming conventions to identify and track all technical specifications outlined for the development and implementation of the eLMIS.

As additional documents may be compiled during the system development, readers can easily navigate through the list of specifications using the provided reference numbers.

Each reference number is preceded by an abbreviation consisting of several letters, which serves to categorise the requirement. The prefix is followed by a sequential number. For example, *FRQ007* and *FRQ008* are reference numbers for two functional requirements. *NFRQ017* is reference for non-functional requirement.

In this naming convention, letters in the prefix denote the following:

- **FRQ** – Functional requirement;
- **NFRQ** – Non-functional requirement;

Each functional or non-functional technical requirement could have the following marks:

- (**Must-have**) = Mandatory = "The System must / shall…";
- (**Should-have**) = Highly Desirable = "The System should …"; and
- (**Could-have**) = Desirable = "The System may …".

where:

- **MUST** – means that the requirement is defined is an absolute have requirement.
- **MUST NOT** – means that the numbered requirement is defined as an absolute prohibition.
- **SHOULD** – means that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course.

9. FUNCTIONAL REQUIREMENTS

9.1. Commodity Management

Requirement ID	Priority	Explanation / Description
FRQ001	Must-have	The system shall allow facility storekeepers to record the receipt of nutrition commodities (F-75, F-100, BP100, MNPs, zinc, ORS, iron) with details including batch/lot number, expiry date, quantity received, supplier, and date of receipt.
FRQ002	Must-have	The system shall support stock balance management at facility, district, and regional levels, automatically updating balances with every issue, receipt, or adjustment.
FRQ003	Must-have	The system shall support tracking of commodity expiry dates and batch numbers, applying FEFO principles to minimise wastage.
FRQ004	Must-have	The system shall generate real-time alerts for impending stock-outs, expiries (e.g., 3 months before - configurable), and abnormal consumption patterns.
FRQ005	Must-have	The system shall allow recording of wastage, losses, and damaged commodities (e.g., due to expiry, spoilage, spillage, or incorrect storage).
FRQ006	Should-have	The system shall allow facility-level monthly stock status reports to be generated and submitted electronically, replacing current paper-based reports.
FRQ007	Must-have	The system shall support stock distribution transactions with clear audit trails.
FRQ008	Should-have	The system shall support commodity categorisation and grouping (e.g., therapeutic foods, micronutrients, ORS/zinc).
FRQ009	Must-have	The system must provide visual dashboards for commodity management (e.g., stock balance heatmaps, wastage trends, pipeline flows).

Requirement ID	Priority	Explanation / Description
FRQ010	Should-have	The system shall allow recording of storage conditions (temperature, humidity where feasible) to ensure compliance with nutrition commodity storage guidelines.
FRQ011	Must-have	The system shall allow facility-level corrections (e.g., inventory corrections) with mandatory justification and approval workflow.
FRQ012	Must-have	The eLMIS shall support the use of barcode/QR scanners to capture commodity identifiers (batch/lot number, expiry date, product code) at the point of receipt, storage, and dispensing.
FRQ013	Must-have	The system shall record and track batch/lot information for each stock movement, linking distributed commodities to specific facilities or patients.
FRQ014	Must-have	The eLMIS shall include functionality to flag and quarantine commodities that are expired, damaged, recalled, or withdrawn due to safety/adverse event alerts.
FRQ015	Must-have	Reports shall be generated showing traceability of batches/lots across the supply chain (receipt -> storage -> dispensing), enabling rapid investigation during recalls.
FRQ016	Should-have	The eLMIS should integrate with global GS1 product identifiers where available, ensuring alignment with international supply chain standards.
FRQ017	Must-have	The eLMIS shall enable commodity withdrawal workflows, including identification of affected batches, facilities, and patients, with automated alerts sent to relevant users.

9.2. Requisition and Supply Chain

Requirement ID	Priority	Explanation / Description
FRQ018	Must-have	The system shall allow health facilities to create and submit requisitions for nutrition commodities with fields for requested quantity, justification, and reporting period.
FRQ019	Must-have	The system shall implement a multi-level approval workflow (facility -> district -> region -> national) with role-based permissions and electronic sign-off.
FRQ020	Must-have	The system shall allow district and regional officers to consolidate requisitions from lower levels into a single request for higher-level supply planning.
FRQ021	Must-have	The system shall automatically cross-check requisition requests against reported consumption and stock balances, flagging discrepancies for review.
FRQ022	Should-have	The system shall support auto-generation of suggested order quantities based on consumption patterns, buffer stock policies, and pipeline visibility (with manual override).
FRQ023	Must-have	The system shall provide tracking of requisition status (e.g., submitted, under review, approved, partially fulfilled, rejected) visible to the requesting facility.
FRQ024	Should-have	The system shall allow partial fulfillment of requisitions, with clear documentation of quantities approved vs. delivered.
FRQ025	Must-have	The system shall record and track distribution of commodities against requisitions, creating an auditable link between requests and fulfilled deliveries.
FRQ026	Should-have	The system shall allow requisition and delivery data to feed into pipeline monitoring dashboards, showing supply chain performance indicators (e.g., average lead time, fill rate, stock-out incidents).
FRQ027	Could-have	The system could allow electronic notifications/alerts (email and/or in-app) to requisition creators and approvers at each workflow stage.

Requirement ID	Priority	Explanation / Description
FRQ028	Should-have	The system shall provide standardised requisition templates, configurable by commodity type, facility level, and reporting cycle.
FRQ029	Must-have	The system shall ensure audit trails for all requisitions, approvals, and distributions, recording user ID, timestamp, and action taken.

9.3. Treatment and Outcome Recording

Requirement ID	Priority	Explanation / Description
FRQ030	Must-have	The system shall allow facilities to register children receiving nutrition treatment (minimum identifiers in line with MoHSPP regulations, e.g., name, sex, date of birth (age), facility ID). For this purpose, System shall consume a Unique Patient ID from Tandurusti.tj when available and store it as the primary identifier for the child record. Where a UID is not available (e.g., children born before Tandurusti rollout), the System shall use an internal generated unique patient ID, usable for all transactions and reporting, and clearly distinguishable from other patients.
FRQ031	Must-have	The system shall support patient search and retrieval against Tandurusti.tj (by UID and by demographic query), and auto-fill patient demographics into the eLMIS when a match is returned.
FRQ032	Must-have	The eLMIS shall implement HL7 FHIR Patient-aligned data structures and APIs for patient identity (core demographics only), to enable future interoperability with potential national EHR/EMR or a Patient Index Registry.
FRQ033	Should-have	The eLMIS should support record linkage: when a patient initially registered with an internal ID later receives a

Requirement ID	Priority	Explanation / Description
		Tandurusti UID, the system shall map & link the records (internal-external). In other words, the System shall include duplicate detection (deterministic by UID; and rules-based/probabilistic by name, DoB, sex, etc) and provide an authorised merge workflow with full audit trail.
FRQ034	Must-have	The system shall capture only minimal personal data necessary for treatment and logistics, in line with data minimisation principles.
FRQ035	Must-have	The system shall enforce PII protection: role-based access, encryption in transit/at rest, masking in UI/exports where appropriate.
FRQ036	Must-have	The system shall capture baseline anthropometric data at admission such as weight, height/length, MUAC, oedema status, Z-score, and appetite test results, aligned with the Tajik IMAM guidelines.
FRQ037	Must-have	The system shall record the presence of co-morbidities and medical complications (13 types as defined in national protocols). If complications are detected, the system shall enforce referral to hospital and block commodity dispensing until referral is recorded.
FRQ038	Must-have	The system shall allow entry of treatment episodes, including type and dosage of commodities provided (F-75, F-100, BP100, MNPs, zinc, ORS, iron), by day or week.
FRQ039	Must-have	The system shall capture treatment outcomes (recovered, defaulted, referred, transferred, died) in line with MoHSPP and WHO standards.
FRQ040	Must-have	The system shall allow linkage of treatment episodes to commodity consumption, automatically deducting stock used for each treatment.

Requirement ID	Priority	Explanation / Description
FRQ041	Should-have	The system shall allow recording of caregiver or patient refusal of prescribed treatment, with reason captured in a dropdown or free text.
FRQ042	Must-have	The system shall support outpatient and inpatient cases, including referral from one facility to another, with unique patient case continuity.
FRQ043	Should-have	The system shall support growth monitoring data (weight gain per day/week, progress).
FRQ044	Should-have	The system shall allow recording of caregiver information where required.
FRQ045	Must-have	The system shall support the capture of treatment outcomes at discharge: recovered, defaulted, referred, non-response, died, ongoing. Additionally, treatment outcome recording shall include premature discharge cases (incomplete treatment) with reasons (e.g., caregiver withdrawal, transfer, stock-out).
FRQ046	Must-have	The system shall allow aggregation of patient data into facility reports, producing required indicators (e.g., cure rate, default rate, mortality rate, average length of stay).
FRQ047	Should-have	The system shall enable disaggregation of treatment outcomes by age, sex, and geographic location, consistent with nutrition survey and MUAC monitoring guidance.
FRQ048	Must-have	The system shall maintain an audit trail for all patient treatment records, logging who entered or modified data, with timestamps.
FRQ049	Must-have	The system shall allow health workers to record adverse effects observed during or after administration of nutrition commodities (linked to specific batch/lot where possible).

9.4. Facility and Programme Reporting

Requirement ID	Priority	Explanation / Description
FRQ050	Must-have	The system shall allow facilities to generate monthly reports on stock status, consumption, and treatment outcomes, aligned with MoHSPP reporting templates (e.g., Form no.12, nutrition summaries).
FRQ051	Must-have	The system shall support automated consolidation of reports at district, regional, and national levels, ensuring roll-up of facility submissions into aggregated dashboards.
FRQ052	Must-have	The system shall apply data validation rules (e.g., stock balances must equal opening balance + receipts – issues).
FRQ053	Must-have	The system shall produce nutrition indicators required by MoHSPP and international partners (e.g., cure rate, default rate, mortality, stock-out rate, Vitamin A coverage, ORS/zinc use).
FRQ054	Should-have	The system shall allow reports to be disaggregated by age, sex, and geographic location, consistent with nutrition survey and MUAC screening guidance.
FRQ055	Must-have	The system shall support export and printing of reports in standard formats (Excel, PDF, Word).
FRQ056	Should-have	The system shall provide visual dashboards of reporting data (charts, graphs, maps) at facility, district, regional, and national levels to complement traditional tabular reports.
FRQ057	Could-have	The system could integrate predictive analytics into reporting modules (e.g., early warning of caseload surges or commodity shortages).
FRQ058	Must-have	The system shall ensure all reporting actions are auditable, logging user ID, timestamp, and changes made to submitted reports.
FRQ059	Could-have	The system could allow multi-sectoral reporting outputs, linking nutrition data with Social Protection, WASH, maternal health, and child health indicators as required under the Multisectoral Action Plan for Nutrition.

9.5. Dashboards and Analytics

Requirement ID	Priority	Explanation / Description
FRQ060	Must-have	The system shall provide role-based dashboards for facility, district, regional, national, and partner users, showing indicators relevant to their responsibilities.
FRQ061	Must-have	Dashboards shall display key supply chain indicators such as stock-out rates, expiry risk, pipeline delays, wastage, and reporting compliance.
FRQ062	Must-have	Dashboards shall display nutrition programme indicators such as admissions, recovery rate, default rate, mortality rate, Vitamin A coverage, and ORS/zinc use.
FRQ063	Should-have	The system shall allow drill-down and drill-up navigation (e.g., from national -> regional -> district -> facility -> patient summaries).
FRQ064	Should-have	Dashboards shall support disaggregation by age, sex, and geography, aligning with Tajikistan's survey and monitoring frameworks.
FRQ065	Must-have	The system shall support data export (Excel, PDF, CSV) of dashboard tables and graphs for official reporting and partner use.
FRQ066	Should-have	The system shall provide trend analysis tools (e.g., stock consumption over time, malnutrition recovery rates, caseload evolution).
FRQ067	Could-have	The dashboards shall incorporate GIS-based visualisations (maps at facility, district, and regional levels) to display stock availability, stock-outs, treatment coverage, and other indicators by geography.
FRQ068	Must-have	The system shall generate and display forecast-based KPIs, including projected demand vs. available stock, buffer

Requirement ID	Priority	Explanation / Description
		requirements (+10–20%), and forecasted stock-outs within defined time horizons.
FRQ069	Must-have	The system shall allow customisable KPIs, so the Paediatric Centre can define and update indicators without vendor intervention.
FRQ070	Should-have	The system shall include a compliance dashboard to monitor facility reporting timeliness, data completeness, and error rates.
FRQ071	Must-have	All dashboards must refresh in real-time or near real-time, reflecting the latest submitted or synchronised data, including offline sync updates.
FRQ072	Should-have	The dashboards shall provide user-friendly visualisations (charts, bar graphs, line graphs, pie charts) with consistent design for easy interpretation.

9.6. Forecasting and Quantification

Requirement ID	Priority	Explanation / Description
FRQ073	Must-have	The eLMIS shall provide a consumption-based forecasting tool that projects commodity needs based on historical facility-reported consumption of nutrition commodities (F-75, F-100, BP100, MNPs, Zinc, ORS, Iron).
FRQ074	Must-have	The system shall support input of target populations by age group and commodity dosage, with configurable coverage percentages, to calculate gross needs.
FRQ075	Must-have	The eLMIS shall allow adjustments to forecasts using configurable buffer percentages (e.g., +10–20%) and record these adjustments with justification.
FRQ076	Must-have	Forecasting must incorporate patient caseload data (e.g., number of malnourished children admitted/treated by age

Requirement ID	Priority	Explanation / Description
		group, MUAC/Z-score classification) to align commodity requirements with treatment protocols.
FRQ077	Must-have	The eLMIS shall incorporate carry-over stocks from previous years (including rollovers, expected consumption, expiries, donations, government or partner-procured supplies) into forecast calculations.
FRQ078	Must-have	The system shall generate facility-, district-, and national-level quantification reports, showing: (a) projected demand; (b) available stock; (c) gap/shortage; (d) required replenishment.
FRQ079	Must-have	The system shall apply the standard formulas such as: Net Forecast = Total Expected Needs – Expected Carryover Stock.
FRQ080	Must-have	The forecasting module shall support multi-scenario planning (e.g., based on different assumptions such as seasonal spikes, emergency caseloads, or population growth).
FRQ081	Must-have	The eLMIS shall allow users to specify expected handling losses (%) and incorporate these into net requirements.
FRQ082	Should-have	The forecasting module should provide side-by-side scenario analysis (e.g., different coverage %, buffer %, or emergency caseload assumptions).
FRQ083	Should-have	The eLMIS should provide alerts when projected demand significantly exceeds available stock or when projected stock-outs are likely within the planning horizon.
FRQ084	Should-have	The forecasting module should include a trend analysis dashboard to visualise year-on-year consumption and highlight anomalies or outliers.

9.7. Master Data Management

Requirement ID	Priority	Explanation / Description
FRQ085	Must-have	The system shall maintain a central Health Facility Registry, containing all health facilities (central warehouses, regional depots, district hospitals, PHCs) with unique identifiers, geographic codes, and metadata.
FRQ086	Must-have	The system shall maintain a Commodity Master List for nutrition products (F-75, F-100, BP100, MNPs, zinc, ORS, iron, Vitamin A), with attributes such as formulation, unit of measure, dosage, batch/lot number, expiry rules, and supplier codes.
FRQ087	Must-have	The eLMIS shall provide CRUD functionality (create, read, update, delete) for managing the list of health facilities and healthcare workers involved in the nutrition commodity chain, while also implementing standards-based APIs (e.g., HL7 FHIR, REST/JSON) to ensure future interoperability with the national Registry of Health Facilities and Registry of Health Workforce once these become available. This dual approach shall guarantee both short-term operational functionality and long-term alignment with national digital health registries.
FRQ088	Must-have	The system shall maintain a User Registry with role assignments (facility nurse, storekeeper, district logistics officer, regional nutrition officer, MoHSPP manager, etc.), ensuring each user has unique login credentials and access rights.
FRQ089	Should-have	The system shall allow geographic master data management, including administrative levels (region, district, settlement), ensuring consistency across reports and dashboards.
FRQ090	Must-have	The system shall support master data version control, logging all changes to facility, commodity, or user records (who, when, what was changed).
FRQ091	Must-have	The system shall enforce approval workflows for master data changes (e.g., new facility, updated commodity code),

Requirement ID	Priority	Explanation / Description
		requiring authorization at national or regional level before changes are applied.
FRQ092	Could-have	The system could integrate with global master data standards to improve interoperability.
FRQ093	Should-have	The system should ensure that master data is available offline for facilities, syncing updates automatically when connectivity is restored.
FRQ094	Should-have	The system shall provide audit reports on master data changes (e.g., list of all facilities added or modified in the last month).

9.8. User and Role Management

Requirement ID	Priority	Explanation / Description
FRQ095	Must-have	The system shall implement RBAC, ensuring that users can only access functions and data relevant to their role (e.g., facility nurse cannot approve requisitions; Paediatric Centre's manager can view national dashboards).
FRQ096	Must-have	The system shall allow creation, modification, and deactivation of user accounts by authorized administrators, with mandatory assignment of roles.
FRQ097	Must-have	The system shall support multi-level roles (facility, district, regional, national, partner, administrator) aligned with Tajikistan's health system structure.
FRQ098	Must-have	The system shall maintain an audit trail of all user account changes (creation, role change, deactivation), including user ID, timestamp, and administrator making the change.

Requirement ID	Priority	Explanation / Description
FRQ099	Should-have	The system shall allow temporary or delegated access (e.g., if a district officer is on leave, another officer can be granted delegated access with expiry date).
FRQ100	Must-have	The system shall enforce password and authentication policies (minimum complexity, expiration, lockout after failed attempts, session timeout) in line with MoHSPP security rules.
FRQ101	Must-have	The system shall allow administrators to assign multiple roles to one user (e.g., facility director may also act as stock approver), with clear separation of permissions.
FRQ102	Must-have	The system shall provide reporting on active, inactive, and dormant user accounts, enabling administrators to ensure compliance and remove unused accounts.
FRQ103	Must-have	The system shall enforce segregation of duties, preventing conflicts of interest (e.g., the same user cannot create and approve requisitions).
FRQ104	Could-have	The system could provide multi-factor authentication (MFA) for sensitive roles (e.g., system administrators, national-level managers).
FRQ105	Should-have	The system shall provide self-service account management for users (e.g., password reset, profile update), subject to admin verification where required.
FRQ106	Must-have	The system shall allow role-specific dashboards and menus so users see only the modules/functions relevant to their responsibilities, improving usability and reducing error.

9.9. Interoperability

Requirement ID	Priority	Explanation / Description
FRQ107	Must-have	The system shall provide open, standards-based APIs (REST/JSON) to enable secure data exchange with national and partner systems.
FRQ108	Must-have	The system shall support interoperability with Tajikistan's Tandurusti.tj platform to enable the exchange of patient demographic and identification data, ensuring that nutrition-focused case records within the eLMIS are linked to unique health system identifiers whenever available.
FRQ109	Must-have	The system shall support interoperability with the DHIS2-based HMIS to allow automated transfer of nutrition indicators and commodity data.
FRQ110	Must-have	The system shall support interoperability with DHIS2 Tracker and DHIS2 Aggregate APIs, ensuring nutrition indicators and treatment data can be integrated into existing national health reporting flows.
FRQ111	Must-have	The system shall support HL7 FHIR standards (resources for patient, encounter, observation, medication, inventory) to enable alignment with international health data exchange frameworks.
FRQ112	Must-have	The system shall support import and export of CSV, Excel, and JSON files, with schema validation, to accommodate facilities and districts still transitioning from paper/Excel workflows.
FRQ113	Should-have	The system shall provide integration adapters for future national digital health tools such as Patient Registry, Health Workforce Registry, EHR/EMR systems, e-Perinatal Referral System.
FRQ114	Must-have	The system shall implement secure authentication and authorisation for APIs (API keys, OAuth2), ensuring only authorised systems can connect.

Requirement ID	Priority	Explanation / Description
FRQ115	Should-have	The system shall support scheduled and on-demand data exchange with external systems, with configurable frequency (e.g., daily, weekly, monthly).
FRQ116	Must-have	The system shall maintain an audit log of all data exchanges (incoming and outgoing), including timestamp, source/target system, data volume, and status (success/failure).
FRQ117	Could-have	The system could provide a data mapping and transformation tool within the admin console, allowing local teams to configure mappings between eLMIS data fields and HMIS/DHIS2 fields.
FRQ118	Should-have	The system shall support federated data exchange in the future, enabling decentralised warehouses or regional systems to synchronise with the national platform.

9.10. Notifications and Alerting

Requirement ID	Priority	Explanation / Description
FRQ119	Must-have	The system shall provide automatic alerts for critical stock levels, including stock-outs, low stock (below buffer threshold), and upcoming expiries (e.g., 3 months before).
FRQ120	Must-have	The system shall generate reminders for reporting deadlines (monthly/quarterly facility reports), with escalation to district or regional officers if submissions are delayed.
FRQ121	Should-have	The system shall allow configurable notification channels (in-app and/or email) depending on user access and connectivity.
FRQ122	Must-have	The system shall maintain an audit log of all workflow actions and notifications, recording user ID, timestamp, and action taken (e.g., requisition approved, alert sent).

Requirement ID	Priority	Explanation / Description
FRQ123	Should-have	The system shall allow thresholds for notifications (e.g., buffer stock levels, caseload surges) to be set and adjusted by national administrators.
FRQ124	Must-have	The system shall generate notifications for data validation errors (e.g., stock balance mismatch, implausible MUAC/Z-score values) before report submission.

9.11. Help and User Support Features

Requirement ID	Priority	Explanation / Description
FRQ125	Must-have	The system shall include in-app help features such as tooltips, step-by-step wizards, contextual guidance to assist users in completing common tasks such as stock entry, requisition submission, and treatment recording.
FRQ126	Must-have	The system shall provide multilingual support (Tajik, Russian, and English) for all help content, user manuals, and training modules.
FRQ127	Should-have	The system shall include a searchable knowledge base such as FAQs, troubleshooting guides, video tutorials, accessible from within the platform.
FRQ128	Must-have	The vendor shall provide comprehensive user manuals (printable and digital), covering workflows such as commodity management, requisitions, treatment & outcome recording, and reporting.
FRQ129	Should-have	The system shall provide in-app error messages that are clear, actionable, and user-friendly (e.g., “Stock balance mismatch: opening + receipts – issues ≠ closing balance”).

Requirement ID	Priority	Explanation / Description
FRQ130	Should-have	The system shall support context-sensitive help (linking users directly to the relevant section of the manual/FAQ when they click on a help icon).
FRQ131	Must-have	The vendor shall provide training materials tailored to different roles (e.g., storekeepers, clinicians, district officers, national managers, system administrators).

10. NON-FUNCTIONAL REQUIREMENTS

10.1. Software architecture

Requirement ID	Priority	Description of the Requirement
NFRQ001	Must-have	The eLMIS architecture shall be modular and based on open standards, with clearly separable services/components to enable replacement or reuse without impacting other parts of the system.
NFRQ002	Must-have	The solution shall remain technology-neutral with respect to DPG/COTS/bespoke options, provided it meets all requirements and can be adapted to Tajikistan's context (multilingual, integration, featuring mobile app supporting off-line mode).
NFRQ003	Must-have	The architecture shall follow an N-tier design with at least Presentation, Business-Logic, and Data layers, ensuring strict separation of concerns and well-defined interfaces between layers.
NFRQ004	Should	The system shall adopt service-oriented principles; where practical, microservices (or modular services) may be used so that features can be developed, deployed, and scaled independently.
NFRQ005	Must-have	The UI components (web + mobile) shall be designed with resilient sync and conflict handling, and multilingual (Tajik, Russian, and English).
NFRQ006	Must-have	Core domain services shall encapsulate nutrition workflows (commodity, requisition, treatment/outcome, reporting) and expose them only via internal APIs to enforce business rules consistently system-wide.
NFRQ007	Must-have	The architecture shall separate OLTP (transactional) data stores from analytics/warehouse structures to protect operational performance while enabling dashboards and forecasting.

Requirement ID	Priority	Description of the Requirement
NFRQ008	Must-have	All inter-component communication shall use secure, versioned APIs (REST/JSON) with OpenAPI/Swagger docs; externally exposed interfaces must support HL7 FHIR, DHIS2 APIs, and GS1 identifiers where applicable.
NFRQ009	Must-have	The architecture shall include an API gateway/integration layer (or equivalent pattern) to manage authentication, throttling, transformation/mapping, and observability of integrations with HMIS/DHIS2 and Tandurusti.tj.
NFRQ010	Must-have	RBAC and centralised audit logging shall be enforced at the platform level (not only in UI), with immutable audit trails across stock movements, patient records, approvals, and data exchange events.
NFRQ011	Should-have	The system should support OIDC/OAuth2 based authentication, and allow future SSO with MoHSPP identity providers, without hard-wiring to a single IdP.
NFRQ012	Must-have	The application layer shall be stateless by default (session state externalised), enabling horizontal scaling and blue/green or rolling deployments with no session loss.
NFRQ013	Should	The solution should support containerisation; where orchestration is required, it should support Kubernetes (or equivalent) for portability, resilience, and zero-downtime updates.
NFRQ014	Must-have	The architecture shall avoid single points of failure; critical services (API, DB, message broker, cache) must support redundancy/failover in line with availability objectives (detail in Section 5.4).
NFRQ015	Should	A message/event bus (e.g., queue or pub/sub) should be used for asynchronous jobs (sync, notifications, report generation) to decouple modules and improve resilience in low-connectivity contexts.
NFRQ016	Must-have	Master Data Management (facilities, geographies, users, products) shall be a distinct component, with authoritative

Requirement ID	Priority	Description of the Requirement
		IDs and versioning to ensure consistent reporting and interoperability.
NFRQ017	Must-have	The architecture shall include observability by design: central log aggregation with correlation IDs, metrics, and distributed tracing across services and integrations.
NFRQ018	Should	The client applications shall implement graceful degradation (cached reads, queued writes, user prompts) during connectivity loss, and automatic retry with back-off upon reconnection.
NFRQ019	Must-have	The architecture shall be deployable in the MoHSPP's data centre, supporting VM and container targets, with identical automation across dev/test/stage/prod.
NFRQ020	Must-have	Public interfaces and data models shall be versioned and backward-compatible to support incremental roll-out from pilot to national scale without breaking dependent systems.

10.2. System Performance and Scalability

Requirement ID	Priority	Description of the Requirement
NFRQ021	Must-have	The eLMIS shall ensure an average response time of ≤3 seconds for standard facility transactions (stock issue/receipt entry, requisition submission, treatment record entry) under normal operating conditions at national scale.
NFRQ022	Must-have	The eLMIS shall support high transaction throughput, able to process at least 3,000 stock transactions and 1,000 patient treatment entries per hour without performance degradation.
NFRQ023	Must-have	The system shall be capable of handling simultaneous use by up to 3,000 concurrent users (covering national, regional,

Requirement ID	Priority	Description of the Requirement
		district, and facility staff) during peak reporting periods (e.g., month-end).
NFRQ024	Must-have	The eLMIS shall be scalable from pilot to nationwide rollout without requiring major redesign, supporting incremental onboarding of additional facilities, commodities (e.g., therapeutic foods, micronutrients, ORS/zinc, iron), and users.
NFRQ025	Must-have	The system shall be optimised for low-bandwidth environments, ensuring transactions (e.g., stock updates, requisitions) can be synchronised reliably over low connections.
NFRQ026	Should	The system should be able to handle at least 30,000 patient treatment records annually without significant performance degradation.
NFRQ027	Must-have	The eLMIS shall undergo load and stress testing prior to rollout, demonstrating stable performance under conditions exceeding projected national workloads (e.g., 150% of estimated transaction and user volumes).
NFRQ028	Must-have	The system shall implement query optimisation and caching strategies to ensure efficient dashboard refresh and reporting at facility, district, regional, and national levels.
NFRQ029	Should	The eLMIS solution should support horizontal scaling (adding application or database nodes) and elastic resource allocation (CPU, memory, storage) to meet increases in demand during emergencies or seasonal surges.
NFRQ030	Must-have	The system shall maintain data consistency under load, ensuring ACID properties in OLTP transactions and eventual consistency in synchronised offline data.
NFRQ031	Could	The system could provide auto-scaling monitoring dashboards, allowing administrators to view real-time usage,

Requirement ID	Priority	Description of the Requirement
		performance, and resource consumption for proactive scaling decisions.

10.3. Security and Privacy

Requirement ID	Priority	Description of the Requirement
NFRQ032	Must-have	The eLMIS shall implement RBAC so that users only access the functions and data relevant to their role (e.g., facility nurse cannot approve requisitions; national manager can access dashboards).
NFRQ033	Should-have	The system should support standards-based authentication using OAuth2/OIDC, with the ability to integrate in the future with MoHSPP identity providers for SSO.
NFRQ034	Must-have	All data in transit shall be encrypted using TLS 1.2+, and all data at rest shall be encrypted using AES-256 or equivalent national standard.
NFRQ035	Must-have	The system shall maintain a comprehensive audit trail of all user actions (e.g., logins, commodity transactions, patient treatment updates, approvals), capturing user ID, timestamp, and action taken, with immutable logs.
NFRQ036	Must-have	The eLMIS shall enforce PII protection and data minimisation: only the minimal personal data required for nutrition case management shall be collected and stored.
NFRQ037	Must-have	The system shall comply with Tajikistan data protection rules and principles (lawfulness, fairness, transparency, purpose limitation, minimisation, accuracy, storage limitation, integrity, confidentiality, accountability).
NFRQ038	Must-have	The system shall comply with UNICEF Responsible Data for Children principles, ensuring privacy, protection, and ethical use of sensitive child and patient data.

Requirement ID	Priority	Description of the Requirement
NFRQ039	Could-have	The system could support multi-factor authentication (MFA) for sensitive roles (e.g., system administrators, national-level managers).
NFRQ040	Must-have	The system shall enforce password policies (minimum length, complexity rules, expiration, account lockout after failed attempts, and session timeout) consistent with MoHSPP security regulations.
NFRQ041	Must-have	The eLMIS shall mask or anonymise PII (e.g., patient names, IDs) when displayed in reports or exports, except for authorised roles explicitly permitted to view full details.
NFRQ042	Should	The system should support data pseudonymisation or de-identification for use in aggregated dashboards, research, and monitoring, ensuring that individual patients cannot be re-identified.
NFRQ043	Must-have	The system shall provide configurable role-based permissions for API access, ensuring that only authorised systems and users can interact with specific endpoints.
NFRQ044	Must-have	The eLMIS shall ensure secure configuration management, with secrets (API keys, credentials) stored in encrypted vaults, never hard-coded in application code or configuration files.
NFRQ045	Must-have	The system shall provide data retention and secure disposal policies, ensuring records are retained only as long as required by MoHSPP regulations, with archiving and deletion processes.
NFRQ046	Must-have	The eLMIS shall allow role-based export permissions, ensuring that sensitive datasets (e.g., patient-level data) cannot be exported without explicit authorisation.
NFRQ047	Could	The system could provide geo-restriction of logins (e.g., access from within Tajikistan only for facility-level roles) if required by MoHSPP.

10.4. Availability, Reliability, and Continuity

Requirement ID	Priority	Description of the Requirement
NFRQ048	Must-have	The eLMIS shall guarantee a minimum monthly system uptime of 99.5%, excluding scheduled maintenance windows agreed in advance with MoHSPP.
NFRQ049	Must-have	The system shall be deployed in redundant infrastructure at MoHSPP data centre, avoiding single points of failure for critical services (application, database, API gateway).
NFRQ050	Must-have	The eLMIS shall support automatic failover mechanisms for critical components (e.g., database replication, application server redundancy) to minimise service disruption.
NFRQ051	Must-have	The system shall include a Disaster Recovery Plan with clear RTO less than 8 hours and RPO less than 15 minutes for transactional data).
NFRQ052	Must-have	The eLMIS shall continue to function in offline mode at facility level during connectivity or power outages, with queued transactions automatically synchronised when connectivity is restored.
NFRQ053	Should	The system should support graceful degradation: when some services are unavailable (e.g., dashboards), core commodity management and requisition workflows shall continue functioning.
NFRQ054	Must-have	The solution shall support incremental rollout and scaling without requiring downtime of national services, enabling phased implementation from pilot to nationwide coverage.
NFRQ055	Must-have	The eLMIS shall provide real-time health monitoring dashboards for administrators, showing availability status of application, APIs, and database components.
NFRQ056	Should	The system should allow scheduled maintenance windows to be defined and announced to users (via in-app

Requirement ID	Priority	Description of the Requirement
		notification), minimising disruption during routine patching or upgrades.
NFRQ057	Must-have	The system shall log and report all availability incidents (downtime, performance degradation) with timestamp, root cause, and resolution, ensuring traceability for UNICEF and MoHSPP oversight.

10.5. Data Management and Quality

Requirement ID	Priority	Description of the Requirement
NFRQ058	Must-have	The eLMIS shall implement Master Data Management (MDM) for facilities, nutrition commodities (F-75, F-100, BP100, MNPs, zinc, ORS, iron, Vitamin A), users, and geographic locations, ensuring consistency across all modules and reports.
NFRQ059	Must-have	The system shall enforce unique identifiers for master data entities (facilities, commodities, users, patients) to prevent duplication and support interoperability with DHIS2, Tandurusti.tj, and other national registries.
NFRQ060	Must-have	The eLMIS shall apply data validation rules at the point of entry (e.g., stock balance must equal opening + receipts – issues, MUAC/Z-score values within biologically plausible ranges) to minimise data errors.
NFRQ061	Must-have	The system shall enforce referential integrity across transactions (e.g., no stock issue can be recorded without a corresponding batch in stock, no treatment episode without a patient record).
NFRQ062	Must-have	The system shall support audit logs for data changes, capturing before/after values, user ID, timestamp, and

Requirement ID	Priority	Description of the Requirement
		justification for corrections (especially for stock adjustments and patient record modifications).
NFRQ063	Should	The eLMIS should provide data quality dashboards (completeness, timeliness, consistency, duplication rates) at facility, district, and national levels, with automated alerts for anomalies.
NFRQ064	Must-have	The system shall implement data retention policies aligned with MoHSPP rules, specifying how long patient, stock, and requisition records are stored before archival or disposal.
NFRQ065	Must-have	Archived data shall be read-only and securely stored, ensuring historical reports and audits remain possible without risk of tampering.
NFRQ066	Must-have	The system shall provide secure data disposal mechanisms once retention limits are reached, in compliance with Tajikistan's laws and UNICEF RD4C principles.
NFRQ067	Must-have	The eLMIS shall allow data import/export with validation (CSV, Excel, JSON), ensuring that bulk uploads (e.g., legacy stock data migration) are subject to schema checks and error reporting.
NFRQ068	Could	The system could implement automated duplicate detection for patient and facility records, suggesting merges with user approval.
NFRQ069	Must-have	The system shall support data harmonisation with national and international standards (e.g., GS1 identifiers for products, HL7 FHIR resources for patients/encounters/observations).
NFRQ070	Must-have	The eLMIS shall ensure synchronisation integrity for offline facilities, with conflict detection and resolution rules clearly defined (e.g., last-write-wins or authorised merge with audit).

10.6. Interoperability and Standards Compliance

Requirement ID	Priority	Description of the Requirement
NFRQ071	Must-have	The eLMIS shall provide open, standards-based APIs such as REST/JSON with full documentation (OpenAPI/Swagger), enabling secure integration with national and partner systems.
NFRQ072	Must-have	The eLMIS shall support interoperability with DHIS2-based HMIS (both aggregate and tracker APIs), ensuring automated transfer of nutrition indicators, stock data, and treatment outcomes.
NFRQ073	Must-have	The system shall implement HL7 FHIR resources (Patient, Encounter, Observation, Medication, Inventory) to align with global health information exchange standards.
NFRQ074	Must-have	The eLMIS shall support integration with Tandurusti.tj for patient demographic and ID management, enabling linkage of treatment records with unique identifiers when available.
NFRQ075	Should-have	The system should support interoperability with national digital health platforms (e.g., health facility registry, workforce registry, Patient Registry, EMR/EHR) as these become available.
NFRQ076	Must-have	The system shall conform to GS1 standards for product identification and batch/lot traceability where such identifiers exist for nutrition commodities.
NFRQ077	Must-have	The eLMIS shall implement API security (OAuth2, API keys, role-based permissions) to ensure only authorised systems can connect.
NFRQ078	Should-have	The system should support scheduled and on-demand data exchange with external systems, with configurable frequency (daily, weekly, monthly).

Requirement ID	Priority	Description of the Requirement
NFRQ079	Must-have	The eLMIS shall provide audit logs for all data exchanges (incoming and outgoing), including timestamp, source/target system, payload type, and success/failure status.
NFRQ080	Could	The system could include a data mapping and transformation console, allowing administrators to configure mappings between eLMIS fields and DHIS2/HMIS fields without vendor intervention.
NFRQ081	Should	The system should support federated data exchange (regional or warehouse-level synchronisation) to allow decentralised deployments to remain consistent with the national platform.
NFRQ082	Must-have	The eLMIS shall ensure backward compatibility of APIs when new versions are released, to avoid disruption of dependent systems.

10.7. Usability and Accessibility

Requirement ID	Priority	Description of the Requirement
NFRQ083	Must-have	All eLMIS business functions shall be accessible only through the GUI via web browsers or mobile apps. End-users shall have no direct access to the business logic or database layers.
NFRQ084	Must-have	The eLMIS shall provide a user-friendly, intuitive, and comfortable interface, requiring minimal training and ensuring that health facility users can operate the system without extensive technical assistance.
NFRQ085	Must-have	The system shall support multilingual GUIs in Tajik, Russian and English as mandatory. Switching between languages shall not cause data loss.

Requirement ID	Priority	Description of the Requirement
NFRQ086	Must-have	All modules of the eLMIS shall follow a unique and consistent graphic design style, ensuring visual and functional uniformity (colours, icons, terminology, and navigation patterns).
NFRQ087	Could-have	The GUI could allow personalisation of the workspace (e.g., adding menu items to favourites, saving parameterised searches, displaying last login/access) to improve efficiency.
NFRQ088	Must-have	The GUI design shall respect Tajikistan's context, including the use of official symbols (e.g., flag, emblem, eLMIS logo) as agreed with the Paediatric Centre, while maintaining a clean, functional layout.
NFRQ089	Must-have	The GUI shall provide clear, concise, and actionable error messages without exposing technical details. Error alerts shall guide the user step by step on corrective actions.
NFRQ090	Should-have	The eLMIS shall provide context-sensitive help (tooltips, "?" icons, or inline guidance) directly at the user interface level, linking to relevant training or manual sections.
NFRQ091	Must-have	The GUI shall comply with WCAG 2.1 AA accessibility standards, ensuring readability and usability by users with visual, hearing, or motor impairments.
NFRQ092	Must-have	The user interface shall be responsive and optimised for desktops, laptops, tablets, and smartphones, with a minimum resolution support of 1360×768 for desktops.
NFRQ093	Must-have	The system shall be optimised for low-spec Android devices commonly available in Tajikistan's health facilities, ensuring stable performance in rural contexts.
NFRQ094	Should-have	The GUI shall provide search, filter, paging, and grouping functions for lists and tabular data (e.g., patient records, stock reports), allowing users to easily navigate large datasets.

Requirement ID	Priority	Description of the Requirement
NFRQ095	Must-have	The GUI shall ensure that data entry fields are validated at both client-side (real-time form validation) and server-side (business rules), providing clear alerts when incorrect or incomplete data is entered.
NFRQ096	Must-have	The interface shall follow a simple navigation principle: on every screen, the user must clearly see "*Where am I now?*" and "*How can I go back?*", with predictable use of navigation buttons (Next, Back, Home).
NFRQ097	Should-have	The system should allow role-based interface customisation, showing only modules and menus relevant to a user's role (e.g., nurses see treatment forms; logisticians see stock dashboards).
NFRQ098	Must-have	The GUI shall use icons accompanied by text labels ('hints') to ensure clarity for users with limited ICT literacy.
NFRQ099	Should-have	The GUI shall allow printing of key forms and reports in layouts similar to on-screen views (e.g., stock cards, requisitions, treatment reports).
NFRQ100	Must-have	If the eLMIS is accessed through an unsupported browser, the system shall display a clear message explaining the issue and suggesting supported browsers.

10.8. Offline-Mode and Connectivity Resilience

Requirement ID	Priority	Description of the Requirement
NFRQ101	Must-have	The eLMIS shall follow a hybrid connectivity model: the web application for desktops/laptops shall be online-first, requiring internet connectivity for normal operations, while the mobile application (Android/iOS) shall support full offline functionality for critical workflows (commodity transactions, requisition entry, patient treatment recording).

Requirement ID	Priority	Description of the Requirement
NFRQ102	Must-have	The mobile client shall provide local data caching on the device so that users can continue operations during connectivity outages, with automatic synchronisation when connectivity is restored. The web client shall provide graceful error handling (e.g., retries, draft saving, clear error messages) during transient connectivity loss.
NFRQ103	Must-have	The mobile application shall implement conflict detection and resolution rules during synchronisation (e.g., last-write-wins, authorised merge workflows), with full audit logging of resolved conflicts.
NFRQ104	Must-have	Both the web and mobile applications shall support graceful error handling in case of connectivity loss, displaying clear user messages and automatically queuing unsent transactions for retry (mobile) or allowing re-submission once connectivity resumes (web).
NFRQ105	Must-have	Mobile synchronisation shall be resumable, allowing partially transmitted data to continue from the point of failure without re-entry of transactions.
NFRQ106	Should-have	The mobile application should allow manual sync triggers by authorised users (e.g., facility managers) in addition to automated sync cycles, to ensure timely data submission before reporting deadlines.
NFRQ107	Must-have	The system shall support compressed and bandwidth-optimised data transfers (e.g., JSON compression, differential updates) to ensure reliable operation over low-speed connections.
NFRQ108	Must-have	The mobile client shall allow offline validation of data entry rules (e.g., stock balance formulas, MUAC/Z-score ranges) so that errors are detected before sync, not only after upload.

Requirement ID	Priority	Description of the Requirement
NFRQ109	Should-have	The mobile client should allow background synchronisation while the app is idle, minimising disruption to user workflows.
NFRQ110	Must-have	The mobile client shall support retry with exponential back-off for failed sync attempts, avoiding network congestion and ensuring eventual data delivery.
NFRQ111	Must-have	Offline data stored on mobile devices shall remain encrypted at rest until synchronised, protecting sensitive information in case of device loss.
NFRQ112	Could-have	The mobile client could provide a connectivity status indicator (online, offline, syncing, error) visible to users at all times.
NFRQ113	Must-have	The offline capability shall be mandatory for mobile clients (Android tablets/smartphones). For desktops/laptops, the web application shall remain online-first but provide robust handling of temporary connection issues (e.g., retries, draft saving, user alerts).

10.9. Deployment, Hosting, and Infrastructure

Requirement ID	Priority	Description of the Requirement
NFRQ114	Must-have	The eLMIS shall be deployed in the MoHSPP's data centre, that meets national data sovereignty data protection policies.
NFRQ115	Must-have	The deployment shall support multiple environments (development, testing, staging, production), with strict separation and version control across environments.
NFRQ116	Must-have	The eLMIS shall support containerisation or virtualisation such as Docker, Kubernetes, VMware or similar to ensure portability, scalability, and simplified maintenance.

Requirement ID	Priority	Description of the Requirement
NFRQ117	Must-have	The infrastructure shall include redundancy for critical services (application servers, databases, API gateway) to prevent single points of failure.
NFRQ118	Must-have	The system shall support load balancing across application nodes, ensuring stable performance during peak workloads (e.g., end-of-month reporting).
NFRQ119	Must-have	The deployment shall include automated alerting mechanisms (e.g., email, dashboard alerts) for critical incidents such as downtime, high error rates, or failed backups.
NFRQ120	Could-have	The solution could support hybrid deployment options (e.g., MoHSPP data centre + cloud backup) to improve disaster recovery and resilience in case of national infrastructure failure.
NFRQ121	Must-have	The selected supplier shall provide as-built deployment documentation (network diagrams, environment setup, server specifications) to UNICEF/MoHSPP for sustainability and maintenance.

10.10. Operational Monitoring, Diagnostics, and Troubleshooting

Requirement ID	Priority	Description of the Requirement
NFRQ122	Must-have	The eLMIS shall include real-time system monitoring dashboards for system administrators, showing system uptime, transaction volumes, error rates, and synchronisation status.
NFRQ123	Must-have	The system shall provide centralised log aggregation (application, database, API, security events), searchable with filters (by user, facility, module, or timestamp).

Requirement ID	Priority	Description of the Requirement
NFRQ124	Should-have	The eLMIS should provide health-check endpoints for each service/component (application, API, database) to allow automated monitoring and alerting.
NFRQ125	Must-have	The infrastructure shall include automated alerts (e.g., email/SMS/in-app) for critical issues such as downtime, failed backups, sync errors, or repeated login failures.
NFRQ126	Should-have	The system should support distributed tracing across services and APIs, enabling administrators to diagnose bottlenecks in workflows (e.g., DHIS2 data exchange).
NFRQ127	Must-have	The eLMIS shall provide a diagnostics console for system administrators with tools for error log review, system configuration status, and resource usage.
NFRQ128	Must-have	The supplier shall establish incident categorisation and escalation procedures (Critical, High, Medium, Low), aligned with SLAs defined in the ToR.
NFRQ129	Must-have	The system shall produce incident reports including root cause, corrective action taken, and resolution time, available for UNICEF/MoHSPP audit.
NFRQ130	Must-have	The supplier shall ensure proactive monitoring during rollout and stabilisation period, providing weekly monitoring reports to UNICEF.
NFRQ131	Should	The system should enable role-based access to diagnostics data, ensuring only authorised administrators can view logs and system-level metrics.

10.11. Requirements for Exemptions and Errors Management Mechanism

Requirement ID	Priority	Description of the Requirement
NFRQ132	Must-have	The eLMIS shall include solution(s) for capturing and categorising system errors and exceptions, covering application, database, and integration layers.
NFRQ133	Must-have	All exceptions shall be logged with full metadata (timestamp, user ID, facility, module, error type, and stack trace where applicable) for analysis and troubleshooting.
NFRQ134	Must-have	The system shall present clear, user-friendly error messages at the interface level.
NFRQ135	Must-have	The system shall ensure that errors do not cause data loss; transactions that fail shall be queued for retry or rolled back safely with full traceability.
NFRQ136	Should	The system should classify errors by severity (Critical, High, Medium, Low), aligned with the SLA framework, and trigger corresponding alerts and response times.
NFRQ137	Must-have	The eLMIS shall include a mechanism for administrators to acknowledge and track resolution status of errors and exceptions through a dashboard or ticketing system.
NFRQ138	Must-have	All error handling routines shall be tested during QA and UAT to ensure predictable system behaviour and graceful recovery under fault conditions.
NFRQ139	Could	The system could allow export of error and exception logs (in CSV/Excel) for further analysis and external audit.
NFRQ140	Must-have	The GUI shall provide a predictable navigation principle when errors occur (e.g., “Where am I now?” and “How can I go back?”), ensuring users can recover without abandoning their workflow.

Requirement ID	Priority	Description of the Requirement
NFRQ141	Must-have	Under no circumstances shall technical error details (e.g., database schema, stack traces) be exposed to end-users; such details must only be logged for administrators.

10.12. Compliance and Governance

Requirement ID	Priority	Description of the Requirement
NFRQ142	Must-have	The eLMIS shall comply with Tajikistan rules on data protection, public health information management, and ICT regulations.
NFRQ143	Must-have	The system shall align with UNICEF RD4C principles, ensuring child-sensitive data use, minimisation, and protection across all modules.
NFRQ144	Must-have	The eLMIS shall align with UNICEF Approach to Digital Health, WHO Digital Implementation Investment Guide (DIIG), and WHO Digital Transformation Handbook for Health Supply Chain Architecture. The solution shall ensure sustainability, openness, interoperability, and scalability in line with these global frameworks.
NFRQ145	Must-have	The system shall support full auditability, producing logs and reports suitable for review by MoHSPP.
NFRQ146	Should	The system should align with ISO/IEC 25010 quality model characteristics (reliability, security, usability, performance, maintainability, portability) in design and QA processes.
NFRQ147	Must-have	The eLMIS shall support compliance with HL7 FHIR, GS1, and OpenHIE standards for interoperability, ensuring vendor-neutral and future-proof design.
NFRQ148	Must-have	The system shall enforce segregation of duties through RBAC, preventing conflicts of interest (e.g., one user creating and approving requisitions).

Requirement ID	Priority	Description of the Requirement
NFRQ149	Must-have	The vendor shall ensure that the solution, documentation, and deliverables respect UNICEF intellectual property rights clauses, granting UNICEF/MoHSPP full ownership and transfer rights.

11. QUALITY ASSURANCE AND SOFTWARE TESTING

11.1. QA Principles

The Supplier shall establish and apply a comprehensive QA and Software Testing Framework to ensure the eLMIS meets all functional, non-functional, and interoperability requirements defined in this ToR. QA shall be embedded across the full lifecycle—planning, design, development, integration, deployment, and maintenance—and reflect real workflows at facility, district, regional, and national levels in Tajikistan. The guiding principles in this regard are:

- **Standards-aligned:** QA and testing shall follow recognised practices (e.g., ISO/IEC 25010 for quality characteristics; ISTQB for test practice; ITIL for service quality; and OWASP guidance for security testing).
- **End-to-end validation:** All core modules (commodity management, requisitions, treatment & outcomes, reporting/dashboards, MDM, and interoperability) must be validated together—not only in isolation.
- **User-centred & context-aware:** UNICEF/MoHSPP stakeholders shall be involved, and test scenarios shall reflect multilingual use (Tajik, Russian and English), low-connectivity environments, and offline/online synchronisation behaviours.
- **Traceability:** Test cases must be traceable to ToR requirements; defects must map back to the requirement(s) they affect.
- **Auditability:** QA processes must produce clear, durable evidence (plans, cases, logs, reports) suitable for future audits or maturity assessments.

11.2. Inspections

After delivery of the eLMIS and related components (software packages, documentation, configuration files, and training materials), UNICEF and/or MoHSPP representatives should conduct post-delivery inspections to verify that the system and deliverables comply with the contractual and technical requirements. These inspections will focus on:

- Confirming that all agreed components (source code, executables, documentation, test artefacts, training materials) have been delivered in full and are consistent with the requirements in the ToR and Annexes.
- Ensuring that the eLMIS has been correctly deployed in the designated environments (development, test, staging, production) and that installation procedures are documented and reproducible.
- Validating that the core modules (commodity management, requisitions, treatment and outcome recording, reporting/dashboards, master data, and interoperability) are accessible, properly configured, and perform as intended at the point of delivery.
- Confirming that the system implements required security controls (authentication, authorisation, encryption, audit logging) and complies with data protection regulations applicable in Tajikistan.
- Inspecting the completeness and usability of technical documentation (system architecture, database schema, API specifications, user and administrator manuals).

If deficiencies are identified during inspections following delivery, the Supplier shall address them promptly at no additional cost to UNICEF. A Corrective Action Plan must be submitted by the Supplier within 5 working days, and follow-up inspections may be carried out to confirm that the deficiencies have been resolved.

These inspections serve as an entry point into the subsequent phases of testing (Pre-commissioning and Operational Acceptance), ensuring that the system is fit for purpose and ready for structured validation.

11.3. Pre-commissioning Tests

Before the eLMIS can be accepted for operational use, the Supplier shall conduct a comprehensive set of Pre-commissioning Tests under the supervision of UNICEF and Paediatric Center representatives. These tests aim to confirm that the system is stable, compliant with requirements, and ready for pilot and national deployment. More precisely the Pre-commissioning Tests shall include:

1) **Functional Validation**: Execution of test cases covering all mandatory functionalities defined in the ToR and Annexes, including commodity management, requisition

workflows, treatment and outcome recording, facility reporting, dashboards, master data management, and integration points.

2) **Data Validation**: Verification that stock transactions, and reporting outputs are processed accurately and consistently, including cross-checks against anonymised sample datasets.

3) **Performance and Load Testing**: Demonstration that the eLMIS can support anticipated national workloads—such as thousands of concurrent facility transactions—while maintaining acceptable response times and without degradation.

4) **Security Testing**: Confirmation that authentication, role-based access, audit logging, and encryption (in transit and at rest) operate as required, and that no critical vulnerabilities exist.

5) **Interoperability Testing**: Validation of data exchange with HMIS DHIS2, and any other agreed national or partner systems.

Pre-commissioning Tests shall be executed in a staging environment that replicates the production setup. All results shall be documented in formal Test Reports, with pass/fail status for each requirement. Any defects detected must be logged, categorised by severity, and resolved before the system is allowed to proceed to Operational Acceptance Tests.

If critical issues remain unresolved after Pre-commissioning Tests, UNICEF reserves the right to require re-testing at the Supplier's cost.

11.4. Operational Acceptance Tests

After successful completion of Pre-commissioning Tests, the Supplier shall conduct Operational Acceptance Tests in collaboration with UNICEF and MoHSPP. These tests are intended to demonstrate that the eLMIS is fully functional, stable, and ready for day-to-day operations at facility, district, regional, and national levels in Tajikistan.

The Operational Acceptance Tests shall:

- **Simulate Real-world Workflows**: Demonstrate complete end-to-end processes, including:

  (a) recording and tracking of nutrition commodities (F-75, F-100, BP100, MNPs, zinc, ORS, iron);

  (b) requisition and approval workflows;

  (c) treatment and outcome recording for children

(d) facility and programme reporting, and

(e) dashboard/analytics for decision-making.

- **User Acceptance Testing**: Involve designated facility, district, and national-level staff as test users. Their feedback shall be collected, documented, and incorporated into defect resolution or system improvements.
- **Operational Environment Validation**: Confirm that the system performs correctly in the production environment, using real infrastructure, user roles, and access controls.
- **Interoperability in Production**: Demonstrate successful data exchange with the HMIS DHIS2, and other agreed national platforms.
- **Performance Under Load**: Verify that the system can support national-level workloads (simultaneous users and transactions) in a production setting, maintaining agreed response times.
- **Security and Compliance**: Validate that role-based access, audit trails, encryption, and data protection measures function in the live environment, in line with Tajikistan's laws and UNICEF's data protection standards.
- **Multilingual and Offline Operations**: Confirm that the Tajik, Russian, and English interfaces are accurate and user-friendly, and that the offline module allows facility staff to work during connectivity gaps with seamless synchronisation upon reconnection.
- **Operational Support Readiness**: Demonstrate that helpdesk/support mechanisms, monitoring tools, and backup/recovery procedures are in place and functioning.

11.5. Acceptance Criteria

The eLMIS shall not be considered accepted until the following criteria have been met and formally approved by UNICEF and MoHSPP:

#	Criteria	Explanation
1.	**Completion of Inspections**	Post-delivery inspections confirm that all deliverables (software, documentation, training materials, source code) have been provided and are complete.
2.	**Successful Completion of Pre-commissioning Tests**	All mandatory functional and non-functional requirements defined in the ToR and Annexes are tested and demonstrated in a controlled staging environment. No Critical or High severity defects remain unresolved.

#	Criteria	Explanation
		Medium and Low severity defects are documented with agreed remediation timelines.
3.	**Successful Completion of Operational Acceptance Tests**	Core business processes (commodity management, requisition workflows, treatment/outcome recording, reporting, dashboards, master data, interoperability) function correctly in the production environment. Performance, security, interoperability, multilingual, and offline functionality are demonstrated in line with requirements. UAT is successfully carried out with UNICEF representatives, and feedback incorporated.
4.	**Documentation and Training Delivered**	Technical documentation (architecture, database schema, API specs, user/admin manuals) is complete and validated. Training sessions for administrators, facility/district/national staff, and helpdesk/support staff have been delivered.
5.	**Support Readiness**	Helpdesk/support processes are ready, with escalation paths defined.
6.	**Final Approval**	Formal acceptance is recorded in an Acceptance Certificate signed by UNICEF.

11.6. Testing Documentation

The Supplier shall be responsible for preparing and maintaining all **testing documentation and artefacts** created before, during, and after the testing of the eLMIS. These artefacts must support test effort estimation, test coverage measurement, resource tracking, execution progress monitoring, and defect tracking.

The testing documentation shall form a complete suite of documents that describe test planning, test execution, and test results. All documents shall provide sufficient detail to demonstrate compliance with the functional and non-functional requirements defined in this ToR.

The Supplier shall prepare all testing documentation in close consultation with UNICEF and the Paediatric Centre, ensuring alignment with Tajikistan's nutrition workflows and reporting requirements. At minimum, the Supplier shall prepare and deliver the following artefacts:

- **Test Plan** – a complete planning document defining the scope, objectives, testing approach, environments, tools, resources, roles, and schedules of the testing activities. It shall include coverage of nutrition workflows (commodity management, requisitions, treatment and outcome recording, reporting, interoperability, multilingual/offline modules).
- **Test Scenarios** – descriptions of eLMIS functionalities or events to be tested (e.g. requisition approval workflow, MUAC entry validation, stock-out alerts, synchronisation of offline records).
- **Test Cases** – detailed test cases linked to each test scenario, including at least:
    - Unique ID and title;
    - Description of the functionality under test (narrative);
    - Preconditions (e.g. stock data available, user role logged in);
    - Dependencies (e.g. linked module or integration preconditions);
    - Actor (e.g. facility storekeeper, nurse, district nutrition officer);
    - Steps to execute;
    - Expected results;
    - Exceptions/edge cases;
    - Comments/notes.
- **Testing Reports** – summary reports documenting testing activities, coverage achieved, test results, and identified deficiencies (bugs, exceptions, gaps). Reports must classify deficiencies by severity (critical, high, medium, low).
- **Action Plan for Fixes** – a prioritised plan of corrective actions to address deficiencies, including debugging, code fixes, or configuration updates. Priorities must align with defect severity (critical/high defects resolved before acceptance).
- **Report on Action Plan Implementation** – a follow-up summary that documents the resolution status of each defect, comparing fixed versus outstanding deficiencies.

All testing documentation shall be version-controlled, linked to the relevant requirements, and made available to UNICEF for review, approval, and audit purposes.

12. POST-IMPLEMENTATION SERVICES (WARRANTY, MAINTENANCE, AND SUPPORT)

12.1. Technical Support Services During System Stabilisation

Requirement ID	Requirement
SRV001	A three-month stabilisation period shall start after commissioning of each component of the eLMIS. During this period, the Supplier must address system errors, deficiencies, and operational issues under live conditions.
SRV002	The Supplier shall provide on-site or remote support (up to 20 hours/week) during the stabilization period to resolve defects and adjust workflows, especially at pilot facilities.
SRV003	All fixes, patches, and adjustments during the stabilization period shall be included in the contract at no additional cost.
SRV004	Final system acceptance shall be granted only after the stabilization period ends and no critical errors remain. Minor errors must not exceed an agreed threshold and data integrity must be intact.
SRV005	At the end of stabilization, the Supplier shall deliver a Transition Readiness Report, confirming the users can operate the eLMIS independently, with evidence of training and competency.

12.2. Technical Support Services After System Stabilisation

After the stabilisation period ends, the Supplier shall provide technical support services to address incidents arising during eLMIS operation. These services must ensure that any issues[1] detected are resolved promptly and that the system continues to be used effectively and efficiently by authorised users.

A *support request* is defined as a formal application submitted by authorised system users (e.g., facility, district, regional, or MoHSPP staff) to the Supplier in order to obtain consulting or technical assistance during system operation.

[1] An issue is defined as the underlying cause that has led, or could lead, to the occurrence of an incident. An incident is defined as any event that disrupts, or could potentially disrupt, the smooth operation of the eLMIS.

The overall objective of technical support services is to guarantee that the eLMIS is used in accordance with the quality parameters expected by UNICEF and Paediatric Centre. These quality parameters are defined as follows:

- **Availability** – The capacity of the eLMIS and its components to receive queries from authorised users and respond within agreed service levels.
- **Suitability for Use** – The ability of the eLMIS to function correctly, delivering the expected services and outputs to authorised users.
- **Performance** – The ability of the eLMIS to process transactions and queries within the parameters established in the Technical Requirements.
- **Security** – The ability of the eLMIS to ensure the confidentiality, integrity, and availability of all stored, transmitted, and managed nutrition and patient data, in compliance with MoHSPP regulations and UNICEF standards.

The table below specifies the requirements for technical support services that must be rendered by the Supplier during the warranty and post-implementation support period.

Requirement ID	Requirement
SRV006	The Supplier must provide warranty, maintenance, and support services for the eLMIS for 12 months, after the stabilisation period starting from final acceptance.
SRV007	The MoHSPP/Paediatric Centre shall designate at least one trained system administrator and one alternate as focal points for communication with the Supplier's support team.
SRV008	The designated administrators must take reasonable steps to verify issues (e.g. replicate errors, check user documentation) before escalating to the Supplier.
SRV009	The Supplier must designate a support contact person and alternate, responsible for communication with MoHSPP/Paediatric Centre.
SRV010	Technical support during the warranty period shall cover all new bugs and shortcomings identified during eLMIS operation.
SRV011	Any needed fix, patch, or other minor improvement required to resolve reported issues shall be provided at no additional cost during the support period.

Requirement ID	Requirement
SRV012	The Supplier must resolve all issues falling within the original scope of work. If such issues are identified within the warranty period, they must be addressed free of charge, even if discovered after the warranty expires, and resolved within the SLA timeframes.
SRV013	The Supplier must provide an online helpdesk system where eLMIS administrators can log incidents. Remote access for troubleshooting must follow MoHSPP security protocols.
SRV014	If a defect cannot be resolved remotely, the Supplier shall provide telephone, online, or on-site support to resolve the issue within SLA timeframes.
SRV015	The Supplier shall assist eLMIS owner in establishing operational maintenance procedures for the eLMIS (e.g. backups, monitoring, user management), delivered as part of the Technical Documentation.
SRV016	The Supplier must provide incident management support, including: (1) receiving incident reports; (2) localising and mitigating impact; (3) identifying causes and corrective actions; (4) guidance in applying temporary measures; (5) reporting on causes and preventive measures; and (6) logging related issues for resolution.
SRV017	The Supplier must provide issue management support at application level, including: (1) collecting information; (2) analysing root causes; (3) identifying temporary solutions; (4) implementing permanent solutions through configuration or code changes, tested and deployed within SLA.
SRV018	The Supplier must provide technical advisory services during eLMIS operation, including responding to requests for advice, validating solutions in test environments, and guiding administrators on correct responses.

12.3. Management of Technical Support Services

Requirement ID	Requirement
SRV019	The Supplier must render services in line with ICT service management best practices, following ISO 20000, ITIL v3.0, or equivalent frameworks.
SRV020	The Supplier must have the capacity and internal processes to deliver services in compliance with recognised ICT industry practices, and to interact effectively with UNICEF and MoHSPP/Paediatric Centre according to agreed protocols.
SRV021	Support services must be provided under a SLA attached to the Contract, defining service levels, scope, and responsibilities.
SRV022	The Supplier must maintain a Client Support Centre or Helpdesk to receive and process all support requests from eLMIS administrators.
SRV023	The Supplier must ensure that the Support Centre's working hours and activities align with the service levels defined in this document (at minimum, Tajikistan business hours, with escalation for critical incidents).
SRV024	The Supplier must be able to provide remote support services, and where necessary, dispatch technical staff to provide on-site support in Tajikistan.
SRV025	The Supplier must ensure that any online support platform used is properly secured, with all interactions between Supplier, UNICEF, and MoHSPP logged and auditable.
SRV026	The Supplier must monitor the quality of support services and address deviations promptly to maintain agreed service levels.
SRV027	The Supplier must submit monthly service reports to UNICEF/MoHSPP, including incidents logged, actions taken, SLA compliance, and planned improvements.

12.4. Development Services During Support Period

The Supplier shall provide technical support, maintenance, and development services with the objective of maintaining the eLMIS in optimal operational condition. To this end, the Supplier may deliver updates, patches, and new releases of the application as required.

- ***Updates*** are defined as software changes delivered to eLMIS at the Supplier's initiative, intended to resolve known problems, errors, or vulnerabilities identified in the eLMIS.
- ***New releases*** are defined as consolidated software packages delivered to the eLMIS owner at the Supplier's initiative, containing all previous updates and fixes. New releases may also include functional enhancements, improvements, or new components that extend the capabilities of the eLMIS, provided these are consistent with the agreed scope and architecture.

The table below sets out the requirements for development services to be rendered by the Supplier during the warranty, maintenance, and technical support period.

Requirement ID	Requirement
SRV028	The Supplier shall provide change and development services. The scope of changes shall include, at minimum: (a) modifications to the Presentation Layer (user interfaces and dashboards), (b) the Application Layer (functional modules such as commodity management, requisitions, treatment and outcome recording, reporting, and interoperability), and (c) the Data Layer (database structures, master data, and reporting schemas).
SRV029	As part of change and development services, the Supplier shall: (a) receive formal change requests with functional specifications from UNICEF or MoHSPP/Paediatric Centre; (b) prepare a System Requirement Specification and, where required, a System Design Document for each approved change, and obtain eLMIS owner's approval; (c) implement the approved change in the relevant functional components.
SRV030	All change requests and developments shall follow the change management process agreed with UNICEF/MoHSPP, ensuring traceability, approval, and auditability.
SRV031	The Supplier shall provide development services as part of operational maintenance, including (a) amending existing eLMIS functionalities, and (b) implementing new functionalities, where approved by UNICEF/MoHSPP.
SRV032	Any development activity shall be initiated based on a formal request from eLMIS Owner, accompanied by functional specifications. The process must include: (a) implementation in a testing environment, with unit testing by the Supplier; (b) acceptance testing with authorised users; (c) deployment to the

Requirement ID	Requirement
	production environment under agreed procedures; and (d) final revision and acceptance by eLMIS Owner.
SRV033	The Supplier shall include in its proposal at least 50 person-days of development services to be delivered during the 12-month warranty period, in addition to fixes and patches covered under warranty.
SRV034	UNICEF/MoHSPP may request additional development services beyond the included allocation. These shall be provided by the Supplier through separate agreements as required.

12.5. Service Levels (SLA)

The service levels applicable during the warranty period shall define the requirements and parameters under which the Supplier will render support and maintenance services for the eLMIS.

The Supplier shall support the operation of the eLMIS in the following ways:

- ***First-line Support (Remote):*** The Supplier shall provide phone, email, or instant messaging support for general issues once the eLMIS is fully operational. This first-line support shall be available during the execution of the Contract, including the post-delivery phase, at no additional cost to UNICEF/MoHSPP. The minimum level of support expected is at least five (5) hours per week after the stabilisation period.
- ***Second-line Support (Remote or On-site):*** In the case of emergency incidents that disrupt system operation, the Supplier shall provide second-line troubleshooting support. Corrective actions shall be implemented on-site within two (2) hours of an incident report if the issue cannot be resolved remotely. Where appropriate, remote troubleshooting may be used to minimise downtime.

To carry out system maintenance and troubleshooting, the Supplier is expected to ensure the availability of support staff, either physically present or virtually connected, during the stabilisation and warranty period.

The level of support services shall be described using the following parameters:

- ***Response Time*** – the maximum time allowed for the Supplier to acknowledge a technical support request, diagnose the situation, and propose corrective actions.

- ***Resolution Time*** – the maximum time within which the Supplier is expected to resolve the incident or implement a suitable workaround.

All support requests submitted by UNICEF or Paediatric Centre during the warranty period shall be classified according to their criticality and impact on operations. The classification will be based on the actual or potential effect of the incident on system operation and service continuity.

Table below sets out the classification of requests by importance, together with the corresponding response and resolution times agreed under the SLA.

Level	Impact	Response Time	Resolution Time
Critical	**Availability:** The eLMIS is completely unavailable for all or most users (national, regional, district, facility). Urgent transactions such as stock movements, patient treatment recording cannot be performed. **Suitability for use:** Key functions (commodity management, requisitions, reporting) are unusable with no alternative procedure. **Performance:** Response times make the eLMIS inoperable. **Security:** A major incident threatens data confidentiality, integrity, or availability.	15 minutes	4 hours
High	**Availability:** The eLMIS is unavailable for many users (e.g. one or more regions or districts). **Suitability for use:** Use of key functions is severely limited, preventing timely requisitions or treatment/outcome reporting. **Performance:** Response times significantly delay supply chain or programme processes. **Security:** A high-risk vulnerability could compromise confidentiality, integrity, or availability of nutrition/patient data.	1 hour	1 day
Medium	**Availability:** The eLMIS is unavailable for some users (e.g. one facility or a subset of users). **Suitability for use:** Some functions are limited, but workarounds exist.	1 day	3 days

Level	Impact	Response Time	Resolution Time
	Performance: System slowness moderately impacts business processes. **Security:** A medium-risk vulnerability may affect data confidentiality, integrity, or availability.		
Low	**Availability:** The eLMIS is unavailable for a small number of users, but critical work can continue. **Suitability for use:** Operations are slightly affected, but alternatives exist. **Performance:** Response times are slower than normal, but processes continue. **Security:** A minor risk exists with negligible impact.	3 days	Best effort

12.6. Quality Assurance of Support Services

Requirement ID	Requirement
SRV035	At the start of the warranty period, the Supplier shall submit a Quality Assurance Plan covering maintenance and technical support services for the eLMIS.
SRV036	The QA Plan shall define performance indicators for services, risks that may affect them, preventive actions to manage risks, and mitigation measures for residual risks.
SRV037	The QA Plan shall be subject to review and formal acceptance by UNICEF.
SRV038	The Supplier should revise the QA Plan whenever significant deviations in service delivery are identified.
SRV039	The Supplier shall include in its tender proposal a description of its approach to quality assurance for maintenance and technical support during the warranty and support period.
SRV040	The QA Plan shall cover at least two risk categories: (a) operational risks (e.g. Supplier losing capacity to deliver services, weaknesses in internal

Requirement ID	Requirement
	processes), and (b) technological risks (e.g. risks affecting availability, performance, or security of the eLMIS).
SRV041	The QA Plan shall include detailed information on identified risks, preventive measures, residual risks, and contingency actions if residual risks occur.
SRV042	The Supplier shall implement a ticket categorisation system (e.g. Critical, High, Medium, Low) within its support/helpdesk tool to enable monitoring and reporting by severity.
SRV043	The Supplier shall establish a Problem Management Process to ensure recurring incidents are analysed and root causes are addressed, not only symptoms.
SRV044	The Supplier shall ensure that all support documentation and QA records (incident logs, service reports, QA updates) are stored in a secure, accessible repository and made available to UNICEF and MoHSPP/Paediatric Centre upon request.
SRV045	The Supplier could implement a continuous improvement log, capturing user feedback, service performance issues, and proposed improvements to be reviewed at each service review.

13. ANNEXES

13.1. ANNEX A. Project Governance Model and Other Arrangements

13.1.1. Project Team Structure

The governance of the Nutrition-focused eLMIS project in Tajikistan will follow a specifically tailored project management methodology, adapted to UNICEF's operational environment and the specific needs of this initiative. The model ensures that the interests of the commissioning organisation, the end-users, and the supplier are represented fairly, while providing clear decision-making authority and accountability.

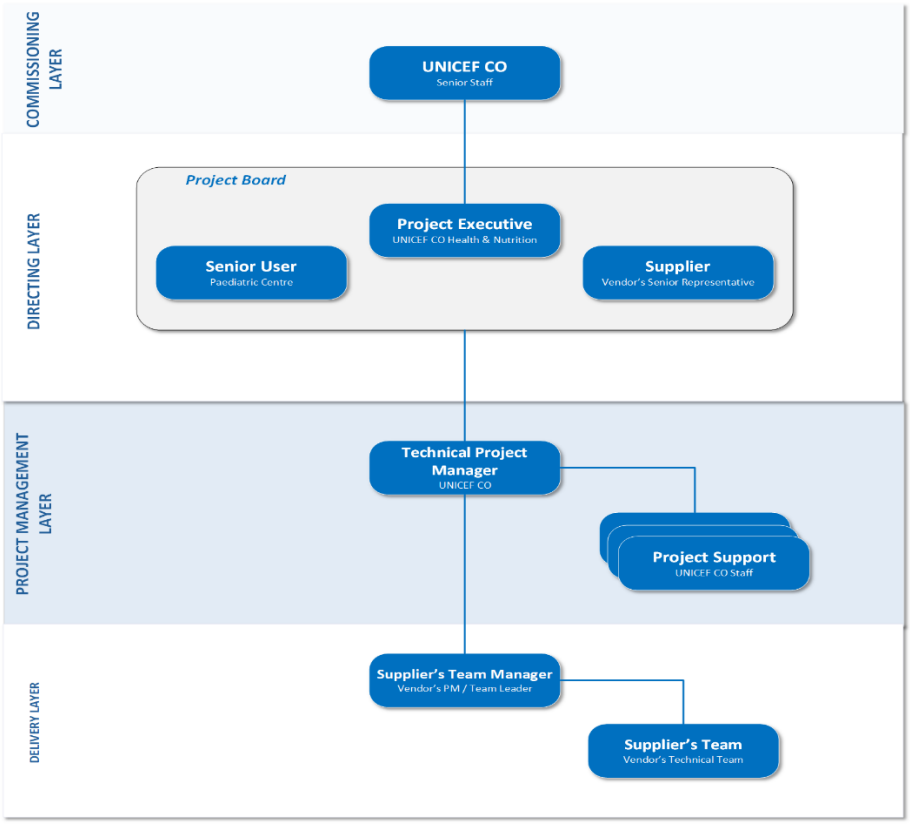


Figure 3. Project Team Structure

As shown in the figure above, the project team structure is organised into distinct layers, reflecting the project governance model. The diagram highlights the core project roles directly accountable for project direction, management, and delivery. To avoid any confusions, please note that it does not capture the full set of stakeholders in the project environment (such as health facilities, MoHSPP, AMSI, etc), who remain engaged and consulted, but rather focuses on the key roles with direct responsibility for steering, managing, and implementing the system.

1. Commissioning Layer

This layer represents the Commissioning interest, ensuring that the project delivers value and contributes to UNICEF and Government priorities for nutrition. It is represented by UNICEF

Tajikistan CO, through a senior staff from the Health and Nutrition Section, acting on behalf of UNICEF as the commissioning authority.

2. Directing Layer (Project Board)

The Directing Layer is responsible for overall project direction and decision-making. It will operate as a Project Board, consisting of:

Project Executive Role

The Project Executive represents the Commissioning interest and holds ultimate accountability for the success of the Nutrition-focused eLMIS project in Tajikistan. For this project, the Executive role will be undertaken by a designated staff member from the UNICEF Tajikistan CO Health and Nutrition Section.

The Project Executive provides overall leadership and has ultimate decision-making authority within the Project Board. While the Senior User (*Paediatric Centre*) and Senior Supplier (*eLMIS vendor, once selected*) provide advice and perspectives, the Project Executive alone is authorised to take final decisions on project scope, priorities, acceptance of deliverables, and escalation issues[2]. This aims to ensure clear accountability and avoids decision deadlock. Key responsibilities of the Project Executive include:

- **Strategic alignment:** Safeguarding that the project objectives remain aligned with UNICEF's Country Programme, the Multisectoral Action Plan for Nutrition, and broader strategies.
- **Value for money:** Making certain that the investment in the eLMIS delivers measurable benefits, including improved visibility, efficiency, and accountability in the nutrition supply chain.
- **Decision-making:** Approving major plans, deliverables, and changes, and resolving escalated risks and issues raised by the Technical Project Manager or other stakeholders.
- **Board leadership:** Chairing Project Board meetings, ensuring balanced input from the Senior User and Senior Supplier, and making decisions in a transparent manner.
- **Risk oversight:** Ensuring that risks are being effectively identified, monitored, and mitigated, and that the project remains within its agreed tolerance for time, cost, scope, and quality.

[2] The Project Board members may express their views and provide advice, but the Project Executive alone holds decision-making authority. The Board will meet at key milestones to review progress and plans, and agree on escalated issues.

In practical terms, the Project Executive will receive progress notes and advisory memos from the Technical Project Manager, convene the Project Board at stage boundaries or when major issues arise, and approve deliverables before payment milestones are released.

Senior User

The Senior User represents the User interest within the Project Board and ensures that the eLMIS meets the needs of those who will operate the system and benefit from its outputs. This role will be undertaken by a designated senior staff member from the Paediatric Centre, with inputs from selected regional and district facilities that will use the system daily.

The Senior User is responsible for articulating operational requirements, validating that the system delivers the expected functionality, and confirming that the benefits of the eLMIS can be realised in practice. While the Project Executive holds decision-making authority, the Senior User provides critical assurance that user needs are properly represented and that the project outcomes translate into improved nutrition logistics and service delivery. Key responsibilities of the Senior User include:

- **Requirements definition:** Ensuring that the functional requirements reflect real operational practices in the storage, distribution, and use of nutrition commodities.
- **User validation:** Participating in workshops, reviews, and UAT to confirm that system prototypes, workflows, and reports align with facility-level needs.
- **Benefit realisation:** Advising on how the eLMIS will contribute to improved supply chain visibility, reduced stock-outs, better expiry tracking, and more reliable reporting.
- **Operational feasibility:** Identifying practical constraints – such as connectivity, staff capacity, and storage conditions – that must be addressed in system design and rollout.
- **Change management:** Supporting user buy-in by communicating benefits to facility staff, identifying potential resistance, and contributing to training and capacity-building efforts.
- **Feedback to the Board:** Providing the Project Executive and Senior Supplier with insights on usability, adoption risks, and operational readiness.

In practice, the Senior User will engage closely during the Technical Design and UAT phases, validating that the specifications and final system reflect the workflows of the Paediatric Centre and downstream facilities. The Senior User will also play an active role in ensuring that facility staff are involved in design validation, pilot testing, and training, thus anchoring the eLMIS in the realities of day-to-day service delivery.

By ensuring that the project delivers genuine operational benefits, the Senior User role is critical to the long-term sustainability and effectiveness of the nutrition-focused eLMIS.

Senior Supplier

The Senior Supplier represents the Supplier interest on the Project Board and ensures that the eLMIS solution is developed and delivered to the required quality standards, within the agreed schedule and budget. This role will be filled once a software development firm (eLMIS vendor) is contracted through UNICEF's competitive procurement process.

The Senior Supplier brings the perspective of the delivery team, ensuring that the system architecture, code, and configuration are technically sound, realistic to implement, and compliant with international standards. The role is essential in balancing the expectations of UNICEF (as Project Executive) and the Paediatric Centre (as Senior User) with the practical realities of software development and deployment in Tajikistan's health system environment. Key responsibilities of the Senior Supplier include:

- **Technical feasibility:** Advising the Project Board on whether the work packages, timelines, and resources defined are achievable.
- **Resource commitment:** Confirming that the supplier organisation allocates the necessary staff, skills, and infrastructure to deliver the eLMIS.
- **Solution delivery:** Ensuring that the supplier's development team produces outputs that meet the agreed specifications, quality criteria, and security/privacy requirements.
- **Internal QA:** Providing evidence that internal QA processes (unit testing, integration testing, security checks) are followed, complementing the independent QA provided by the Technical Project Manager.
- **Risk management:** Identifying and communicating technical risks, dependencies, or constraints that could affect delivery.
- **Engagement with users:** Responding to feedback from the Paediatric Centre and facility staff during reviews and UAT, and incorporating changes where agreed by the Project Board.

In practice, the Senior Supplier will usually be a designated senior representative of the contracted vendor. They will attend Project Board meetings, provide status updates, and act as the escalation point within the supplier organisation. The Senior Supplier will also coordinate closely with the Technical Project Manager to address issues raised in QA reviews or UAT observations.

3. Project Management Layer

This layer manages the direction of the project within the boundaries set by the Project Board. It will consist of:

Technical Project Manager

The Technical Project Manager is responsible for the coordination and technical assurance of the eLMIS project. This role will be carried out by the UNICEF ICT consultant to safeguard quality, ensure alignment with requirements, and keep the project on track.

While the Project Executive provides strategic direction and final decisions, the Technical Project Manager ensures that activities at the operational level are properly planned, monitored, and reported. The Technical Project Manager also bridges the gap between the commissioning body (UNICEF), the end-users (Paediatric Centre), and the supplier (once contracted). Key responsibilities of the Technical Project Manager include:

- **Planning and control:** Developing and maintaining workplans, schedules, and ensuring that deliverables are produced in line with agreed timelines.
- **Requirements management:** Leading stakeholder consultations and documentation of functional and non-functional requirements for the eLMIS.
- **Quality assurance:** Reviewing vendor deliverables and providing structured advisory notes. Ensuring compliance with UNICEF digital health principles, industry standards, and project quality gates.
- **Risk and issue management:** Maintaining the project's risk and issue log, escalating matters to the Project Executive or Project Board where tolerance thresholds are exceeded.
- **Communication:** Providing progress notes to UNICEF CO and ensuring the flow of information between stakeholders.
- **Testing oversight:** Contributing to test plans, observing UAT, reviewing defect logs, and issuing validation memos with acceptance recommendations.
- **Change control:** Documenting change requests, assessing their impact on scope, cost, and schedule, and advising the Project Executive on options.
- **Capacity building:** Reviewing training materials and observing sessions to provide feedback that improves user readiness and long-term sustainability.

In practical terms, the Technical Project Manager will act as the single point of contact for technical coordination, ensuring that the eLMIS is delivered to the right specification, at the right quality, and within the agreed time and resource limits. The Technical Project Manager will not

directly manage the supplier's team, but will supervise and assure their outputs on behalf of UNICEF.

Project Support

The Project Support function provides the administrative and coordination backbone of the project, ensuring that day-to-day logistics and documentation are handled efficiently so that the Technical Team can focus on strategic and technical matters. In other words, some specific Project Management functions may be delegated to relevant UNICEF CO staff, particularly within the Health and Nutrition section and Operations/Supply teams. Key responsibilities may include:

- **Administrative coordination:** Assisting with the scheduling of meetings, workshops, and field visits; preparing invitations; and ensuring that stakeholders receive agendas and materials in advance.
- **Contract and financial support:** Facilitating contract management tasks, including coordination of vendor contract, processing of invoices, and monitoring of payment schedules in line with deliverable acceptance.
- **Logistical support:** Organising travel and on-site arrangements for field missions, training sessions, and UAT workshops.
- **Documentation management:** Supporting the maintenance of project records, including version-controlled deliverables, meeting minutes, and decision logs. Ensuring that all project documentation is stored in UNICEF's designated repository for future reference.
- **Liaison:** Acting as a coordination point between UNICEF administrative units, the Technical Project Manager, and external stakeholders for operational matters.

In practice, Project Support staff will not make technical or strategic decisions but will enable smooth project execution by ensuring that processes run efficiently behind the scenes.

4. Delivery Layer (Supplier Delivery)

The Delivery Layer consists of the **Supplier's Team Manager** *(may be known also as Supplier's Project Manager or Team Leader)* and the development team contracted to design, configure, and implement the eLMIS. This team is responsible for delivering products to the specifications agreed in the ToR and Technical Requirements, under the supervision of the Technical Project Manager and in line with UNICEF and Paediatric Centre expectations.

The Supplier will ensure that outputs meet quality criteria, adhere to international standards required by the project and are produced within agreed timelines.

Supplier's Team Manager Role

The Supplier's Team Manager leads the vendor's delivery team and is responsible for the day-to-day management of development activities under the contract with UNICEF. This role ensures that the supplier's resources are organised effectively, that outputs are delivered on time and to the agreed quality, and that the development process aligns with the ToR and Technical Requirements, UNICEF standards, and international best practices.

The Supplier's Team Manager serves as the main operational counterpart to the Technical Project Manager (UNICEF). While the Senior Supplier represents the supplier at governance level, the Team Manager ensures that the actual work of software development, testing, and deployment is carried out as agreed. Key responsibilities of the Supplier's Team Manager include:

- **Work planning and control:** Developing detailed stage/sprint or iteration plans, allocating tasks within the vendor team, and ensuring delivery against milestones.
- **Delivery management:** Overseeing coding, configuration, and testing activities, ensuring outputs are in line with the eLMIS technical specifications, quality criteria, and UNICEF's digital health principles.
- **Team coordination:** Managing the supplier's developers, testers, UI/UX designers, and other technical staff; ensuring they have the required tools and resources.
- **Quality compliance:** Implementing internal QA processes, including code reviews, unit testing, integration testing, and security checks, before deliverables are submitted for UNICEF review.
- **Communication:** Serving as the daily contact point with the UNICEF's Technical Project Manager, providing progress updates, flagging risks and issues early, and responding to advisory notes.
- **Issue resolution:** Coordinating corrective actions when defects or gaps are identified during QA reviews or UAT, ensuring rapid turnaround and retesting.
- **Handover readiness:** Preparing technical documentation, configuration guides, and operational manuals to facilitate smooth transition to the eLMIS owner after project closure.

In summary, the Supplier's Team Manager will participate actively in technical meetings, demonstrate system increments during stage/sprint reviews, and provide evidence of completed work at each quality gate.

Governance Roles and Responsibilities

Role	Institution / Holder	Key Responsibilities
Project Executive (Commissioning Interest)	UNICEF Tajikistan CO (Head of Health and Nutrition Section)	Provides overall direction and decision-making authority; ensures strategic alignment with UNICEF CPD and the Multisectoral Action Plan for Nutrition; approves major deliverables and stage plans; chairs the Project Board; accountable for value for money and project success.
Senior User (User Interest)	State Scientific Clinical Centre of Paediatrics and Paediatric Surgery (Republican Paediatric Centre), with input from selected facilities	Ensures that user needs are defined and met; validates requirements, design, and outputs; represents operational feasibility; participates in UAT and training; champions adoption and benefit realisation at facility level.
Senior Supplier (Supplier Interest)	To be appointed after vendor selection	Ensures that the solution is deliverable within agreed time, cost, and quality; commits supplier resources; assures technical feasibility; provides delivery assurance to the Project Board; escalates risks and constraints from supplier perspective.
Technical Project Manager	Consultant under this ToR	Manages the project; maintains workplan and risk log; reviews vendor deliverables; issues QA/advisory notes; facilitates communication across stakeholders; contributes to test strategy and observes UAT; escalates risks/issues; provides independent, impartial technical assurance.

Role	Institution / Holder	Key Responsibilities
Project Support	UNICEF Tajikistan CO (Health/Nutrition and Operations staff)	Provides administrative and coordination support; manages meeting schedules, documentation, and decision logs; supports contract administration, invoicing, and payment tracking; organises logistics for missions, workshops, and training.
Supplier's Team Manager	Vendor's Project Manager/Team Leader (to be selected)	Manages vendor's development team (developers, testers, UI/UX, sysadmins); prepares stage or sprint/iteration plans; ensures delivery of outputs to specification; implements internal QA (code reviews, unit/integration testing, security checks); provides daily communication with Technical Project Manager; prepares technical documentation and handover materials.

13.1.2. Issue Management Approach and Change Control

13.1.2.1. Issue Management

An issue is defined as any unplanned event or situation that has occurred and is impacting, or is likely to impact, the scope, schedule, cost, quality, or risk profile of the eLMIS project. Issues may include defects, deviations from requirements, requests for change, or operational problems raised during implementation of the project.

- The Technical Project Manager will maintain the official Issue Register (Issue Log), consolidating all reported defects, change requests, and project concerns, categorised by severity (critical, major, minor).
- The Supplier will record and track defects and technical issues in its internal system but must report them to the Technical Project Manager, including regular extracts or summaries where appropriate.
- All issues must include a clear resolution plan with timelines and responsible owners.

- Issues that cannot be resolved within agreed tolerances must be escalated to the Technical Project Manager, who will determine whether to raise them to the Project Board for Project Executive's decision.
- Closure of issues will be formally validated by the Technical Project Manager and, where applicable, during UAT.

13.1.2.2. *Change Control Approach*

A change is any modification to the agreed baseline of requirements, deliverables, or timelines. Changes must remain within the general scope of the project and must not constitute unrelated work.

13.1.2.2.1. Introducing a Change:

- UNICEF (through the Project Executive or Technical Project Manager) may propose changes to the Supplier.
- The Paediatric Centre, as Senior User may also propose changes to reflect operational needs or improve usability and adoption at the facility level. Such requests will be submitted via the Technical Project Manager (UNICEF) for logging and impact assessment.
- The Supplier may also propose changes that improve quality, efficiency, or sustainability. UNICEF may approve or reject such proposals at its discretion.
- Changes required due to the Supplier's own default will not be considered formal changes and shall not result in adjustments to contract price or timelines.

13.1.2.2.2. Change Request Procedure

- All proposed changes must be submitted in writing using a Change Request Form, including:
  - Description of the change.
  - Expected benefits or rationale.
  - Impact on schedule, cost, and quality.
  - Impact on interoperability, security, or compliance.
- The Supplier may first submit a Change Estimate Proposal, including indicative costs for preparing a full Change Proposal. UNICEF may:
  - Accept and request a full Change Proposal.

- Request revision of the estimate.
- Decline the proposal.

- Full Change Proposals must include detailed impacts (schedule, cost, functional performance, compliance).

13.1.2.2.3. Assessment and Decision

- The Technical Project Manager will review all Change Proposals and assess impacts on scope, time, cost, quality, and risk.
- The Project Executive (on behalf of the Project Board) will make the final decision to approve, reject, or defer changes.
- Approved changes will be issued as formal Change Orders and recorded in the Change Log.
- Where no agreement on costs or impacts can be reached, the change will not be implemented.

13.1.2.2.4. Tolerances and Thresholds

- Minor changes that do not affect scope, timeline, or cost may be approved at Technical Working Group level, subject to ratification by the Project Executive.
- Changes with significant contractual, budgetary, or schedule implications must be escalated to the Project Board for decision.
- If cumulative approved changes would increase or decrease the total contract price, UNICEF reserves the right to reject further changes or renegotiate scope.

13.1.2.2.5. Freezing of Requirements

- The baseline of Technical Requirements will be considered frozen at an agreed date prior to UAT. Any new requests after this date will be considered only for post-Operational Acceptance implementation, unless critical for system functionality or compliance.

13.1.2.2.6. Reporting

- The Supplier will provide regular reporting on change requests: open, approved, rejected, or deferred.
- The Change Log will be reviewed in the progress meeting and summarised in reports to the Project Board.

13.2. ANNEX B. Source Code Management and Intellectual Property Rights

The Supplier shall ensure that all deliverables under this Contract, including the source code, documentation, and related artefacts, are developed and delivered in a manner that guarantees sustainability, transparency, and long-term ownership by UNICEF.

UNICEF shall be the owner of the Intellectual Property Rights (IPR) to the source code, documentation, and other materials produced as part of this project. UNICEF may, at its discretion, transfer these rights in full or in part to the MoHSPP to ensure sustainability and continuity of the eLMIS in Tajikistan.

The Supplier shall manage the source code and related assets using modern version control systems and shall deliver these assets in an organised and usable format to UNICEF upon completion of the Contract or earlier if requested.

Where the eLMIS is based on DPGs, COTS products, or open-source components, the Supplier shall clearly identify such components, their licences, and any restrictions that may apply. In all cases, UNICEF must retain the right to use, modify, and extend the eLMIS without vendor lock-in.

Requirement ID	Requirement
IPR01	The Supplier shall deliver the full source code, build scripts, configuration files, and technical documentation of the eLMIS to UNICEF at key milestones, at the end of the project, and upon request.
IPR02	All Intellectual Property Rights to the source code, documentation, and deliverables produced under this Contract shall vest in UNICEF, with the ability to transfer rights to MoHSPP.
IPR03	The Supplier shall use a recognised version control system such as Git to manage the source code throughout the project lifecycle, ensuring traceability of changes and version history.
IPR04	The Supplier shall provide UNICEF with access credentials to the version control repository throughout the project.
IPR05	The Supplier shall ensure that all code delivered is fully documented and commented, following international best practices in software development.

Requirement ID	Requirement
IPR06	The Supplier shall provide an as-built technical documentation package (including architecture diagrams, database schema, API specifications, and deployment manuals) aligned with the final release.
IPR07	Where the solution leverages open-source or third-party components, the Supplier shall disclose all such components, their licences, and any conditions attached to their use.
IPR08	The Supplier shall ensure that no component of the eLMIS is subject to restrictive licensing terms that would prevent UNICEF or MoHSPP from using, modifying, or extending the eLMIS.
IPR09	The Supplier should provide training sessions for MoHSPP/UNICEF technical staff on how to manage, build, and extend the system from the source code.
IPR10	The Supplier shall guarantee that the eLMIS can be maintained, updated, and extended by UNICEF/MoHSPP or any third-party vendor designated by UNICEF, without requiring proprietary tools or vendor-specific dependencies.
IPR11	In case of termination of the contract, the Supplier shall immediately hand over the full source code, documentation, and all associated materials to UNICEF.
IPR12	The Supplier could maintain a public or private repository (e.g. GitHub, GitLab, Bitbucket) for transparency and ease of collaboration, provided security and confidentiality are respected.

13.3. ANNEX C. Project Documentation Requirements

13.3.1. Software Requirements Specification (SRS)

The Supplier must prepare and submit a comprehensive SRS for the eLMIS as a formal deliverable. The SRS must conform to international best practices and include, at a minimum:

- Overall description of the eLMIS, including system architecture, core functional components and their interactions, user roles, and system constraints.
- Detailed description of functional requirements, including use cases or user stories with actors, preconditions, and expected outcomes (e.g., commodity management, requisitions, treatment and outcome recording, reporting).
- Non-functional requirements, including performance, security, scalability, usability, accessibility (WCAG 2.1 Level A/AA), and offline operation.
- Integration and interoperability requirements, including APIs, standards compliance (HL7 FHIR, DHIS2 APIs).
- System constraints and limitations such as hosting dependencies, connectivity limitations in rural Tajikistan, or minimum hardware/software requirements.
- The documentation must be provided in English.

13.3.2. Software Design Specification (SDS)

The Supplier must prepare and submit a comprehensive SDS as a detailed technical design guiding the eLMIS development and implementation. The SDS must include:

- System architecture, including high-level diagrams, description of major components, architectural style(s) and patterns (e.g., SOA, microservices, other modular architecture), scalability and availability considerations.
- Detailed design of system components and architectural layers (presentation/UI, application/service logic, data management, integration & interoperability, workflow engine).
- Data model and database design, including entity-relationship diagrams, database schema(s) and relationships, and strategies for retention, archiving, and backup.
- Deployment and infrastructure model (cloud/national data centre, containerisation, backup, disaster recovery).

- UI/UX design guidelines, including wireframes and layouts, multilingual support (Tajik, Russian, English), and accessibility requirements.
- Other relevant design considerations to ensure maintainability, interoperability, and extensibility.
- The documentation must be provided in English.

13.3.3. System Resources

The Supplier must provide all artefacts, code, and configurations required for UNICEF to fully own, operate, and maintain the eLMIS. At minimum:

- **Application Source Code** (well-documented, version-controlled, with clear build instructions).
- **Configuration Files** (for runtime environment, database connections, logging, authentication, APIs, etc.).
- **Database Resources**, including schema documentation, SQL/data migration scripts, and database initialisation procedures.
- **Frontend Resources**, including UI/UX components (HTML, CSS, JavaScript frameworks) and media assets (icons, logos, fonts).
- **System Configuration Documentation**, including authentication, authorisation, encryption, and integration settings.
- **Third-party Libraries and Dependencies**, including a full list of all packages, licences, and their role in the system.
- **API Documentation** for all exposed or consumed services, including endpoints, request/response formats, authentication methods, and usage examples.
- **Testing and Deployment Artefacts**, including automated test scripts, CI/CD pipeline configurations, and containerisation where applicable.
- **Backup and Recovery Procedures**, including scripts and instructions for restoring application and database from backup.

13.3.4. Users' Manual

The Supplier must prepare a Users' Manual that provides clear, role-specific instructions for end-users (facility staff, district/regional officers, national programme managers).

- Delivered electronically in PDF format, and printable for training use.
- Written for users with mid-level digital literacy.
- Must include: system overview, user roles and responsibilities, step-by-step instructions for common tasks (commodity management, requisitions, treatment entry, reporting, dashboard use), troubleshooting tips.
- Must be available in Tajik, Russian, and English.
- The manual shall also serve as training material and reference documentation.

13.3.5. System Online Help

The eLMIS shall provide an on-screen help function, accessible from within the application.

- Online help shall cover critical tasks from the Users' Manual, contextualised to the screen/module where the user is working.
- It should be concise, multilingual (Tajik, Russian, English), and searchable.
- Online help is not a duplication of the full manual but shall focus on key workflows (e.g., stock entry, requisition approval, treatment record entry, offline synchronisation).

13.3.6. Administration Manual

The Supplier shall prepare an Administration Manual targeted at system administrators (IT staff, UNICEF technical staff).

- Must cover installation, deployment, and configuration procedures (environments, servers, databases, APIs).
- Describe user and role management, security settings, backup and recovery procedures, and monitoring tools.
- Provide guidance on system maintenance, upgrades, and troubleshooting.
- Must also include instructions for applying patches, hotfixes, and configuration changes.

13.3.7. Developer's Manual

The Supplier shall prepare a Developer's Manual to enable future extension or customisation of the eLMIS.

- Describe the programming style and practices, code structure, naming conventions, and configuration rules.
- Provide details on the system's components, third-party dependencies, APIs, and integration methods.
- Include guidelines for extending functionality (e.g., adding new commodities, reporting indicators, or integration endpoints).
- Document the development environment setup, build and deployment process, and testing frameworks used.
- This manual must be vendor-neutral and technology-agnostic, enabling future developers (from MoHSPP, UNICEF, or third parties) to extend the system.
- The documentation must be provided in English.

13.3.8. Other Technical Documentation

The Supplier must also prepare and submit the following technical documentation:

- Deployment Model (as-built), including environment diagrams, nodes, and infrastructure specifications (data centre/cloud, servers, network).
- Final System Architecture (as-built).
- Final Database Documentation, including entity relationship diagrams, SQL scripts, and data models.
- API Documentation (as-built), including all interfaces with DHIS2-baes HMIS, and partner systems.
- Change Log & Versioning documenting all changes made during development and implementation.
- The documentation must be provided in English.