TERMS OF REFERENCE FOR DIGITAL CONSULTANCY FIRM

TECHNICAL ASSISTANCE: STRENGTHENING LABOR MARKET AND SOCIAL SECURITY SYSTEMS IN INDIA

Estimate Assignment Duration: 8 months

National Firm

31 August 2026 to 30 April 2027 (Indicative)

Contents

1. Overview and Background

The Asian Development Bank (ADB) is providing technical assistance (TA) support to the Ministry of Labor and Employment (MOLE) to strengthen India's labor market and social security systems to enhance worker protection, well-being, and employability. The TA will support MOLE in three areas: (i) policy analysis and recommendations to improve labor market and social security schemes, (ii) technical analysis and strategy to enhance the operations, analytics, and digital integration of systems, and (iii) capacity building of key stakeholders on evidence-based policy development and implementation.

India's labour market ecosystem remains large, diverse, and institutionally complex, spanning a wide range of public and private actors involved in policy, regulation, service delivery, social protection, skilling, and labour market intermediation. MOLE plays a central role, overseeing labour policy, regulation, research, social security, and employment services, alongside key statutory bodies, state labour departments, other central ministries, and private-sector actors. Over time, the digital systems supporting these functions have evolved independently. The result is multiple databases operating in silos, inconsistent data standards, limited real-time data exchange, and fragmented service delivery. This imposes direct challenges for workers and employers who must navigate separate systems, while also limiting MOLE's capacity to generate integrated labour market intelligence for evidence-based policymaking.

The TA aims to strengthen MOLE's digital architecture and institutional frameworks to improve labor market efficiency and social protection delivery. Under Output 2 of the TA, this will include: (i) developing an operational strategy for a unified Labor and Employment (L&E) Stack (ii) preparing a roadmap and investment plan for a Labor Market Information System (LMIS), and (iii) Capacity development and trainings for MOLE on data and digital systems, including the proposed L&E stack and LMIS. MOLE, with support from individual TA consultants, is currently developing a vision document and initial concepts for these priority areas. The Digital Consultancy Firm engaged under this ToR will build directly on this foundational work to produce the detailed operational strategy, technical architecture, implementation roadmap, and procurement-ready documentation required for MOLE to develop and operationalize the L&E Stack and LMIS.

The proposed Labour & Employment (L&E) Stack & LMIS are not intended to replace existing systems. Instead, the aim is to provide a unifying digital infrastructure that enables these diverse platforms and datasets to work together more effectively. By establishing shared registries, common data models, and interoperable APIs, the L&E Stack will facilitate seamless data exchange, reduce duplication, and support integrated service delivery across the labour lifecycle, while preserving and enhancing the investments already made in existing systems, where possible.

2. Key Objectives

The Firm's engagement has three sequenced objestives:

- **Operational Strategy and Technical Architecture for the Labour & Employment (L&E) Stack:** The L&E Stack is envisioned as a foundational digital public infrastructure for labour market ecosystem in India to strengthen labour market governance, enhance service delivery, and enable seamless and secure data exchange across institutions. Building on the vision document and technical concept being prepared under the TA, the firm will translate this vision into a detailed operational strategy, layered technical architecture, and procurement-ready specifications aligned with India's Digital Public Infrastructure (DPI) principles and the InDEA 2.0 reference architecture.

- **Roadmap and investment plan for a Labor Market Information System (LMIS):** The LMIS is envisioned as the analytics layer of the L&E Stack - a system to produce, store, disseminate, and use labour market information for evidence-based policymaking. Building on the preliminary LMIS concept to be developed under the TA, the firm will prepare a detailed functional design, phased implementation roadmap, and investment plan that positions the LMIS as an integrated component of the broader L&E Stack architecture.
- **Capacity development and related workshops for MoLE on the proposed L&E Stack and LMIS:** To prepare MOLE for the implementation of the L&E Stack and LMIS, the firm will deliver a focused capacity-development program covering core concepts, system architecture, data governance, and implementation requirements. Targeted workshops will build a shared understanding across policy, technical, and operational teams, enabling MOLE to effectively guide procurement, coordinate with system integrators, and manage phased rollout of both the L&E Stack and LMIS.

3. Scope of Work for the Consultancy Firm

Following outlines the detailed scope of work and tasks for the Digital Conutancy Firm:

3.1 L&E Stack Implementation Strategy, Architecture & Specifications

A. Implementation Strategy

The consultancy firm will translate the high-level L&E Stack vision and preliminary concepts into a comprehensive, actionable implementation strategy, addressing functional scope, architecture, institutional arrangements, sequencing, interoperability requirements, and technical, operational, and financial considerations required for successful rollout.

The consultancy firm will:

a. Review the L&E Stack vision document, technical concepts, digital assessments, and dataset mappings.

b. Translate the high-level vision into a structured, actionable implementation strategy.

c. Define the functional scope and priority use cases for the L&E Stack.

d. Develop phased approach and sequencing, with clear dependencies and short-, medium-, and long-term priorities.

e. Identify institutional roles, governance arrangements, and operating models required for implementation – including the respective roles of MOLE, MeitY, MSDE MOSPI, state governments, and other key stakeholders.

f. Outline integration and interoperability requirements across MOLE priority systems, statutory bodies, state systems, and private-sector platforms.

g. Recommend technology, infrastructure, and platform approaches aligned with InDEA 2.0 and national DPI standards.

h. Prepare investment estimates, resource requirements, and financing framework and considerations.

i. Identify risks (technical, institutional, legal, political) and propose mitigation strategies.

j. Outline change management, capacity-building, and stakeholder engagement needs to support adoption.

B. Development of Detailed Technical Architecture and System Design

The consultancy firm shall develop the complete technical architecture and design required to operationalize the L&E Stack. The design must translate the implementation strategy into detailed architecture and specifications that can support subsequent procurement. This should cover architecture, data models, integration frameworks, security, and performance requirements. All designs should align with national digital public infrastructure principles, InDEA 2.0 reference models, and the Digital Personal Data Protection Act (DPDPA) 2023.

The consultancy firm will:

- Develop the overall system architecture for the L&E Stack and LMIS, including logical, physical, and deployment architectures.
- Prepare module-level functional specifications, including workflows, business rules, and user journeys for priority use cases.
- Design the data architecture, including data models, master data management structures, metadata standards, and data quality frameworks.
- Define the integration architecture, including API specifications, data exchange protocols, consent management framework aligned with the DPDPA 2023, and interoperability standards.
- Develop the security and privacy architecture in alignment with national cybersecurity guidelines and data protection principles.
- Specify scalability, performance, and reliability requirements to support future expansion and evolving labour market needs.
- Identify AI-enabled use cases within the Stack, including skills demand forecasting, automated data quality improvement, intelligent case routing, and anomaly detection, and ensure the architecture supports their development and deployment.

C. Implementation Roadmap and Governance Framework

The consultancy firm will prepare a comprehensive implementation plan and governance framework to guide the phased rollout of the L&E Stack. The plan should outline timelines, institutional arrangements, infrastructure needs, resource requirements, and risk mitigation measures necessary for successful implementation and long-term sustainability.

The consultancy firm will:

- Develop a phased implementation roadmap with timelines, milestones, sequencing of activities, and clear dependencies.
- Recommend institutional and governance arrangements for development, rollout, and long-term operations, including a proposed Steering Committee structure with key stakeholders.
- Identify infrastructure requirements, including cloud/on-premise considerations, hosting models, and network needs.
- Assess human resource and capacity-building needs across MOLE and partner institutions, including for data governance, API management, and system oversight.
- Prepare investment estimates, cost breakdowns, and budgeting frameworks.
- Conduct risk assessments and propose mitigation strategies for technical, operational, and institutional risks.

D. Preparation of Procurement-Ready Documentation

To support MOLE in engaging system integrators and technology vendors, the consultancy firm will prepare procurement ready documentation aligned with government procurement standards. These materials should enable MOLE to initiate procurement processes for the development and deployment of L&E Stack and LMIS components.

The consultancy firm will:

- Support detailed reports and request for proposals (RFPs) for system development, integration, and related services.
- Define technical evaluation criteria, scoring frameworks, and vendor qualification requirements.
- Prepare technical specifications and service-level requirements.

E. Incorporation of Artificial Intelligence (AI) in the L&E Stack Architecture and Design

The consultancy firm shall ensure that the design, architecture, and specifications for the L&E Stack and LMIS fully account for the strategic and operational role of Artificial Intelligence (AI). AI must be treated as an integral design consideration, not an add-on, so that the L&E Stack is future-ready, capable of supporting advanced analytics, automation, and decision-support functions. The firm will identify appropriate AI use cases, ensure the underlying architecture can support AI workloads, and embed AI-readiness into all relevant technical and functional specifications.

The consultancy firm will:

- Identify and validate AI-enabled use cases relevant to labour market governance, such as labour market forecasting, skills-demand prediction, automated data quality improvement, intelligent case routing, and anomaly detection in compliance or benefits administration.
- Ensure the overall architecture of the L&E Stack, including data pipelines, registries, integration layers, and LMIS, supports AI model development, deployment, monitoring, and lifecycle management.
- Incorporate AI-readiness into the data architecture by defining data models, metadata standards, and data quality frameworks that enable training, validation, and continuous improvement of AI models.
- Define infrastructure requirements (compute, storage, model hosting, GPU/accelerator needs, sandbox environments) necessary for AI workloads, ensuring alignment with MoLE's infrastructure strategy.
- Integrate AI-related security, privacy, and ethical safeguards into the security architecture, including model governance, bias mitigation, auditability, and responsible AI principles.
- Specify APIs, integration patterns, and data exchange mechanisms that allow AI components to interact seamlessly with core systems, LMIS, and external platforms.
- Ensure that procurement-ready documentation includes AI-related requirements, evaluation criteria, and vendor capability expectations.
- Recommend capacity-building measures for MOLE to manage AI-enabled systems, including skills for data science, model monitoring, and responsible AI oversight.

3.2 LMIS Functional Design and Roadmap

Building on the preliminary LMIS concept, the firm will develop the detailed functional design and implementation roadmap, architecture and specifications for LMIS. The LMIS must be designed as the analytics layer of the L&E Stack, drawing data through the Stack's interoperability infrastructure, while maintaining a distinct institutional identity and governance arrangement.

The firm will:

- Review the preliminary LMIS concept and align it with the L&E Stack architecture developed.
- Define LMIS functional modules: data ingestion and harmonization; indicator production; policy monitoring dashboards; and public dissemination interfaces.
- Specify the LMIS data ingestion architecture, including data flows from priority sources and API-based exchange mechanisms with the Stack's interoperability layer.
- Support the governance structure for the LMIS, including the institutional home within or affiliated to MOLE, coordination arrangements with MoSPI, and a proposed Steering Committee.
- Define the dissemination model: access tiers, public data portal requirements, researcher access protocols, and alignment with the national policies.
- Prepare a phased roadmap and investment plan, identifying the minimum Stack infrastructure required for an early-phase functional LMIS, and specifying how LMIS capabilities expand as additional Stack layers come online.
- Develop functional and technical procurement ready requirements and specifications for LMIS.

3.3 Technical and Capacity Building Support

To strengthen MOLE's readiness for the upcoming procurement and implementation of the L&E Stack and LMIS, the firm will deliver a structured program of capacity-development workshops focused on deepening institutional understanding of the proposed architecture, specifications, governance model, and implementation approach.

The firm will:

- Conduct a rapid needs assessment to identify priority knowledge gaps related to architecture, governance, procurement, and implementation.
- Develop and deliver workshops on data and digital systems, including explaining the L&E Stack vision, layered architecture, interoperability model, and LMIS integration.
- Build MOLE's understanding of key considerations, including sequencing, packaging, vendor management, and specification interpretation.
- Introduce risk-management approaches for large-scale digital public infrastructure, including data governance, cybersecurity, and change-management risks.
- Facilitate sessions on phasing strategies for implementing the L&E Stack and LMIS, highlighting minimum viable components and dependencies.
- Prepare concise guidance notes, briefing decks, and reference materials to support MOLE during procurement and early implementation stages.
- Provide other technical and capacity building support needed for roll out.

4. Key Deliverables

The consultancy firm will produce the following deliverables, each prepared in close consultation with MOLE and ADB.

a. Inception Report (+ 4 weeks)

The Inception Report shall set out the firm's detailed work plan, methodology, stakeholder engagement approach, and timelines. It will confirm the assignment's scope, sequencing, and coordination arrangements and serve as the baseline for all subsequent activities.

b. Operational Strategy and Roadmap for L&E Stack and LMIS (+ 10 weeks)

The Implementation Strategy shall translate the L&E Stack vision and LMIS scope and objectives into a clear, actionable plans. It will define the functional scope and priority use cases, outline development approach and phased sequencing, and describe the institutional roles and enable conditions required for implementation.

c. Detailed Technical Architecture and System Design Documents (+ 16 weeks)

This set of documents shall provide the complete technical blueprint for the L&E Stack and LMIS. It will include the system architecture across logical, physical, and deployment layers; detailed functional specifications; the data architecture and data models; the integration architecture and API framework; and the security, privacy, and performance architecture needed for a scalable and secure platform.

d. Implementation Roadmap and Governance Framework (+ 22 weeks)

The Implementation Roadmap and Governance Framework shall present the phased plan for rollout, the governance and institutional arrangements required, and the associated infrastructure and resource needs. It will also include cost estimates, an investment plan, and a risk assessment with mitigation measures for L&E Stack and LMIS.

e. Procurement-Ready Documentation (+ 26 weeks)

The consultancy firm shall prepare documentation required for MOLE to procure system integrators and technology vendors. This will include Requests for Proposals (RFPs), evaluation criteria, vendor qualification frameworks, and service-level requirements.

f. Capacity Building Report (+ 32 weeks)

The consultancy firm will provide a report summarizing the capacity building and training activities conducted for MOLE on increasing knowledge in integrated data and digital systems.

Fortnightly Updates

The assignment is expected to be completed in eight months and the firm shall submit fortnightly progress during the engagement period. These shall provide updates on work completed, emerging risks and issues, mitigation actions, and planned activities for the following period, ensuring continuous alignment and oversight throughout the assignment.

5. Minimum Qualifications and Team Composition

The consulting firm must demonstrate substantial experience in architecting, designing, and delivering large-scale, user-intensive digital platforms or digital public infrastructure, preferably in India or comparable federal systems. The firm should have at least 10 years of proven experience in national-level ICT strategy, enterprise architecture, systems integration, and API-led interoperability across complex government ecosystems. Demonstrated capability in designing and operationalizing interoperable stacks, registries, data exchange layers, consent-based data sharing frameworks, and cloud-native architectures is essential. The firm must show strong expertise in data governance, cybersecurity, privacy-by-design, and compliance with India's DPDPA 2023, along with experience developing AI-ready architectures, analytics platforms, and high-volume data processing systems. Prior work with labour, social protection, skilling, or public service delivery systems is desirable. The firm should also have a track record of preparing procurement-ready documentation, and preferably experience working with Government of India ministries, state governments, and multilateral development partners.

The following roles represent the core expertise required to deliver the activities and outputs outlined in the TOR. Consulting firms may propose additional experts as needed to ensure high-quality delivery.

Key National Experts:

1. **Team Lead / ICT Strategist**

- Serve as the primary point of contact for MOLE and lead all project activities and coordination.
- Translate the L&E Stack vision into a structured, actionable implementation strategy.
- Synthesize inputs from technical, institutional, and stakeholder analyses into the Implementation Strategy and Roadmap.
- Facilitate workshops with MOLE leadership to validate goals, priorities, and sequencing.
- Oversee development of the phased implementation roadmap, governance model, investment plan, and risk framework.
- Ensure alignment with India Stack, InDEA 2.0, and national DPI principles.
- Guide the strategic use of AI for analytics, automation, and decision-support within the L&E Stack and LMIS.
- Review and finalize all deliverables to ensure quality, coherence, and compliance with the TOR.

Minimum Qualifications and Requirements:

The Team Lead should hold an advanced degree in information systems, computer science, engineering, or related field, with at least 15 years of experience leading large-scale digital transformation programs and architecting national-level digital public infrastructure. The expert must demonstrate proven capability in designing and steering multi-layered architectures, interoperability frameworks, and API-driven platforms similar to India Stack or other population-scale systems. Experience translating high-level digital visions into actionable implementation strategies, governance models, and phased roadmaps is essential. The role requires familiarity with InDEA 2.0, DPI principles, consent-based data exchange, and AI-enabled public sector applications. Experience working with senior government leadership and multilateral agencies is desirable.

2. **Enterprise Architect**

- Lead the design of the end-to-end technical architecture for the L&E Stack and LMIS.
- Define architectural patterns, technology stack, deployment models, and non-functional requirements.
- Assess existing MOLE systems and identify integration needs aligned with long-term architecture.
- Develop logical, physical, and deployment architectures for all components.
- Define the integration architecture, API framework, and interoperability standards.
- Ensure alignment with InDEA 2.0 reference models and national interoperability frameworks.
- Identify opportunities to incorporate AI-enabled components (e.g., automated data classification, intelligent routing, predictive analytics) within the architecture.
- Provide technical inputs for procurement documentation and vendor evaluations.

Minimum Qualifications and Requirements:

The Enterprise Architect should have at least a bachelor's degree in computer science, engineering, or a related field (master's preferred) and at least 12 years of experience architecting and designing large-scale, user-intensive platforms, digital public infrastructure, or multi-tenant government systems. The expert must demonstrate deep expertise in designing logical, physical, and deployment architectures; microservices; cloud-native patterns; and API-led interoperability aligned with India Stack and InDEA 2.0. Experience architecting registries, data exchange layers, consent frameworks, and high-availability environments is essential. Familiarity with integrating AI-enabled components such as predictive analytics, intelligent routing, and automated classification is desirable.

3. **Data Architect**

- Design the data architecture, including data models, MDM structures, metadata standards, and data governance frameworks.
- Define data ingestion, validation, transformation, and quality assurance processes.
- Develop data exchange specifications for high-priority integrations.
- Ensure alignment with national DPI data standards and sectoral data frameworks.
- Identify opportunities for AI-driven data quality improvement, entity resolution, and labour market analytics.
- Contribute to the data governance policy covering ownership, stewardship, access control, and privacy.

Minimum Qualifications and Requirements:

The Data Architect should hold a degree in data engineering, computer science, information systems, or a related field, with at least 10 years of experience designing enterprise-scale data architectures for high-volume, multi-source platforms. The expert must demonstrate strong capability in designing data models, master data management structures, metadata standards, and data quality frameworks for interoperable, API-driven systems. Experience architecting data ingestion pipelines, harmonization layers, and analytics-ready data stores for national-scale platforms is essential. Familiarity with AI-ready data architectures, including training datasets, feature stores, and automated data quality improvement, is desirable. Knowledge of DPDPA-aligned data governance is required.

4. **Security Architect**

- Design the security and privacy architecture for the L&E Stack and LMIS.
- Define identity and access management, encryption standards, audit mechanisms, and compliance requirements.
- Conduct security risk assessments and propose mitigation measures.
- Ensure secure-by-design principles across APIs, data pipelines, registries, and applications.
- Provide guidance on secure integration of AI components, including model governance and data protection.
- Support preparation of security-related procurement documentation and vendor evaluations.

Minimum Qualifications and Requirements:

The Security Architect should have a degree in cybersecurity, information security, or computer science, preferably with relevant certifications (e.g., CISSP, CISM) and at least 10 years of

experience designing security architectures for large-scale, mission-critical digital platforms. The expert must demonstrate strong expertise in secure-by-design principles, identity and access management, encryption, auditability, and API-level security for interoperable systems. Experience designing security controls for cloud and hybrid environments, registries, consent systems, and high-volume data exchange layers is essential. Familiarity with DPDPA 2023, national cybersecurity guidelines, and AI-related security considerations such as model governance and bias mitigation is desirable.

5. **IT Infrastructure & Governance Specialist**

- Assess MoLE's current ICT infrastructure, including hosting, network, storage, and DR readiness.
- Evaluate ICT governance mechanisms, processes, and institutional capacity.
- Identify gaps in infrastructure, governance, and technical skills.
- Recommend infrastructure upgrades, cloud/on-premise strategies, and consolidation opportunities.
- Provide guidance on infrastructure readiness for AI workloads, including compute, storage, and model deployment environments.
- Propose improvements to ICT governance, procurement processes, and capacity-building measures.

Minimum Qualifications and Requirements:

The IT Infrastructure & Governance Specialist should have a degree in information technology, engineering, or a related field, with advanced cloud/network/security certifications preferred, and at least 12 years of experience architecting and managing infrastructure for large-scale, user-intensive digital platforms or national-level stacks. The expert must demonstrate strong experience designing cloud and hybrid architectures, high-availability environments, storage and network configurations, and disaster-recovery frameworks for mission-critical systems. Experience planning infrastructure for API-driven, multi-tenant platforms and ensuring scalability, resilience, and performance at population scale is essential. Familiarity with infrastructure requirements for AI workloads and experience strengthening ICT governance, operational processes, and institutional capacity is desirable.

6. **API / Integration Expert**

- Lead the detailed design of APIs, integration workflows, and data exchange mechanisms for the L&E Stack and LMIS.
- Develop API specifications, integration patterns, and standards aligned with India Stack and InDEA 2.0 principles.
- Support the design of the interoperability layer, including gateway, throttling, monitoring, and versioning.
- Work with the Data Architect to define data exchange formats, payload structures, and validation rules.
- Ensure integration proposals support both short-term interoperability needs and long-term L&E Stack architecture.
- Incorporate AI-enabled integration monitoring, anomaly detection, and automated error handling where appropriate.

- Support integration testing, sandbox design, and onboarding of external systems.

Minimum Qualifications and Requirements:

The API / Integration Expert should hold a degree in computer science, engineering, or a related field, with at least 8-10 years of experience designing and implementing API-led integration for large-scale, interoperable platforms. The expert must demonstrate strong capability in architecting API specifications, microservices, integration patterns, and gateway management aligned with India Stack and InDEA 2.0. Experience designing interoperability layers, onboarding external systems, and managing high-volume data exchange is essential. Familiarity with AI-enabled integration monitoring, anomaly detection, and automated error handling is desirable.

Non-Key National Experts:

7. **Business Analyst (Strategy & Processes)**

- Conduct stakeholder mapping across MOLE, central ministries, state bodies, and statutory agencies.
- Document existing business processes and workflows for labour market management and social security.
- Identify process gaps, inefficiencies, and opportunities for automation.
- Support strategic goal-setting workshops and contribute to the gap analysis.
- Identify areas where AI-enabled automation or decision-support could improve service delivery or operational efficiency.
- Provide inputs for defining future-state processes aligned with the L&E Stack vision.

Minimum Qualifications and Requirements:

The Business Analyst should have a bachelor's degree in public administration, economics, IT, management, engineering, or a related field, and at least 8 years of experience in business process analysis, institutional assessments, and workflow mapping in public sector contexts. The expert must demonstrate experience conducting stakeholder mapping across ministries, state agencies, and statutory bodies, and in documenting as-is processes, identifying gaps, and proposing future-state workflows. Familiarity with labour market, social protection, or public service delivery processes is an advantage. The role requires understanding of digital transformation principles, including opportunities for automation and AI-enabled decision-support, and experience supporting strategy development and change-management planning.

8. **Business Analyst (Systems & Requirements)**

- Lead consultations to elicit functional and non-functional requirements for the L&E Stack and LMIS.
- Identify and prioritize urgent integration needs across MOLE systems.
- Document business-driven data exchange requirements, data flows, business rules, and use cases.
- Translate business needs into clear, structured requirement specifications for technical design.

- Capture requirements for AI-enabled features such as labour market forecasting, automated case triage, or intelligent dashboards.
- Ensure requirements align with the implementation strategy and architectural direction.

Minimum Qualifications and Requirements:

The Business Analyst should hold a bachelor's degree in information systems, engineering, computer science, or a related field, with at least 8 years of experience eliciting and documenting functional and non-functional requirements for ICT systems. The expert must demonstrate capability in translating business needs into structured requirement specifications, documenting data flows, business rules, and user journeys, and identifying integration and data exchange requirements for API-based systems. Experience with AI-enabled features such as forecasting, automated triage, or intelligent dashboards is desirable. Prior involvement in drafting requirement sections for procurement processes is an advantage.

6. Reporting Requirements

The firm will work under ADB's supervision and in close coordination with MOLE as the executing and implementing agency. All deliverables will be reviewed and approved jointly by ADB and MOLE. The firm will participate in regular progress reviews with the TA team and facilitate workshops and consultations with MOLE leadership and key partner institutions at agreed milestones.