

MINISTRY OF INFORMATION TECHNOLOGY & TELECOM

Digital Economy Enhancement Project (DEEP) | World Bank Project No. P174402

Hiring of Individual Consultant Under DEEP Project

<u>TERMS OF REFERENCE</u>					
Announcement Reference no:		PK-MOITT-556875-CS-INDV			
Project	Digital Economy Enhancement Project (DEEP)				
Position Name	Digital Public Infrastructure and Interoperability Lead			Position ID	P174402
Vacancy	1	Type of Contract	Individual Consultancy	Duration of Contract	Project Lifecycle
BACKGROUND					
Digital Economy Enhancement Project (DEEP) is a World Bank assisted project with the objective of enhancing the Government’s capacity for digitally enabled public services delivery for citizens and businesses. Ministry of IT & Telecom (MoITT) is the Executing Agency of the project with implementation support from (i) Board of Investment (BoI), (ii) National Database and Registration Authority (NADRA), (iii) Ignite – National Technology Fund and (iv) National IT Board (NITB).					
PROJECT DESCRIPTION					
DEEP aims to develop a framework and technology to promote digital services across Pakistan, significantly transforming citizen centric unified services nationwide. The project will support the development of digital public infrastructure including for responsible data exchange, digital authentication, and verifiable credentials and digitalization of public services (including to make them available through a new national citizen portal), which will improve the accessibility and delivery of services, economic opportunities, and social protection. In addition, DEEP will support a transition towards a digital inventory of administrative procedures and the development of an electronic single window the Pakistan Business Portal (PBP) integrated across all three layers of government for new and existing businesses to apply, renew, pay, and meet all their compliance needs. It will also promote civic innovation and digital inclusion.					
OBJECTIVES OF THE ASSIGNMENT					
The objective of this assignment is to lead the technical implementation, operational execution, and interoperability assurance of the Digital Economy Enhancement Project (DEEP), ensuring that all DEEP digital platforms, integration components, and participating organizations correctly implement and comply with approved national interoperability standards, data exchange frameworks, and enterprise architecture requirements. The role shall ensure the correct and consistent implementation of API standards, metadata schemas, enterprise architecture practices, data exchange protocols, authentication mechanisms, and interoperability frameworks across DEEP platforms and participating organizations — in alignment with national standards and frameworks. The position is the principal technical interoperability implementation interface for DEEP which is the core of national digital infrastructure ecosystem, including NODE, NDEL, Citizen Services and Digital Identity systems.					

The role shall technically execute and ensure compliance with Push/Pull/Federation/Event-driven integration patterns, API lifecycle practices, secure digital exchange mechanisms, and federated data ecosystem integration requirements, while verifying that all vendor-proposed solutions under DEEP meet interoperability, scalability, modularity, standards compliance, and long-term sustainability criteria.

SCOPE OF THE ASSIGNMENT

1. Technical Interoperability Implementation & DPI Integration:

The DPI & Interoperability Lead shall serve as the principal technical implementation authority for interoperability execution across DEEP's multi-platform digital infrastructure.

- a. Implement and operationalize interoperability requirements across heterogeneous technology stacks, legacy systems, APIs, integration layers, and digital platforms operating under DEEP.
- b. Ensure that all DEEP platforms — including Citizen Services, Digital Identity, National Open Data Ecosystem (NODE) and NDEL-connected systems — are implemented, integrated, and operated in accordance with approved national interoperability standards and Digital Public Infrastructure principles.
- c. Apply and enforce approved interoperability principles, API design standards, and integration patterns across DEEP implementations to prevent fragmented architectures, incompatible APIs, inconsistent metadata models, isolated vendor solutions, and non-standardized integration mechanisms.
- d. Provide technical input on scalable, modular, reusable, and interoperable digital service implementation approaches aligned with approved national digital government frameworks and DEEP objectives.
- e. Serve as the principal technical implementation interface for DEEP which is the core of National Digital Public Infrastructure ecosystem, including NODE, NDEL, and Digital Identity systems, ensuring DEEP's components are correctly aligned and technically integrated with all participating National Platforms.

2. Vendor Solution Technical Review & Interoperability Compliance

The role shall conduct technical review and compliance assessment of all vendor-proposed solutions under DEEP to verify conformance with interoperability, scalability, modularity, standards compliance, and long-term sustainability requirements.

- a. Review and assess vendor-proposed solution architectures, integration designs, API specifications, and implementation approaches against DEEP interoperability requirements, approved enterprise architecture standards, and national digital government frameworks.
- b. Verify that vendor implementations correctly apply API-first design principles, modular micro services architecture, secure data exchange protocols, and metadata standards — preventing vendor-locked, siloed, or non-interoperable solutions.
- c. Provide technical guidance to vendors on enterprise integration patterns, API gateway configurations, metadata implementation, and authentication mechanism requirements consistent with approved frameworks.
- d. Verify architectural modularity, scalability, and long-term sustainability of all DEEP platform components to prevent single-point-of-failure designs and proprietary integration dependencies.

- e. Support PMU and relevant technical committees in vendor technical assessments, proposal evaluations, and implementation compliance reviews from an interoperability and integration perspective.

3. Interoperability Standards Implementation & Metadata Compliance

The position shall facilitate and ensure the correct implementation and application of approved technical standards, governance frameworks, and metadata requirements within DEEP platforms and across participating organizations.

- a. Facilitate and ensure implementation of approved API governance requirements — including authentication mechanisms (OAuth 2.0, OpenID Connect, token-based), rate limiting policies, versioning protocols, and lifecycle practices — within DEEP platforms.
- b. Facilitate and oversee adoption of approved metadata standards — including DCAT/DCAT-AP, Dublin Core (DCMI), DDI, and ISO 19115/19139 as required — across participating organizations, ensuring correct application within NODE and associated DEEP platforms.
- c. Ensure correct application of approved data classification approaches, controlled vocabulary requirements, and interoperability coordination mechanisms within DEEP to maintain consistent metadata quality and cross-platform discoverability.
- d. Support implementation of approved enterprise integration patterns and interoperability coordination practices for structured, semi-structured, and geospatial datasets across heterogeneous source systems within DEEP.
- e. Facilitate implementation of trusted digital exchange practices governing secure data-sharing, access control policies, and data compliance requirements across federal and provincial entities participating in DEEP.

4. Technical Coordination & Integration Quality Assurance

The DPI & Interoperability Lead shall provide sustained technical coordination and quality assurance across all integration and interoperability implementation activities under DEEP.

- a. Review technical proposals, integration specifications, and implementation plans to verify compliance with interoperability standards, scalability requirements, modular architecture principles, and approved national frameworks.
- b. Conduct technical quality reviews of ETL/ELT pipeline designs, API endpoint configurations, data exchange implementations, and metadata schema applications across DEEP platforms.
- c. Identify and escalate technical interoperability issues including schema conflicts, authentication gaps, integration bottlenecks, non-compliant API designs, and metadata inconsistencies, and coordinate their resolution.
- d. Provide technical oversight of security controls relevant to interoperability implementation: API authentication, authorization enforcement, encrypted data exchange, and secure cross-organizational data sharing mechanisms.
- e. Support PMU in technical assessments, procurement evaluations, and vendor performance monitoring from an interoperability compliance and integration quality perspective.

5. Stakeholder & Institutional Technical Coordination

The position shall serve as the senior technical interoperability coordination interface with key national digital infrastructure stakeholders involved in DEEP implementation.

- a. Lead technical interoperability coordination and implementation-level engagement with the following entities:
 - i. National Data Exchange Layer (NDEL) technical and integration teams
 - ii. NADRA — Digital Identity and registry integration requirements
 - iii. National Information Technology Board (NITB)
 - iv. Punjab Information Technology Board (PITB)
 - v. Ignite National Technology Fund
 - vi. Federal Ministries and Divisions participating in DEEP
 - vii. Provincial Governments and digital authorities
 - viii. Regulatory Bodies with data exchange and integration requirements
 - ix. World Bank and other development partners
- b. Facilitate technical consultation sessions, interoperability coordination workshops, integration planning meetings, and implementation alignment activities with participating entities and DEEP vendors.
- c. Coordinate inter-institutional technical alignment on API implementation requirements, metadata schema adoption, authentication configurations, and data exchange implementation — within the scope of DEEP's integration mandate.
- d. Coordinate with NDEL and relevant national platform teams to ensure DEEP's integration implementations are correctly aligned with and compliant with NDEL's approved specifications and data exchange protocols.

6. Technical Advisory & Sustainability Support

- a. Advise PMU and MoITT on implementation challenges, technical risks, emerging interoperability technologies, and international DPI implementation practices relevant to DEEP's execution.
- b. Support PMU in formulating technical inputs for long-term interoperability implementation roadmaps and API ecosystem evolution plans under DEEP, in coordination with relevant national authorities.
- c. Ensure DEEP platforms and integration components are implemented and documented to enable long-term government ownership, operational continuity, and extensibility beyond the project lifecycle.
- d. Advise on implementation-level alignment with international DPI principles, World Bank digital infrastructure standards, and interoperability frameworks as applicable to DEEP's execution context.

7. Documentation & Technical Reporting

- a. Prepare technical interoperability implementation assessments, architecture compliance review reports, integration standards application documentation, and vendor solution compliance evaluations.
- b. Develop and maintain integration implementation records, interoperability compliance status reports, metadata standards adoption tracking, and NDEL integration implementation logs.
- c. Submit regular technical progress reports and interoperability implementation status updates to the PMU covering integration pipeline status, standards compliance, implementation risks, and resolution actions.

CORE ACTIVITIES AND FUNCTIONAL RESPONSIBILITIES:

The DPI & Interoperability Lead shall be responsible for supporting and contributing towards the following activities:

1. Technical interoperability implementation assessments & reports
2. API standards compliance & lifecycle implementation reports
3. NDEL integration implementation records & alignment outputs
4. Metadata standards adoption & schema compliance documentation
5. Vendor solution interoperability compliance review reports
6. Data exchange protocol & authentication implementation records
7. Integration & organizational onboarding technical outputs
8. Interoperability risk identification & resolution reports
9. Federated data ecosystem integration coordination outputs
10. Standards application & quality assurance reports
11. Stakeholder technical coordination & consultation summaries
12. Platform sustainability & knowledge transfer documentation
13. PMU technical advisory inputs & progress reports

QUALIFICATION AND EXPERIENCE

- 1) Minimum qualification: Bachelor's degree (16 years of education) in Computer Science, Software Engineering, Information Technology, Computer Engineering, Information Systems, or a related technical discipline from an HEC-recognized institution.
- 2) Preferred: Master's degree in Computer Science, Information Technology, Software Engineering, Enterprise Architecture, or a related field.
- 3) Minimum 15 years of progressive professional experience in digital government, enterprise architecture, technical interoperability, digital platform integration, API ecosystem development, or large-scale national ICT initiatives, with a demonstrated trajectory from technical implementation roles to senior programme or advisory responsibilities.
- 4) Demonstrated hands-on technical experience in Digital Public Infrastructure (DPI) implementation and integration, enterprise architecture frameworks, API ecosystem design and lifecycle management, interoperability framework application, and middleware platform configuration.
- 5) Demonstrated technical experience in data exchange protocol implementation, authentication mechanism configuration including OAuth 2.0, OpenID Connect, and SAML, federated identity integration, metadata standards application, and heterogeneous system integration across legacy, cloud-native, and hybrid technology stacks.
- 6) Demonstrated experience in cross-organizational digital integration and whole-of-government technical coordination, including data governance framework implementation, data classification, and trusted exchange mechanism configuration.
- 7) Experience with government or public sector digital transformation programmes, donor-funded projects financed by the World Bank, ADB, or equivalent international financial institutions, or large-scale national digital platform implementation will be preferred.
- 8) Technical implementation experience in any of the following areas shall be considered a distinct advantage: national open data platform integration, national data exchange layer or

integration backbone implementation, digital identity ecosystem integration including national registries and federated identity systems, API management platform configuration, or multi-agency cross-government integration and onboarding.
ADDITIONAL SKILLS / EXPERTISE
1) Digital Public Infrastructure (DPI) implementation & integration 2) Enterprise Architecture application & interoperability standards compliance 3) API implementation, lifecycle execution & API gateway configuration 4) Authentication mechanism configuration: OAuth 2.0, OpenID Connect, SAML 5) Data exchange protocol implementation & federated integration execution 6) Metadata standards application: DCAT, Dublin Core, DDI, ISO 19115 7) Heterogeneous system integration & middleware implementation 8) Interoperability compliance assurance & technical quality review 9) Technical review, compliance assessment & vendor solution evaluation 10) Push / Pull / Federation / Event-driven integration pattern execution 11) Technical implementation advisory & risk coordination 12) Technical documentation, compliance reports & integration records 13) Senior stakeholder technical coordination & inter-agency engagement 14) Digital government ecosystems & whole-of-government integration
SCHEDULE FOR THE ASSIGNMENT
The Consultant will be appointed on a contract basis for the DEEP project lifecycle.
REMUNERATION AND OTHER BENEFITS
1) The consultant will receive remuneration as per the scope of work defined and based on the World Bank guidelines applicable to individual consultants for this position. 2) Travel expenses as approved by the World Bank and the Government of Pakistan. 3) This is a consulting-based appointment and does not offer medical or other benefits.
REPORTING OBLIGATIONS
1) This position is based in Islamabad, Pakistan. 2) The consultant will report to the Program Director. 3) The consultant is required to follow working days and timings as per the directives of the Federal Government of Pakistan. 4) The consultant shall provide all necessary technical reports, interoperability implementation updates, integration records, and programme documentation to the Program Director on agreed timelines. 5) The consultant is required to report to work in official attire. 6) The consultant shall ensure that all required reports are prepared on time in accordance with World Bank requirements.
SELECTION CRITERIA
Procurement will be carried out in accordance with the Open Competitive Selection of Individual Consultants in accordance with the World Bank's "Procurement in Investment Project Financing, Goods, Works, Non-Consulting and Consulting Services, Fifth Edition, September 2023" ("Procurement Regulations").

SUBMISSION
Candidates meeting the required criteria should submit their applications at http://www.njp.gov.pk within 15 days of publication of the advertisement. No hard copy of application shall be accepted and all applications must be sent via NJP online. Shortlisted candidates who are working in Government sector are required to produce NOC at the time of interview.