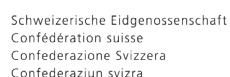


for a Comprehensive Nepal-Labour Market Information System



Swiss Agency for Development and Cooperation SDC
स्वीस सरकार विकास सहयोग एसडीसी



The Digitalization Blueprint and Plan for the Nepal Labour Market Information System was prepared by Young Minds Creation Pvt. Ltd. at the request of the Ministry of Labour, Employment, and Social Security.

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LIST OF ABBREVIATIONS

Table 1 List of Abbreviations

AES	Advanced Encryption Standard
AI	Artificial Intelligence
AMC	Annual Maintenance Contract
API	Application Programming Interface
ASP	Active Server Pages
BPR	Business Process Re-engineering
CIT	Citizen Investment Trust
CTEVT	Council for Technical Education and Vocational Training
DAS	Demand Attestation System
DBMS	Database Management System
DC	Data Center
DOB	Date of Birth
DoCS	Department of Consular Services
DoFE	Department of Foreign Employment
DoNIDCR	Department of National ID and Civil Registration
DR	Disaster Recovery
EMIS	Employment Management Information System
EOL	End of Life
EPS	Employment Permit System
ESC	Employment Service Center
EU	European Union
FEB	Foreign Employment Board
FEIMS	Foreign Employment Information Management System
FEWIMS	Foreign Employment Welfare Information Management System
GDPR	General Data Protection Regulation
GEA	Government Enterprise Architecture
GESI	Gender Equality and Social Inclusion

GRM	Grievance Redress Mechanism
HR	Human Resources
ID	Identification
ILMIS	Integrated Labour Management Information System
ILO	International Labour Organization
INGO	International Non-Governmental Organization
IoT	Internet of Things
IRD	Inland Revenue Department
ISCO	International Standard Classification of Occupations
ISIC	International Standard Industrial Classification
IT	Information Technology
JSON	JavaScript Object Notation
LMIS	Labour Market Information System
LMS	Learning Management System
MEP	Minimum Employment Programme
MIS	Management Information System
ML	Machine Learning
MoFAGA	Ministry of Federal Affairs and General Administration
MoLESS	Ministry of Labour, Employment and Social Security
NAVT	National Academy of Vocational Training
NeGIF	Nepal Government Interoperability Framework
NEMIS	National Employment Management Information System
NGO	Non-Governmental Organization
NID	National Identity Card
NSIC	Nepal Standard of Industrial Classification
N-LMIS	National Labour Market Information System
NPC	National Planning Commission
NQF	National Qualifications Framework
NSTB	National Skill Testing Board
OT	Overtime

PAN	Permanent Account Number
PDOT	Pre-Departure Orientation Training
PMEP	Prime Minister Employment Program
PwDs	Persons with Disabilities
QR	Quick Response
ReMI	Reintegration of Returnee Migrant Workers
RBAC	Role-Based Access Control
RFP	Request For Proposal
RMW	Returnee Migrant Workers
RPL	Recognition of Prior Learning
RPO	Recovery Point Objective
RTO	Recovery Time Objective
SAMI	Safer Migration
SAN	Storage Area Network
SME	Small and Medium Enterprise
SPA	Single Page Application
SQL	Structured Query Language
SRS	Software Requirements Specification
SSF	Social Security Fund
TLS	Transport Layer Security
TOR	Terms of Reference
TVET	Technical and Vocational Education and Training
UI/ UX	User Interface/User Experience
URL	Uniform Resource Locator
VAPT	Vulnerability Assessment and Penetration Testing
VM	Virtual Machine

EXECUTIVE SUMMARY

Introduction & Purpose: The Ministry of Labour, Employment, and Social Security (MoLESS) is mandated to regulate, promote, and safeguard labour rights, employment opportunities, and social security in Nepal. This Digitalization Blueprint outlines a comprehensive strategy to modernize MoLESS operations, making them data-driven, citizen-focused, and future-ready. The purpose is clear — to address the urgent need for an integrated, intelligent, and inclusive Nepal Labour Market Information System (N-LMIS) that strengthens governance, enhances service delivery, and supports evidence-based decision-making.

Context and Rationale: Currently, MoLESS operates through fragmented and siloed data systems, leading to inefficiencies, duplication, and limited visibility into labour market trends. Policy formulation is hindered by data gaps, outdated processes, and inconsistent reporting standards. At the same time, advances in digital governance, big data, and artificial intelligence present an unprecedented opportunity to transform labour market management. This blueprint aligns with Nepal's e-Governance Master Plan, Digital Nepal Framework, and global commitments such as the ILO LMIS guidelines—ensuring MoLESS's transformation supports national and international labour governance goals.

Strategic Objectives: The digitalization initiative is anchored in four core objectives:

1. **Transparency** – Open, accessible, and accountable labour data and services.
2. **Efficiency** – Streamlined processes, reduced duplication, and faster service delivery.
3. **Inclusivity** – GESI-responsive design ensuring equitable access for women, youth, persons with disabilities, and marginalized groups.
4. **Evidence-Based Policymaking** – Strengthened labour market intelligence for informed decision-making.

Focus areas include governance reform, advanced labour analytics, improved citizen and employer services, and stronger multi-stakeholder collaboration.

Key-components of Digitalization Blueprint: The key-components of the Digitalization Blueprint are

- **Infrastructure Modernization:** Deployment of scalable cloud/hybrid hosting, secure networks, and resilient disaster recovery systems.
- **Data Ecosystem Development:** Creation of a unified, API-driven N-LMIS integrating platforms like FEIMS, FEWIMS, NAVT MIS, SSF, EMIS, Shramsansar, and private job portals.
- **Service Digitalization:** Launch of multilingual citizen portals, employer dashboards, grievance redressal systems, and self-service learning platforms.
- **Skills & Capacity Building:** Continuous training for MoLESS staff, Employment Service Centers (ESCs), Migrant Resource Centers (MRCs), and system administrators.

- **Policy & Regulatory Framework:** Establishment of IT governance guidelines, interoperability standards, and data protection/privacy protocols.

Expected Impact and Outcomes: The successful implementation of this blueprint will:

- Improve accessibility, efficiency, and transparency in labour and employment services.
- Enable real-time labour market forecasting, skill gap analysis, and targeted employment programs.
- Enhance job matching for domestic, foreign, gig, self-employment, and informal sectors.
- Support national economic resilience through evidence-based workforce planning.

Implementation Roadmap: The rollout follows a phased approach:

- **Short-Term (0–18 months):** Establish core IT policies, N-LMIS backbone, API gateway, and minimum viable services.
- **Medium-Term (18–36 months):** Expand integration with external systems, deploy advanced analytics, scale services nationwide.
- **Long-Term (36+ months):** Introduce AI-driven forecasting, cross-border data integration with missions abroad, and continuous innovation cycles.

Governance and Partnerships: The blueprint proposes a dedicated N-LMIS Bureau under MoLESS, supported by a multi-stakeholder Technical Advisory Group. Formal partnerships will be established with ministries (DoIT, NPC, MoFAGA), private sector job portals, academic institutions, and development partners. Cross-ministerial MOUs and data-sharing protocols will institutionalize interoperability and governance alignment.

Risk Management & sustainability: Key-risks include cybersecurity threats, funding constraints, and system adoption challenges. The mitigation strategies include:

- Mandatory VAPT and annual security audits.
- Dedicated O&M budgets.
- Change management programs and user onboarding campaigns.
- Green IT practices for environmental sustainability.

Conclusion and Call to Action: This Digitalization Blueprint is not just a technical roadmap — it is a policy and governance transformation agenda for MoLESS. By implementing this plan, MoLESS will position itself as a national leader in digital governance, ensuring that Nepal's labour and employment ecosystem is integrated, inclusive, and future-ready. The call to action is clear: Invest, collaborate, and commit to building the N-LMIS as the cornerstone of Nepal's labour governance for the next decade.

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CHAPTER 1 - INTRODUCTION

The Ministry of Labour Employment and Social Security (MoLESS) has a vision to modernize its operations, services, and infrastructure through digital transformation. The aim is to enhance service delivery, improve transparency, increase efficiency, and enable data-driven decision-making. This initiative is aligned with national development goals and global trends in leveraging technology for governance and seeks to address issues of digital literacy and digital divide among users, while contributing to better planning, synergies and introduction of new systems in a streamlined and standardized manner at the Ministry.

The **digitalization blueprint of the Ministry** provides detailed guidance on how to integrate all labour, employment and other related digital and information management systems in an efficient, accessible, inclusive, and safe manner, through provision of a wide-range of data, information and infrastructure services, duly leveraging upon interoperable, standards-based digital systems, and ensuring the security, confidentiality and privacy of private and personal data.

This digitalization blueprint is the first step towards technological advancement at **MoLESS**. Looking ahead, this initiative will fundamentally reshape how the Ministry operates by creating a seamless digital ecosystem that empowers citizens, streamlines services, and establishes **MoLESS** as a leader in public sector efficiency and transparency.

1.1. BACKGROUND AND CONTEXT

A National Planning Commission (NPC) Report on Integrated National Employment Systems emphasized that a well-integrated system is required to improve understanding of domestic employment opportunities and analysing labour market demand and supply. Bridging the information gap between Nepal's available human resource pool and existing employment opportunities is critical to strengthening the labour market and improving workforce utilization.

A framework of an integrated **Nepal – Labour and Employment Information System** was proposed, which defines building blocks of integrated systems including labour market, employment and other related information management systems. This framework forms the basis of this digitalization blueprint.

This system will serve as a cornerstone for the collection, management, and dissemination of information on domestic employment, while providing a solid evidence base for calculating national human resource and skills needs, and for shaping employment policies, skill-development initiatives, and other related programmes.

A few of key existing and functioning digital platforms within the purview of the MoLESS include the Foreign Employment Information Management System – FEIMS (2018) developed in 2018 by the Department of Foreign Employment (DOFE), the Foreign Employment Welfare Information Management System – FEWIMS launched in 2022 to streamline services compensation claims and the Employment Management Information System – EMIS developed in 2019 for the registration of unemployed individuals at the local government (LG) level. Also, in the process of being developed are management information systems for

the National Academy for Vocational Training (NAVT) to manage skills training related information, and a Returnee MIS for registration and profiling of returnee migrant workers.

In May 2025, the MoLESS launched Shram Sansar as the flagship digital platform and mobile app of Nepal's government that serves as a comprehensive labor market information system and employment portal. The Shram Sansar is currently at the early stages of development and rolling out, and forms the starting point of the comprehensive digitalization efforts.

This blueprint builds on these existing and planned national systems while incorporating global LMIS practices in countries like India, Korea, Australia, France, and Germany to align Nepal's N-LMIS with international standards. A phase-wise roadmap is included for the design, development and deployment of the N-LMIS, include institutional and infrastructure preparedness, along with immediate/short-, mid- and long-term priorities identified.

1.2. VISION AND OBJECTIVES

To create an integrated, inclusive, and future-ready N-LMIS that provides real-time, accurate, and actionable labour market insights for citizens, employers, policymakers, and development partners. The system will be seamlessly integrated into Nepal's broader e-governance framework, supporting the Government of Nepal's digital transformation and evidence-based decision-making efforts.

1.2.1. Long-Term Vision

To create a **digitally integrated labour market ecosystem** that ensures every Nepali has access to reliable employment data, decent job opportunities, and government services—through a single, secure digital interface.

1.2.2. Strategic Objectives

- Achieve seamless interoperability across MoLESS systems
- Improve labour market data quality and real-time accessibility
- Enable predictive analytics and AI-assisted decision support
- Ensure inclusivity in design and delivery of services
- Ensure meaningful prioritization and sequencing in system design

CHAPTER 2 - MoLESS DIGITALIZATION PLAN

2.1. CORE DESIGN PRINCIPLES

The core design principles serve as the foundational guidelines for the development and implementation of the Nepal Labour Market Information System (N-LMIS) as envisioned in this blueprint.

These principles are intended to guide not only the initial design of the N-LMIS but also all future software systems, databases, and digital platforms developed under or connected to the labour market ecosystem. They provide a consistent framework for system architects, developers, policymakers, and institutional stakeholders to align their efforts toward a unified, citizen-centric digital ecosystem for labour market governance.

Interoperability: API-driven integration with national and sectoral systems. E.g., NID, SSF, CIT, CTEVT, MoFAGA, DoFE, FEWIMS, FEIMS, NEMIS, PMEP MIS, (NPC, 2079) and Shramsansar.

Cross-Border Data Exchange: Secure and policy-compliant data transfer should be enabled between Nepal's missions/consulates abroad, the Ministry of Foreign Affairs (MoFA), MoLESS, and other relevant stakeholders for migration, employment, and reintegration tracking.

GESI Responsive: Accessibility should be prioritized for women, youth, persons with disabilities, and marginalized groups with multilingual and mobile-first solutions. Continuous user engagement, including feedback from marginalized groups, should be established.

Real-Time Data Use: Nowcasting and real-time labour market updates should be enabled using automated data feeds and AI-powered analytics.

Life-Cycle Approach: Users should be tracked through education, skills, migration, employment, and reintegration journeys.

Data Governance: Robust policies should be established for data quality, security, privacy, and ownership.

2.2. CONTENTS OF N-LMIS

Table 2 Core Functional Modules for N-LMIS

Contents of Nepal Labour Market Information System						
1. Labour supply	2. Labour Demand	3. Foreign Employment	4. Returnee	5. Skill Training	6. Grievance & Support	7. Academic Qualification
Labour Force Participation (by age, gender, geography, education)	Details of Job Vacancies (Domestic & Foreign)	Details of Outbound Migrants (by Destination Country, occupation, gender, age, geography)	Details of Returnee Migrants	Number of Training Enrollments	- Grievance Submission - Response, Resolution and Feedback	- Academic Programs & Courses - Enrollment and Graduation statistics
Long-Term Unemployment (by age, gender, geography, education, duration of unemployment)	Domestic Jobs Posted by Employers (Public & Private)	Number of Foreign Employment Permits Issued and Expired	Returnees by (Country of Return, gender, age, geography)	Training Completion Rate	13. AI	
Underemployment Rate (by age, gender, geography, sector, skills)	Employment by sector (Agriculture, Industry, Services, etc.)	Foreign job demands (by, destination, occupation, skill level, wage)	Returnee by (Reason of return, Duration of Stay Abroad)	Details of Certificates issued (Level, sector, occupation, Issue date)	- Labour Demand forecasting - Labour Market Trend Monitoring - Skill Gap Analysis - Unemployment Risk Detection - Chatbots	14. Service Provider, Gig Worker, Self Employed
Disaggregated Labor Supply Indicators (by age, geography, gender, education, occupation)	Disaggregated Labor Demand Indicators (by industry, geography, gender, age)	Number of Re-entry (Repeat) Permits Issued	Migration history of an individual	Training details (courses, trainer, time for each course, location, level)	15. Government Jobs	- Details of Services offered (Type, Location, Fees, Ratings & Reviews) - Affiliation with service/gig platforms - Entrepreneur and self-employed
Status in employment (employee, self-employed, employer)	Employment by Occupation, industry (ISCO, ISIC codes, skill levels)	Foreign Worker Welfare details (health & social welfare, repatriation, compensation claims, missing applications)	Employment Status of Returnees	Enrollment by (sector, training provider, geography, demographics)	Federal Level Government Jobs Provincial Level Government Jobs	16. Unemployed Individual Tracking
Occupational Disease, Occupational Accident	9. Wage Indicators	Details of Skills Training/Certification Before Migration	Details of Skills Gained Abroad	Post-Training Employment details (within 6 months or 1 year)	17. Local Labour Support Services(ESC/MRC)	- Profile of unemployed persons (background, work history, skillset, vulnerability) - Support targeting of public employment programs (e.g., PMEP).
8. Labour Force Surveys	- Wage by (occupation, industry, employment type, gender, education, geography) - Real Wage Index (adjusted for inflation) - Real Wage Growth Rate - Sectoral Wage Trends	10. N-LMIS Bureau	11. Demographic Details	12. Non-National Workers	18. Employer Details	19. Program Indicators
- Unemployment rates - Direct measurement of labour force status - Captures informal and hidden employment trends - Tracking changes in unemployment over time	- Outreach programs\Surveys - Policy Coordination and Inter-agency Collaboration - MOLESS Staff Training	- Labour Population structure - Age, Gender, Geographic Distribution - Household Characteristics	- Number of foreign workers in the country - Disaggregated Foreign workers by (industry, skill, occupation, geography, gender, age)	- Company details(size, type, PAN, tax details, province/district) - Job posting frequency	Tracks program-level outcomes from PMEP, SaMi, ReMi, etc., with beneficiary-level analytics	

That table below provides an overview of all the key components of the N-LMIS for the Ministry of Labour Employment and Social Security. A color coding is utilized to indicate the availability of information through various systems and sources as follows:

The [✓] shows that data can be made available since the system already has those datasets.

The [–] shows that the data can be made available upon system development under progress.

The [0] shows that the data can be made available in future upon system development.

The following table depicts data availability and feasibility for the contents of N-LMIS. There might be need of some customization or work on API to be able to provide the data.

Table 3 Index

✓ Immediate Availability	– In Progress	0 Future Development
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Table 4 Data Availability/ Feasibility of the Contents of N-LMIS

Module	Description	Data Availability / Feasibility
1. Labour Supply Module	Labour Force Participation (by age, gender, geography, education)	FEIMS [✓], Shramsansar [–], EMIS [✓], Returnee MIS [–],
	Long-Term Unemployment (by age, gender, geography, education, duration of unemployment)	EMIS [✓], SSF [✓], CIT [✓],
	Underemployment Rate (by age, gender, geography, sector, skills)	Shramsansar [–], Labour Force Survey [0]
	Disaggregated Labour Supply Indicators (by age, geography, gender, education)	FEIMS [✓], Shramsansar [–], EMIS [✓], Returnee MIS [–], Labour Force Survey [0]
	Status in employment (employee, self-employed, employer)	FEIMS [✓], Shramsansar [–], EMIS [✓], Returnee MIS [–], Labour Force Survey [0]
	Occupational disease and Occupational accidents	ILMIS [✓]
2. Labour Demand Module	Details of Job Vacancies (Domestic and foreign)	Shramsansar [–], Private job portals [✓], FEIMS [✓], DAS [✓],
	Domestic Job Posted by Employers (public and private)	Shramsansar [–], Private job portals [✓]
	Employment by sector (Agriculture, Industry, Services, etc.)	Shramsansar [–], Private job portals [✓], FEIMS [✓], DAS [✓]
	Disaggregated Labour Demand Indicators (by industry, geography, gender, age)	Shramsansar [–], private job portals [✓], FEIMS [✓], DAS [✓]

	Employment by Occupation, industry (ISCO, NSIC codes, skill levels)	Disaggregated data by NSIC, ISCO, and skill level lacks standardization due to the absence of national coding frameworks [0]
3. Foreign Employment Module	Details of Outbound Migrants (by Destination Country, occupation, gender, age, geography)	FEIMS [√], Immigration [√]
	Number of Foreign Employment Permits Issued and Expired	FEIMS [√]
	Foreign job demands (by, destination, occupation, skill level, wage)	FEIMS [√], DAS [√]
	Number of Re-entry (Repeat) Permits Issued	FEIMS [√]
	Foreign Worker Welfare details (health & social welfare, repatriation, compensation claims, lost/missing application)	FEWIMS [√] CLCS [√]
	Details of Skills Training/Certification Before Migration	FEIMS [√], TVET Digitalization System [-], NAVT [-], EPS [√]
4. Returnee Migrant Module	Details of Returnee Migrants	Immigration System [√] Returnee MIS [-],
	Returnees by (Country of Return, gender, age, geography)	Immigration System [√] Returnee MIS [-],
	Returnee by (Reason of return, Duration of Stay Abroad)	Immigration [√], Returnee MIS [-],
	Migration history of an individual	Immigration [√], Returnee MIS [-],
	Employment Status of Returnees	Returnee MIS [-],
	Details of Skills Gained Abroad	Returnee MIS [-],
5. Skill Training Module	Number of Training Enrollments	NAVT MIS [-], TVET Digitalization System [-] EPS [√]
	Training Completion Rate	NAVT MIS [-], TVET Digitalization System [-] EPS [√]
	Details of Certificates issued (Level, sector, occupation, Issue date)	NAVT MIS [-], TVET Digitalization System [-], EPS [√]
	Training details (courses, trainer, time for each course, location, level)	NAVT MIS [-], TVET Digitalization System [-], EPS [√]
	Enrollment by (sector, training provider, geography, demographics)	NAVT MIS [-], TVET Digitalization System [-] EPS [√]
	Post-Training Employment details (within 6 months or 1 year)	NAVT MIS [-]
6. Grievance & Support Module	Allows citizens to raise grievances, get support, and access chatbot/IVR/helpline-based services via ESCs/MRCs.	To be developed as part of N-LMIS front-end service delivery [-]

7. Academic Qualification Module	Links Academic Programs & Courses Enrollment and Graduation statistics	University Grant Commission (UGC) [√]
8. Labour Force Surveys	Unemployment rates, Direct measurement of labour force status, Captures informal and hidden employment trends, Tracking changes in unemployment over time	Force survey for Informal sector [0]
9. Wage Indicators Module	Foreign Wage by (occupation, industry, employment type, gender, education, geography)	FEIMS [√]
	Domestic Wage by (occupation, industry, employment type, gender, education, geography)	Lack of regular and systematic mechanism for collecting wage and earnings data across sectors in domestic jobs [0]
	Real Wage Index (adjusted for inflation), Real Wage Growth Rate, Sectoral Wage Trends	Existing wage data is sparse, unstandardized, and outdated [0]
10. N-LMIS Bureau	Manage N-LMIS operations, data governance, system integration, analytics, and sustainability	N-LMIS Bureau [0]
11. Demographic Details	Labour Population structure, Age, Gender, Geographic Distribution, Household Characteristics	NID [√], Vital Registration System [√],
12. Non-National Workers Module	Manages profiles of foreign nationals working in Nepal including industry, occupation, and permit data.	ILMIS [√]
13. AI Module	Supports labour demand forecasting, trend monitoring, skill gap analysis, and migration prediction models. Interfaces with core database and training systems.	To be developed as part of core N-LMIS architecture [-]
14. Service Provider, Gig Worker and Self Employed Module	Maps freelancers, registered service providers, service categories, and feedback metrics. Integrates with Shramsansar and external gig platforms.	Shramsansar [-], Private Gig Portals [√] IRD [√]
15. Government Jobs	Federal Level Government Jobs	PSC (PSRMS) [√]
	Provincial Level Government Jobs	Provincial PSC portal [√]
16. Unemployed Individual Tracking Module	Profiles unemployed persons (background, work history, skillset, vulnerability), links to ESC and SSF data. Supports targeting of public employment programs (e.g., PMP).	EMIS [√], ReMi MIS [-], Labour Force survey for Informal sector [0]

17. Local Labour Support Services	Local-level data on labour supply, demand, migration intent Local-level Grievance Handling & Case Reporting	EMIS [√], SaMi MIS [√], Shramsansar [-], FEIMS [√],
18. Employer Module	Maintains company profiles (PAN, tax info, size, type, location, job posting frequency).	Shramsansar [-], Private Job Portals [√], IRD [√]
19. Program Indicator Module	Tracks program-level outcomes from PMEP, SaMi, ReMi, etc., with beneficiary-level analytics by location, gender, status.	Lack of uniform indicators and centralized beneficiary tracking across programs [0]

2.3. FUNCTIONALITY AND INTEROPERABILITY MATRIX

The Functionality and Interoperability Matrix provides a comprehensive overview of the core digital systems within MoLESS, their primary functions, intended users, and the level of integration between platforms. This tool is designed to map the ministry's current and planned digital assets, highlighting how data flows between systems, where integration gaps exist, and where opportunities for optimization lie. By clearly outlining system functionality and interoperability, the matrix serves as a planning and decision-making resource to guide phased implementation, prevent duplication, and ensure seamless coordination across labour, migration, and social protection services.

The table below provides outlines the key systems relevant to Nepal's labour market and their potential integration with the proposed N-LMIS. High-priority systems such as FEIMS, FEWIMS, Shramsansar, EMIS, ILMIS, SaMi-MIS, DAS and NAVT/CTEVT are central to capturing real-time data on foreign and domestic employment, job demand and supply, skills training, unemployment status, and migrant welfare.

Integrating these systems with N-LMIS will enable end-to-end visibility of the labour lifecycle—from job demand generation to placement and welfare service delivery. Medium-priority systems like the PAN system, Vital Registration, LRIMS, UGC and SSF/CIT offer critical demographic, income, and social security data to enrich employment profiling and targeting. Interoperability with these platforms ensures that the N-LMIS becomes a unified data exchange and analytics engine capable of supporting employment policy, workforce planning, and program implementation. Establishing standardized APIs, data governance protocols, and cross-agency coordination is essential to ensure secure, efficient, and scalable integration across these systems.

The integration priorities in the system integration matrix were identified through meetings and consultations with relevant MoLESS officials, based on institutional integration needs, operational relevance, and the extent to which each system can contribute labour market-related data to the N-LMIS.

Table 5 System Integration Matrix

Platform/ Agency	Stakeholders/ Features and Services	Development Platform and Technology Stack	Integration with N-LMIS/ Purpose/ Priority
Foreign Employment Information Management System (FEIMS) Department of Foreign Employment https://feims.dofe.gov.np/New-Individual-Login	Stakeholders: Manpower Company, Bank, Insurance Company, Medical Institution, Orientation/ Training Center, Embassy/ Mission Features: FEIMS supports the full cycle of foreign employment approvals, including: - Online user registration for migrant workers - Online work permit issuance. - Employers and embassies upload job demand documents verified by Nepal's diplomatic missions. - Integrated with: - Department of passport (passport number verification) - Department of immigration (departure tracking) - Department of consular services (foreign job demand data) - Payment gateways (payment to SSF, welfare fund, insurance)	Under operation since: 2073-9-3 Programming Language: C# Framework and version: ASP.NET 4.5, proprietary framework (Sage Frame 2.0) Database and Version: MS SQL 2014 standard edition System Architecture: Monolithic Architecture Hosting: IDMC Server: Vendor Managed; Windows Server with IIS 10.0; operating since 2073 Server Condition: reached EOL in 2020 Data Exchange: via API, Integrated with Passport system, Immigration system, consular services system, Payment gateways Backup storage: same server; daily; not repeatedly checked VAPT: Yes on 2025-06-05; VAPT patches on process. (DoFE, 2025)	Foreign job demand data, migrant workers data Purpose: To get real-time foreign employment demand and migrant worker records for tracking foreign-employed population High

Foreign Employment Welfare Information Management System (FEWIMS), Foreign Employment Board https://fewims.feb.gov.np/login	Stakeholders: FEB, Migrants, MRCs Features: Managing and providing welfare services to migrant workers. Online application submission for: ▪ Body Withdraw ▪ Salary Allowances ▪ Academic Scholarship ▪ Deceased Body Transport ▪ Tax Compensation Medical Expenses for Family ▪ Compensation After Return ▪ Compensation to Nearest Relative ▪ Disability by Accident ▪ Rescue and Search ▪ Female Orientation After verification of application, compensation amount is transferred to bank account of beneficiary. Integrated with: ▪ FEIMS (for retrieval of passport numbers and work permit data) ▪ Payment Gateway-connect IPS (for payment to beneficiary)	Programming Language: PHP 7.4.1 Framework and version: Laravel Framework 7.4 Database and Version: MySQL 5.7.32 System Architecture: MVC (Model-View-Controller) Architecture Hosting: IDMC Server: Apache Server Data Exchange: integrated with FEIMS VAPT: not done (FEWIMS, 2025)	Migrant worker's welfare information like death, accident Purpose: To track worker risk factors, enable benefits verification, and assess reintegration/welfare gaps High	Job vacancies, job seeker data, employer data, service provider data, training provider data Purpose: To collect domestic labor market dynamics
Shramsansar Portal https://shramsansar.gov.np	Stakeholders: Job seekers, Job providers (Employer and Agency), Service providers (Individual and Agency), Training providers, LGs Admin, Province Admin, Federal Admin, Super Admin	Programming Language: Java, JavaScript Framework and version: Spring Boot, React Database and Version: PostgreSQL 17.3 System Architecture: Micro Services Hosting: GIDC,		

	Features: Provides web and mobile platform that connects job seekers, employers, training providers, and service providers ▪ Registration of job seekers, employers, Service providers/Freelancers ▪ Job application ▪ Job demand entry ▪ Training program details entry ▪ Service listing and application	Server: Linux VM Data Exchange: via API Backup storage: GIDC VAPT: by DoIT on 30th April (Chapagain, Shramsansar Stock Taking Form, 2025)	including job demand/supply, and skill needs High
Employment Management Information System (EMIS) https://www.pmep.gov.np/emis-job-portal	Stakeholders: PEMP, YETI Project, Ward Level, ESC Features: ▪ Registration and enrollment of unemployed individuals ▪ Core system for implementing the Prime Minister Employment Program (PMEP) ▪ Work allocation and wage tracking under PMEP ▪ Matches registered individuals to employment opportunities	Under operation since: 2076/77 Programming Language: PHP 8.2.9 Framework and version: Laravel 9.52.13 Database and Version: MySQL 10.4.14 System Architecture: Modular Hosting: IDMC (GIDC) Server: Centos OS 7; internally managed; 6 years old; Server Condition: Good, but Dell PowerEdge R730 reached its EOL Data Exchange: via API, Integrated with Nagarik App; Token authentication Backup storage: IDMC (Hetauda), daily(12 am), monitored daily VAPT: yes on 2023; patches applied after VAPT (EMIS PMEP, 2025)	Unemployed worker data Purpose: To map unemployed population and their status

Integrated Labour Management Information System (ILMIS) Department of Labour and Occupational Safety (DoLOS) ilmis.dolos.gov.np	Stakeholders: Foreign workers, Labour suppliers, Trade Unions, Features: - Online registration of foreign workers/ organizations, labour supply companies, trade unions (Enterprise, Association, Federation) - Foreign worker work permit issue - Permission certificate generation/renewal by labour supply companies/ trade unions Not integrated to any other system	Programming Language: PHP 8.0 Framework and version: Laravel 8 Database and Version: MySQL/10.9.8-Maria DB System Architecture: Modular,MVC Hosting: DOIT G-Cloud Server: CentOS; Apache HTTP Server 2.4.6 (Web Server) Data Exchange: no data exchange (API integration with SSF on process) Backup storage: no VAPT: before launch of system (DoLOS ILMIS, 2025)	Foreign worker (in Nepal) data, Labour supplier company data Purpose: To obtain data on foreign labor in Nepal and track domestic labor and track domestic labor regulatory entities High
Demand Attestation System Department of Consular Services (DoCS) demand.nepalconsular.gov.np	Stakeholders: Migrant workers, Foreign recruitment companies Features: - Foreign Employer Registration and Approval - Creating a new foreign employment demand	Programming and Language: PHP 8.3.7 (DoCS DTS, 2025)	Foreign job demand Purpose: To receive verified foreign employment opportunities from foreign companies High
Consular and Legal Consultation System Department of Consular Services https://legal.nepalconsular.gov.np/	Features - Case registration with unique case number and online status tracking - Family notification and communication during emergencies - Medical and legal consultation support for detained or injured citizens - Evacuation, repatriation, and deceased	Programming Language: PHP 8.1.29 Web Server: Apache HTTP Server 2.4.6 Operating System: CentOS	Migrant Distress records, emergency case records, missing/ lost people records, evacuation and repatriation Purpose: To receive details on foreign workers abroad that are missing/

	body transportation coordination ▪ Issuance of emergency travel documents ▪ Case-based reporting and analytics on migrant distress and welfare incidents		lost, distressed, and need services like evacuation and repatriation. Medium
PAN System Inland Revenue Department	Provides income tax, business, and employment income details	-	Income data, business registration data Purpose: To identify employment status and comparing income data High
Vital Registration System Ministry of Home Affairs	Manages birth, marriage, migration, divorce, and death data	-	Birth, death, migration, age, marriage/divorce data Purpose: To establish age and demographic profile for job eligibility and targeting Medium
Social Security System Social Security Fund (SSF) ssf.gov.np sosys.ssf.gov.np	System for managing employer and contributors' fund contributions, inventory management, including connections with banks, Nagarik App, FEIMS, DoLOS, NCHL, and Remit.	-	Financial Contribution data Purpose: to identify contribution of individual High
NAVT/CTEVT	Manages data manually on vocational/skills training institutions and trained individuals	-	Individual with skills training, training providers data Purpose: To map training outputs, skill profiles, and employability of workforce High

University's Information Systems	Educational qualification data for higher education graduates	-	Personal and educational qualification data Purpose: To validate qualification, analyze education-employment links Medium
Eps Pre-Orientation Program Management System Vocational & Skill Development Training (VSDT)	Implementation of the EPS Korea recruitment pipeline by handling online applications for mandatory pre-orientation training for Nepali workers selected to work in South Korea under the EPS scheme. Feature: Online application submission Admit card issuance	Programming Language: Javascript Database : MySQL Hosting: IDMC Server type and OS: Linux (Supported by vendor) Data Exchange: no exchange with other system VAPT: No (EPS, 2025)	Pre- orientation training data Medium
Training Management Information System (TMIS) Foreign Employment Board http://tmis.feb.gov.np/	Stakeholders: FEB, CTEVT	Framework and version: Microsoft ASP.NET 4.5 Server: Windows Server (IIS 10.0) (FEB TMIS, 2025)	Medium
SaMi-MIS SaMi	Stakeholders: Federal government/ SaMi Team, province government/SaMi Team SaMi MIS captures real-time and periodic data record of the following theme: - Access to Justice - Skills and Employment - Financial Literacy	The application is internally used by SaMi and its partners without external access. Programming Language: PHP Framework and version: Codeigniter 3 Database and version: MySQL 5.7 System Architecture: MVC	Data on migrant justice, reintegration, skills; multi-level government reporting High

	All three levels of government: LG, PG, FG, and respective national partners have access as per their mandate/role Due to SaMi IV program, only PNCC and the internal certification field of skills component are being used. All other data are institutional memories of Phase II and III.	Hosting: Helvetas Hosted Server: Windows Server (App), Linux Server (DB) Data Exchange: via API, no data exchange as of now Backup storage: Helvetas Nepal Servers VAPT: No VAPT done (SAMI MIS, 2025)	
SaMi-MIS (for MRC and monthly report) SaMi	Stakeholders: Federal government, province government, SaMi PSU team, SaMi Province Team - Major theme: access to information, access to justice, related real-time data input. - Yearly Plan of Operation (YPO) related data input, which serves as monthly reporting. - Access at three levels of government: LG, PG, and FG, including SaMi PSU and respective national partners (data input, verification and report view access as per program mandate/role)	The application is internally used by SaMi and its partners without external access. Programming Language: .NET Framework and version: .NET Framework v5.0 (Being upgraded to .NET Framework v8.0) Database and Version: MSSQL System Architecture: Hosting: Helvetas Hosted Server: Windows Server 2016 (Managed by Helvetas) Data Exchange: via API, no data exchange as of now Backup storage: Helvetas Nepal Servers VAPT: No VAPT done Incident Recording: application-level and server-level logs (SAMI MIS, 2025)	Low

K-Hami Project KOICA/ MoLESS	Stakeholders: MoLESS , KOICA Financial literacy, entrepreneurial skills, and social, psychological, and economic reintegration of returnee migrants from Korea. Stakeholders: DoFE, Passport Office, Migrant Worker Features: Information portal on foreign employment - Search (pre-permission detail, passport, recruiting agency, orientation center, medical institution, insurance company, Bank) - Track Complain - Notices - Important Contacts (Different countries' embassies with location, phone, fax no, email, password) - Re-Entry (Service not available)	-	Low
Baideshik Rojgari Mobile App Department of Foreign Employment https://www.feb.gov.np/mobileapp	Mobile app: Available in App Store (Apple)	-	High
Immigration System Department of Immigration	Manages records of border entry and exit of individuals including migrant departure/arrival data	-	Migrant inflow/outflow data Purpose: To verify foreign employment deployment and arrival data.
Nepal Rastra Bank System Nepal Rastra Bank	Oversees financial flows, including remittance inflow, foreign currency transactions, and labour remittance corridors	-	Remittance data Purpose: To track labour remittance trends, and link economic outcomes to labour migration

2.4. MAPPING OF SYSTEMS AND SYSTEM RE-ENGINEERING RECOMMENDATIONS

As part of developing the digitalization blueprint, a detailed assessment was conducted of all existing and planned digital systems related to labour and employment. The assessment examined existing digital systems, institutional structures, and processes related to labour, employment, migration, and skills under the Ministry of Labour, Employment and Social Security (MoLESS). Its purpose was to inform the design of an integrated, user-friendly, and future-ready Nepal-Labour Market Information System (N-LMIS).

The assessment engaged MoLESS departments, other key government agencies, training and vocational institutions, private sector actors, and development partners, including returnee-focused projects. It analysed major digital platforms such as FEIMS, FEWIMS, EMIS, SSF, and PMEP MIS, assessing their functionality, scalability, interoperability, and compliance with national standards.

In addition, the assessment considered ICT infrastructure, connectivity, human resource capacity, and governance frameworks, including readiness for integration with national systems such as the Nagarik App, National ID, and Government Enterprise Architecture (GEA/NeGIF). Gender equality and social inclusion (GESI) were also reviewed to ensure accessibility and usability for disadvantaged groups.

This comprehensive exercise provided the evidence base for the Digitalization Blueprint for the Ministry and highlights specific areas for updates and system re-engineering.

2.4.1. System Re-engineering

Several systems are currently in operation and actively used by the respective agencies. However, these systems require re-engineering to enhance performance, adopt modern technologies, and meet evolving functional and regulatory requirements. Improvements are needed to ensure long-term sustainability, strengthen security. Additionally, updating the underlying frameworks and technologies will enable seamless data exchange and interoperability across platforms. The re-engineering should be done referring what is already available.

2.4.1.1. Foreign Employment Information Management System (FEIMS)

The Foreign Employment Information Management System (FEIMS) serves as the backbone for managing end-to-end processes of foreign employment in Nepal. However, to improve efficiency, data integrity, and service delivery, following areas within FEIMS will require system re-engineering.

Hardware Infrastructure: FEIMS currently relies on vendor-managed physical servers that have reached their End-of-Life (EOL). (DoFE, 2025)

Recommendation:

- Migration to a modern, cloud-compatible or hybrid hosting infrastructure should be carried out, which is more secure and supports scalability.
- Server management should be transferred from vendor-dependent to MoLESS/ DoFE IT teams for sustainability. To support this transition, the vendor should provide a comprehensive video

tutorial covering key server components, IP configuration, access protocols, and relevant tools. These resources should be integrated into a Self-Learning Portal to enable ongoing, independent learning and capacity-building for MoLESS/DoFE IT teams.

Software: FEIMS is built on an older software platform using ASP.NET 4.5 with a proprietary framework (SageFrame 2.0) and Microsoft SQL Server 2014. The system follows a monolithic architecture in the developers own proprietary framework, which makes it difficult to update and maintain. It might be challenging to find skilled developers familiar with this proprietary setup. The VAPT of the system was done but patching was not done because of these challenges.

Recommendation:

- System architecture should be redesigned towards modular or SOA-based solutions to enable faster updates, easier maintenance, and better integration with other government systems.
- API management and security should be strengthened to ensure safe, efficient data exchange with integrated systems such as Passport, Immigration, and Payment gateways.
- To support users in understanding and effectively using the system, a built-in section should be included that offers video tutorials for each component. This will create a self-sustaining approach to training, enabling users to continuously build their skills and capacity without relying solely on external support. This video tutorials can also be used in the N-LMIS self-learning platform labeled as “FEIMS Operation Training”.

2.4.1.2. Foreign Employment Welfare Information Management System (FEWIMS)

The Foreign Employment Welfare Information Management System (FEWIMS) is a crucial platform supporting welfare services for Nepali migrant workers and their families. However, to enhance operational efficiency, security, and overall service delivery, system re-engineering efforts are needed.

Hardware Infrastructure: FEWIMS currently relies on vendor-managed physical servers that have reached their End-of-Life (EOL). There is no formal AMC done with the vendor and no sustainable plan is seen.

Recommendation:

- Migration to a modern, cloud-compatible or hybrid hosting infrastructure should be carried out, which is more secure and supports scalability.
- Server management should be transitioned from vendor-dependent to MoLESS/ FEB IT teams for sustainability. To support this transition, the vendor should provide a comprehensive video tutorial covering key server components, IP configuration, access protocols, and relevant tools. These resources should be integrated into a Self-Learning Portal to enable ongoing, independent learning and capacity-building for MoLESS/FEB IT teams.

Software Platform: The system uses legacy versions of PHP (7.4.1), Laravel (7.4), and MySQL (5.7.32), all of which have reached end-of-life status.

Recommendations:

- System architecture should be redesigned towards modular or SOA-based solutions to enable faster updates, easier maintenance, and better integration with other government systems.
- Modern, open-source frameworks should be used that are easier to maintain and offer longer-term security updates.
- To support users in understanding and effectively using the system, a built-in section should be included that offers video tutorials for each component. This will create a self-sustaining approach to training, enabling users to continuously build their skills and capacity without relying solely on external support. This video tutorials can also be used in the N-LMIS self-learning platform labeled as “FEWIMS Operation Training”.

Security and Compliance: A formal Vulnerability Assessment and Penetration Testing (VAPT) has not been conducted, exposing the system to potential security risks.

Recommendation:

- Regular VAPT should be conducted and identified vulnerabilities should be addressed promptly.
- Continuous security monitoring and incident response capabilities should be established.

2.4.1.3. Employment Management Information System (EMIS)

The Employment Management Information System (EMIS), designed to support Nepal's Prime Minister's Employment Program (PMEP), plays a key role in managing short-term employment and collecting data on unemployed individuals.

Hardware Infrastructure: Although the server condition is currently good, the underlying hardware (Dell PowerEdge R730) has reached its end-of-life, which may impact performance and future scalability. (Prajapati, 2025)

Recommendations: Phased server hardware replacement or migration to a cloud-based or hybrid hosting model.

Data Collection and Quality Management: Data collected from local ward offices and Employment Service Centers (ESCs) is often incomplete or inconsistent due to manual entry, limited staff training, and temporary staffing structures.

Recommendation:

- Form design should be standardized with mandatory fields and built-in validations to reduce inconsistencies during registration and reporting.
- Training should be provided to ESC and municipal users on data entry protocols and system functionalities.

2.4.2. Planned Digital platform

2.4.2.1. NAVT MIS

The NAVT MIS will serve as a centralized digital platform to manage trainee registration, training delivery, trainer records, course content, certification, and post-training employment tracking under the National Academy for Vocational Training (NAVT). Replacing the existing Excel-based system, the MIS will enhance data accuracy, monitoring, and integration with N-LMIS and other government platforms.

Recommended Core Modules and Features

1. Trainee Management Module

- Trainee Registration: Registration option for trainee including NID-based real-time verification and alternate ID options (citizenship, passport).
- Course and Batch Allocation: Assign trainees to courses with calendar-based scheduling.
- Attendance Tracking: Digital or biometric attendance capture.
- Training Progress & Completion Logs: Track course/module completion milestones.
- QR-Enabled Digital Certificates: Auto-linked to NSTB verification records.

2. Trainer Management Module

- Trainer Roster: Maintain database of certified trainers with specializations and training history.
- Batch Assignment: Allocate trainers to specific courses with schedule planning.

3. Course and Syllabus Management

- Curriculum Management: Align course content with national standards.
- Syllabus Repository: Store and manage approved digital syllabi.

4. Certification and Assessment Integration

- Online Registration for Skill Tests: Linked with NSTB system.
- Certification Tracking: Record skill test results and validity.
- QR-Verified Certificates: Employers can view authenticity.

5. Post-Training Employment Tracking

- Shramsansar Integration: Link graduates to domestic job opportunities.
- DoFE Linkage: Align with foreign employment data for migration-ready trainees.
- Self-Employment Tracking: Register self-employed outcomes.

6. Pre-Departure Orientation Training (PDOT)

- Expand PDOT digitization beyond EPS - Korea.
- Link training data with DoFE and Immigration for foreign-bound workers.

7. System Integration

- CTEVT/ NSTB: Skill test data exchange and certificate sync
- DoFE/ Immigration: PDOT status and permit linkage
- Shramsansar: Job matching, employment tracking
- FEWIMS: Female trainee orientation validation
- NID/ Nagarik App: Identity verification and cross-platform service access

2.4.2.2. Returnee MIS

The Returnee MIS, as outlined in the (ToR for Returnee Profiling Database) under the Reintegration of Returnee Migrant Workers (ReMi) Project, is a dedicated digital platform designed to support the reintegration of Returnee Migrant Workers (RMWs). The platform will be implemented through Employment Service Centers (ESCs) across all 753 LGs.

Key Modules

- Lead Generation Module: Integrated with FEIMS and Immigration systems to automatically populate returnee data.
- Screening Module: Captures vulnerability and profiling information through field-based or walk-in registration.
- Counselling and Planning Module: Enables case management and action planning by ReMi Counselors.
- Referral and Follow-up Modules: Supports service linkage and monitors reintegration progress with scheduled tasks.
- Employment Coordinator Module: Matches returnees to schemes based on eligibility.
- Report and Dashboard Module: Offers real-time analytics, standard/custom reports, and performance tracking.
- E-Learning Module: Provide training content for Social Mobilizers and Counselors.
- Data Exchange Module: After the complete profiling of the returnee, it will be pushed to Shram Sansar Module and Nagarik App Module.

Data exchange with other digital platforms:

- NID: Will be used as a uniform identifier to prevent duplication.
- FEIMS :
 - o Will be integrated in the Lead Generation Module.
 - o The system will receive the Returnee list with phone numbers based on passport numbers.
- FEWIMS: Will enable selective data sharing through APIs.
- Nagarik App
 - o The Returnee Profiling Database will send Skill Profiles and Resumes to Nagarik App.
 - o It will receive Demographic Profiles of returnees from Nagarik App.

- Shramsansar
 - The system will share Returnee Skill Profiles and Resumes to Shramsansar.
 - It will receive job opportunities from Shramsansar for matching.
- Or any other digital platforms identified by MoLESS.

2.4.2.3. TVET Digitalization System

The proposed centralized School Management Information System (MIS) under the QualiTY project aims to enhance data management, service delivery, and interoperability across technical and vocational institutions in Nepal. Managed by the Council for Technical Education and Vocational Training (CTEVT), this system aims to centralize key data and processes that are currently managed in fragmented and often manual ways across different schools and training centers.

The system will include a wide range of features to support schools, students, and administrators. These include:

- **Institutional Profile Management:** Each school will be able to maintain its own identity with custom branding (logo, color theme, and private URL), while still operating within the national system.
- **Student Information Management:** This includes digital records for admissions, attendance, curriculum progress, academic results, internal and external exam registration, assignment tracking, and certification history.
- **Teacher Management:** Teacher profiles, attendance, assigned courses, learning materials, and performance monitoring will be recorded.
- **Administrative Modules:** Library management, learning management systems (LMS), inventory, human resources, accounting, finance, and billing—creating a complete digital management tool for TVET institutions.

2.4.3. Data Gaps and Challenges

Some important data needed for the N-LMIS are currently missing or difficult to collect. This section lists the key areas where no systems exist, no plans are in place, or there are major challenges in gathering reliable data.

2.4.3.1. Informal Sector Employment

The informal sector forms a significant portion of Nepal's labour market, particularly in agriculture, construction, domestic work, and small-scale trade (Central Bureau of Statistics, 2017/2018). However, data on informal workers is largely incomplete.

- No dedicated system exists to register or monitor informal workers or their employers.
- Informal workers often operate outside formal institutions, making it difficult to track their employment status, income levels, working conditions, or skillsets.

- There is no mandatory reporting mechanism, and many informal workers are not affiliated with social protection, training, or employment services.

2.4.3.2. Wage and Earnings Data

Accurate and up-to-date wage data is essential for labour market analysis, job matching, policy development, and fair wage setting. However, there are multiple challenges:

- There is no centralized or routine mechanism to collect wage and earnings data across different sectors, occupations, or regions.
- While wage data for foreign migrant workers can be partially obtained through FEIMS and the Demand Attestation process, this only covers formal labour migration and excludes informal or undocumented workers.

2.4.3.3. Labour Force Survey Integration

Labour Force Surveys (LFS), conducted periodically by the Central Bureau of Statistics (CBS), are one of the most comprehensive sources of information on employment, unemployment, underemployment, informal work, and labour market trends in Nepal. However, their integration into the N-LMIS system presents several challenges:

- Data is collected only periodically, often with multi-year gaps (e.g., every 5 years), which limits its usefulness for real-time or even annual labour market monitoring.
- The survey data is not currently linked or integrated into any digital labour information system or platform. N-LMIS does not yet have direct access to CBS datasets or any API-level integration.
- There is no automated mechanism or institutional arrangement in place for structured sharing or regular updating of labour force statistics between CBS and the N-LMIS.
- The format and indicators used in CBS labour surveys may differ from those required by N-LMIS, making it difficult to align classifications, timeframes, and disaggregation levels.
- Due to the above gaps, LFS data must currently be manually extracted, processed, and interpreted, creating additional delays and reducing timeliness.
- Limited granularity in published data (e.g., by province, occupation, or gender) further restricts its use in local-level planning or policy targeting.

To fully benefit from CBS's labour force surveys, a formal data-sharing mechanism, regular integration schedule, and technical standardization across indicators and classifications would need to be established.

2.5. CORE FUNCTIONAL MODULES FOR N-LMIS

The Core Functional Modules of the Nepal-Labour Market Information System (NLMIS) are designed to serve as the foundational components for effective labour market data management. These modules are specifically tailored to address the unique needs of Nepal's labor sector, encompassing a range of

functionalities from data collection and processing to analysis and dissemination. This section outlines the key modules that enable the NLMIS to act as a centralized, reliable, and accessible platform for stakeholders, including government agencies, policymakers, researchers, and job seekers. The architecture of these modules is built to ensure seamless data exchange, interoperability, and the provision of timely, accurate, and comprehensive labor market insights.

The core functional modules for N-LMIS are as shown below.

2.5.1. Migrant Worker

The Foreign Employment Information Management System (FEIMS), operated by the DoFE is responsible for collecting, verifying, and managing data related to Nepali migrant workers. As part of the integrated Nepal Labour Market Information System (N-LMIS), FEIMS will serve as the primary source for all verified information on migrant workers.

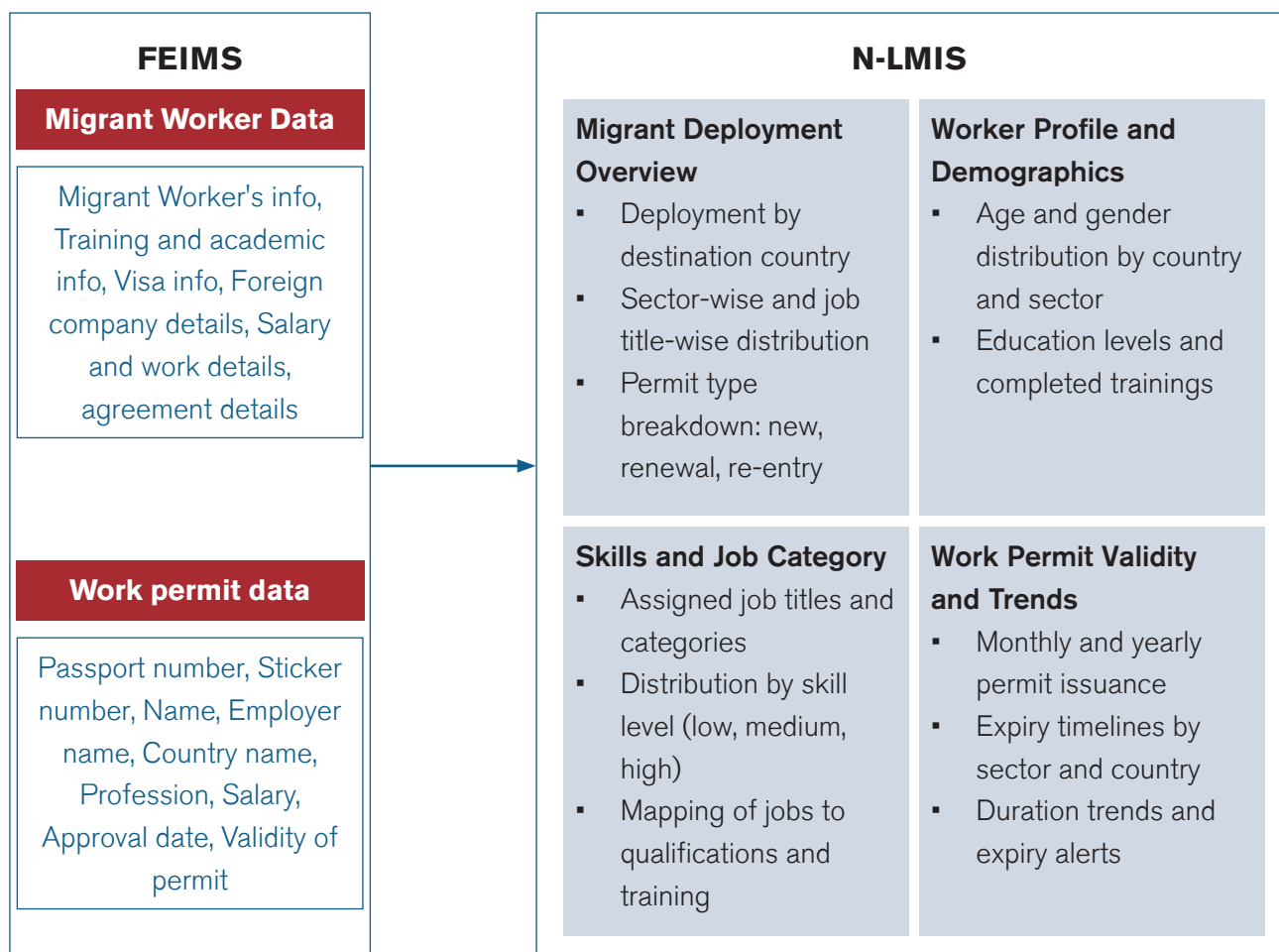


Figure 2 Migrant Worker Data Figure 2 Migrant Worker Data

FEIMS collects following data on migrant workers:

- 1. Personal and Demographic Information:** Full name, gender, age, date of birth, email, marital status, religion, contact details, address, bank information, family information.

2. **Verification Data:** Passport number, issue date, citizenship number, issuing district, labour permit e-sticker
3. **Training & Academic Information:** Academic qualification, skills declared at application, training certification
4. **Visa Information:** Visa number, issue date, expiry date, contract duration (years)
5. **Employment and Migration Information:** Foreign Company Details, agreement, skill, salary, work details, facility (health insurance, transportation), pre-departure orientation details,
6. Pre-departure Orientation, Insurance, and Medical Details

Migrant workers data not captured by FEIMS: Departure and arrival data of migrant workers are recorded by the Department of Immigration and partially shared with FEIMS, the arrival tracking is often incomplete or inconsistent. As a result, identifying returnee migrants and capturing verified return data remains a major challenge within this system.

FEIMS can provide Migrant Worker Information who has applied for work permit.

2.5.2. Foreign Employment Demand Data

The Demand Attestation System developed by the Department of Consular Services (DoCS) under the Ministry of Foreign Affairs, gets data from foreign employer companies. The system is digitally linked with FEIMS and ensures that only approved, attested, and verified job demands are entered into the system.

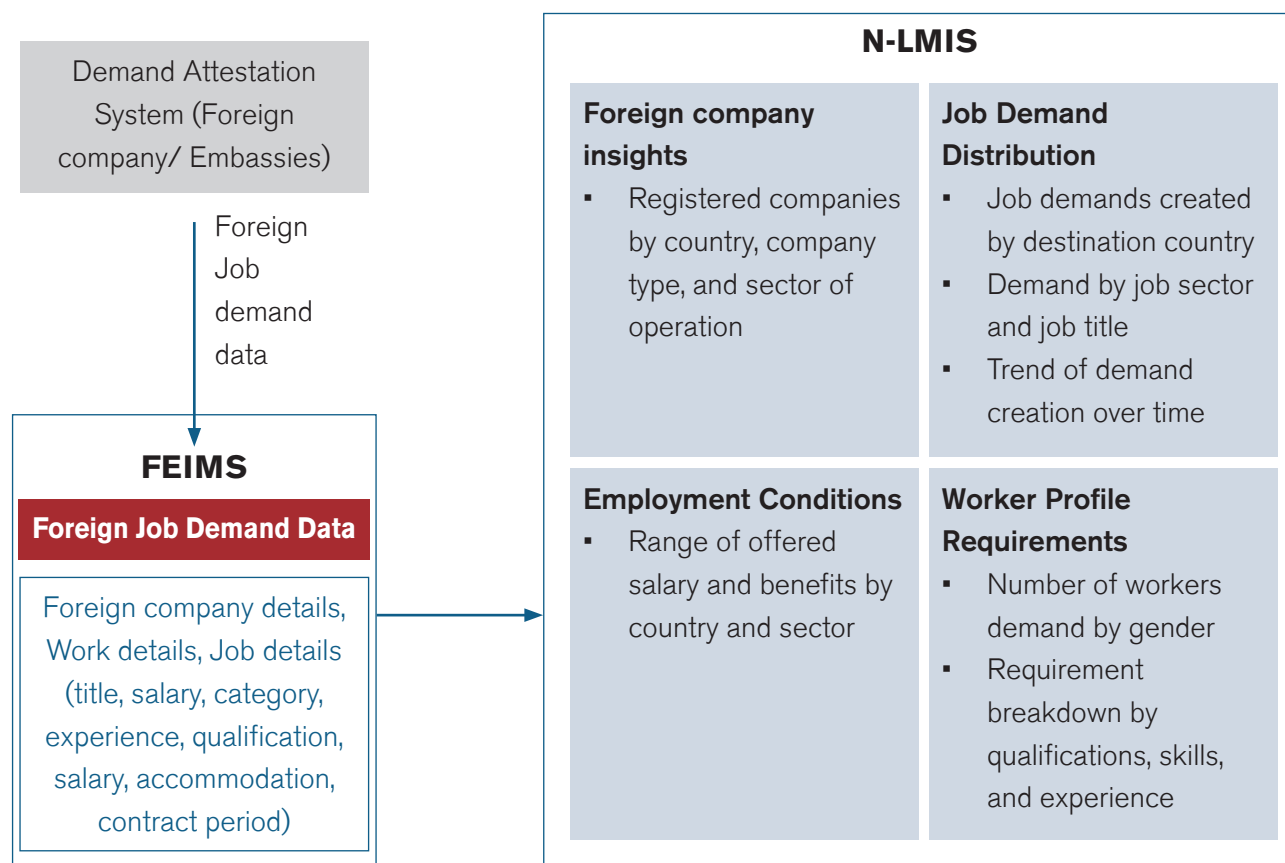


Figure 3 Foreign Employment Demand Data

Data Collected by Department of Consular Services:

1. **Company Details:** Related embassy, company type, work type, company name, company registration number, company address, company phone, login email, login password, confirm password, registration certificate, company owners details, company managers details
2. **Job Demand Data:** Recruiting agency in Nepal details, number of workers, job category, job title, experience/qualification, visa number/company code, gender breakdown (female), salary, accommodation, contract period, over time (OT).

FEIMS and DAS can provide all the verified data on foreign job demand including Foreign Company details, Job Demand details.

2.5.3. Foreign Employment Welfare Data

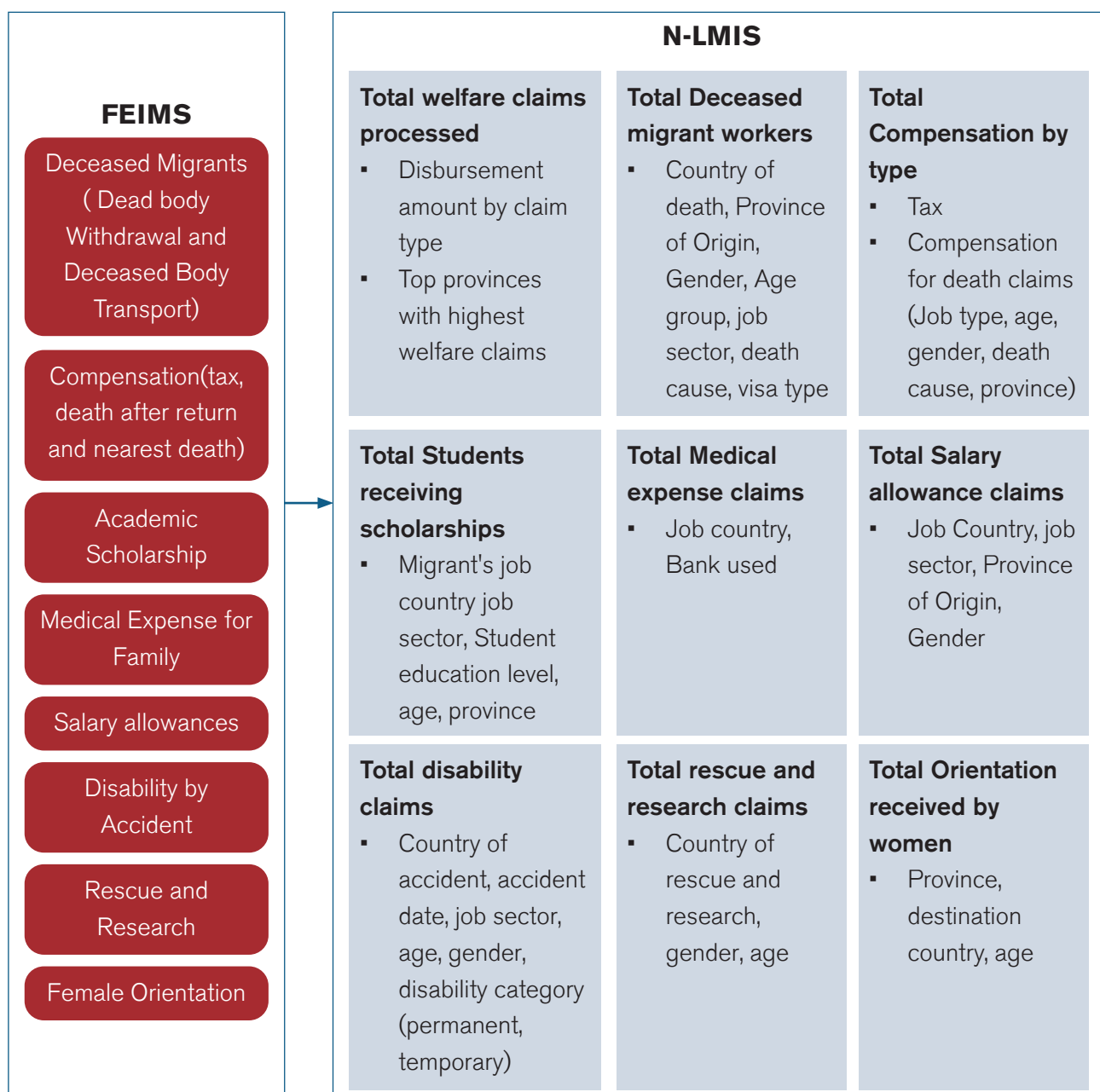


Figure 4 Foreign Employment Welfare Data

FEWIMS operated by the **Foreign Employment Board (FEB)** is designed to manage welfare services for Nepali migrant workers and their families. The following information can be relevant for N-LMIS

1. **Body Withdraw Form:** Migrant's workplace and death details, visa type, municipality info, applicant's personal and citizenship data.
2. **Salary Allowances:** Fiscal and location data, applicant's relation to migrant, contact info, and required documents.
3. **Academic Scholarship:** Migrant's employment and permit details, student info (school, class etc), and applicant's relation.
4. **Deceased Body Transport:** Migrant's permit data, death and transport logistics (location, time), and applicant's identity and relation.
5. **Tax Compensation:** Migrant's labor history, tax amount, bank info, applicant details, and supporting documents.
6. **Medical Expenses for Family:** Migrant and family member info, illness/treatment details, and applicant's full family background.
7. **Compensation for Death after Return:** Returnee migrant's death, family member details, and applicant's personal, citizenship, and contact data.
8. **Compensation to Nearest Relative (Death Case):** Deceased migrant's family structure and death info; collects nearest beneficiary and applicant data.
9. **Disability by Accident:** Accident details, migrant's employment period, and applicant's basic ID and contact info.
10. **Rescue and Search:** Workplace data, rescue reason, and applicant's local government and contact details.
11. **Female Orientation:** Training/orientation dates, country of employment, migrants and applicant's passport, and contact information.

In addition to FEWIMS, the **Consular and Legal Consultation System** operated by the **Department of Consular Services** is a source of welfare-related data for Nepali citizens abroad. The system captures structured data related to migrant distress, protection needs, legal issues, and repatriation support, which directly complements foreign employment welfare and migrant protection objectives of N-LMIS. The following information can be relevant for N-LMIS:

1. **Details of person (person abroad):** Official full name as per passport or legal documents, gender, province, district, ward number, travel document, date of lost contact, reason for lost contract.
2. **Foreign country and employment details:** Country of employment, date of departure, purpose of going abroad, employer / company Name, address, mobile Number (Abroad), work Permit / foreign Country ID Number, sending agency / person from Nepal.

- 3. Missing details:** Date of lost contact, reason for lost contact, reachable contact phone number, camp / jail name and address (If Detained).

FEWIMS can provide data on deceased migrants, family compensation, medical reimbursements, and academic scholarships for children, and accident-related disabilities. FEWIMS also holds structured information on rescue operations, tax compensation, female orientation programs, and nearest-relative claims, along with granular datasets such as employment permit history, death location and logistics, bank details, municipality and contact information, and applicant-migrant relationships. This rich dataset can enable N-LMIS to display real-time statistics on welfare claims, returnee support trends, disbursement volumes, and regional patterns of risk or need, enhancing the government's ability to track migrant well-being, plan reintegration services, and support data-driven policy decisions.

Consular and legal consultation system can provide data on missing person including lost contact dates and reasons.

2.5.4. Job Portal

There can be different private and public data sources related to Job Portal. The job portal can have following features as seen in international practices (Ministry of Labour & Employment, Government of India; Republic of Korea e-governance; Government of Canada; Indeed Australia).

Table 6 Job Portal Features

Feature Category	Specific Features
Basic Job search	Job Title, location
Advanced Job Filters	Date posted Employment Conditions (day/night/morning/overtime) Work Hours (full-time/part-time) Workplace Type (onsite/remote/hybrid) Salary Range Job Types (internships/apprentice jobs/freelancer/ permanent/contract) Location (provinces) Job Source (placement agency jobs/government postings) Sector (IT and communication, manufacturing) Higher Education Level (diploma/IT) Years of experience Company Type (SME/public enterprise) Recruitment Category (commercial/day laborer) Inclusive (indigenous people/newcomers/visible minorities/ disabilities/ youth) Intended applicants (national candidates/international candidates) Occupation wise classification Foreign Language

Resume	Resume builder (templates) AI suggestions
Application	Direct apply using one click Application tracking (notifications to applicants) View jobs applied, save jobs, job alert and match, jobs near me
Career Planning and Guidance	Find Training/ Courses (rate, feedback) Career quizzes Career Information (Browse by sectors), career schemes (e.g., scheme name, benefits) Change in employment View and Apply in Job Fairs and filter by state, district and industry Articles on how to find a job Career Awareness Sessions
Employment Center Access	Search Employment Center, Recruitment Center
SME Search	Search and filter SME by region, industry, classification Register as firm of interest, notification for new vacancies Download SME lists by year
Labour Market Info	Explore occupations and outlook (reports) Compare wages and vacancies Employment indicators and snapshot Labour market by region Industry profiles and analytics Labour market news and publications
International Jobs	View and apply international jobs
News and Notices	View news and notices
Feedback/Grievance	Create feedback/grievance and track status using ticket number
Accessibility	Multilingual accessibility

2.5.4.1. Job Seeker Data

Shramsansar supports employment opportunities, skills training, freelancing services, and access to job-related information in Nepal. Shramsansar portal has a Job Seeker module to capture following data on job seeker:

- 1. Demographic and Socioeconomic Profile:** Full name, gender, DOB, ethnicity, location (province/district/municipality), returnee status, preferred work location, and references.
- 2. Identification and Verification Details:** National ID number, citizenship number, PAN, driving license number.
- 3. Educational Qualification and Training Background:** Academic qualifications, vocational training, certification, language proficiency, area of expertise and skill sets.

4. **Employment Status and Preferences:** Current employment status (unemployed, employed, self-employed), job interest, and purpose of registration (e.g., job search, training).
5. **Job Application History and Outcome Tracking:** History of job applications, selected jobs, interview attendance, and employment outcomes.

Shramsansar should provide comprehensive data on the employment lifecycle of job seekers, including initial registration and profiling details such as demographics, identification, education, and training background. It can track employment status declarations, capturing sector, occupation, duration of employment, and reasons for unemployment. The system can also supply data on job matching and placements, including information on applied jobs, employers, contract types, start dates, placement sources, and salary ranges. Furthermore, Shramsansar can support monitoring of employment transitions by recording job end dates, reasons for leaving, employment gaps, and new job details—enabling the N-LMIS dashboard to display dynamic statistics on workforce engagement, mobility patterns, job placement efficiency, and re-employment trends.

2.5.4.2. Local Employer Data (Job Provider)

The labor market is served by a range of job providers, including enterprises, industrial sectors, government institutions, non-governmental organizations (NGOs), and foreign employment agencies. Capturing data from these diverse sources is vital for the N-LMIS to generate a comprehensive and accurate overview of employment opportunities and skill demands across all sectors.

Shramsansar portal collects following data on Employer Company:

1. **Organization Profile:** Company name, registration number, PAN, size, year of establishment, sector/industry, and location.
2. **Job Posting and Demand Details:** Job title, job description, required qualifications, skills, number of positions, offered salary, job location, contract type (temporary/permanent), and benefits.
3. **Recruitment Status and Response:** Number of applicants per job, shortlisted candidates, history and status (Shortlisted, Hired or Rejected)

For N-LMIS company details can be sourced from PAN from IRD.

2.5.4.3. Labour Demand (Job Vacancies)

Nepal's job market consists of various employment categories, including private sector jobs (hospitality, banking, IT, education), industrial work (manufacturing, hydropower, construction), service roles (tourism, healthcare, finance), agriculture, informal work, public sector jobs, self-employment, and foreign employment. Shramsansar has a module to collect data on job demand by various organizations registered in the portal.

Shramsansar should provide detailed data on job demand, including job titles, categories, sectors, required education, skills, experience, location, salary ranges, and contract types. It tracks the number of openings, job duration, working hours, and recruitment status such as deadlines and application trends. For N-LMIS, Shramsansar can also contribute extended attributes like company type (e.g.,

SME, large enterprise), job source, and integration with job fairs and recruitment events. With a skill-matching module, it can support real-time matching of job seekers to vacancies and recommend upskilling paths. Additionally, it enables labour demand trend analysis by capturing changes in vacancies over time—allowing the N-LMIS dashboard to visualize dynamic employment opportunities, sector-wise demands, recruitment activity, and skill gaps.

FEIMS and **DAS** can provide all the verified data on foreign job demand including Foreign Company details, Job Demand details.

2.5.4.4. Service Providers

Service providers are a growing part of Nepal's labour market, including freelancers, gig workers, and formal enterprises. They offer services across sectors such as digital work, home repairs, health, education, and consulting, and are key contributors to both employment and service delivery.

Shramsansar has a module to collect basic service provider data such as profiles, service listings, and client interactions.

Shramsansar should provide valuable data on service providers, including freelancers, gig workers, and enterprises, by capturing provider profiles (name, registration number, PAN, contact information, service type), service listings (nature, location, description, and pricing), and client interactions (number of services delivered, feedback scores, and service status). This data can help the N-LMIS dashboard display statistics on the size and distribution of the service economy, sectoral engagement of gig workers, service demand trends, quality ratings, and geographic concentration of service provision—supporting evidence-based planning for informal and platform-based labour markets.

2.5.5. Unemployed Individuals' Data

For identification and tracking of unemployed individuals, especially in the formal and semi-formal sectors, multiple existing systems can be used to provide relevant data. These include:

Employment Management Information System (EMIS): Implemented through Employment Service Centres (ESCs) and local governments under the Prime Minister's Employment Programme (PMEP), collects and manages data on individuals registering as unemployed at the local level.

EMIS captures key variables such as demographic information, employment history, educational qualifications, skills, job preferences, and wages offered and received through the Minimum Employment Programme (MEP), which provides up to 100 days of employment annually for unemployed individuals.

Returnee Profiling System: In-development under the ReMi initiative, this system could gather comprehensive data on unemployed returnee migrant workers through ESCs and MRCs, including reintegration needs, employment status, and skill profiles.

Social Security Fund (SSF): SSF data can provide corroborative support to identify unemployed individuals by analyzing contribution gaps. Individuals who have ceased contributions for a significant period may be considered inactive or unemployed in the formal sector.

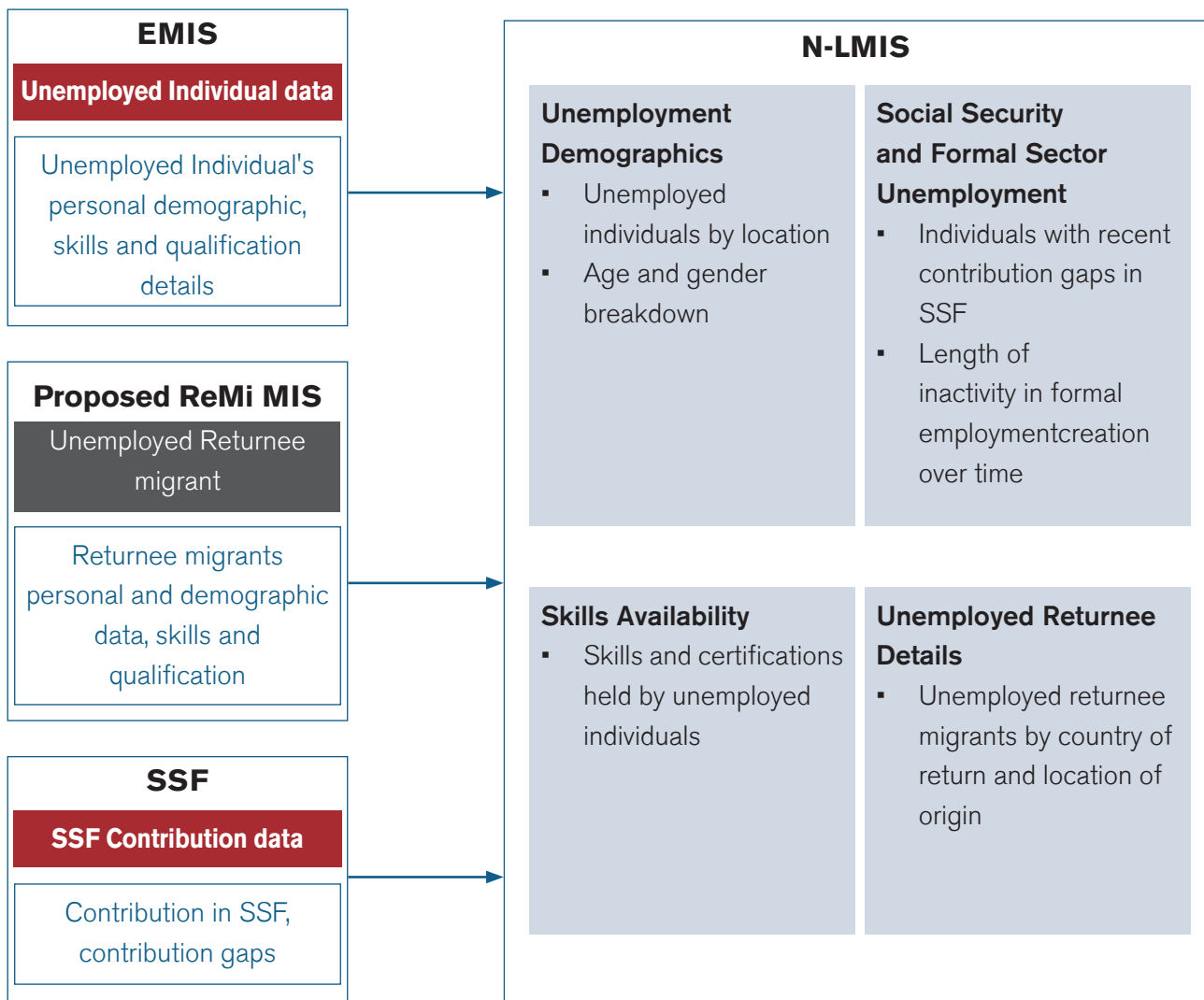


Figure 5 Unemployed Individuals Data

N-LMIS should establish a dedicated unemployed individual module, which should have following details on unemployed individuals:

- 1. Identification and Demographic Information:** Full name, NID/Citizenship number, age, gender, ethnicity, disability status, Province, District, Municipality/Ward, Household ID (for family-based targeting)
- 2. Employment History:** Last job held (sector, position, duration), Last employer (name, type), Reason for job loss: contract expiry, layoffs, resignation, return from foreign employment, Duration of unemployment (months/years), Skills, Education and Training, Educational qualification, Technical/vocational training received, Certifications and skill levels, Preferred occupation/sector
- 3. Labour Market Preferences:** Preferred type of work (formal, informal, seasonal), Expected wage/salary range, Preferred work location (local, national, international)
- 4. Social and Economic Vulnerability:** Belonging to marginalized or vulnerable groups (e.g., Dalit, women-headed households, returnees, youth with disability), Poverty ID or Social Security recipient status, Access to welfare allowances
- 5. Social Security Fund Information:** Contribution Status (start date, end date), last contribution date, Employer-wise contribution history (can help detect job switches or terminations).

EMIS can provide comprehensive data on unemployed individuals registered at the local level. It tracks individuals receiving short-term employment under the Minimum Employment Programme. For N-LMIS, EMIS can offer real-time statistics on local unemployment rates, duration of joblessness, skills mismatch, and demand for public employment schemes—enabling localized planning and service targeting.

The **Returnee Profiling System**, under development by ReMi, through ESCs and MRCs, can collect information on reintegration needs, employment status, skill profiles, preferred work type and location, and vulnerability indicators (e.g., disability, women-headed households). This system can feed N-LMIS with targeted insights on the returnee population, helping to monitor unemployment trends among migrants, identify high-need groups, and design reintegration support programs.

SSF data can offer corroborative evidence to identify formal sector unemployment by analyzing contribution records. Individuals who have ceased contributions or show significant gaps can be flagged as potentially unemployed or inactive. Employer-wise contribution history also helps trace job switches or terminations. For N-LMIS, SSF data supports validation of employment status, detection of job exits in the formal economy, and identification of workers at risk of long-term unemployment—enhancing the reliability and depth of unemployment tracking.

2.5.6. Non-National Workers Data

The Integrated Labour Management Information System (ILMIS), managed by the Department of Labour and Occupational Safety (DoLOS) is used to grant work permit for foreigners working in Nepal, ensures regulatory compliance through document verification, and maintains a national database of employed foreign nationals.

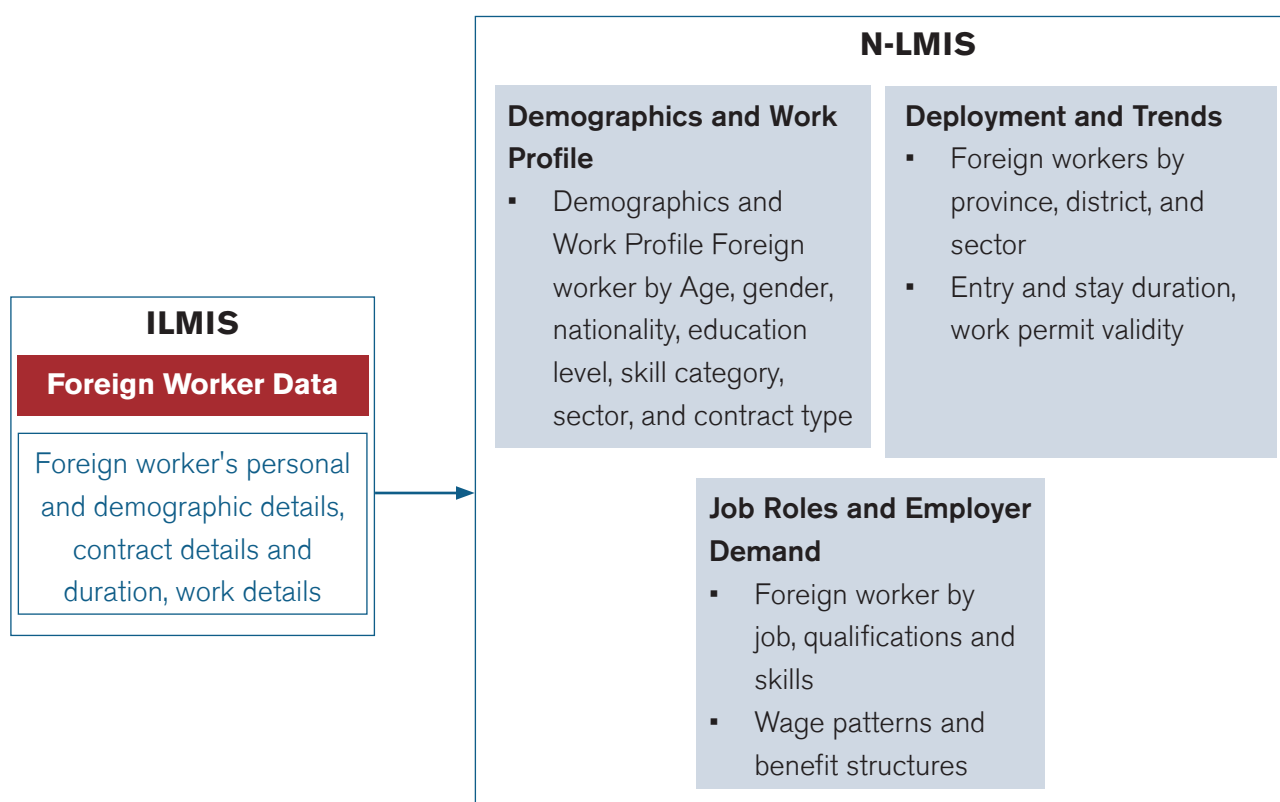


Figure 6 Non National Workers Data

ILMIS should provide comprehensive statistics on foreign workers in Nepal, including demographic details. It should highlight employment patterns across sectors and occupations, skill levels required, and geographical distribution by province, district, and municipality. The dashboard must also present contract specifics like wages, contract type, working hours, and worker benefits. In addition, it should display employer information such as company type, sector, name, address, and registration number. Finally, it should track permit data, including type, issue and expiry dates, and current status.

2.5.7. Vital Registration Data

The Vital Registration System, maintained by the Department of National ID and Civil Registration (DoNIDCR), captures key life events such as birth, death, marriage, and migration at the individual level. For N-LMIS, integration with this system will accurately assess the size, structure, and dynamics of the labour force.

The Department of National ID and Civil Registration (**DoNIDCR**) should provide N-LMIS with birth and death records to support accurate estimation of future labour market entrants and removal of deceased individuals from the workforce database. Age-specific data will enable identification of the working-age population and support targeted workforce planning, including youth employment and retirement-age monitoring. Additionally, internal migration records will help track geographic mobility within the country, allowing the N-LMIS dashboard to present dynamic statistics on labour force demographics, regional workforce distribution, and population movement trends.

2.5.8. Training and Skills Data

Training and skills-related data is collected and maintained by several institutions, including the National Academy of Vocational Training (NAVt), the Council for Technical Education and Vocational Training (CTEVT), and the EPS Pre-Departure Orientation Training (PDOT) program.

Currently, NAVt does not have a digital system for managing training processes and data however the data are stored manually in excel format (Acharya & Upreti, 2025). To enable effective integration with the Nepal Labour Market Information System (N-LMIS), NAVt needs to adopt a proper digital system to manage its training data and regularly share standardized information with N-LMIS.

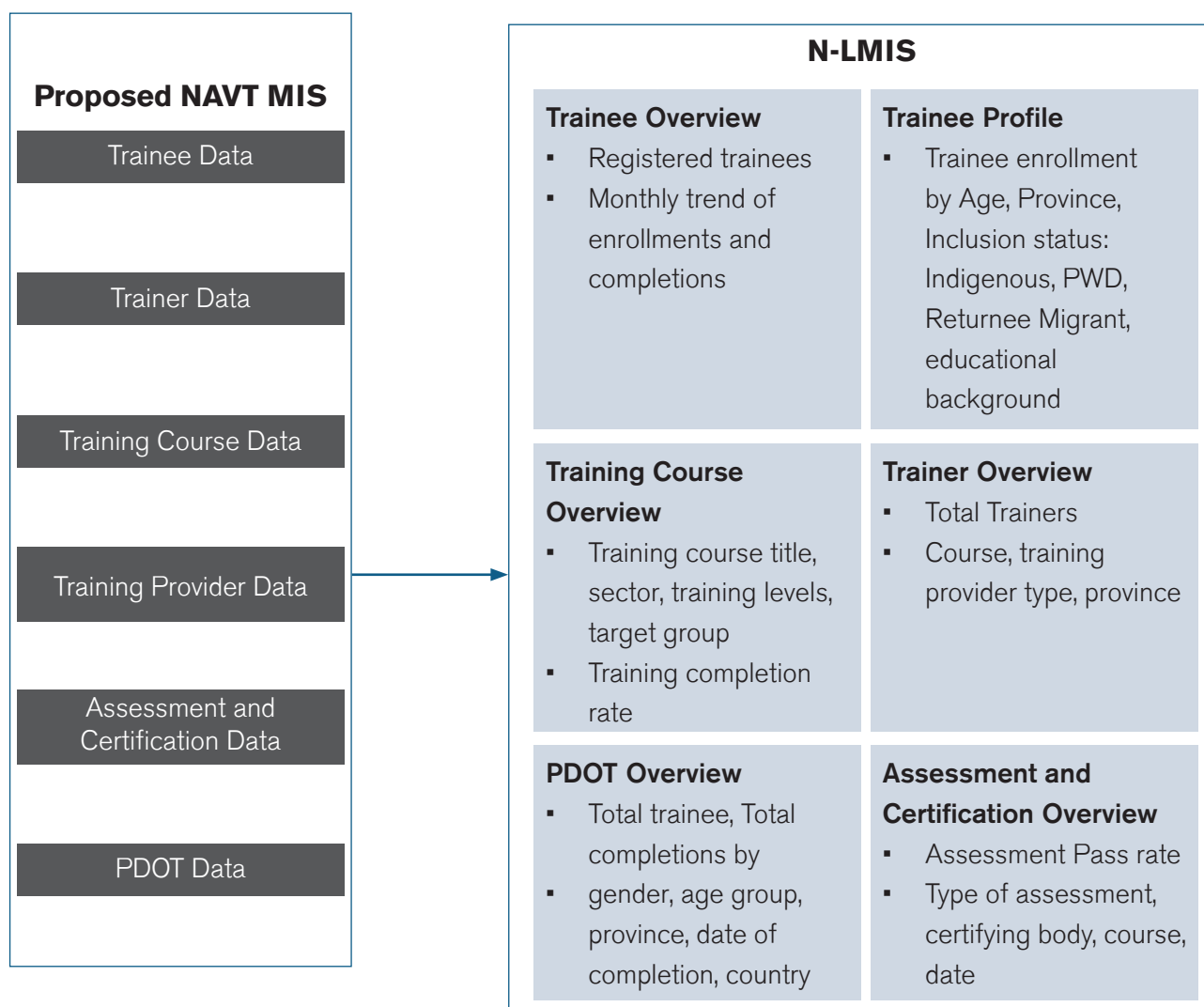


Figure 7 Training and Skills Data

The system should record and provide following data to N-LMIS:

Trainee-Level Data (Individual Skills Record)

- Individual Trainee Profile:** Full name, gender, age, NID/Citizenship number, contact details, province/district/municipality, educational background.
- Training Course Information:** Course name, skill sector/occupation, level (e.g., basic/intermediate/advanced).
- Training Duration:** Start date, end date, total training hours.
- Training Certification:** Training Completion Certificate
- Certification Status:** Certification of Skill/Training upon examination
- Post-Training Outcome:** Placement status, district/country of employment, type of employment/job title, employer (if applicable), wage/salary (optional), district/country of employment

Training Program and Provider-Level Data

1. **Training Provider Information:** Name of institution, registration/licensing number, licensing authority (e.g., CTEVT, NAVT, MoLESS), type: Public, Private, NGO/INGO, TVET school, district and province, contact information
2. **Training Course Details:** Course title, Sector/industry classification, target group: Unemployed youth, returnee migrants, women, etc., stipend/support amount (if applicable), duration (weeks/months, number of hours), batch size and training frequency
3. **Trainer Information:** Number of trainers, qualification and certification
4. **Assessment and Certification:** Type of assessment (internal, third-party), certifying body, assessment frequency, pass rate (%)

NAVT should provide N-LMIS with detailed training and skills data at both the trainee and provider levels. This includes individual trainee profiles with demographic and geographic information, course details, training duration, certification status, and post-training employment outcomes such as job title, employer, location, and wage (if available). At the provider level, they should supply data on training institutions, licensing details, course offerings, target groups, stipends, batch sizes, and training frequency. Additional data should cover trainer qualifications, assessment methods, certifying bodies, and pass rates. These datasets will enable the N-LMIS dashboard to display real-time statistics on training participation, completion and certification rates, job placements after training, and regional and sectoral training coverage.

2.5.9. Education and Graduate Data

Academic institutions and universities maintain data on student enrollment, graduation, and fields of study. Integration of this data with N-LMIS will enable forecasting of the incoming educated workforce and better alignment between education supply and labour market needs.

Academic institutions and universities should provide N-LMIS with enrollment and graduation records disaggregated by institution, faculty, and education level to estimate the annual supply of educated labour. They should also share data on fields of study and specialization, such as engineering, IT, agriculture, and health sciences, to help map workforce qualifications against current and projected labour market demand. This information will enable the N-LMIS dashboard to generate statistics on educational output trends, sector-wise qualification supply, and potential skill gaps—supporting more effective workforce planning and education-to-employment alignment.

2.5.10. Employment Program Management

This module will help monitor, and report on government and partner-supported employment and reintegration programs such as the Prime Minister Employment Program (PMEP), Safer Migration (SaMi), and Reintegration of Returnee Migrants (ReMi).

1. **Data Integration from Multiple Programs:** Collect and display data from PMEP, SaMi, ReMi, and similar programs.

2. **Service and Support Overview:** Show what types of services (e.g., temporary employment, counselling, training, financial support) were provided to different groups, along with program timelines and implementing agencies.
3. **Program Beneficiary Insights:** Analysis of who has benefited from which program, categorized by location, age group, gender, or returnee status.
4. **Monitoring and Reporting:** Program-wise dashboards and summary reports for policymakers and local governments to monitor performance, compare regions, and improve targeting of employment services.

SAMI MIS should provide N-LMIS with integrated data from government and partner-supported employment and reintegration programs such as PMEP, SaMi, and ReMi. It should display the types of services delivered—such as temporary employment, counselling, training, and financial assistance—along with program duration and implementing agencies. The module should also offer beneficiary insights disaggregated by location, age group, gender, and returnee status. These inputs will allow the N-LMIS dashboard to present program-wise performance metrics, service coverage, and regional comparisons, supporting evidence-based decision-making and more effective targeting of employment and reintegration services.

2.5.11. Returnee Migrant Worker Data

Currently, there is no dedicated national system that comprehensively captures and manages data related to returnee migrant workers. Helvetas Nepal is in the process of developing an information management system to address this requirement.

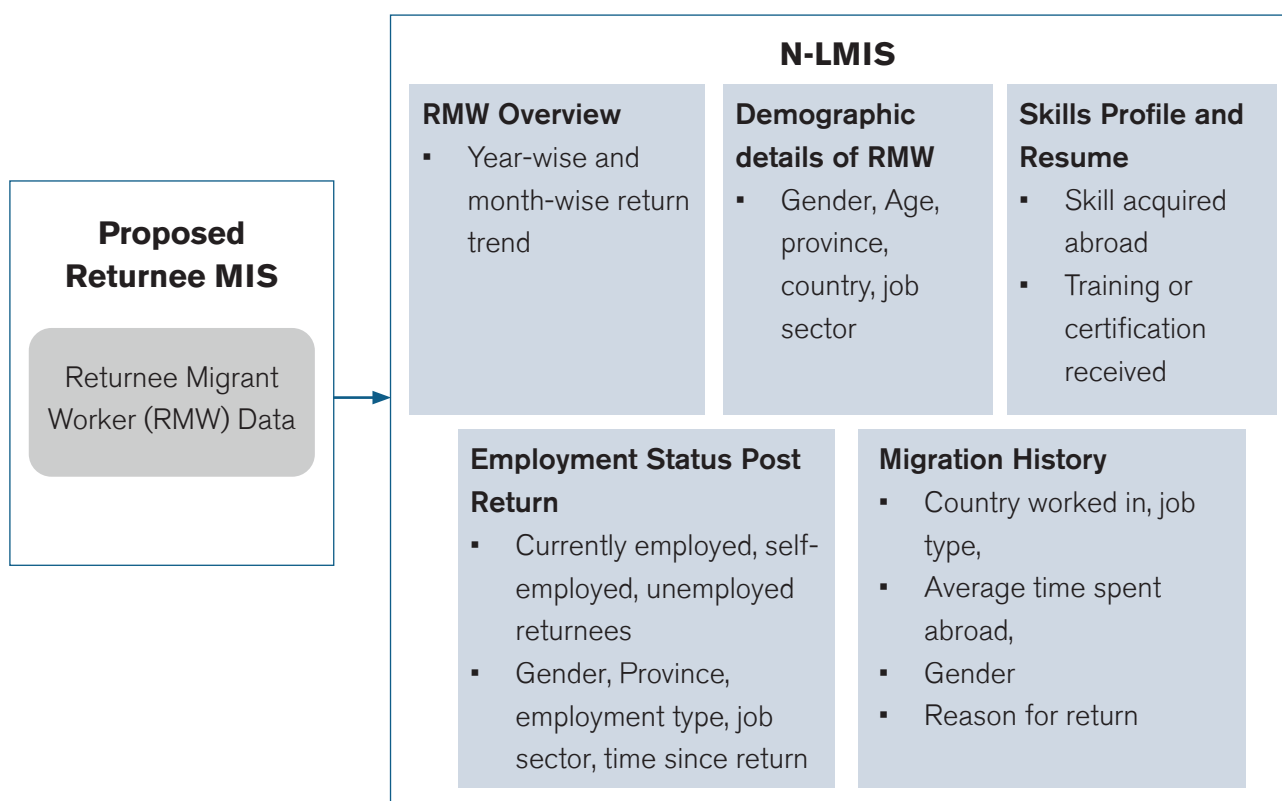


Figure 8 Returnee Migrant Worker Data

The ReMi **Returnee Profile Database** should provide N-LMIS with detailed data on returnee migrant workers, including verified identity and return information, migration history, and employment abroad. It should capture reasons for return, post-return employment status, income sources, and intentions to re-migrate. The database will also supply information on skills acquired abroad, recognition through RPL, training received after return, and interest in further up-skilling or entrepreneurship. Additionally, it will track access to reintegration support programs such as business grants, counselling, and financial aid, along with health and welfare data including medical conditions, disabilities, and insurance claim status. This information will enable N-LMIS to present real-time statistics on the returnee workforce, reintegration needs, economic reintegration outcomes, and regional service coverage.

2.5.12. Departure and Arrival Data

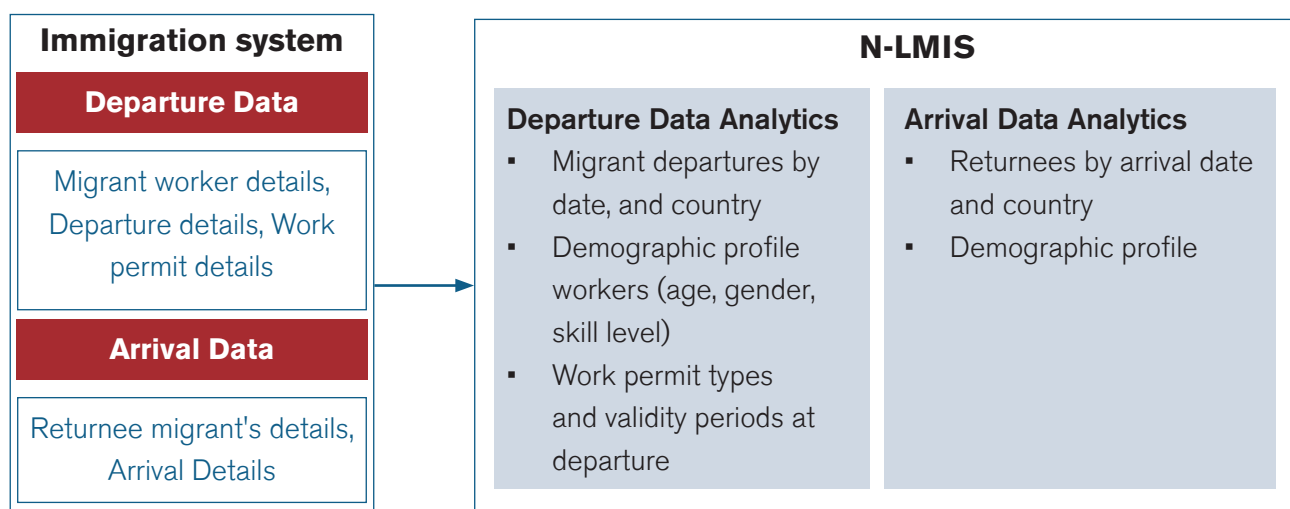


Figure 9 Departure and Arrival Data

The Department of Immigration maintains official records of individuals' international travel, including departures and arrivals of labour migrants. Integration of this data with N-LMIS is critical for migration tracking.

Tracking migration through the open border with India remains challenging, as a significant number of returnees entering via land routes are not officially documented or registered upon arrival.

The Department of Immigration should provide N-LMIS with verified travel history data, including departure and arrival records of labour migrants, to confirm whether individuals with labour permits have actually migrated or returned. This data will support accurate identification of returnee migrants for reintegration support and enable tracking of labour mobility trends. By monitoring the real-time outflow and inflow of workers, the system can generate dynamic statistics on migration volumes, returnee patterns, and cross-border labour flows—informing evidence-based foreign employment policies and bilateral coordination with destination countries.

2.5.13. Labour Profile Module

The Labour Profile Module shall serve as a centralized and intelligent interface within the N-LMIS, enabling administrators and authorized users to retrieve a complete, real-time profile of any individual in the labour ecosystem using identifiers such as National ID, Citizenship Number, or Passport Number.

By integrating data across systems like FEIMS, FEWIMS, EMIS, NAVT MIS, Returnee MIS, DoI, DoNIDCR, SSF, CIT, and more, this module aggregates a person's employment history, training, welfare claims, migration status, grievances, and social security contributions. It significantly enhances case investigation, policy targeting, and service delivery by offering a 360-degree digital footprint of workers—supporting faster resolution of grievances, identification of vulnerable groups, and informed decision-making for program planning.

2.5.14. Self-Employment

The self-employment module will capture and analyze data related to individuals who are engaged in their own economic activities, either registered as sole proprietors, in cooperatives, or operating in informal entrepreneurship without formal registration. The module will integrate data from sources such as the municipality offices, DoCSI, IRD, microfinance institutions, cooperatives, and relevant government entrepreneurship programs.

Municipality Offices: Number of PAN/VAT-registered sole proprietors, sector of operation, and income/tax records indicating economic activity.

DoCSI: Number of registered self-employed individuals, type of business activity, business ownership details

IRD (for registered businesses): Number of registered micro/ cottage/ small industries, sector type, scale of operation, and ownership information.

2.5.15. Government Jobs

This module will integrate job vacancy and employment data from the Public Service Commission (PSC), provincial commissions, and local government recruitment systems. It will allow job seekers to access consolidated government job information and enable policymakers to track recruitment patterns.

The official PSC website is the primary and verified source for all federal government job announcements, applications, and recruitment data.

PSRMS can provide data on federal level job vacancies, application volumes, recruitment outcomes, and inclusivity quota fulfillment. It also holds structured information on applicant profiles, including educational qualifications, professional certifications, work experience, training history, and demographic attributes such as age, gender, and geographic origin. Additional datasets cover examination schedules, admit card issuance, exam center allocations, and result publications. This dataset can enable N-LMIS to present real-time statistics on public sector hiring trends, competitive ratios, geographic distribution of applicants, and inclusivity performance, strengthening the government's ability to monitor recruitment transparency, forecast workforce needs, and design evidence-based employment policies.

Each province in Nepal has its own Provincial Public Service Commission responsible for managing recruitment into provincial civil service positions. These commissions operate independently and maintain their own digital portals for announcing vacancies, managing applications, conducting examinations, and publishing recruitment results.

- Bagmati Province: spsc.bagmati.gov.np
- Koshi Province: psc.koshi.gov.np
- Lumbini Province: ppsc.lumbini.gov.np
- Madhesh Province: ppsc.p2.gov.np
- Gandaki Province: ppsc.gandaki.gov.np
- Karnali Province: ppsc.karnali.gov.np
- Sudurpashchim Province: psc.sudurpashchim.gov.np

Provincial PSC Portals provide access to provincial-level employment opportunities, application processes, examination schedules, and recruitment statistics specific to their respective provinces.

2.5.16. Gig Workers

The gig workers module will track short-term, on-demand, and freelance work facilitated by online and offline platforms. It will include digital platform workers (e.g., ride-hailing, delivery, freelancing platforms) and other on-demand services.

2.5.17. Informal Sectors

The informal sector constitutes a significant portion of Nepal's workforce, with high concentration in agriculture, construction, domestic work, transportation, street vending, and small-scale trade. Despite its economic importance, informal sector labour data remains fragmented and incomplete, limiting the ability of policymakers to design targeted employment, social protection, and skills development programs.

There are gaps seen in informal sector. No **dedicated national registry** for informal workers or employers. Workers often operate outside formal institutions, leading to **no visibility** over their employment status, income levels, working conditions, or skills. Absence of **mandatory reporting** or integration with government systems. Limited coverage of social security, training, or employment services.

A dedicated Informal Sector Labour Data Component will be integrated into N-LMIS to capture, analyze, and report on informal sector employment. Given the lack of administrative data, information will be collected through multiple, complementary channels:

1. Community-Based Surveys & Household Profiling
 - o Periodic local-level surveys conducted at ward/municipality level in partnership with CBS, local governments, and Employment Service Centers (ESCs).
 - o Captures occupation, income patterns, working conditions, and skills.

2. ESC & Migrant Resource Center (MRC) Outreach
 - o Registration desks at ESCs and MRCs to allow walk-in profiling for informal workers.
 - o Target groups: domestic workers, street vendors, construction labourers, home-based workers.
3. Integration with NGO/INGO and Cooperative Databases
 - o Partner with organizations already working with informal sector groups to import aggregated or anonymized records.
4. Mobile and Web-Based Self-Registration
 - o Enable self-enrollment via Shramsansar Portal and Nagarik App using simplified forms and optional voice-based assistance for low-literacy users.

2.5.18. Social Security and Financial Linkages Module

This module enables structured integration between N-LMIS and social security and financial institutions to ensure workers are correctly linked to their benefits and contributions. Following institutions and data can be connected to NLMIS:

1. **Social Security Fund (SSF):** SSF can provide data on individual enrolment status, SSF identifiers, Contribution Status (start date, end date), last contribution date, Employer-wise contribution history (can help detect job switches or terminations). Identity verification using NID/Citizenship can be done to check whether an individual is already enrolled in SSF, if not, a new SSF ID can be created and attached with profile of labour. In addition, N-LMIS can transmit updates on employment type (e.g., transition from formal to migrant employment) to SSF through when changes are recorded in the N-LMIS profile.
2. **Citizen Investment Trust (CIT):** CIT should provide basic information on individual and employer participation in CIT schemes, including registration status and contribution participation indicators, to support employment-linked savings and social protection analysis.
3. **Employees Provident Fund (EPF):** EPF should provide enrolment and participation status of workers covered under provident fund schemes, supporting alignment of employment records with long-term social security coverage.

2.5.19. Grievance Redressal System (GRM)

This module will track and manage complaints related to employment services, foreign employment support, and reintegration programs. It will help ensure that users' concerns are addressed in a timely and transparent manner.

Key functions

1. **Complaint Integration:** N-LMIS will integrate grievance data from systems like PMEP, SaMi, ReMi, and other relevant programs.
2. **Lifecycle Tracking:** Monitoring each complaint through its full process—from registration (in the source system) to review, resolution, and closure.

2.5.20. AI Module

Artificial Intelligence (AI) can enhance N-LMIS by enabling predictive analytics, automation, and intelligent decision support across the labour market ecosystem. The AI module will process integrated data from FEIMS, EMIS, Shramsansar, SSF, ReMi, and training institutions to generate policy-relevant information.

Key Functions:

1. **Labour Market Forecasting:** AI models can analyze historical and current data to predict future trends in employment, sectoral labour demand, and skill shortages across regions.
2. **Skill Gap Analysis:** By comparing employer demand with the skills reported by job seekers and trainees, AI can identify gaps and suggest where upskilling or curriculum alignment is needed. This will help training providers and policy planners make data-driven decisions.
3. **Unemployment Risk Detection:** AI can detect early signs of potential unemployment by analyzing SSF contribution lapses, prolonged inactivity in EMIS, or returnee profiles from ReMi. This enables timely interventions such as job counselling, reskilling, or support services.
4. **User Assistance and Engagement:** AI-powered chatbots can provide real-time, multilingual support to users of N-LMIS—especially job seekers in rural or marginalized communities. These tools can help users navigate the system, update profiles, find relevant services, and receive timely updates.
5. **Migration Flow Prediction:** Using integrated data from Immigration, FEIMS, and global labour demand feeds, AI can predict outbound and inbound migration trends for policy and resource planning.
6. **Impact Evaluation of Programmes:** AI models can assess the effectiveness of public employment programmes, training schemes, and reintegration support by correlating service delivery data with employment outcomes over time.
7. **Personalized Job and Training Recommendations:** Recommendation engines will match users with suitable job openings, training programs, or government schemes based on their profile, skills, and location.
8. **Labour Market Sentiment Analysis:** Natural Language Processing (NLP) can be used to analyse feedback, grievances, and social media content to gauge worker satisfaction, identify systemic issues, and track employer reputation.
9. **Real-Time Labour Market Monitoring Dashboards:** AI will automate the generation of dynamic, predictive dashboards for decision-makers, updating in near real-time to reflect labour market shifts.

2.6. CORE NON-FUNCTIONAL MODULES OF N-LMIS

Beyond the core functionalities that define what the Nepal-Labour Market Information System (N-LMIS) does and as described in the section above, a range of non-functional modules are essential for ensuring the system operates effectively, reliably, and securely. These modules, which focus on system quality attributes rather than specific business tasks, are critical for maintaining data integrity, ensuring user trust, and guaranteeing long-term sustainability.

This section will delve into key non-functional requirements such as performance, security, availability, and scalability, which collectively determine how well the N-LMIS can support its functional modules and serve its diverse user base in a robust and efficient manner.

2.6.1. Coding Standards

To ensure standardized, comparable, and accurate labour market data, N-LMIS should develop referring internationally and nationally recognized classification systems. These coding standards are essential for system interoperability, consistent reporting, and alignment with national policies and global labour frameworks.

2.6.2. Service Level Agreement (SLA)

Service Level Agreement should define clear expectations between MoLESS and the technical team or vendor responsible for developing, hosting, and maintaining the N-LMIS.

It should include measurable service targets, such as:

Table 7 SLA

Component	Service Target/Description
System Uptime Guarantee	Minimum 99.5% monthly uptime for production systems, excluding scheduled maintenance.
Incident Response Time	< 2 hours for critical issues; < 4 hours for major issues; < 8 hours for minor issues.
Resolution Time	Critical: 8 hours; Major: 24 hours; Minor: 3 business days.
Backup and Recovery	Daily backups (every night at 00:00 hours) with 7 days instance of backup maintained. Weekly Backup (every Saturday night at 23:00 hours) with 5 weeks instance of backup maintained Monthly Backup (every month-end night at 22:00) with 3 months backup instance maintained.
Security Compliance	Annual VAPT and regular patching; Immediate mitigation for critical vulnerabilities.
Data Privacy & Protection	Full compliance with national data protection guidelines and GDPR-equivalent standards.
Disaster Recovery Testing	Bi-annual DR drill to ensure failover systems are operational and compliant.
System Performance	Response time < 2 seconds for 95% of transactions under normal load conditions.
Change Management	Formal approval and documentation required for any updates, patches, or configuration changes.

Monitoring and Reporting	Real-time system health dashboard; Monthly SLA compliance reports shared with MoLESS.
Penalty and Escalation	Repeated SLA breaches may lead to financial penalties, warnings, or contract termination depending on severity and recurrence.

2.6.3. Data Exchange

N-LMIS should receive data from other systems in a clear, consistent, and readable format to reduce errors, support fast integration, and ensure all systems can understand the shared information.

To support structured and consistent data exchange, a Central Master Data Dictionary shall be prepared to define and harmonize core datasets across all systems. This will ensure uniform use of classifications, taxonomies, and codes, thereby reducing duplication and enabling interoperability among integrated platforms.

Key Guidelines for Data Exchange

1. Use of Standardized Formats
 - Standardized field names and formats should be followed (e.g., first_name, dob, job_category) across all shared datasets.
 - Consistent data types should be used (e.g., dates in YYYY-MM-DD format, numeric fields without text).
 - Validation rules should be applied before data is sent (e.g., no blank mandatory fields, correct ID formats).
 - Document shared fields clearly, including data types, length limits, and descriptions.
2. Naming Conventions (Annex - 2) (DoIT, 2019)
 - a. Standardization across Systems naming conventions should ensure consistency across all government IT systems to promote interoperability and ease of integration.
 - b. Service-Oriented Architecture (SOA) Systems should be named and structured based on services they provide, aligning with SOA principles. This helps in modular development and reuse.
 - c. Clear Role and Responsibility Mapping Names should reflect the function and ownership of the system or component, making it easier to assign roles and manage accountability.
 - d. Open Standards Compliance Naming should follow open standards to ensure compatibility and future scalability.
 - e. User-Centric Design Names should be intuitive and easily understood by users, including citizens and government staff, to enhance accessibility and usability.
 - f. Security and Privacy Considerations Naming conventions must avoid exposing sensitive information and should align with data protection and confidentiality norms.
 - g. Interoperability Focus Systems should be named in a way that facilitates data exchange and integration with other government platforms.

3. Code Alignment

- Standardized classification codes (e.g., for occupations, industries, and qualifications) should be used where applicable to ensure consistency across platforms.

4. API-Based Communication

- Data exchange must occur via secure APIs (RESTful or SOAP, depending on system capability).
- APIs must follow the guidelines provided in Annex 3 – API Guidelines for Data Exchange with N-LMIS.

5. Authentication and Authorization

- Only authenticated systems and users should be allowed to exchange data with N-LMIS.

6. Frequency of Data Exchange

Depending on the use case, data exchange may be:

- Real-time
- Scheduled batch (e.g., daily or weekly sync)

2.6.4. API based Exchange

API-based data sharing should be the standard method for all systems connected to N-LMIS. It ensures secure, real-time, and automated data exchange.

Key Points

- All systems should expose APIs following national interoperability and security standards.
- APIs should use secure protocols (authentication, encryption) and formats like JSON.
- API development should be planned in phases based on each system's readiness.

Systems not yet ready for APIs should use temporary methods such as:

- Scheduled CSV/Excel uploads
- Secure file-sharing platforms (e.g., SFTP)
- Web forms with upload and validation features

These alternatives should only be used during a defined transition period and should be replaced by APIs as soon as possible.

Annex 3 – API Guidelines for Data Exchange with N-LMIS must be followed

2.6.5. Trainings for key-staffs

To ensure effective use and long-term sustainability of N-LMIS, all relevant staff at the MoLESS, DoFE, FEB, NAVT, MRCs, ESCs etc should be properly trained. Trainings should be practical, role-based, and repeated regularly to ensure that all users can operate the system with confidence and accuracy.

Key Training Focus Areas

- System Navigation: Staff should be well-versed in navigating the system interface efficiently.
- Data Management: Training should cover accurate procedures for data entry, editing, and validation.
- Reporting Skills: Users must understand how to generate, interpret, and utilize system-generated reports effectively.
- Role-Based Learning: Training materials should be tailored to specific roles (e.g., data entry operators, administrators, analysts).
- Continuous Learning: Refresher sessions should be conducted periodically to reinforce knowledge and introduce new features.
- Server Administration: Training should include server configuration, performance monitoring, and troubleshooting.
- Server Health Monitoring: Trainings must include protocols for monitoring server health indicators such as uptime, resource usage, and alert management.
- User Support: Staff should be trained to manage citizen/user support inquiries effectively and empathetically.
- Help Desk Support: Staff should learn to handle user queries and provide technical assistance.
- Backup & Restore Verification: Personnel should learn to perform and verify system backups and restoration processes to ensure data integrity and disaster recovery readiness.
- VAPT Reports: Staff must be equipped to interpret Vulnerability Assessment and Penetration Testing (VAPT) findings and verify appropriate fixes.

To ensure long-term sustainability and capacity-building within N-LMIS, a dedicated self-learning platform should be embedded in the system. This platform would serve as a centralized hub where key staff across all levels of government can access structured learning resources on system usage, server management, data backup procedures, and Vulnerability Assessment and Penetration Testing (VAPT). Integrating video tutorials for each module—covering both technical and operational aspects—will empower users to independently build their skills and troubleshoot issues as they arise. By making these tutorials available within the system itself,

2.6.6. Self-Service Learning & Support Framework

Instead of trying to conduct physical or instructor-led training for every job seeker or employer—which would be logistically and financially unfeasible—the N-LMIS blueprint can propose a self-service, scalable learning ecosystem embedded within the platform.

1. Interactive Onboarding Wizard
 - A step-by-step guide that appears when a user (job seeker or employer) first registers.
 - Walks them through creating a profile, searching/posting jobs, and using core features.
 - Can be re-launched anytime from the help menu.
2. Built-in Help Center & Knowledge Base

- Searchable library of articles, FAQs, and “how-to” guides, categorized for different user types.
- Available in multiple languages and optimized for mobile.
- 3. Video Tutorials & Walkthroughs
 - Short videos showing tasks like posting a vacancy, applying for jobs, or uploading training records.
 - Auto-captioned and downloadable for offline viewing.
- 4. Contextual Tooltips & Inline Guidance
 - On-page explanations or pop-ups triggered when a user hovers over a feature.
 - Keeps training in the flow of work without requiring them to leave the page.
- 5. AI-powered Chatbot for Guidance
 - 24/7 virtual assistant to answer questions, guide users step-by-step, and link to relevant help articles.
 - Can escalate complex issues to a human help desk agent.
- 6. Gamified Learning: Reward badges or points for completing profile setup, applying for jobs, posting vacancies, or attending online workshops.
- 7. Community Support Forum
 - Moderated discussion boards where job seekers and employers can ask questions and share tips.
 - Supported by ESC/MRC moderators for accuracy and trustworthiness.
- 8. Integration with Government Portals & Apps: Key tutorials and guidance also embedded in the Nagarik App and Shramsansar portal so users can access without needing to visit a separate training center.
- 9. Offline Support Materials: Printable quick-start guides and infographics distributed through Employment Service Centers, MRCs, and local governments for people without regular internet access.
- 10. Feedback Loop for Improvement
 - Simple “Was this helpful?” buttons on each guide or tutorial to track effectiveness.
 - Usage analytics to see which resources are most accessed and improve them over time.

2.7. RECOMMENDED TECHNOLOGY STACK

2.7.1. Backend

A modern, AI/ML-ready technology stack should be adopted to ensure scalability, flexibility, and future-proofing of the system. The platform should support integration with widely-used machine learning and data science libraries, enabling advanced analytics, predictive modeling, and intelligent automation. It must also be compatible with various external IoT devices and data collection tools—such as biometric systems, QR code scanners, and mobile sensors—to facilitate seamless data acquisition and real-time processing.

Additionally, the framework should allow for rapid development of APIs and web services, supporting modular architecture and efficient system interoperability.

At the time of developing this blueprint, Python (with Django/FastAPI) is recommended because it is AI/ML-native, device-friendly, scalable, secure, and ideal for API-first, data-driven government platforms like N-LMIS.

Please note: This recommendation is not exclusive, allowing for flexibility and contextualization in the final technology selection and decision.

The API Guidelines for Data Exchange with N-LMIS is presented in Annex 3.

2.7.2. Frontend

A modern, component-based frontend framework should be used to deliver a dynamic, responsive, and user-friendly interface. The chosen technology should support modular development, reusability of components, and seamless integration with backend services to ensure maintainability and scalability of the system.

At the time of developing this blueprint React.js is suggested as the more appropriate technology for this purpose.

Please note: This recommendation is not exclusive, allowing for flexibility and contextualization in the final technology selection and decision.

2.7.3. Database

The N-LMIS should utilize an enterprise-grade relational database management system (RDBMS) capable of handling large-scale, complex, and relational data with high performance and reliability. The selected solution should support advanced features such as geospatial data handling, full-text search, complex queries, and robust relational integrity. Considerations in choosing the database technology should include scalability, compatibility with government IT infrastructure, total cost of ownership (including licensing and maintenance), and long-term sustainability for large-scale government use.

At the time of developing this blueprint PostgreSQL (for complex relational data management) being opensource and powerful is suggested as the more appropriate technology for this purpose.

Please note: This recommendation is not exclusive, allowing for flexibility and contextualization in the final technology selection and decision.

2.7.4. Mobile App

Android/iOS mobile app with offline capabilities in Flutter or ReactNative. They both support cross-platform (Android/iOS), however, ReactNative requires slightly more effort for offline and complex UI features compared to flutter.

Please note: This recommendation is not exclusive, allowing for flexibility and contextualization in the final technology selection and decision.

2.8. DIGITAL READINESS MATRIX (SIMPLIFIED SNAPSHOT)

The Digital Readiness Matrix assesses MoLESS's current capacity to develop and operate the N-LMIS, identifying both strengths and gaps. It serves as a baseline assessment for prioritizing actions that will ensure the system is built on a stable, interoperable, and sustainable foundation.

Table 8 Digital Readiness Matrix

Domain	Current Status	Implication for N-LMIS	Immediate Action Required
Software	Partially End-of-Life	Legacy systems (FEIMS, FEWIMS) may limit integration and cause inefficiencies.	Re-engineer FEIMS and FEWIMS; develop NAVT MIS and core N-LMIS platform.
ICT Infrastructure	Partially End-of-Life	Insufficient server and DR capacity may affect uptime and scalability.	Install upgraded servers and establish a disaster recovery facility.
Staff Digital Literacy	Moderate	Limited capacity in LMS use, analytics, and system administration could slow adoption.	Deliver targeted training in LMS, analytics, and N-LMIS administration.
Interoperability	Weak	Current systems lack API compliance with GEA/NeGIF, risking data silos.	Build API gateway, harmonize master codes, enforce interoperability standards.
Human Resources	Limited	Inadequate technical and administrative staffing may hinder rollout and support.	Recruit/assign dedicated N-LMIS operations and support team.
Policy & Guidelines	Limited	Lack of clear IT governance may result in inconsistent standards and risks to sustainability.	Issue interim IT/data governance guidelines; develop full IT policy framework.

2.9. DATA CONFIDENTIALITY, PROTECTION & SECURITY

The protection of personal and sensitive data is paramount to ensure public trust, compliance with global standards, and the safe operation of the N-LMIS. A robust security and privacy framework must be implemented from the design stage and maintained continuously.

Recommended Security Measures

- **Data Encryption at Rest and in Transit:** All sensitive data (e.g., personal identifiers, employment records, welfare claims) must be encrypted using AES-256 standard for data at rest, and TLS 1.3 for data in transit between servers, APIs, and client devices.
- **Two-Factor Authentication (2FA):** For all administrative and user accounts with access to sensitive modules, enable 2FA via OTPs or authenticator apps to minimize unauthorized access risk.

- **Role-Based Access Control (RBAC):** Enforce strict user access policies by assigning roles (e.g., admin, data-entry, report-viewer) and limiting data visibility and actions based on predefined rules.
- **Comprehensive Audit Logs:** Maintain immutable logs of all system activities including logins, data changes, file access, and API transactions. Logs should be automatically backed up and retained for a minimum of 3 years.
- **GDPR-Inspired Privacy Policy**
 - o Implement a transparent privacy policy modeled after international best practices like the EU's General Data Protection Regulation (GDPR), including:
 - o Consent management for data collection
 - o Right to view and correct personal data
 - o Data retention policies
 - o Protocols for breach notification
- **Secure API Gateway:** Use a centralized, secure API Gateway server to monitor, authenticate, and throttle API traffic between systems, preventing misuse and ensuring data consistency.
- **Data Backup and Recovery:** Automate full daily backups of application files, databases, and logs. Use encrypted backups and store copies both onsite and at a Disaster Recovery (DR) site with hourly sync.
- **Periodic Penetration Testing and Security Audits:** Engage third-party cybersecurity firms to conduct VAPT (Vulnerability Assessment and Penetration Testing) at least annually.

2.10. GOVERNANCE AND RISK MITIGATION

Effective governance structures and proactive risk mitigation strategies are essential to ensure that N-LMIS remains a sustainable, secure, and adaptive platform.

Governance Recommendations:

- **Establish a Digital Oversight Committee:** Form a high-level committee under MoLESS to provide policy direction, oversee data governance, and resolve inter-agency issues related to N-LMIS. The committee should include representatives from MoLESS, DoFE, FEB, DoNIDCR, MoFAGA, CTEVT, and development partners.
- **Formalize SLAs and Vendor Contracts:** Define detailed Service Level Agreements (SLAs) with all technology vendors and service providers. SLAs must specify uptime guarantees, response times, backup frequencies, and escalation protocols.
- **Adopt Change Management Protocols:** Implement structured approval and testing processes before any software updates, feature rollouts, or hardware changes to reduce the risk of disruptions.
- **Maintain a Disaster Recovery (DR) Site in Hetauda**
 - o Deploy a mirror site in Hetauda, located in a different seismic zone than the primary DC. Ensure:
 - o Real-time data replication

- o Automated failover mechanisms
- o Independent power supply and internet redundancy
- o Periodic DR drills and failover testing
- Develop and Maintain a Risk Register: Identify, score, and monitor risks across technical, operational, and institutional domains. Update mitigation plans regularly.
- Cybersecurity Awareness & Capacity Building
 - o Train all MoLESS and provincial stakeholders on:
 - o Data privacy and security hygiene
 - o Incident reporting procedures
 - o Secure system usage practices
- Establish Legal Frameworks for Data Ownership and Sharing: Clearly define that all data collected by N-LMIS and integrated systems is the property of the Government of Nepal, not of any individual ministry or department. Use MOUs or legal clauses to govern sharing, rights, and responsibilities.

CHAPTER 3 – INSTITUTIONAL READINESS, DEVELOPMENT & DEPLOYMENT PLAN

The successful implementation of the Nepal Labour Market Information System (N-LMIS) requires a dual-track approach—simultaneously preparing institutional structures and deploying the technical solution. While software development, system integration, and infrastructure deployment are critical, the long-term sustainability of N-LMIS depends equally on institutional readiness, governance mechanisms, and policy alignment.

This chapter outlines both the institutional preparation measures and the technical deployment roadmap needed to ensure that the N-LMIS is not only operational within the planned timeframe but also future-proof and sustainable.

3.1. INSTITUTIONAL READINESS SCOPE

Institutional readiness is a critical and foundational component of the Ministry's digitalization blueprint, serving as the preparatory phase to ensure a successful and sustainable digital transformation. This section details the necessary strategic and operational measures to be undertaken, including the establishment of robust governance frameworks and the implementation of key technological enablers.

A primary objective of this phase is the formalization of the Ministry's IT Policy, which will encompass comprehensive guidelines for software development, data recovery, licensing, maintenance, and compliance with the Government Enterprise Architecture and Interoperability Framework. To facilitate seamless data exchange across the public sector, the Ministry will develop and publish a central Master Data Dictionary and API specification documents, ensuring data standardization and validation. Furthermore, the establishment of cross-ministerial Memorandums of Understanding (MoUs) will formalize data-sharing protocols with other government agencies, and the deployment of a Unified API Gateway will serve as the secure conduit for all data transactions. These foundational steps are essential for creating an integrated, secure, and interoperable digital ecosystem that supports the Ministry's long-term strategic objectives.

3.1.1. IT Policy and Governance Framework

- Minimum IT governance guidelines for interoperability, APIs, data ownership, and security should be approved.
- A full MoLESS IT Policy covering procurement, licensing, disaster recovery, maintenance, SLAs, and change management should be developed.
- A permanent IT Governance Framework with clear architecture standards and accountability should be established.

3.1.2. Institutional and Governance Structures

- The N-LMIS Bureau should be established with defined staffing, roles, and budget lines. A dedicated

N-LMIS Bureau within MoLESS should be made responsible for the daily operations, data governance, coordination, and improvement of the system. The bureau should provide leadership, technical oversight, and accountability. It should ensure that N-LMIS remains updated, integrated with new systems, and responsive to user needs. Having a permanent unit also helps with sustainability—so that N-LMIS continues to function even when projects or external support end.

- Formal linkages should be created with DoIT for compliance with e-governance and cybersecurity frameworks, and with the National Planning Commission (NPC) for alignment with labour market policy priorities.
- Cross-ministerial MOUs with DoFE, FEB, SSF, CTEVT, DoNIDCR, IRD, Immigration, and others should be developed for secure and standardized data sharing.
- A multi-stakeholder Technical Advisory Group should be formed for strategic oversight and global best-practice alignment.

3.1.2.1. ESCs as Digital Intermediaries and Assisted Access Model

To address the digital divide and ensure equitable access to N-LMIS services, Employment Service Centers (ESCs) shall be formally designated as Digital Intermediaries within the N-LMIS ecosystem.

ESCs will function as official offline entry points for job seekers, informal workers, returnees, and other vulnerable populations who lack digital access or literacy. Trained ESC officers will support walk-in users by conducting structured interviews, verifying documents, and entering accurate data into N-LMIS on their behalf.

A three-tier, SLA-driven support model shall be institutionalized:

- o Level 1: ESC-based assisted support for registration, updates, and basic grievances
- o Level 2: Central MoLESS support units handling escalations, account issues, and cross-system cases
- o Level 3: Technical vendor support for system-level issues

All support requests will be managed through a centralized ticketing system with defined resolution timelines, performance metrics, and audit trails.

To enhance efficiency and scalability, AI-enabled tools—such as multilingual chatbots, LLM-powered knowledge bases, and automated grievance triaging—shall be integrated to assist both users and support staff.

ESC performance shall be evaluated not only on the number of registrations, but on data quality, successful job matches, grievance resolution time, and user satisfaction, ensuring a shift from quantity-based to outcome-based service delivery.

3.1.3 Interoperability Standards

- National and international classification codes for occupations, industries, skills, and standardized province/district/municipality codes should be adopted (Refer Annex-2).
- A Master Data Dictionary and API specification guide for all MoLESS-linked systems should be published.

- A unified API Gateway should be implemented for secure, real-time, and controlled data exchange.

3.1.4 Inclusivity and Accessibility

- A multilingual, mobile-first platform with offline capability for rural and low-connectivity areas should be built.
- GESI principles should be applied to ensure accessibility for women, youth, persons with disabilities, and marginalized groups.
- User personas and feedback loops should be integrated to improve usability for low-literacy users.

3.1.5. Capacity Building and Skills Readiness

- Role-specific training should be conducted for MoLESS staff, ESCs, MRCs, and system administrators.
- Training should be provided in AI analytics, API integration, and security monitoring.
- A Self-Service Learning & Support Platform should be implemented to enable ongoing user education without requiring constant physical training.

3.2. INFRASTRUCTURE PLAN

The National Labour Market Information System (N-LMIS) should be hosted in a secure, scalable, and high-availability environment designed to ensure minimal downtime, optimal performance, robust disaster recovery capabilities, and clear logical separation from other systems. To achieve this, following plan must be followed.

Table 9 System Integration Matrix

Server	Purpose
Physical N-LMIS Server	
Frontend v-server	Front-end application
Backend v-server	Back-end application
Database v-server	Database
Physical N-LMIS DC	
Frontend v-server	Front-end application for high-availability cluster at the primary DC location
Backend v-server	Back-end application for high-availability cluster at the primary DC location
Database v-server	Database for high-availability cluster at the primary DC location
Physical AI/ML Server	
AI Server	Receive data payload and return structured JSON with result
Physical Application Server	
Application Servers	The virtual servers based on the resource availability.
Physical Application Server DC	
Application Servers	High-availability cluster at the primary DC location

3.3. HUMAN RESOURCES PLAN

The proposed Human Resource Plan (HRP) provided below is a critical component for ensuring the long-term success and sustainability of the N-LMIS. This section outlines a strategic framework for managing the human capital required to build, implement, and maintain the N-LMIS. It addresses the need for a skilled workforce by identifying key roles and responsibilities, defining training and capacity-building requirements, and establishing a roadmap for talent acquisition and development.

The HR team suggested below shall

- Ensure 24/7 system stability, uptime, and proactive monitoring.
- Facilitate rapid integration with multiple government systems (e.g., FEIMS, SSF, CTEVT).
- Enable real-time analytics and AI-based forecasting for policymakers.
- Provide direct support to users, including vulnerable groups (women, PwDs, returnees).
- Maintain data integrity, security, and legal compliance.
- Drive institutionalization and sustainability of N-LMIS under MoLESS.

Table 10 Recommended HR Composition

Category	Number of Staff (Approx.)
Management & Directors	3–4
Technical Team	3–4
Data & Analytics	2–3
User Support & Outreach	4–8
Total	12–19

3.3.1. Organizational Structure of the N-LMIS Bureau

The establishment of an effective organizational structure is paramount for the efficient and sustainable operation of the Nepal-Labour Market Information System (N-LMIS) Bureau. This section details the proposed organizational framework, outlining the key units, roles, and reporting lines necessary to manage the system's core functions. The structure is designed to promote clear communication, streamline decision-making processes, and ensure accountability across all levels. By defining a robust organizational blueprint, this plan aims to equip the N-LMIS Bureau with the institutional capacity required to successfully implement the digitalization initiative and serve as the central authority for all labor market data.

Table 11 Organizational Structure of the N-LMIS Bureau

Position Title	Rank/Level	Key Responsibilities
Executive Director, N-LMIS	Under Secretary or higher (Gazetted Class I)	Overall leadership, strategic planning, and coordination with MoLESS, other ministries, development partners, and stakeholders. Policy direction, budget approval, and institutional representation.

Director, N-LMIS	Under Secretary (Gazetted Class II)	Strategic leadership, cross-ministry coordination, planning and budgeting, national reporting, and policy alignment. Manage labour market analytics, AI/ ML insights, data modeling, visualization, and report generation.
Director – Technical Operations	Under Secretary (Gazetted Class II)	Oversee system administration, hardware/ software maintenance, security, and API/ integration infrastructure.
Deputy Director – User Services & Outreach	Section Officer (Gazetted Class III)	Supervise user support teams, outreach programs, helpdesk operations, feedback collection, and training.
Deputy Director – Shramsansar	Section Officer (Gazetted Class III)	Supervise Shramsansar Operation and Support.

3.3.2. Core Technical and Support Team

Table 12 Core Technical and Support Team

Position Title	Level/Grade	Key Responsibilities
System Administrator	IT Officer (Gazetted III)	Manage servers (DC/DR), network, security (firewalls, encryption), backups, and system uptime.
Software Administrator	IT Officer (Gazetted III)	Manage Software, API, APP
Liason and Support Administrator	IT Officer (Gazetted III)	Inter-ministerial Coordination with DoFE, FEB, SSF, MoFAGA, DoNIDCR, CTEVT, etc. for integration, MOUs, and data exchange.

3.3.3. Analytics and Data Management

Table 13 Analytics and Data Management

Position Title	Level/Grade	Key Responsibilities
Labour Market Analyst	Officer Level	Analyze trends in employment, migration, skills supply-demand, and prepare policy-oriented briefs.
Data Quality & Validation Officer	Assistant Officer	Ensure data consistency, remove redundancies, and validate incoming data from various systems. Ensure system meets gender equality and inclusion standards; monitor GESI-specific indicators.

3.3.4. User Support and Helpdesk Unit

Table 14 User Support and Helpdesk Unit

Position Title	Level/Grade	Key Responsibilities
Helpdesk Supervisor	Non-Gazetted First Class	Lead user support operations, report recurring issues, manage support workflows.
Chatbot & AI Support	Assistant Level	Train and update AI chatbot with FAQs, intents, GESI-sensitive scripts.
Phone/ Email Support Executives (2–3)	Support Staff	Respond to user queries via phone, email, or chat; escalate technical issues.

3.4. PHASED ACTION PLAN

The Phased Action Plan section outlines the strategic and incremental roadmap for the digitalization of the Ministry and deployment of the comprehensive N-LMIS. Each phase is defined by specific objectives, key activities, and a clear timeline, ensuring a systematic and measurable approach to implementation. This phased methodology allows the Ministry to effectively manage resources, mitigate risks, and build momentum by delivering tangible results at each stage, ultimately leading to a fully digital and integrated operational environment.

The plan is divided into three key phases:

Short-Term (0–18 Months): This phase focuses on institutional preparation and infrastructure setup. Key actions include developing the Ministry's IT policy, establishing a central N-LMIS/ShramSansar Coordination Unit, and formalizing data-sharing agreements with other ministries and agencies. This phase also includes recruiting and training staff, procuring necessary hardware, including the Open Data Platform, Master Data standards, and beginning the development of the ShramSansar platform as the starting point of the N-LMIS, re-engineering of existing systems like the Foreign Employment Information Management System (FEIMS) and Foreign Employment Web Information Management System (FEWIMS), and development of new systems for NAVT and the Returnee MIS.

Medium-Term (18–36 Months): This phase is dedicated to system and institutional expansion. The N-LMIS Coordination Unit will transition into a full N-LMIS Bureau, and the system will be enhanced with a Workforce Analytics Engine. Key data integration activities will also occur, linking the N-LMIS with other platforms such as the Vital Registration system, the Returnee Profiling (ReMi) system, and various financial institutions⁵. The Ministry will launch a grievance module.

Long-Term (3–5+ Years): The final phase is focused on platform maturity, sustainability, and institutionalization. This includes launching predictive labor forecasting tools and integrating the N-LMIS with national planning and budgeting processes. The long-term goal is to fully establish the N-LMIS Bureau with dedicated budgets and staff, while also embedding gender equality, social inclusion (GESI), and eco-sustainability considerations into the system's operations.

Table 15 Phased Action Plan

Timeline	Category	Key Actions	Responsible
0-18 Months	Institutional Preparation	- Develop MoLESS IT Policy, including - software development, licensing, disaster recovery (DR), maintenance, and service-level agreements (SLAs) - compliance with the Government Enterprise Architecture (GEA) and Nepal Government Interoperability Framework (NeGIF) - IT Governance Framework defining digital architecture guidelines, change management processes, and accountability mechanisms - Data governance and privacy policy - Develop and publish a central Master Data Dictionary and API specification documents to guide data entry, exchange, and validation. - Define and adopt standard taxonomies and codes for key fields such as: - Occupation (e.g., ISCO-08) - Industry sectors (e.g., NSIC/Nepal standard codes) - Skills and qualifications (linked to National Qualification Framework – NQF) - Provinces, districts, municipalities - GESI identifiers (e.g., disability status, ethnicity, gender) - Promote open data standards and secure API frameworks to enable public access while maintaining confidentiality. - Launch Open Data & API portal - Formalize cross-ministerial MOUs and data-sharing protocols between MoLESS, DoFE, FEB, SSF, CTEVT, DoNIDCR, IRD, Immigration, and others. - Establish central N-LMIS Coordination Unit or future N-LMIS Bureau at with clear staffing, mandates, and decision-making authority. - Recruit and train MoLESS and ESC staff - Launch N-LMIS awareness campaign	MoLESS with MOICT/DOIT
			MoLESS
			MoLESS
			MoLESS
			MoLESS
			MoLESS
			MoLESS
			MoLESS
			MoLESS
			MoLESS

18–36 Months Medium-Term	Infrastructure Setup	Establish Monitoring & Evaluation Framework	MoLESS
		Allocate dedicated budgets for O&M (Operation and Maintenance), training, system upgrades, and long-term data infrastructure investments.	MoLESS
		Procure and install servers, DR site, and firewall	MoLESS
		Start Development of N-LMIS	MoLESS
		Re-Engineer FEIMS	DoFE
		Re-Engineer FEIMS	FEB
		Develop NAVT MIS	NAVT
		Integrate FEIMS Data to N-LMIS,	MoLESS/ DoFE
		Integrate FEWIMS data to N-LMIS,	MoLESS/ FEB
		Integrate ILMIS data to N-LMIS	MoLESS/ DoLOS
System Expansion – Institutional set up	Data Integration (Phase I)	Integrate NAVT data to N-LMIS,	MoLESS/ NAVT
		Purify unique non-redundant EMIS data to a harmonized database	MoLESS
		Integrate Shramsansar data with N-LMIS	MoLESS
		Transition the N-LMIS Coordination Unit into a full N-LMIS Bureau with budget lines, staffing, and legal mandate under MoLESS.	MoLESS
		Institutionalize periodic data cleaning, system evaluation, and update cycles through internal protocols and third-party assessments.	MoLESS
		Regularly update data protection protocols to align with international privacy regulations (e.g., GDPR-inspired practices)	
		Add Workforce Analytics Engine (demand/ supply, labor tracking, labor status, forecasting, job matching)	MoLESS
		Integrate Vital Registration with N-LMIS for individual profile	MoLESS/ MoNIDCR
		Integrate PAN with N-LMIS for Employer profile	MoLESS/IRD
		Integrate PAN with N-LMIS for Employer profile	MoLESS/ DOIT
		Enable dashboards for public/ admin	MoLESS

3-5+ Years Platform Maturity		▪ Deploy API Gateway Server	MoLESS
	Data Integration (Phase II)	▪ Integrate with Returnee Profiling (ReMi)	MoLESS/ ReMi
		▪ Integrate with CTEVT	MoLESS/ CTEVT
		▪ Integrate with Vital Registration	MoLESS/ DoNIDCR
		▪ Integrate with LRIMS	MoLESS/ DoLMA
		▪ Integrate with CIT, Employee Provident Fund, SSF	MoLESS/ CIT/ EPF/ SSF
	Service & Ecosystem Expansion	▪ Integrate with Nepal Rastra Bank	MoLESS/ NRB
		▪ Integrate with EPS	MoLESS/ EPS
		▪ Deploy Grievance module	MoLESS
	Long-Term Platform Maturity	Platform Maturity	▪ Deploy unemployed tracking module using SSF
▪ Link private job portals and gig platforms			MoLESS
▪ Launch predictive labour forecasting tools			MoLESS
Policy & Program Alignment		▪ Use N-LMIS for PMEP, SaMi, ReMi targeting	MoLESS
		▪ Integrate with national planning and budgeting	MoLESS/NPC
		▪ Support labour diplomacy with data	MoLESS
Sustainability & Institutionalization		▪ Establish N-LMIS Bureau under MoLESS	MoLESS
		▪ Develop dedicated IT Policy for labour data	MoLESS
		▪ Secure HR and O&M budget lines	MoLESS
		▪ Institutionalize M&E and regular audits	MoLESS
	▪ Embed GESI and eco-sustainability considerations	MoLESS	

3.5. KEY MILESTONES, DELIVERABLES AND TIMELINE

The following key milestones represent a comprehensive, multi-phased approach to the Ministry's digital transformation. The plan is structured across three distinct timelines: Short-Term (0–18 Months), which focuses on institutional and infrastructural preparation; Medium-Term (18–36 Months), dedicated to system expansion and further data integration; and Long-Term (3–5+ Years), which emphasizes platform maturity and long-term sustainability.

In the initial Short-Term phase, the focus is on laying a solid foundation by developing the Ministry's IT Policy and establishing a central Master Data Dictionary and API specifications. This phase also involves establishing the N-LMIS Coordination Unit, initiating cross-ministerial data-sharing MoUs, and beginning the re-engineering of core systems such as Shram Sansar, FEIMS and FEWIMS.

The Medium-Term phase builds on this foundation by transitioning the N-LMIS Coordination Unit into a full N-LMIS Bureau. Key system enhancements include deploying a Workforce Analytics Engine and a Unified API Gateway, as well as integrating data from a wide range of external sources, including Vital Registration and the Nagarik App.

The final phase, Long-Term, is dedicated to institutionalizing the N-LMIS Bureau and embedding the system into national planning and budgeting processes. This phase will see the deployment of advanced tools like predictive labor forecasting and the institutionalization of long-term sustainability measures.

Table 16 Key Milestones, Deliverables and Timeline

Phase	Milestone	Milestone Title	Key Deliverables	Timeline
Short-Term (0-18 Months)	M1	Institutional Preparation	- MoLESS IT Policy Developed - Central Master Data Dictionary Developed - Standard taxonomies and codes developed - Open Data & Developer API portal launched	Month 5
	M2	Institutional Setup & Staff Trained	- Core N-LMIS unit established at MoLESS - MOUs initiated with SSF, Immigration, CTEVT, DoNIDCR, IRD - ESC/MoLESS staff trained	Month 8
	M3	Governance Tools and User Services Live	- Data governance and privacy policy finalized - Awareness campaign launched - Helpdesk operational	Month 9
	M4	Infrastructure Setup Completed	- Servers, firewall, DR site installed - Hosting and network configured	Month 6
	M5	Core System Development Completed	- N-LMIS core platform developed - FEIMS and FEWIMS re-engineered - NAVIT MIS developed	Month 10
	M6	Phase I - Data Integration Operational	- FEIMS, FEWIMS, NAVIT, ILMIS integrated - Shramsansar integrated - EMIS data cleaned and harmonized	Month 12
	M7	System Expansion – Institutional set up	- N-LMIS Coordination Unit transitioned into a full N-LMIS Bureau - Periodic data cleaning, system evaluation, and update cycles institutionalized	

Medium-Term (18-36 months)	M8	System Expansion Completed	▪ Workforce Analytics Engine deployed ▪ NID & PAN integration ▪ Integrated with Nagarik App ▪ Admin/ public dashboards live ▪ API Gateway deployed	Year 2
	M9	Phase II Data Integration Completed	▪ Integrated with ReMi, CTEVT, Academic Records, Vital Registration, LRIMS, CIT, Employee Provident Fund, NRB, EPS	Year 2.5
	M10	Ecosystem Integration and Service Expansion	▪ SSF-based unemployment tracker deployed ▪ Private job/gig platforms linked	Year 3
	M11	Predictive & Advanced Analytics Live	▪ Labour forecasting tools- Heatmaps and mobility analytics	Year 4
	M12	Policy & Program Integration in Use	▪ N-LMIS used for PMEP, SaMi, ReMi targeting ▪ Data feeding into national planning and budgeting ▪ Used for labour diplomacy evidence base	Year 4-5
Long-Term (3-5+ Years)	M13	Institutionalization and Sustainability Secured	▪ N-LMIS Bureau established under MoLESS ▪ IT policy for labour data adopted ▪ HR and O&M budgets secured ▪ M&E framework institutionalized ▪ GESI and eco-sustainability embedded	Year 5

3.6. ROLE AND RESPONSIBILITIES OF STAKEHOLDERS

A successful digital transformation requires the active participation and collaboration of a wide range of stakeholders. The Ministry of Labour, Employment and Social Security (MoLESS) is central to this initiative, driving the overall strategy and implementation. However, the project's success is dependent on formal cooperation with key external agencies, including the Ministry of Communication and Information Technology (MOICT), Department of Information Technology (DOIT), and economic and social security entities like the Social Security Fund (SSF) and Inland Revenue Department (IRD). The clear delineation of roles and responsibilities ensures a unified and interoperable digital ecosystem.

Table 17 Role and Responsibilities of different Stakeholders

Stakeholder	Role	Key Responsibilities
Government of Nepal (GoN)	Data Owner and Policy Authority	- Owns all labour-related data collected via public systems - Enforces national directive on data sharing and system interoperability
MoLESS (Ministry of Labour, Employment and Social Security)	Lead Implementing Agency	- Leads planning, implementation, and oversight of N-LMIS - Hosts and manages the N-LMIS system - Signs MOUs with other ministries/departments for data integration - Uses data for labour policies, planning, and monitoring - Ensures sustainability, GESI, and data governance frameworks
Line Ministries, Departments, and Agencies (e.g., DoFE, FEB, DoNIDCR, SSF, CTEVT, IRD, Immigration)	Data Contributors and Integration Partners	- Share relevant data through secure APIs or batch systems - Maintain data accuracy and updates - Participate in data standardization and governance committees - Ensure use of common identifiers (e.g., NID, Passport)
N-LMIS Bureau / Technical Unit (within MoLESS)	System Operator and Technical Coordinator	- Manage infrastructure, database, and API Gateway - Monitor integration, security, and data flow - Develop dashboards, analytics, and reporting tools - Ensure compliance with privacy and access protocols - Coordinate among all integrated systems
Employment Service Centres (ESCs), MRCs and Local Governments	Local Data Collectors and Users	- Register job seekers, returnees, and unemployed individuals - Update profiles and service records regularly - Support user access to N-LMIS (grievance, jobs, referrals) - Provide feedback and local insights for decision-making
Private Sector and Civil Society Organizations (e.g., job portals, training centers, NGOs)	Ecosystem Partners	- Share job demand or training data using agreed formats - Comply with N-LMIS data and privacy standards - Collaborate on reintegration, up-skilling, and placements - Support innovation and use of N-LMIS tools

Donors and Development Partners (e.g., Helvetas/ReMi, ILO, World Bank)	Technical and Financial Support	- Provide funding, advisory, and capacity building - Align their projects and platforms with N-LMIS goals - Participate in reviews, evaluations, and technical committees
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3.7. MONITORING AND EVALUATION PLAN

The Monitoring and Evaluation Plan for N-LMIS outlines mechanisms to track progress, assess key performance indicators, and ensure quality implementation. It includes regular reporting, stakeholder reviews, system audits, and feedback loops. The plan supports evidence-based decision-making and continuous improvement to ensure effectiveness, sustainability, and long-term institutional integration.

This monitoring and evaluation plan is provided below as a recommendation for the successful implementation and functioning of the N-LMIS. Actual annual milestones and targets will be reviewed and finalized by the Ministry of Labour, Employment, and Social Security (MoLESS) to ensure alignment with evolving needs and objectives.

3.7.1 Mechanisms for tracking progress

The blueprint recommends progress to be tracked through structured milestone tracking, reporting, and committee reviews.

Table 18 Mechanisms for tracking progress

Mechanism	Purpose	Frequency	Responsible Unit
Milestone-based Tracking	Track completion of defined deliverables against timeline	Monthly	N-LMIS Project Management Unit (PMU) at MoLESS
Workplan and Gantt Review	Visual tracking of activity schedules and dependencies	Quarterly	MoLESS PMU + Technical Team
Progress Reports	Summarize accomplishments, delays, risks, and next steps	Bi-monthly / Quarterly	Project Team Leads
Steering Committee Reviews	Validate progress, address bottlenecks, approve changes	Quarterly	MoLESS, Donors, ReMi, Helvetas
Field Monitoring Visits	Verify system use, data entry, and user capacity at provincial/ ESC level	Semi-Annually	Monitoring & Evaluation Officer, Regional Focal Points
Mid-Term and Final Evaluations	Assess outcomes, process quality, and sustainability	Midpoint & Project End	Independent Evaluator or Donor-led

3.7.2. KPIs and success metrics

KPIs will assess not just development output, but also usage, integration, and long-term sustainability.

3.7.2.1. System Development & Deployment KPIs

Table 19 System Development & Deployment KPIs

Indicator	Target	Milestone
% completion of core N-LMIS system	100%	By Month 6
No. of modules developed and operational	≥ 10	By Year 2
Mobile app launch	1 functional app	By Year 2
Data integration completed (systems)	≥ 10 key systems	By Year 2.5
API gateway deployed	Yes	By Year 2

3.7.2.2. Data and Interoperability KPIs

Table 20 Data and Interoperability KPIs

Indicator	Target	Milestone
% real-time data sync between integrated systems	≥ 90%	Ongoing
Unique job seeker profiles created	≥ 500,000	By Year 3
Returnee migrant records integrated	≥ 100,000	By Year 3
Data-sharing MOUs signed	≥ 8 key institutions	By Year 1

3.7.2.3. Utilization and Impact KPIs

Table 21 Utilization and Impact KPIs

Indicator	Target	Milestone
Registered job seekers actively using the platform	≥ 60% of profiles	By Year 3
Number of jobs matched through the platform	≥ 200,000	By Year 4
Number of ESCs submitting data monthly	100% compliance	After Year 2
Stakeholder satisfaction score	≥ 80% (user survey)	Annual

3.7.2.4. Institutional & Sustainability KPIs

Table 22 Institutional and Sustainability KPIs

Indicator	Target	Milestone
Dedicated N-LMIS unit established	Yes	By Year 1
HR and O&M budget allocated	Yes	By Year 5
National IT Policy for labour data adopted	Yes	By Year 5
M&E and audit systems operational	Yes	By Year 3

3.7.3. Continuous Improvement Process

Continuous improvement will be ensured through agile sprints, feedback systems, audits, and learning loops.

Table 23 Continuous Improvement Process

Process	Description	Frequency	Owner
User Feedback Loops	Gather feedback through surveys, support tickets, and usage analytics	Continuous	Helpdesk Team, QA Unit
Agile Sprint Reviews	Review functionality every 2–3 weeks and improve iteratively	Bi-weekly (during dev)	Development Team
Quarterly Learning Workshops	Internal review of lessons learned, best practices, and course corrections	Quarterly	M&E Lead, MoLESS PMU
Annual System Audit	Evaluate data quality, security, GESI, and privacy compliance	Annually	Independent Auditor
Policy Adaptation Reviews	Adjust data governance, access, and usage policy based on trends	Annually	MoLESS Policy Unit

3.8. INTEROPERABILITY IMPLEMENTATION

Effective interoperability is the cornerstone of the N-LMIS, ensuring seamless exchange of structured, timely, and meaningful labour-related data across multiple government and partner systems. Given the fragmented digital ecosystem in Nepal, the N-LMIS must adopt both technical standards and institutional protocols to enable system-to-system communication without redundancy or data loss.

3.8.1. Interoperability Principles

N-LMIS will adopt the following key principles for interoperability:

- **Standardization:** All data exchanges must comply with international and national standards (e.g., ISCO, NSIC/NSIC, NQF, GEA, NeGIF).
- **Loose Coupling:** Systems will remain independent but communicate via well-defined APIs.
- **Security & Privacy:** Encrypted data transfer, OAuth2.0/Token-based authentication, and audit logs.
- **Scalability:** API architecture designed for future integration with new systems, including international LMIS platforms.

3.8.2. Master Code Harmonization

To ensure consistency in data interpretation across systems, a centralized Master Code Registry will be developed and hosted by N-LMIS for:

- Occupation Codes (ISCO)
- Industry Codes (NSIC)

- Training & Skills Codes (NQF, ESCO)
- Geographic Codes (Province/District/Municipality/Ward)
- Education Levels (ISCED)

All integrated systems must map their internal classifications to these master codes before data exchange.

3.8.3. System-Specific Integration Plans

Table 24 System Specific Integration Plans

System	Data to Exchange	Integration Mechanism
FEIMS (DoFE)	Migrant records, foreign job demands, permits	REST API with push-pull mechanism
FEWIMS (FEB)	Welfare claims, medical, disability, death data	Secure API and scheduled sync
Shramsansar	Jobseeker and employer data, job postings	Live data fetch via authenticated APIs
NAVT MIS	Training records, certifications, provider info	Batch uploads + API for real-time data
SSF/EPF/CIT	Contribution history, employer-employee links	API access on agreed schedule
Immigration	Travel records for migrant verification	One-way API pull (from DoI)
Vital Registration	Birth, death, internal migration info	Secure batch sync and API
Universities/CTEVT	Graduation and enrollment data	Batch-based standard XML/JSON upload
ReMi (Returnee DB)	Returnee profile, reintegration support	API push with consent-based model

3.9. TECHNICAL DEPLOYMENT STANDARDS AND SECURITY MEASURES

To ensure a secure, efficient, and future-proof deployment of N-LMIS, the following technical deployment and security standards must be incorporated during system development, hosting, and scaling phases:

3.9.1. Containerization and Orchestration

- Docker for packaging microservices and application modules to ensure consistency across environments (development, testing, and production) must be adopted.
- Kubernetes for container orchestration to manage scaling, self-healing, load balancing, and service discovery across the N-LMIS platform must be implemented.
- Each service (e.g., job matching engine, AI analytics module, API gateway) should be containerized and managed independently to enable modular deployment and updates.

3.9.2. Authentication and Authorization

- OAuth 2.0 protocol for secure authentication and delegated access control must be used.
- Role-based access control (RBAC) for all user tiers (admin, data contributor, public user, service desk, etc.) must be enabled.

Integrate with NID and Nagarik App for identity verification, when appropriate.

3.9.3. Mandatory Security Audits and VAPT

- Regular Vulnerability Assessment and Penetration Testing (VAPT) at least twice a year, covering the API layer, server infrastructure, and frontend interfaces must be conducted.
- All critical and high-severity findings based on OWASP Top 10 threats must be fixed and documented.

3.9.4. Centralized Monitoring and Logging

- Tools like Prometheus and Grafana for system health monitoring, uptime tracking, and resource usage is recommended to use.
- Centralized logging solution (e.g., ELK Stack - Elasticsearch, Logstash, Kibana) for audit trails, user activity tracking, and debugging is recommended to be deployed.
- Alert and monitoring systems should be linked to the N-LMIS Helpdesk and Super Admin dashboard.

3.9.5. Disaster Recovery and Backup

- Automated backups with 3-2-1 strategy (3 copies, 2 types of storage, 1 offsite) must be enforced.
- A hot DR (Disaster Recovery) site, preferably in Hetauda, ensuring 99.9% availability must be maintained.

CHAPTER 4 –RECOMMENDATIONS & SUSTAINABILITY

4.1. IT POLICY RECOMMENDATIONS

To ensure a robust and future-proof digital foundation for N-LMIS, MoLESS should adopt a phased IT policy approach that supports immediate system development while establishing long-term governance.

Short-Term (Before & During Core N-LMIS Build)

- Minimum critical IT governance guidelines covering interoperability standards, API specifications, data ownership, and security protocols—sufficient to guide the initial engineering of the core LMIS within 6 months should be defined and approved.
- Interim compliance directives aligned with the GEA and NeGIF should be issued to ensure early integration readiness.

Medium to Long-Term (Post Initial Deployment)

- A comprehensive Ministry-wide IT Policy covering procurement, licensing, disaster recovery, maintenance, SLAs, and change management should be developed and institutionalized.
- A permanent IT Governance Framework defining architecture guidelines, approval processes, and accountability structures across all MoLESS digital platforms should be established.

This phased approach ensures that policy readiness and system engineering proceed in parallel, avoiding delays in N-LMIS rollout while ensuring compliance with national standards and sustainability requirements.

4.2. TECHNICAL STANDARDS AND SECURITY COMPLIANCE

To ensure long-term sustainability, scalability, and data protection for the N-LMIS platform, all development and deployment processes must comply with established technical standards and security protocols as outlined in Section 3.7 – Technical Deployment Standards and Security Measures. Specifically:

- **Containerization and Modularity:** All system components should follow modular design principles using Docker and be orchestrated via Kubernetes to ensure scalable, maintainable deployments across environments.
- **Authentication Protocols:** Systems should implement OAuth 2.0 or equivalent protocols for secure, standards-compliant user authentication and delegated access.
- **Vulnerability Assessment and Penetration Testing (VAPT):** Mandatory bi-annual VAPT processes should be performed by MoLESS or authorized security partners. Findings must be remediated promptly.
- **Monitoring and Observability:** Centralized logging (e.g., ELK Stack) and system monitoring tools (e.g., Prometheus, Grafana) should be integrated into the core deployment to ensure proactive monitoring and issue detection.
- **Disaster Recovery & Data Backups:** The Disaster Recovery (DR) strategy and backup protocol described in Chapter 3 should be institutionalized with periodic failover testing and off-site replication.

These standards shall be part of the MoLESS-wide IT Policy and enforced through Service Level Agreements (SLAs) with all vendors. Compliance with GEA/NeGIF architectural standards shall also be ensured for interoperability and governance consistency.

4.3. INSTITUTIONAL AND GOVERNANCE RECOMMENDATIONS

To support effective leadership, sustainability, and cross-stakeholder coordination:

- A central N-LMIS Coordination Unit or future N-LMIS Bureau should be established under MoLESS with clear staffing, mandates, and decision-making authority.
- Oversight and alignment with national digital governance bodies should be ensured by establishing formal linkages with the Department of Information Technology (DoIT) for compliance with national e-governance architecture, interoperability frameworks (NeGIF), and cybersecurity standards, and with the National Planning Commission (NPC) to ensure alignment with national development plans and labour market policy priorities.
- Cross-ministerial MOUs and data-sharing protocols between MoLESS, DoFE, FEB, SSF, CTEVT, DoNIDCR, IRD, Immigration, and others should be developed and formalized.
- A multi-stakeholder Technical Advisory Group should be created to provide strategic guidance, oversee implementation, and ensure system evolution aligns with national and global best practices.
- Institutional capacity in AI, analytics, and system administration should be built, with dedicated teams established for infrastructure management, cybersecurity, training, and user support.

4.4. INTEROPERABILITY STANDARDIZATION

- Standard taxonomies and codes should be defined and adopted for key fields such as:
 - o Occupation (e.g., ISCO-08)
 - o Industry sectors (e.g., NSIC/Nepal standard codes)
 - o Skills and qualifications (linked to National Qualification Framework – NQF)
 - o Provinces, districts, municipalities
 - o GESI identifiers (e.g., disability status, ethnicity, gender)
- Mandatory use of these standards should be enforced across all MoLESS and affiliated digital systems (FEIMS, FEWIMS, NAVT-MIS, EMIS, etc.).
- A central Master Data Dictionary and API specification documents should be developed and published to guide data entry, exchange, and validation.
- Unified API Gateway Server should be implemented, ensuring secure, controlled, and real-time data exchange between systems while reducing redundancy and inconsistent queries.

Core digital rails—master data standards, open and permissioned APIs, and interoperability frameworks—should be established early in the N-LMIS implementation to prevent fragmented and parallel system development and to ensure that public and private actors build interoperable solutions on top of the N-LMIS.

4.5. ENVIRONMENTAL AND SOCIAL SUSTAINABILITY

To ensure the platform is inclusive, usable, and accessible to all:

- A multilingual, mobile-first interface with offline functionality should be implemented for low-connectivity and rural areas.
- User-centric and inclusive design principles should be applied to accommodate youth, women, Dalits, persons with disabilities (PwDs), and other marginalized groups.
- The system should be designed and tested based on user personas and real-life scenarios to ensure usability by low-literate or differently-abled users.
- Feedback loops and user reporting mechanisms tailored to vulnerable groups should be integrated.
- Gender- and region-disaggregated labour data analytics should be enabled to support equitable, evidence-based policies and programs.

4.6. MONITORING, EVALUATION, AND SUSTAINABILITY

To monitor performance and ensure continuous improvement:

- A Monitoring & Evaluation (M&E) framework should be established with KPIs across digital adoption, data quality, service delivery, and stakeholder engagement.
- Feedback mechanisms, including the Grievance Redress Mechanism (GRM), periodic surveys, and embedded analytics, should be used to improve system design and responsiveness.
- Annual system audits and penetration tests should be conducted to assess performance, security, and compliance.
- The N-LMIS should be aligned with national digital strategies, e-Governance guidelines, and international frameworks such as ILO LMIS standards.
- Dedicated budgets should be allocated for O&M (Operation and Maintenance), training, system upgrades, and long-term data infrastructure investments.

4.7. LONG TERM SUSTAINABILITY GOALS

To future-proof the system and ensure institutional continuity:

- The N-LMIS Coordination Unit should be transitioned into a full N-LMIS Bureau with budget lines, staffing, and a legal mandate under MoLESS.
- Energy-efficient data centers and green computing practices should be adopted across N-LMIS infrastructure.
- Periodic data cleaning, system evaluation, and update cycles should be institutionalized through internal protocols and third-party assessments.
- Open data standards and secure API frameworks should be promoted to enable public access while maintaining confidentiality.
- The N-LMIS roadmap should be aligned with national planning and budgeting frameworks to ensure relevance and funding continuity.

- Data protection protocols should be regularly updated to align with international privacy regulations (e.g., GDPR-inspired practices).

4.8. PUBLIC-PRIVATE DATA PARTNERSHIP FRAMEWORK

To ensure meaningful participation of private job portals, manpower agencies, and recruitment platforms in the N-LMIS ecosystem, a balanced regulatory and value-based incentive framework shall be adopted.

Regulatory Measures ("Stick")

- Employers seeking selected government services—such as foreign employment approvals, labour permits, tax incentives, or participation in public procurement—shall be required to publish job vacancies on the National Labour Market Portal or via approved API integration for a minimum defined period.
- This requirement ensures comprehensive national visibility of labour demand while avoiding duplication of employer workflows.
- Regulatory provisions shall be aligned with national labour laws and implemented in coordination with MoLESS, DoFE, and relevant regulatory bodies. (Singapore, 2025)

Value-Based Incentives ("Carrot")

- N-LMIS shall operate as an aggregator platform, allowing private portals to associate job listings while retaining ownership of applicant workflows.
- Job applications originating from N-LMIS may redirect users to private platforms, ensuring traffic flow and business continuity for private operators.
- Participating private platforms may be granted access to selected government verification services (e.g., employer validation against tax or registration databases), enhancing trust and reducing fraudulent listings.

Partnership Model

- Integration shall be governed through standardized MOUs defining data scope, usage rights, privacy obligations, and service levels.
- Private sector participation shall be positioned as a partnership model that strengthens market transparency while preserving innovation and competition.

4.9. N-LMIS DEVELOPMENT & IMPLEMENTATION

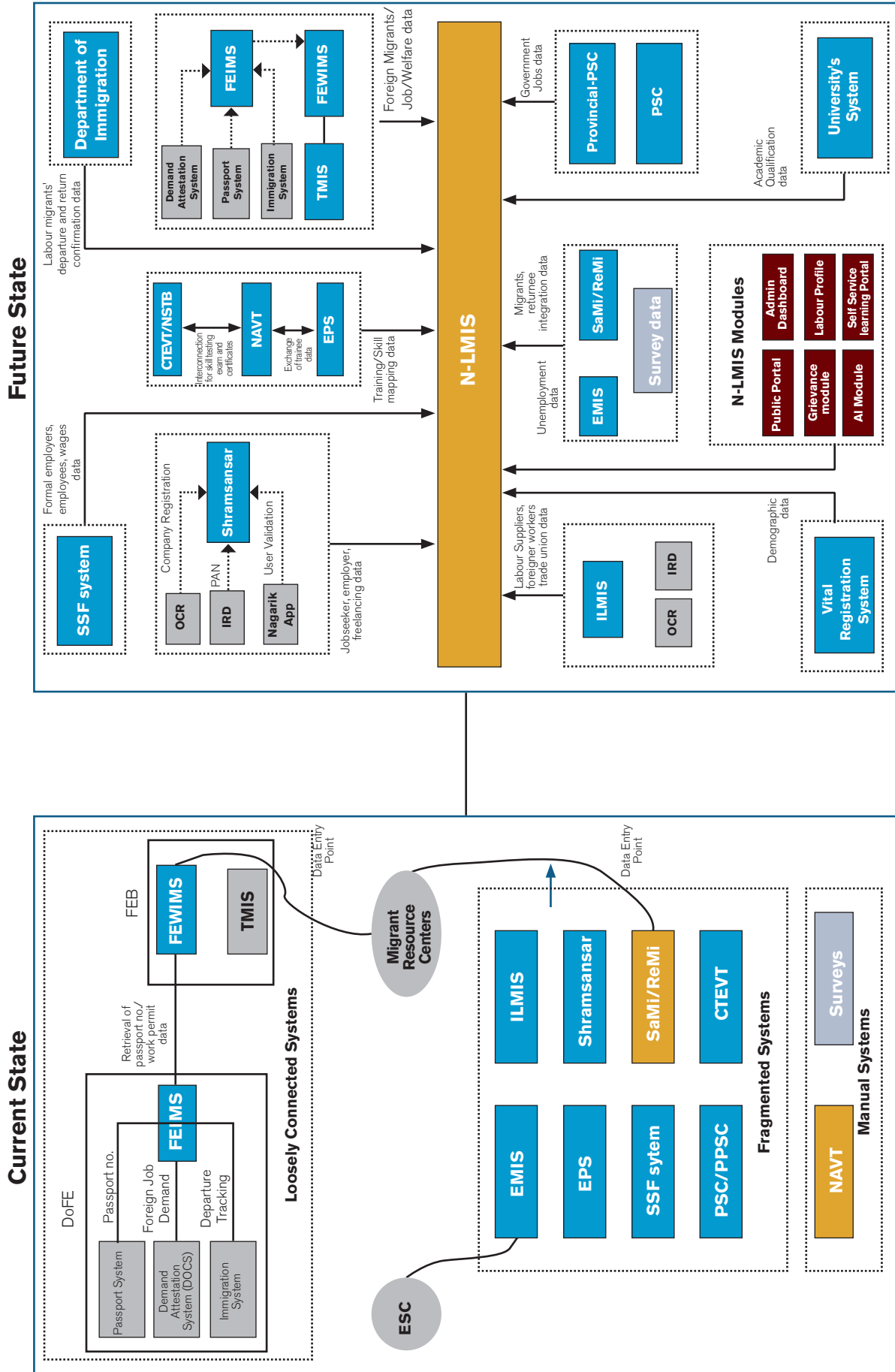


Figure 10 N-LMIS Future State

The transition from the current fragmented and loosely connected systems to a future integrated N-LMIS ecosystem will follow a phased, structured, and agile-driven approach as shown in above diagram.

The current state consists of multiple disconnected systems such as FEIMS, FEWIMS, EMIS, ILMIS, EPS, Shramsansar, SSF System, SaMi/ReMi, PSC/PPSC, and CTEVT, with certain processes still handled manually (e.g., NAVT, surveys). These systems operate in silos, causing inefficiencies, data duplication, and limited interoperability.

In the future state, N-LMIS will act as a centralized integration hub, connecting all major labour market-related systems, including:

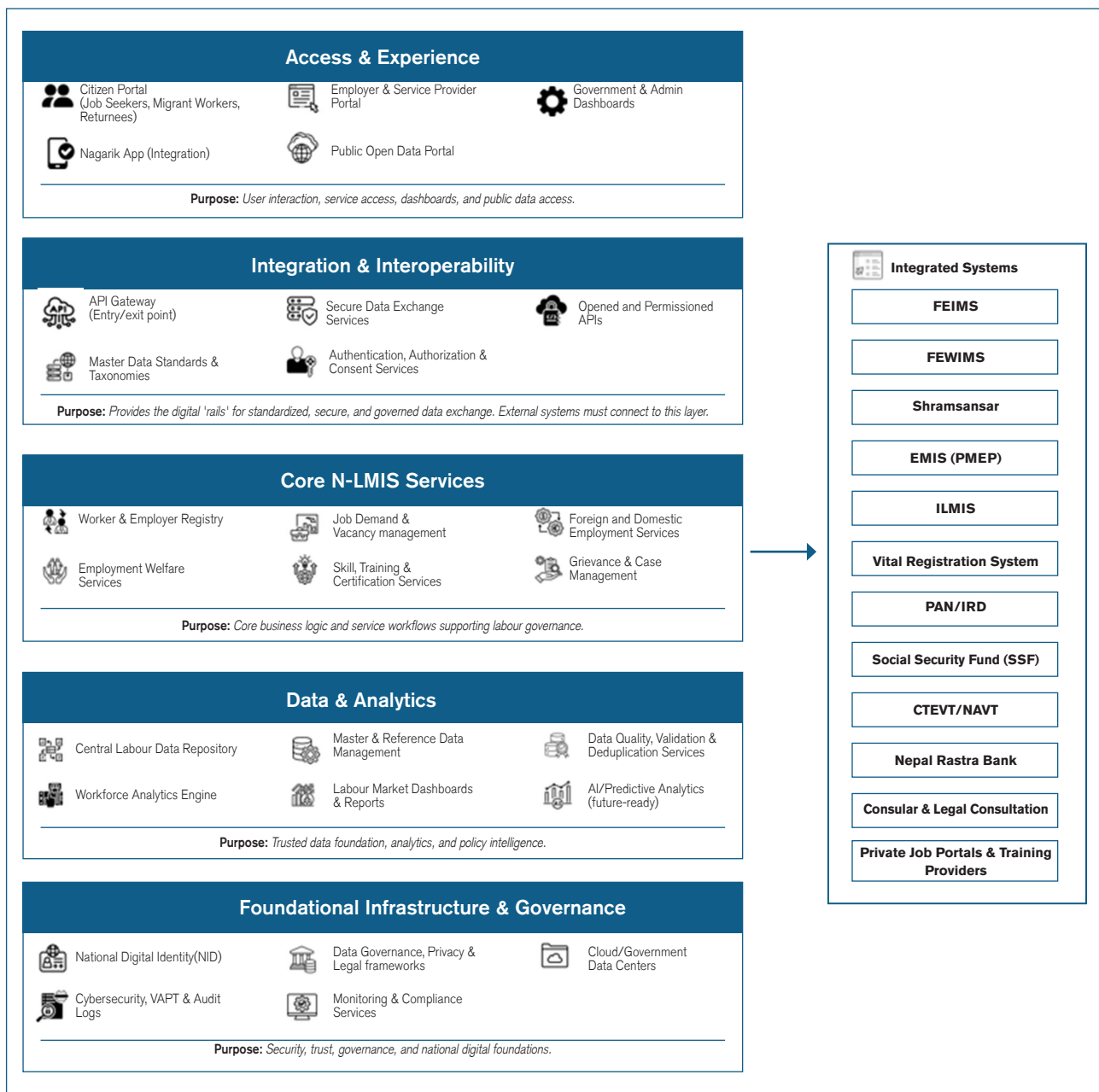
- **Government Platforms** – Department of Immigration, FEIMS, FEWIMS, TMIS, SSF, OCR, IRD, NAVT, EPS, Provincial and Public Service Commissions, Vital Registration System.
- **Sectoral and Skills Systems** – CTEVT/NSTB, universities, training institutions.
- **Labour Market Data Sources** – EMIS, ILMIS, Shramsansar, SaMi/ReMi, employer/job portals.
- **N-LMIS Modules** – Public Portal, Admin Dashboard, Grievance Module, Labour Profile, AI Module, Self-Service Learning Portal.

The implementation strategy will include:

1. Phased Development – Begin with core functional modules (Labour Market Portal, basic data integration) and gradually add advanced analytics, AI-based forecasting, and extended interoperability.
2. Agile or Hybrid Project Management – Allow flexibility for changes during development while maintaining focus on core objectives.
3. Quick Wins – Launch high-impact, visible components (e.g., Labour Market Portal) early to encourage adoption and build stakeholder confidence.
4. Parallel Capacity Building – Conduct continuous training for MoLESS, ESC, and partner staff so they are prepared to operate the system from day one.
5. Pilot Testing – Use real datasets to rigorously test functionalities, integration points, and security measures before the national rollout.
6. Long-Term Support Contracts – Secure vendor and partner agreements for system upgrades, maintenance, and troubleshooting to ensure sustainability.

This transition will enable MoLESS to evolve from a disconnected and manual environment to a data-driven, AI-enabled, and fully interoperable labour market governance system, improving transparency, efficiency, and policy responsiveness.

The N-LMIS is a structured, multi-layered system designed to provide comprehensive labour market services in Nepal. Citizens, employers, and government users access services through portals, mobile applications, dashboards, and a public data portal. The systems connect exclusively via standardized, secure APIs, ensuring interoperability and preventing fragmented development. Core services cover worker and employer registries, migration, welfare, skills and training, and grievance management, supported by robust data analytics, reporting, and governance frameworks.



4.10. N-LMIS AS DIGITAL PUBLIC INFRASTRUCTURE (DPI)

N-LMIS is conceived not merely as a standalone portal, but as a foundational Digital Public Infrastructure (DPI) for Nepal's labour ecosystem. It is designed to reuse and integrate existing national digital assets while enabling public and private actors to build value-added services on top of trusted government data.

The design of N-LMIS as DPI aligns with international experiences where DPI has accelerated inclusion, resilience, and innovation. For example, India's digital infrastructure—anchored by Aadhaar (digital identity), UPI (real-time payments), and India Stack's open APIs—has enabled billions of transactions, improved access to government services, and reduced duplication of systems by allowing both government and private platforms to build on common rails. (Shetty, 2025)

Global development institutions, including the World Bank and UNDP, emphasize that DPI accelerates

inclusion and resilience because it provides core digital functions—such as secure identity, digital payments, and data sharing—that underpin effective service delivery and innovation.

The DPI approach of N-LMIS is realized through:

- **Identity Infrastructure:** Secure authentication and worker profiling anchored on national identity systems, ensuring trusted and verifiable labour records.
- **Payment Infrastructure:** Integration readiness with national digital payment systems for welfare, training incentives, and employment program disbursements.
- **Data Exchange Infrastructure:** An API-first, standards-based interoperability framework that allows authorized external systems to consume verified labour data while maintaining data ownership and privacy.

To be effective as a Digital Public Infrastructure, N-LMIS must embed the following cross-cutting principles:

- **Openness:** Core standards, data definitions, and APIs should be publicly documented and accessible under clear rules to enable interoperable solutions and reduce system duplication.
- **Modularity:** The architecture should allow components to be added, upgraded, or replaced independently, enabling incremental evolution and integration of emerging technologies.
- **User Centricity:** System design should reflect the needs of diverse users through role-based access, intuitive interfaces, and workflows aligned with operational realities.
- **Privacy-by-Design:** Data protection and security controls should be embedded from the outset, including consent mechanisms, access controls, and audit trails.
- **Strong Governance:** Clear institutional roles, accountability mechanisms, and data standards should be established to ensure trust, coordination, and long-term sustainability.

CHAPTER 5 - CONCLUSION

This digitalization blueprint presents a structured and evidence-based roadmap for MoLESS to transition from a fragmented labour information environment to an integrated, intelligent, and inclusive **Nepal Labour Market Information System (N-LMIS)**.

By integrating data from core national platforms—such as FEIMS, FEWIMS, Shramsansar, EMIS, NAVT MIS, and CTEVT—and linking with key external systems, including the Department of Immigration, Social Security Fund (SSF), Department of National ID and Civil Registration (DoNIDCR), Inland Revenue Department, academic institutions, Returnee Profiling Systems, and future labour-related platforms, the N-LMIS will deliver end-to-end interoperability across the full labour lifecycle. This covers domestic and foreign employment, self-employment, government jobs, gig work, and the informal sector.

The blueprint prioritizes the establishment of a robust API gateway for secure, standards-based data exchange; deployment of AI/ML-ready backend infrastructure; and integration of real-time, role-based dashboards for labour market analytics, unemployment tracking, reintegration monitoring, skill profiling, and predictive labour forecasting. The system design incorporates a central Master Code Registry to standardize occupation, industry, skills, geography, and education codes, ensuring seamless data interpretation across all integrated platforms, including private-sector job portals.

A phased action plan defines short-, medium-, and long-term milestones with specific deliverables, complemented by strong governance structures such as the creation of an N-LMIS Bureau, cross-ministerial and cross-agency MOUs, and active engagement with national oversight bodies including the Department of Information Technology (DoIT) and the National Planning Commission (NPC). Institutional capacity building in data analytics, AI tools, and system administration ensures operational sustainability, while inclusive design principles and multilingual, mobile-first interfaces guarantee accessibility for women, youth, persons with disabilities, and marginalized communities.

Environmental and social sustainability is embedded through low-energy hosting options, green IT practices, and data-driven targeting for vulnerable groups. Data protection is strengthened by implementing AES-256 encryption, two-factor authentication, role-based access control, GDPR-inspired privacy policies, and a mandatory Vulnerability Assessment and Penetration Testing (VAPT) process. Continuous monitoring and evaluation—through real-time analytics, grievance tracking, and annual security audits—ensures ongoing improvement.

This blueprint does not just propose a technological upgrade—it lays the foundation for a nationally governed, citizen-centric labour data ecosystem that supports policy formulation, enhances service delivery, empowers workers, and enables evidence-based decision-making at every level.

CHAPTER 6 - ANNEXURE

This chapter includes information on all the annexures in the documents.

Annex 1 – Interoperability Guidelines

Annex 2 – API Guidelines for Data Exchange with N-LMIS

ANNEX-1

INTEROPERABILITY GUIDELINES

To ensure seamless integration, data exchange, and uniform interpretation of labour market information across government, private sector, and development partner systems, N-LMIS will adopt a standardized master coding and interoperability framework.

A1.1. CORE INTEROPERABILITY PRINCIPLES

- **Standards Compliance** – All data fields must follow national and international classification standards where applicable (e.g., ISCO-08 for occupations, NSIC/Nepal Standard Codes for industries, ISO 3166 for geographical identifiers).
- **Single Source of Truth** – The N-LMIS Master Code Registry will serve as the authoritative reference for all codes and definitions, preventing duplication and inconsistencies across integrated platforms.
- **API-Driven Exchange** – All integrated systems must use the N-LMIS API Gateway for real-time data retrieval, submission, and validation.
- **Bidirectional Synchronization** – Changes in any connected system must be reflected in N-LMIS, and vice versa, to ensure data consistency.
- **Backward Compatibility** – All code updates will maintain compatibility with historical datasets to avoid data loss or misinterpretation.

A1.2. STANDARDIZED FIELDS AND CODE STRUCTURES

Field	Definition	Standard / Source	Example Codes
Job Category	Broad classification of work based on skill and function.	ISCO-08 Major Group	1 – Managers, 2 – Professionals
Job Subcategory	Detailed classification within a job category.	ISCO-08 Sub-Major & Minor Groups	21 – Science Professionals
Industry	Sector of economic activity.	NSIC Rev. 4 / Nepal Standard Codes	C – Manufacturing
Ownership	Nature of the employer.	N-LMIS Standard	GOV – Government, PRI – Private
Position	Specific title of employment role.	N-LMIS Standard	Accountant, Civil Engineer
Job Level	Seniority or hierarchy in the organization.	N-LMIS Standard	Entry, Mid, Senior
Job Type	Nature of employment contract.	N-LMIS Standard	FT – Full Time, PT – Part Time
Designation	Official job title assigned to an employee.	N-LMIS Standard	Project Manager

Province	Administrative division.	Government of Nepal Codes	1 – Koshi Province
District	District name/code.	CBS/Nepal Standard	301 – Morang
Municipality	Local government unit.	MoFAGA Standard Codes	30105 – Biratnagar Metropolitan

A1.3. MASTER CODE REGISTRY MANAGEMENT

- **Central Maintenance:** The N-LMIS Bureau will maintain and update the Master Code Registry.
- **Version Control:** All changes to codes must be documented with version histories.
- **Approval Workflow:** Any modification or addition to codes will require approval from the N-LMIS Interoperability Committee.
- **Public Access:** Non-confidential master codes will be published on the N-LMIS Developer Portal for external integration.

A1.4. API SPECIFICATIONS FOR INTEROPERABILITY

- **Authentication:** OAuth 2.0 or equivalent for secure API access.
- **Data Formats:** JSON for API payloads; CSV/Excel for bulk uploads.
- **Validation Rules:** All API requests must validate against the Master Code Registry.
- **Error Handling:** Standard error codes and messages will be returned for mismatched or invalid codes.
- **Rate Limits:** API call limits will be enforced to protect system performance.

A1.5. INTEGRATION REQUIREMENTS FOR EXTERNAL SYSTEMS

All connected platforms (e.g., FEIMS, FEWIMS, EMIS, NAVT MIS, SSF, Shramsansar, private job portals) must:

- Map their internal fields to N-LMIS master codes.
- Implement periodic synchronization to avoid stale data.
- Comply with GEA and NeGIF interoperability standards.
- Support automated updates when the Master Code Registry changes.

A1.6. CHANGE MANAGEMENT AND TRAINING

- **Change Notifications:** API subscribers will receive automated alerts when code changes occur.
- **Training & Documentation:** Technical integration guides, mapping sheets, and API documentation will be provided to partner systems.
- **Annual Review:** Interoperability guidelines will be reviewed annually to align with policy, labour market, and technological changes.

ANNEX-2

API GUIDELINES FOR DATA EXCHANGE WITH N-LMIS

A2.1. GENERAL PRINCIPLES

- All APIs should follow RESTful architecture using HTTPS protocol.
- JSON format must be used for all data exchange to ensure consistency and lightweight integration.
- APIs should be versioned (e.g., /api/v1/feims/worker) for backward compatibility.
- API consumers (e.g., FEWIMS) must authenticate via a token-based mechanism (OAuth2.0 / JWT).

A2.2. AUTHENTICATION AND SECURITY

Requirement	Standard
Authentication	OAuth2.0 with client credentials
Data Transmission	HTTPS (TLS 1.2 or higher)
Encryption at Rest	AES-256
Access Logs	Mandatory logging of every API call (who, when, what)
Rate Limiting	1000 requests/minute/system (customizable)
Access Control	Role-based access for data types (read/write/sync)

A2.3. API COMMUNICATION FLOW

Standard API Interaction Model

External System (e.g., FEWIMS) → Request → N-LMIS API Gateway → N-LMIS Core DB

External System ← Response ← N-LMIS API Gateway

All data interactions should go through the **N-LMIS API Gateway** to:

- Ensure consistent logging
- Apply access and data transformation rules
- Manage rate limits and authentication

A2.4. DATA EXCHANGE SCOPE PER SYSTEM

System	API Scope	Examples of API Endpoints
FEWIMS (Foreign Employment Board)	Welfare service data (deceased, accident, claims)	/api/v1/fewims/deaths, /fewims/claims
FEIMS (DoFE)	Foreign employment permit data, demand, migration	/api/v1/feims/workers, /feims/demand
NAVT MIS (MoLESS/NAVT)	Training records, certifications, providers	/api/v1/navt/trainees, /navt/certifications
SaMi MIS (Helvetas/NPL)	Returnee support services, reintegration	/api/v1/sami/beneficiaries, /sami/services
EMIS (PMEP)	Unemployed persons, public employment data	/api/v1/emis/registrations, /emis/jobs
CTEVT	TVET certified trainee data, providers	/api/v1/ctevt/certificates, /ctevt/institutes

A2.5. API ENDPOINT STRUCTURE

All endpoints should follow:

```
https://api.nlmis.gov.np/api/v1/{source-system}/{data-object}
```

Examples:

```
GET /api/v1/feims/workers?permit_year=2024
```

```
POST /api/v1/navt/trainees (push new data from NAVT)
```

```
GET /api/v1/fewims/claims?status=approved
```

A2.6. RESPONSE AND ERROR FORMATS

```
{
  "status": "success",
  "code": 200,
  "message": "Data retrieved successfully",
  "data": [ ... ]
}
```

Common Error Codes:

- 400: Bad Request
- 401: Unauthorized
- 403: Forbidden
- 404: Not Found
- 500: Server Error

A2.7. DATA SYNC FREQUENCY

Type of Data	Sync Frequency	Mode
Worker registration & permits	Real-time or Daily	Push/Pull
Training certifications	Weekly	Push
Welfare service claim status	Real-time	Push
Reintegration support records	Weekly	Push
Labour demand & job vacancies	Real-time	Pull

A2.8. GOVERNANCE & MOU

Each system must sign a Data Exchange MOU with MoLESS/N-LMIS Bureau outlining:

- Purpose and type of data shared
- Roles and responsibilities
- SLA for uptime and data accuracy
- Data protection and retention guidelines

A2.9. COMPLIANCE & STANDARDS

All APIs must comply with:

- Nepal Government's GEA/NeGIF interoperability framework
- MoLESS's internal Data Protection and Privacy Policy
- Applicable laws such as Right to Privacy Act, if engaged with personal data

A2.10. SUPPORT & CHANGE MANAGEMENT

- A sandbox/test environment shall be provided for each system to test APIs.
- Any change in API endpoints or payload structures will be communicated at least 30 days prior to enforcement.
- A dedicated API support team will be available under N-LMIS for issue resolution and onboarding.

A2.11. API DOCUMENTATION AND VERSIONING

A2.11.1. Documentation Standards

All APIs must be properly documented to ensure ease of understanding, integration, and troubleshooting for external systems. Documentation must include:

- Endpoint descriptions
- Request/Response examples
- Authentication mechanism
- Data formats
- Error handling with sample responses
- Usage limits

A2.11.2. Recommended Tools

- Swagger / OpenAPI Specification should be used to create and publish interactive API documentation.
- Postman Collections may also be shared for quick integration and testing.

A2.11.3. Versioning Policy

- API endpoints must include a version in the URL path (e.g., /api/v1/).
- Any backward-incompatible changes should increment the major version number (e.g., /api/v2/).
- Deprecated versions must be maintained for a minimum of 6 months after the release of a new major version.

A2.11.4. Release Notes

All API releases or changes must be documented with: Change logs, Version number, Date of release, Impact on consuming systems.

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