National e-Governance Division

Digital India
Power To Empower

Concept Memorandum for setting up an AI Team in NeGD-DIC

Contents

Purpose of the Document

This Concept Memorandum, issued by the National e-Governance Division (NeGD), Ministry of Electronics & Information Technology (MeitY), sets out the background for a forthcoming Request for Empanelment (RFE) for providing consulting and development services of AI/ML Solutions for Digital India Projects. The RFE will seek to onboard a Partner Agency(s) to provide an integrated AI/ML Delivery manpower that can take priority use cases ("AI Services") from feasibility to production across Digital India platforms and various ministries/departmental use cases.

The Partner Agency(s) will provide requisite manpower to work in NeGD in a blended on-site/remote model, with key team members available on-site for design, development, deployment and User Acceptance Testing (UAT), for end-to-end implementation of AI services.

The team's mandate is to build and integrate AI Services into NeGD/DIC and government platforms, and to set up inference server capability within NeGD.

Period of engagement: 3 years, extendable by up to 2 years (1 + 1), subject to performance, evolving requirements. The team's capacity may be scaled up or down as per the approved use case within the contracted terms and agreed contract rates.

The indicative list of inputswhich are being sought on this concept memorandum are as follows:

Scope of work Related		
S. No.	**Inputs Required**	**Section of the document**
1	Regarding AI use cases, what additional flexibilities or services could be incorporated to address the evolving needs of the Government of India (GOI) as per industry insights? Furthermore, are there additional opportunities/Use cases that the GOI should explore to enhance its AI capabilities for offering better digital services to citizens?	Heading 2.2 under Section number 2
2	Do the indicative functional flows and development of AI agents for government applications sufficiently address all necessary components for a system of this nature? Please suggest any finetuning of the workflows as per industry standards.	Heading 2.2 under Section number 2
Manpower Related		
3	Is the proposed 18-member team adequate to deliver the	Heading 3.1

	envisioned scope based on industry expertise? If applicable, recommend additional roles and skillsets while maintaining a lean team structure.	under Section number 3
4	Is the hybrid on-site/remote model effective for balancing delivery and attracting talent? Additionally, provide insights into how other organizations manage similar salutations under comparable operational models.	Heading 3.1 under Section number 3
5	Are the proposed 60% manpower and 40% deliverable payment split equitable? Provide recommendations for the payment structure.	Section number 4
6	Are the job descriptions aligned with industry standards for AI projects? Suggest any updates, particularly regarding certifications or public sector experience, to ensure relevance and compliance with industry norms.	Annexure 1
7	Propose effective and industry friendly engagement models (Pro-bono engagement/ Revenue sharing agreements / Short term engagement of resources with Niche skills) methods for engaging agencies or manpower apart from the RFP model with the government for similar initiatives.	This refers to the entire RFP engagement model.

Interested agencies/organizations are invited to submit their comments and inputs on this Consultation Memo. All submissions must be sent in writing via email to **director.pm@digitalindia.gov.in** / **Akshansh.912@digitalindia.gov.in** no later than 15th October 2025.

1. Introduction

The National e-Governance Division (NeGD), under Digital India Corporation, Ministry of Electronics and Information Technology (MeitY), seeks to engage a Partner Agency(s) to design, develop, and deploy an AI technology stack for key Digital India projects, including DigiLocker, UMANG, Poshan Tracker, and Academic Bank of Credits (ABC).

The exponential rise in AI-based problem statements across ministries, departments, and public programs necessitates a specialized AI manpower team within NeGD to assess, design, and implement AI-driven solutions. This team will act as a rapid-response unit for AI adoption, ensuring delivery at scale, speed, and with responsible use of AI.

NeGD and DIC currently have an existing tech team of 500+ resources working on more than 20 projects for MeitY and various government departments. The AI team at NeGD has already developed and deployed conversational AI chatbots across 20+ projects.

2. Scope of Work

2.1 AI Capabilities & Functional Requirements

NeGD intends to deploy a unified AI Delivery Team to implement a portfolio of AI capabilities across priority Digital India platforms and other ministry projects routed to NeGD. Each approved use case will be taken end-to-end—from assessment to production—and designed for reuse across platforms with minimal customization.

The horizontal capabilities are envisioned as AI Services (details are provided in section 2.2) that will be built to supplement these projects. These services include:

1. Document Summarisation for quick insights from lengthy documents.
2. Conversational Bots (Multilingual) to enable interactive assistance.
3. Voice-based Form Filling in government portals for inclusive and accessible user input.
4. Document OCR and Form Processing to digitize and process records efficiently.
5. Image Matching with Liveness Detection to strengthen identity verification.
6. Development of Agentic AI solutions for multiple Government applications and use cases.

Collectively, these AI services will act as reusable enablers that enhance efficiency, scalability, and user experience across multiple government digital platforms.

Apart from the above-mentioned AI services, the team shall also be working on On-Premise inference server setup for scenarios where government departments require data to remain internal. (Refer to section 2.3)

Please note that the abovementioned AI Services are indicative in nature and may evolve as and when required by NeGD/concerned ministries.

In order to complete the work mentioned in section 2.1, the vendor needs to follow the indicative tasks mentioned below:

1. Requirement framing: Translate the business need into a clear Use-Case documentation; capturing scope, users, journeys, and success targets (accuracy, response time, uptime). Map current workflows and integration points; profile available data (sources, volumes, formats, quality) and specify required cleaning, normalization, labelling, and transformations. Identify risks, privacy/consent needs, and controls. Draft the high-level design with dependencies, rollout/rollback approach, and a milestone roadmap for build, test, UAT, and go-live.

2. Enable reuse: Package capabilities as reusable services (APIs/SDKs, prompts, templates), document them, and make them portable for quick application across ministries with minimal rework.

3. Deliver outcomes: Implement at least six (6) AI enhancements on priority NeGD platforms during the contract period and take up additional ministry problem statements approved by NeGD.

4. Operate to targets: For every AI deployment, meet the agreed targets for accuracy, speed, and uptime (set jointly with NeGD and reported monthly), and ensure changes can be safely rolled back if required.

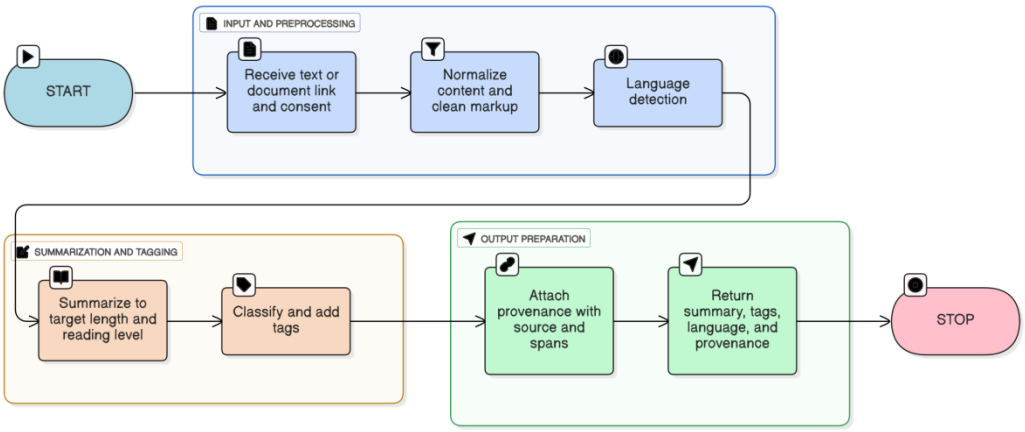
5. Assess and implement inference server capabilities as per the requirements of NeGD

2.2 AI Services

NeGD envisages the development of a suite of AI Services/solutions that will serve as pre-built, reusable AI-driven components designed using a modular approach. These AI services/solutions shall be developed in a manner that enables their deployment across multiple NeGD/DIC platforms and other ministerial projects, with minimal customization. The manpower from selected Agency(s) shall be responsible not only for building these services but also for conducting assessments to determine where their application is feasible and impactful.

2.2.1 Document Summarization & Classification

The partner Agency(s) shall design and implement a summarization and classification AI service to handle circulars, scheme documents, notifications, and unstructured notices, making them more accessible and actionable for citizens and call-centre staff. The envisaged functional flow is as follows:



(Indicative Functional flow of Document Summarization & Classification)

i. Start

ii. Receive text (URL, document upload, API, or scanned content) with consent

iii. Perform ingestion checks (authentication, file-type validation, source verification)

iv. Normalize text (remove markup, clean HTML, standardize structure)

v. Detect language and run multilingual checks

vi. Summarize content into concise, citizen-friendly text with length and reading-level controls

vii. Classify into a taxonomy (e.g., topic, department, type)

viii. Attach provenance (source, section, timestamp, metadata)

ix. Decision point: Quality gates met (length, clarity, coverage)?

If Yes

a. Return SUCCESS with summary, classification, metadata, provenance
b. Stop

If No

a. Retry or send to REVIEW mode with reasons

b. Adjust parameters and re-run

c. Queue for manual review if unresolved

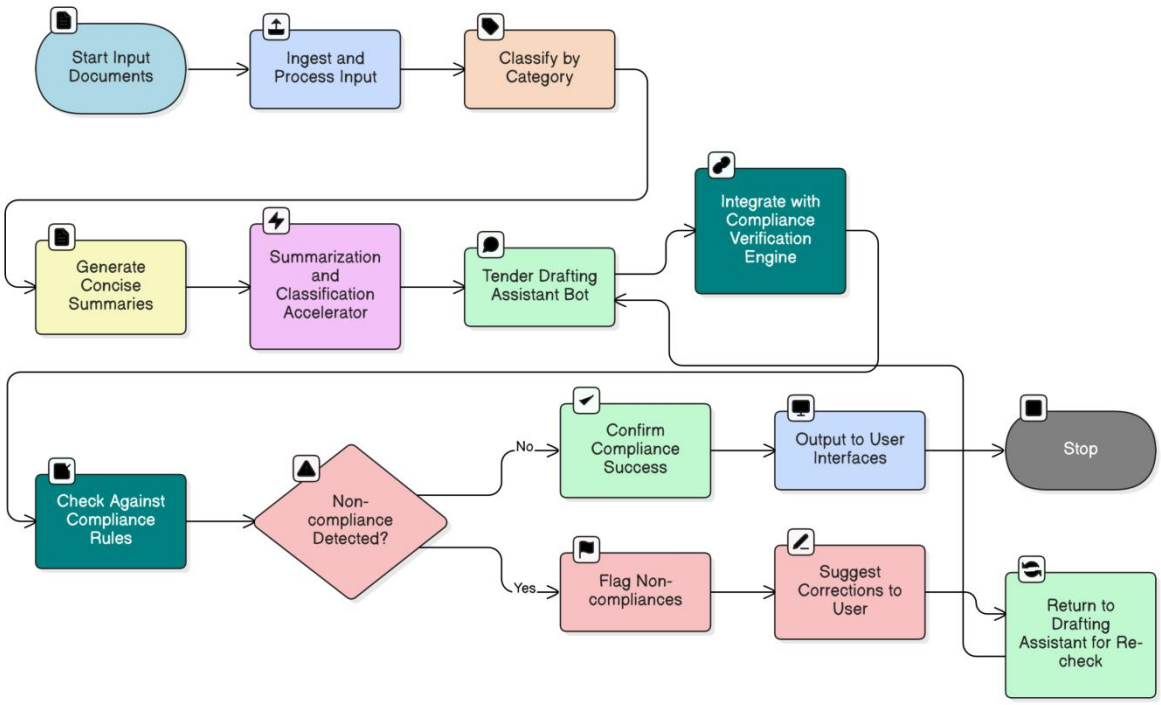
d. Stop

x. Log and audit all events, including versions, errors, and retries

This service shall provide controlled-length multilingual summaries, standardized classifications, and validated provenance metadata, ensuring that key information is easy to interpret and re-usable across government platforms.

2.2.1.1 Legal/Tender Assistance Bots

Another usecase for Document summarisation AI service happens to be a legal assistant bot that summarizes and provides insights on government laws. A Tender Drafting Assistant to assist users in drafting tenders having functionality to check compliance of tenders against specified regulations (e.g., MSME compliance or make in India compliance), flagging any non-compliances or suggesting corrections.



(Indicative Functional flow of Legal/Tender Assistance Bots)

1. Upload inputs (tender/scheme docs, notifications).
2. Ingest & normalize → basic validations.
3. Classify document type/category.
4. Summarize & standardize key requirements (AI).
5. Draft assistant prepares tender text from summaries (AI).
6. Compliance check against rules/clauses.
7. Decision:

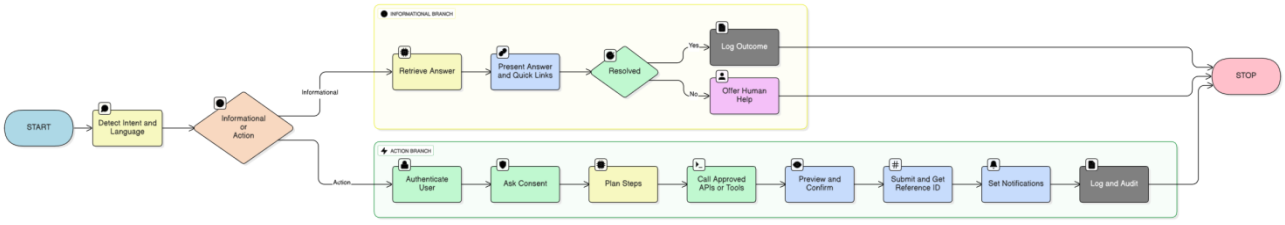
- If gaps: flag issues → suggest fixes → back to drafting.
- If OK: mark compliant.

8. Publish output to user interfaces;
9. End.

2.2.2Conversational bots (Multilingual)

Develop chatbots that utilize government documents (such as annual reports, FAQs, and other PDFs) as the knowledge base for responding to user queries. The chatbots must process and retrieve information from these documents to provide accurate, context-aware responses.

The chatbot will support multiple languages, ensuring seamless interaction for users in various regional languages alongside English. The multilingual capability must apply to input processing, response generation, and any integrated features from other requirements. The envisaged flow is as follows:



(Indicative Functional flow of Voice bots)

i. Start
ii. Detect intent & language
iii. Decision: Informational or Action?

If Informational

a. Retrieve answer from approved knowledge base
b. Present answer + quick links

c. Decision: Resolved?

If Yes

a. Log outcome
b. Stop

If No

a. Offer human help
b. Stop

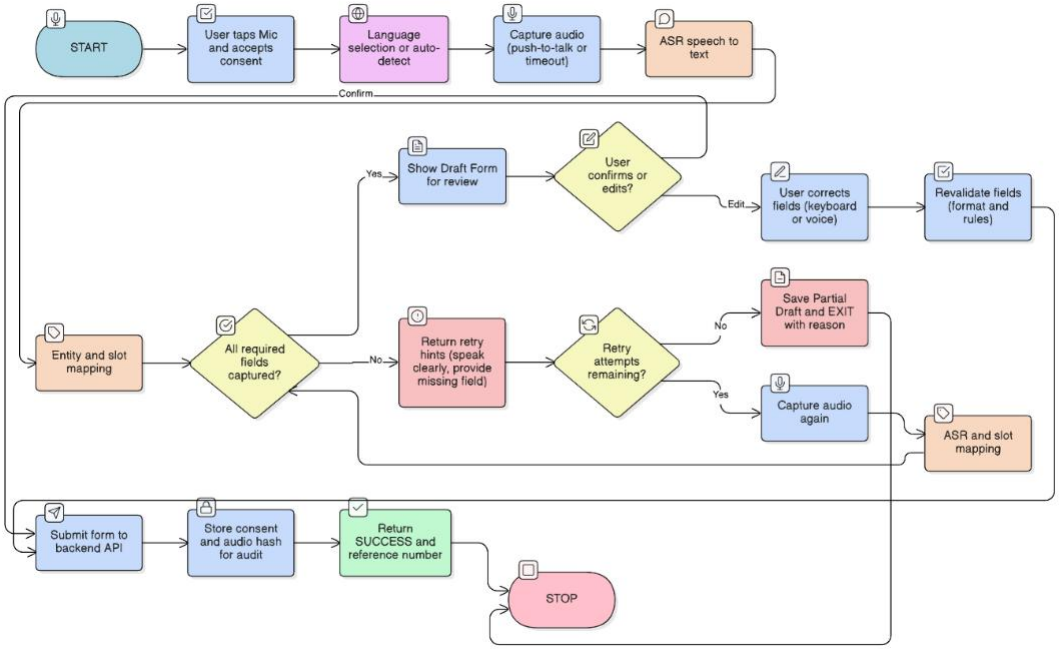
If Action

d. Authenticate user (SSO/OAuth)
e. Ask explicit consent (scope & purpose)
f. [AI] Plan steps/tools (policy-bounded)
g. Call approved APIs/tools (allow-listed)
h. Preview & confirm (human checkpoint)
i. Submit & capture reference ID
j. Set notifications (status/reminders)
k. Log & audit (consents, calls, IDs)
l. Stop

The bots must be designed as policy-bounded, reusable services with multilingual support, auditability, and guardrails for compliance. The solution shall have the ability to adapt to platform-specific workflows while retaining a common architecture.

2.2.3Voice-based Form Filling for inclusive and accessible user input

The selected Agency(s) shall design and implement multilingual voice-driven form-filling service to enable citizens and field workers to complete structured forms using speech. The envisaged flow is as follows:



(Indicative Functional flow of Voice-to-Form (Multilingual) Data Entry)

i. Start
ii. User taps mic and accepts consent
iii. Language selection or auto-detection
iv. Capture audio (push-to-talk / timeout)
v. [AI] Automatic Speech Recognition (ASR) – convert speech to text
vi. Entity & slot mapping for form fields
vii. Decision point: All required fields captured?

If Yes

a. Show draft form for review
b. User confirms or edits
c. Submit to backend API
d. Return success + reference ID
e. Stop

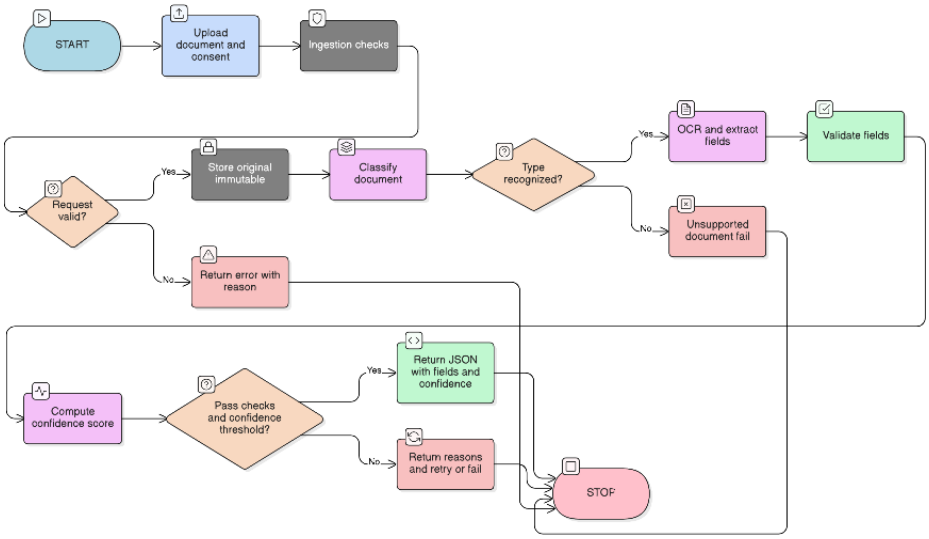
If No

i. Provide retry hints (e.g., speak clearly / missing field prompt)
ii. Retry loop
iii. If attempts exhausted
iv. Save partial draft & exit with reason
v. Stop

The service must be built with multilingual ASR models, policy-bounded consent flows, and fallback to manual entry to ensure reliability and inclusivity. The service shall enable the speech-to-data transformation in diverse contexts (citizen self-service, assisted workflows, or field-level data collection).

2.2.4 Document OCR for form processing

The selected Agency(s) shall design and implement a document ingestion and processing service that automates the extraction and validation of information from certificates, IDs, forms, and scanned PDFs. The envisaged functional flow is as follows:



(Indicative Functional flow of Intelligent Document Processing (IDP)

i. Start

ii. Upload document and capture consent

iii. Perform ingestion checks

iv. Store original copy in immutable archive

v. Classify document type

vi. Decision point: Type recognized?

If Yes

i. Perform OCR and layout parsing

ii. Extract required fields

iii. Validate fields against rules/registries (format, checksum, database lookups)

If No

i. Mark as unsupported document

ii. Fail with reason

iii. Stop

vii. Compute confidence score for extracted data

viii. Decision point: Pass confidence threshold?

If Yes

i. Return clean JSON with fields with confidence score

ii. Stop

If No

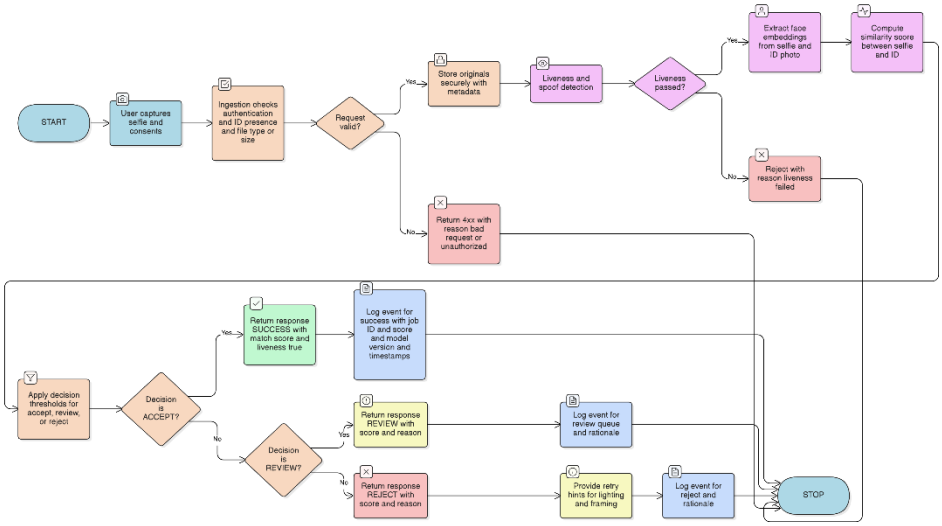
i. Return reasons for failure/retry

ii. Stop

This solution shall provide field-level confidence scores, error reasons, and validated JSON outputs for seamless integration into downstream workflows. The solution should be developed keeping in mind the ability to handle citizen documents, ensuring accuracy, faster turnaround, and reduced manual effort.

2.2.5Image Matching with Liveness Detection to strengthen identity verification

The selected Agency(s) shall design and implement an image matching with liveness detection AI Service to strengthen identity verification processes, reduce fraud, and minimize reliance on manual KYC checks. The envisaged functional flow is as follows:



(Indicative Functional flow of Image / ID Matching with Liveness)

i. Start

ii. Capture user selfie and obtain explicit consent

iii. Perform ingestion checks on file type, size, and authorization

iv. Store originals securely with metadata for audit trail

v. Run liveness and spoof detection on captured image

vi. Decision point: Liveness passed?

If No

a.Reject with reason (e.g., spoof attempt, liveness failed)

b. Stop

If Yes

a. Extract face embeddings from selfie and ID photo

b. Compute similarity score

vii. Decision point: Similarity and liveness thresholds met?

If Yes

a. Return response SUCCESS with match score and reference ID

b. Stop

If No

a. Return response REJECT with score and reason, or REVIEW for flagged cases

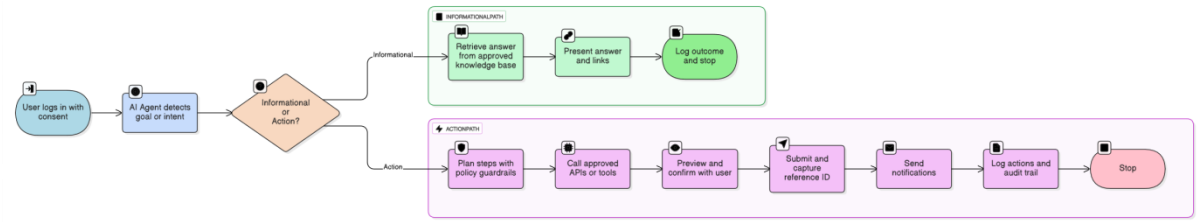
b. Provide retry hints for lighting/framing if applicable

c. Stop

This service shall provide real-time, explainable identity verification with auditability and retry mechanisms.

2.2.6Development of AI agents for Government applications.

The selected Agency(s) shall be working on creating AI agents for specific government applications, such as DigiLocker. These agents must be discoverable and integrable by the development community, allowing them to embed the agents into their own applications for enhanced functionality (e.g., programmatic access to DigiLocker features). The team shall also work on building Agentic AI Framework Development Using Specified Tools, i.e, the Development of an agentic AI framework using tools like LangGraph or CrewAI. These agents should be capable enough to understand user goals, plan required steps, and securely invoke approved APIs/tools to complete transactions, while maintaining full audit trails and human checkpoints for irreversible actions. The following functional flow showcases the potential use case of agentic AI in the context of Digilocker.



(Indicative Functional flow of Agentic AI in Digilocker specific use case)

i. User Interaction Layer: Citizens access DigiLocker, or browser portals with login and consent.

ii. Agent API Layer: The agent interprets user goals, plans next steps, and orchestrates calls to approved APIs (e.g., DigiLocker API for document fetch, NSP API for application submission, SMS/email for notifications).

iii. Document Pipeline (if required): Documents uploaded are de-skewed, classified, validated for forgery/tampering, OCR output for key values, and flagged/accepted.

iv. Rule Submission Layer: Extracted/collected data is validated against eligibility rules, auto-filled into forms, submitted via API, and tracked through status polling.

v. Persistence & Monitoring: All documents, metadata, logs, and metrics are stored securely (databases, object stores, FAISS/Milvus for embeddings). Monitoring systems (Prometheus, Grafana, OpenTelemetry) provide visibility, while human review portals allow flagged cases to be examined.

vi. Audit & Compliance: All actions, API calls, and decisions are logged with reasons, enabling rollback, transparency, and compliance with Responsible AI guidelines.

2.3 LLM Enablement

NeGD will establish an in-house, multi-tenant inference server so AI services/solutions can run securely, reliably and cost-effectively on approved government cloud/infrastructure (e.g., NIC/MeghRaj or equivalent). The objective is to deploy and serve open-source models (Large language Models (LLMs), Small Language models (SLMs), etc.) behind stable APIs that any NeGD/DIC project can call.

The manpower from partner Agency(s) shall be responsible for carrying out the following activities for setting up the inference server:

1. Model & infra fitment: Assess shortlisted open-source base models against target use cases including but not limited to NLP, image, speech, matching etc. and document the runtime requirements (CPU/GPU profile, memory, storage, latency/throughput needs). The assessment shall be done on the basis of use case specificity.

2. Technical specification: Produce a detailed documentation to setup the inference layer on approved government cloud/infrastructure (e.g., NIC/MeghRaj or equivalent), covering:
   i. Compute
   ii. Storage
   iii. Networking
   iv. Security & compliance
   v. Performance metrics

3. Recommend and configure the required orchestration, monitoring, and model-lifecycle/deployment tooling (build → promote → canary/rollback, versioning, drift monitoring), with a clear preference for open-source components. Proprietary tools may be proposed only with prior NeGD approval and a written justification (functional gap, support/SLA etc.). For any paid tool, the team should include full licence and support costs, deployment feasibility on approved government cloud/infrastructure, and a monthly tooling inventory in project reports.

4. Deployment & hardening: Setup up the environment, deploy initial model services, conduct load/security tests, and tune for the agreed upon performance metrics. The team should also provide runbooks, model cards, API specs, and operational dashboards to monitor the performance.

5. Operating policies. Define and implement policies for multi-tenant use, model/version management, sandbox vs. production separation, and access approvals for new projects.

2.3.1 Adaptive inference layer for AI services

In addition to the AI Services outlined in Section 2.2, bidders should note that potential applications developed under this initiative may require robust inference capabilities, with flexibility to integrate multiple AI models and execution pathways. The inference architecture should support seamless switching across:

1. **Commercially Paid Models**
    - Integration with enterprise-grade AI/ML services (e.g., OpenAI, Anthropic, Google, AWS, Azure).
2. **Open-Source models**
    - NeGD deployed open-sourcelarge language models((e g, LaMMA, Mistral etc, which is also a component of this RFE) to ensure sovereignty, compliance, and adherence to data localization norms.

Please note: The activities listed above are illustrative. The selected Agency(s) shall undertake all additional tasks necessary to provision, secure, operate, and continuously improve the NeGD inference server, which includes but not limited to: environment hardening, backup/restore drills, disaster-recovery runbooks, cost/performance tuning, capacity planning, release management, vulnerability remediation, and compliance evidence generation.

3. Resources Deployment

The number of resources to be deployed under this engagement is indicative and may be ramped up or down based on performance, compliance, conduct, or actual workload requirements. The Partner Agency(s) will bear all costs related to resource deployment, including travel, accommodation, IT systems such as laptops, internet connectivity, and any software licenses required for execution of tasks. Only project-specific software, where explicitly approved by NeGD, shall be provisioned by NeGD.

3.1 Proposed Team composition

S.no.	Role	Count	Key Responsibilities (indicative)
1.	**AI/Solution Architect**	1	i. Design and implement end-to-end solution architectures, embedding AI/ML capabilities within NeGD applications. ii. Lead the development and deployment of AI-driven applications, ensuring alignment with organizational and government program goals. iii. Architect and oversee integration of AI applications with NeGD's current enterprise applications and digital platforms. iv. Evaluate AI frameworks, middleware, and cloud platforms to enable seamless interoperability across systems. v. Define technical standards, APIs, and integration patterns for robust, secure, and high-performance solutions. vi. Provide technical leadership, integration expertise, and mentorship to delivery teams working on cross-functional initiatives.
2	**Program Manager**	1	i. Provides overall program governance, planning, and execution oversight. ii. Acts as the primary liaison between NeGD, implementing agencies, and stakeholders. iii. Manages timelines, risks, and dependencies across parallel AI Services. iv. Ensures deliverables are aligned with program objectives and stakeholder

			expectations. v. Tracks KPIs and reporting for senior leadership.
3.	**Business Analyst**	2	i. Works with stakeholders to gather, analyze, and document functional/business requirements. ii. Translates use-case requirements into user stories, acceptance criteria, and workflows. iii. Supports Solution Architect in mapping requirements to technical capabilities. vi. Validates solution outputs against business needs and ensures usability.
4.	**Data Science Lead**	1	i. Conducts exploratory data analysis, feature engineering, and model benchmarking. ii. Assesses the feasibility of datasets for AI/ML use cases. iii. Provides insights into model selection, validation, and evaluation.
5.	**Data Engineering Lead**	1	i. Designs and oversees scalable data pipelines and integration workflows. ii. Defines data architecture, storage strategies, and performance optimization. iii. Ensures compliance with metadata, lineage, and governance requirements. iv. Guides Data Engineers in implementing ETL and real-time data processing pipelines.
6.	**AI/ML Lead**	1	i. Provides technical depth in AI/ML model assessment and early prototyping. ii. Supports the Solution Architect in evaluating model suitability. iii. Defines technical requirements for fine-tuning and optimization by the Development Team.
7.	**MLOps Lead**	1	i. Focused on infrastructure requirements, deployment pipelines, and lifecycle management. ii. Provides input on monitoring, logging, scaling, and retraining frameworks for AI

			solutions. iii. Works with the Solution Architect to define requirements for inference server deployment.
8.	**AI/ML Engineers**	4	Build, fine-tune, and validate models for NLP, computer vision, and automation use cases.
9.	**Data Scientist**	1	i. Develops machine learning models under the guidance of the Data Science Lead. ii. Performs data cleaning, preprocessing, and feature engineering. iii. Conducts model training, testing, and validation for specific use cases. Works closely with AI/ML Engineers to operationalize models.
10.	**Data Engineers**	2	Develop ETL pipelines, preprocess data, and prepare datasets for AI models.
11.	**MLOps Engineer**	2	Implements deployment pipelines, CI/CD workflows, and monitoring tools.
12.	**AI QA Engineer**	1	i. Ensures adherence to data protection laws and Responsible AI principles. ii. Testing of the AI services as per business requirements. iii. Create test plans, regression testing suites for the developed AI services iv. Maintain Logs of defects across environments
	Total	18	

2. The proposed Team may operate in a remote or hybrid deployment model. Key decision-making resources (AI/Solution Architect, AI/ML Lead, MLOps Lead, Data Science Lead, Data Engineering Lead, Program Manager, Business Analyst, AI QA engineer) shall be available for in-house deployment at NeGD premises as and when required, while other resources may work in a hybrid manner, ensuring full availability and accountability. The Deployment mechanism shall be designed to ensure continuity, responsiveness, and close coordination with NeGD stakeholders.

3. A minimum of 2 CVs/resumes of the resources (mentioned in annexure 1) proposed to be deployed, against the stated criteria/requirements in this RFP and subsequent amendments (if any), must be furnished as part of the Technical Proposal. These

resources may be called for interaction/assessment during the technical evaluation process.

4. The total number of resources deployed on the project may vary by up to ±25% of the contract value, depending on project needs and approval by NeGD.

5. NeGD may also request manpower for niche roles beyond the specified team composition. In such cases the bidder shall finalise the applicability of such roles in consultation with NeGD to cover the scope requirement.

4.Payment Criteria

4.1 Overview

Payments will be made every quarter, split as follows:

i. 60% based on manpower deployment.
ii. 40% based on successful delivery of deliverables agreed with NeGD.

4.2 Manpower-Based Payment (60%)

Description: 60% of the payment is for deploying entire team meeting RFP-specified roles and qualifications.

Conditions:

i. All personnel must be fully engaged for the quarter.
ii. Partial deployment results in prorated payment based on actual manpower and duration.
iii. Documentation: Submit timesheets, resource allocation reports, and qualification compliance certificates by the quarter's end.

4.3 Deliverable-Based Payment (40%)

Description: 40% of the payment is for delivering and obtaining approval for deliverables as per the Partner Agency(s) –NeGD agreement.

The deliverables shall be identified jointly with NeGD in quarterly meetings.

Conditions:

i. Deliverables must meet agreed quality, functionality, and timeline standards.
ii. Requires NeGD approval.
iii. Partial or non-delivery withholds this payment until rectified.
iv. Documentation: Submit a deliverable completion report, test results, and NeGD approval letter at the end of each quarter.

4.4 Quarterly Payment Process

i. Submission: Bidders must provide manpower and deliverable documentation by the last working day of the quarter.
ii. Verification: Documentation is verified within 7 working days.
iii. Payment: Manpower-based payment is released post-verification; deliverable-based payment is released post-NeGD approval.

Annexure 1–Indicative Job Descriptions

1.1 AI/Solution Architect

Designation	**AI/Solution Architect**
No. of Positions	**1**
Qualifications	**B.Tech.(CS and IT preferred) /M.S/M.Tech/PhD (in Computer Science, Artificial Intelligence, Machine Learning, Data Science, or related technical field are preferred)** **AWS/Azure/GCP Solutions Architect Professional(are preferred)**

Key Responsibilities

1. Design and implement end-to-end solution architectures, embedding AI/ML capabilities within NeGD applications.
2. Collaborate with stakeholders to translate business requirements into scalable, secure, and future-ready solutions.
3. Lead the development and deployment of AI-driven applications, ensuring alignment with organizational and government program goals.
4. Architect and oversee integration of AI applications with NeGD's current enterprise applications and digital platforms.
5. Evaluate AI frameworks, middleware, and cloud platforms to enable seamless interoperability across systems.
6. Define technical standards, APIs, and integration patterns for robust, secure, and high-performance solutions.
7. Ensure compliance with government regulations, data privacy, security, and ethical AI principles throughout solution design.
8. Partner with NeGD teams, data scientists, and engineers to deliver AI-enabled innovations across governance workflows.
9. Provide technical leadership, integration expertise, and mentorship to delivery teams working on cross-functional initiatives.

10. Drive innovation by identifying opportunities where AI and advanced analytics can enhance NeGD's citizen-facing and enterprise services.

Required Experience:

1. 8-12 years in software/AI architecture
2. 3-5 years leading AI/ML teams and large-scale AI implementations
3. 4-6 years in solution architecture for complex enterprise systems
4. Proven track record of end-to-end AI project delivery

Technical Skills:

1. **Architecture:** Microservices and serverless patterns, event-driven and domain-driven design, high-level data & model lifecycle architecture
2. **Cloud:** AWS (Bedrock, SageMaker, Lambda, API Gateway, S3), Azure (OpenAI Service, ML Studio, AKS), GCP (Vertex AI, BigQuery, Cloud Storage), multi-cloud integration & cost optimization
3. **AI Frameworks:** TensorFlow, PyTorch, Hugging Face Transformers, LangChain (LLM orchestration), prompt-engineering and responsible AI practices
4. **Data & Storage:** SQL (PostgreSQL, MySQL), NoSQL (MongoDB, DynamoDB), vector databases (Pinecone, Weaviate) for RAG & semantic search
5. **APIs & Integration:** REST, GraphQL, WebSocket for real-time chat/voice
6. **Conversational AI & Voice:** Speech-to-Text and Text-to-Speech APIs (AWS Transcribe/Polly, Azure Speech), RAG/chatbot pipeline design with vector stores & LLMs
7. **Security & Governance:** IAM and RBAC across clouds, encryption in transit & at rest, data privacy & AI governance (GDPR, SOC2)

1.2 Program Manager

Designation	**Program Manager**
No. of Positions	**1**
Qualifications	**B.Tech(CS and IT preferred) /M.Tech/M.B.A**

Key responsibilities:

1. Provide comprehensive program governance, planning, and execution oversight for multiple parallel AI services initiatives across government departments
2. Establish program management frameworks and best practices aligned with government standards and AI ethics principles
3. Drive strategic decision-making ensuring AI initiatives align with national digital governance and citizen service objectives
4. Act as primary liaison between NeGD leadership, implementing agencies, government departments, and external technology partners
5. Manage complex timelines, interdependencies, and risks across multiple parallel AI services projects and workstreams
6. Coordinate resource allocation, budget management, and procurement processes in compliance with government regulations
7. Establish and monitor KPIs and success metrics for AI service deployments
8. Ensure deliverables meet program objectives, quality standards, and compliance requirements
9. Develop contingency plans and risk mitigation strategies for critical AI service implementations
10. Monitor and address AI bias, fairness, transparency, and accountability issues in government applications
11. Drive innovation by identifying AI opportunities to enhance citizen-facing services and government operations

12. Evaluate emerging AI technologies and industry best practices for government adoption

Required Experience:

1. 10-15 years in program/project management with focus on technology implementations in large organizations
2. 5-7 years leading AI/ML programs or digital transformation initiatives in enterprise or government environments
3. 3-5 years in senior management roles overseeing cross-functional teams and complex stakeholder relationships
4. Proven track record of successfully delivering large-scale technology programs with multiple parallel workstreams
5. Government or public sector experience preferred, with understanding of regulatory compliance and procurement processes

Technical Skills:

1. **Program Management:** Advanced proficiency in program management methodologies (Agile, PMI, SAFe), portfolio management tools (Jira, Azure DevOps, Monday.com)
2. **Risk & Change Management:** Risk management frameworks, change management principles, and stakeholder engagement strategies
3. **Resource Management:** Budget management, resource planning, and vendor management capabilities
4. **AI Technology Understanding:** Understanding of AI frameworks (TensorFlow, PyTorch), cloud AI services (AWS Bedrock, Azure OpenAI, GCP Vertex AI)
5. **Data Governance:** Knowledge of data governance, privacy frameworks, and AI model lifecycle management
6. **Enterprise Architecture:** Familiarity with API management, microservices architecture, and enterprise integration patterns
7. **AI Applications:** Awareness of conversational AI, computer vision, NLP, and automation technologies relevant to government use cases
8. **Government Procurement:** Understanding of government data protection laws, cybersecurity frameworks (NIST, ISO 27001), and AI ethics guidelines

9. **Procurement & Contracting:** Experience with government procurement processes, vendor evaluation, and contract management
10. **Security & Privacy:** Knowledge of data classification, access controls, and privacy-by-design principles in the government context

1.2 Business Analyst

Designation	**Business Analyst**
No.of Positions	**1**
Qualifications	**B.Tech (CS and IT preferred)/B.C.A/B.com/B.B.A. /M.S/M.Tech/M.B.A**

Key responsibilities:

1. Gather, analyze, and document functional and business requirements from government departments and citizen service units
2. Conduct stakeholder interviews, workshops, and requirement elicitation sessions with government officials and end users
3. Translate use-case requirements into detailed user stories, acceptance criteria, and process workflows for AI development teams
4. Perform current state analysis and identify process improvement opportunities through AI integration and automation
5. Support Solution Architect in mapping business requirements to technical AI capabilities and system specifications
6. Create detailed process maps, user journey flows, and business requirement documentation for AI service implementations
7. Validate solution outputs against business needs ensuring usability, accessibility, and compliance with government standards
8. Facilitate user acceptance testing (UAT) planning, execution, and defect resolution for AI applications
9. Monitor post-implementation performance of AI solutions against defined business objectives and citizen service metrics

10. Maintain requirements traceability matrix and manage change requests throughout the project lifecycle
11. Analyze data patterns and citizen feedback to recommend AI solution enhancements and process optimizations

Required Experience:

1. 5-8 years in business analysis with focus on technology implementations in large organizations or government sector
2. 2-4 years working with AI/ML projects, digital transformation, or automation initiatives
3. 3-5 years in requirements gathering, process analysis, and stakeholder management
4. Proven experience in translating complex business needs into technical specifications
5. Government or public sector experience preferred with understanding of citizen service delivery models

Technical Skills:

1. **Requirements Management:** Advanced proficiency in requirements gathering techniques, user story creation, and acceptance criteria definition
2. **Process Analysis:** Business process modeling (BPMN), workflow design, gap analysis, and process optimization methodologies
3. **Documentation Tools:** Confluence, SharePoint, Visio, Lucidchart, Miro for process mapping and requirement documentation
4. **Testing & Validation:** UAT planning, test case creation, defect management, and solution validation techniques
5. **AI/ML Understanding:** Basic knowledge of AI capabilities, machine learning concepts, and data requirements for AI implementations
6. **Data Analysis:** SQL basics, Excel/Google Sheets advanced functions, and data visualization tools (Tableau, Power BI)
7. **Agile Methodologies:** Scrum, Kanban, user story writing, backlog management, and sprint planning processes.

1.4 Data Science Lead

Designation	**Data Science Lead**
No. of Positions	**1**
Qualifications	**B.Tech. (CS and IT preferred)/M.Tech/M.S/PhD in Statistics, Mathematics, Computer Science, or a quantitative field.** **Research papers, case studies, or significant open-source contributions(are preferred)**

Key Responsibilities:

1. Lead and mentor a team of data scientists in developing advanced machine learning models for government AI services
2. Establish data science strategy, methodologies, and best practices aligned with government objectives and citizen service goals
3. Drive research and innovation in AI/ML techniques applicable to public sector challenges and citizen engagement optimization
4. Collaborate with stakeholders to identify high-impact AI use cases and translate business problems into data science solutions
5. Define model development standards, evaluation frameworks, and validation processes for government AI applications
6. Oversee end-to-end model lifecycle including experimentation, validation, and handoff to engineering teams for production deployment
7. Establish data science governance frameworks ensuring responsible AI practices, bias mitigation, and ethical model development
8. Lead cross-functional collaboration with engineering teams, product managers, and government stakeholders on AI strategy
9. Drive capability building through knowledge sharing, training programs, and adoption of emerging AI technologies

Required Experience:

1. 8-12 years in data science with extensive machine learning model development and deployment experience
2. 4-6 years in technical leadership roles managing data science teams and complex AI/ML projects
3. 6-8 years in advanced analytics, statistical modeling, and research-driven problem solving
4. Experience leading projects involving multiple stakeholders and departments

Technical Skills:

1. **Advanced ML Techniques:** Deep learning, ensemble methods, time series forecasting, NLP, computer vision, reinforcement learning, and causal inference
2. **Programming Expertise:** Python (expert level), R for statistical analysis, SQL for complex data analysis, Scala for big data processing
3. **ML Frameworks:** TensorFlow, PyTorch, Scikit-learn, XGBoost, Hugging Face Transformers with expertise in model architecture design
4. **Statistical Methods:** Experimental design, hypothesis testing, Bayesian inference, multivariate analysis, and advanced statistical modeling
5. **Big Data Processing:** Apache Spark, Databricks, distributed computing, and large-scale data processing for government datasets
6. **Research & Innovation:** Literature review, research methodology, A/B testing design, and evaluation of emerging AI technologies
7. **Data Visualization:** Advanced visualization techniques using Matplotlib, Seaborn, Plotly, Tableau for stakeholder communication
8. **Cloud ML Platforms:** AWS SageMaker, Azure ML, GCP Vertex AI with expertise in scalable model training and deployment
9. **Model Evaluation:** Advanced metrics, cross-validation strategies, bias detection, fairness evaluation, and model interpretability

1.5 Data Engineering Lead

Designation	**Data Engineering Lead**
No. of Positions	**1**
Qualifications	**B.Tech(CS and IT preferred)/M.S/M.Tech/PhD.**

Key Responsibilities:

1. Design and oversee scalable data pipelines and integration workflows for multi-petabyte government datasets
2. Define comprehensive data architecture, storage strategies, and performance optimization for AI/ML workloads
3. Establish data governance frameworks ensuring compliance with metadata management, lineage tracking, and regulatory requirements
4. Lead and mentor a team of data engineers in implementing complex ETL, ELT, and real-time streaming data processing pipelines
5. Architect data lake and data warehouse solutions supporting both batch and real-time analytics for government AI applications
6. Design and implement data quality frameworks, monitoring systems, and automated data validation processes
7. Collaborate with ML engineers and data scientists to optimize data pipelines for model training and inference workflows
8. Establish CI/CD practices for data pipeline deployment, version control, and automated testing across environments
9. Implement security controls, encryption, and access management for sensitive government data processing
10. Optimize data infrastructure costs while maintaining high availability and disaster recovery capabilities
11. Drive adoption of DataOps practices and infrastructure-as-code for scalable data platform management
12. Evaluate and integrate emerging data technologies and open-source tools for enhanced data processing capabilities

Required Experience:

1. 8-12 years in data engineering with focus on large-scale distributed systems and cloud data platforms
2. 4-6 years in technical leadership roles managing data engineering teams and complex data infrastructure projects
3. 5-7 years designing and implementing enterprise data architectures for analytics and AI/ML use cases
4. Proven track record of building production data pipelines processing terabytes of data daily
5. Experience with government or highly regulated industry data compliance requirements preferred

Technical Skills:

1. **Cloud Platforms:** AWS (Redshift, Glue, EMR, Kinesis, S3, Lake Formation), Azure (Synapse, Data Factory, Event Hubs, ADLS), GCP (BigQuery, Dataflow, Pub/Sub, Cloud Storage)
2. **Big Data Technologies:** Apache Spark, Hadoop, Kafka, Airflow, Databricks, Snowflake, dbt for data transformation and orchestration
3. **Programming Languages:** Python, Scala, SQL, Java with expertise in distributed computing frameworks and parallel processing
4. **Data Storage:** Data lake architectures, data warehousing (Redshift, BigQuery, Synapse), NoSQL databases (MongoDB, Cassandra), vector databases for AI applications
5. **DevOps & Infrastructure:** Docker, Kubernetes, Terraform, CI/CD pipelines (Jenkins, GitLab), infrastructure-as-code practices
6. **Monitoring & Observability:**DataDog, Prometheus, Grafana, AWS CloudWatch for data pipeline monitoring and alerting
7. **AI/ML Integration:** MLflow, Kubeflow, feature stores, model serving infrastructure, and ML pipeline orchestration

1.6 AI/ML Lead

Designation	**AI/ML Lead**
No. of Positions	**1**
Qualifications	**B.Tech(CS and IT preferred)/M.S/M.Tech/PhD** **Successfully deployed at least 3-5 ML models in production** **Research papers, blog posts, or open-source contributions (are preferred)**

Key Responsibilities:

1. Provide technical depth in AI/ML model assessment, evaluation, and feasibility analysis for government AI initiatives
2. Lead early prototyping and proof-of-concept development to validate AI solutions against business requirements
3. Support Solution Architect in evaluating model suitability, architecture alignment, and feasibility integration
4. Define comprehensive technical requirements for model fine-tuning, optimization, and production deployment
5. Conduct technical due diligence on AI frameworks, pre-trained models, and emerging AI technologies for government adoption
6. Establish model evaluation criteria, benchmarking standards, and performance metrics for AI service implementations
7. Guide technical decision-making on model selection, training strategies, and optimization approaches
8. Review and validate AI model architectures, ensuring scalability and alignment with government infrastructure
9. Collaborate with data scientists to establish best practices for model development, validation, and deployment

10. Define technical specifications for model monitoring, drift detection, and continuous improvement processes
11. Lead technical risk assessment for AI implementations including bias evaluation and ethical AI compliance
12. Mentor development teams on advanced AI/ML concepts, optimization techniques, and best production practices

Required Experience:

1. 7-10 years in AI/ML engineering with focus on model development, optimization, and production deployment
2. 4-5 years in technical leadership roles guiding AI/ML teams and complex model implementations
3. 5-7 years in deep learning, machine learning architecture design, and model evaluation methodologies
4. Proven experience in AI prototyping, feasibility assessment, and technical requirement definition
5. Experience with large language models and fine-tuning

Technical Skills:

1. **AI/ML Expertise:** Deep learning architectures (CNN, RNN, Transformers), reinforcement learning, transfer learning, and foundation model fine-tuning
2. **Model Development:** TensorFlow, PyTorch, Hugging Face, MLflow, advanced hyperparameter tuning, and neural architecture search
3. **Programming Languages:** Python (expert level), R for statistical modeling, C++ for performance optimization, CUDA for GPU programming
4. **Model Optimization:** Quantization, pruning, knowledge distillation, ONNX, TensorRT, and inference optimization techniques
5. **Cloud AI Platforms:** AWS SageMaker, Azure ML, GCP Vertex AI, distributed training, and cloud-native AI architectures
6. **MLOps& Deployment:** Kubernetes, Docker, model serving (TorchServe, TensorFlow Serving), CI/CD for ML, and production monitoring
7. **Research & Innovation:** Literature review, experimental design, research methodology, and emerging AI technology evaluation
8. **Specialized AI:** NLP (BERT, GPT, LLM fine-tuning), Computer Vision (YOLO, ResNet), Time Series (LSTM, Prophet), and Generative AI

1.7 MLOps Lead

Designation	**MLOps Lead**
No. of Positions	**1**
Qualifications	**B.Tech.(CS and IT preferred) /M.S/M.Tech/PhD.** **Cloud certifications: AWS Solutions Architect Professional, Azure Solutions Architect Expert, or GCP Professional Cloud Architect** **Kubernetes (CKA/CKAD), Docker certification** **Contributions to MLOps or DevOps open source projects**

Key Responsibilities:

1. Design and implement end-to-end MLOps infrastructure including CI/CD pipelines for model training, validation, and deployment
2. Establish model lifecycle management processes from development through production including versioning, rollback, and retirement strategies
3. Build automated model monitoring systems for performance tracking, drift detection, and alert management across government AI services
4. Lead containerization and orchestration strategies for ML workloads using Kubernetes and cloud-native architectures
5. Implement model governance frameworks ensuring compliance with government regulations and responsible AI principles
6. Design and maintain feature stores, model registries, and metadata management systems for enterprise ML operations
7. Establish infrastructure-as-code practices for reproducible and scalable ML environments across development, staging, and production
8. Create automated testing frameworks for model validation, integration testing, and production readiness assessment

9. Implement security controls, access management, and audit logging for ML pipelines and model serving infrastructure
10. Optimize resource utilization and cost management for training and inference workloads across cloud platforms
11. Lead incident response and troubleshooting for production ML systems ensuring high availability and reliability
12. Mentor MLOps engineers and establish best practices for collaborative ML development and deployment

Required Experience:

1. 6-9 years in DevOps, platform engineering, or MLOps with focus on production ML system deployment and management
2. 3-5 years in technical leadership roles managing MLOps teams and enterprise ML infrastructure projects
3. 4-6 years designing and implementing CI/CD pipelines, containerization, and cloud-native architectures
4. Proven experience building scalable ML deployment pipelines and model serving infrastructure

Technical Skills:

1. **MLOps Platforms:**MLflow, Kubeflow, Azure ML, AWS SageMaker Pipelines, GCP Vertex AI Pipelines for end-to-end ML workflow orchestration
2. **Containerization:** Docker, Kubernetes, Helm charts, container registries, and microservices architecture for ML workloads
3. **CI/CD:** Jenkins, GitLab CI, GitHub Actions, Azure DevOps with specialized ML pipeline integration and automated testing
4. **Infrastructure-as-Code:** Terraform, CloudFormation, Ansible for reproducible ML infrastructure provisioning and management
5. **Cloud Platforms:** AWS (EKS, Lambda, ECR, S3), Azure (AKS, Container Registry, Blob Storage), GCP (GKE, Cloud Build, Cloud Storage)
6. **Model Serving:** TorchServe, TensorFlow Serving, Seldon, KServe, REST APIs, and real-time inference infrastructure
7. **Programming Languages:** Python for automation, Bash scripting, YAML for configuration management, basic understanding of Go/Java

8. **Database & Storage:** Feature stores (Feast, Tecton), model registries, data versioning (DVC), and distributed storage systems
9. Workflow Orchestration: Apache Airflow, Prefect, Argo Workflows for complex ML pipeline scheduling and dependency management

1.8 AI/ML Engineer

Designation	**AI/ML Engineer**
No. of Positions	**4**
Qualifications	**B.Tech. (CS and IT preferred) /M.S./M.Tech.**

Key Responsibilities:

1. Analyze and evaluate ML algorithms for specific government use cases, ranking solutions by feasibility and success probability
2. Implement model training pipelines with comprehensive hyperparameter tuning and optimization strategies
3. Perform advanced data preprocessing, feature engineering, and data transformation for government datasets
4. Design and develop API integrations to seamlessly connect AI models with existing government systems and applications
5. Establish performance monitoring frameworks and continuous optimization processes for production AI services
6. Collaborate with data scientists to transition research models into scalable production implementations
7. Build and maintain ML infrastructure supporting model deployment, scaling, and version management
8. Implement automated testing and validation processes for AI model reliability and accuracy
9. Optimize model inference performance and resource utilization for cost-effective government AI operations
10. Document technical implementations, API specifications, and deployment procedures for knowledge sharing

11. Support troubleshooting and incident response for production AI systems and model performance issues

Required Experience:

1. 4-7 years in software engineering with an AI/ML focus
2. 1-2 years of hands-on experience with transformer models and LLMs
3. Experience in at least 2-3 AI domains (NLP, voice, computer vision, etc.)

Technical Skills:

1. **Core ML Development:** Python (expert level), TensorFlow/PyTorch for deep learning, Scikit-learn for traditional ML algorithms
2. **LLM & NLP:** Transformers library, Hugging Face ecosystem, LangChain for LLM orchestration, OpenAI API integration
3. **Speech & Audio:** Whisper for speech recognition, speech synthesis APIs, audio preprocessing, and feature extraction
4. **Vector Databases:** Pinecone, Weaviate, ChromaDB, FAISS for semantic search and RAG implementations
5. **MLOps& Deployment:**MLflow for experiment tracking, Weights & Biases for model monitoring, Docker containerization, model versioning
6. **Cloud Platforms:** AWS SageMaker for model training/deployment, Azure ML Studio, GCP Vertex AI with cost optimization strategies
7. **API Development:** REST API design, FastAPI, Flask, GraphQL for model serving and integration
8. **Data Processing:** Pandas, NumPy for data manipulation, Apache Spark for large-scale data processing
9. **Model Optimization:** ONNX for model conversion, TensorRT for inference optimization, quantization techniques
10. **Version Control:** Git workflows, CI/CD pipelines for ML, automated testing frameworks for AI applications
11. **Database Integration:** SQL databases, NoSQL systems, and data pipeline integration for model training and inference

1.9 Data Scientist

Designation	Data Scientist
No. of Positions	**1**
Qualifications	**B.Tech. (CS and IT preferred) /M.S./M.Tech.**

Key Responsibilities:

1. Develop and implement machine learning models under Data Science Lead guidance for specific government use cases
2. Perform data cleaning, preprocessing, and feature engineering on diverse government datasets
3. Conduct exploratory data analysis to identify patterns and insights relevant to citizen service optimization
4. Execute model training, hyperparameter tuning, testing, and validation using appropriate ML algorithms
5. Design A/B testing frameworks for model performance evaluation and comparison
6. Collaborate with AI/ML Engineers to operationalize models for production deployment
7. Create data visualizations and analytical reports to communicate findings to government stakeholders
8. Develop model monitoring systems to ensure consistent accuracy in production environments
9. Research cutting-edge AI/ML techniques applicable to government and public sector challenges
10. Document model development processes, assumptions, and validation results for compliance requirements

Required Experience:

1. 4-7 years in data science with hands-on machine learning model development and deployment experience
2. 2-3 years working on production ML systems or AI applications in enterprise or government environments

3. 3-5 years in statistical analysis, predictive modeling, and data-driven problem solving
4. Experience collaborating with engineering teams to operationalize ML models and analytics solutions

Technical Skills:

1. **Machine Learning:** Supervised/unsupervised learning, deep learning, NLP, computer vision, time series forecasting, and ensemble methods
2. **Programming Languages:** Python (scikit-learn, pandas, numpy), R for statistical analysis, SQL for data manipulation and analysis
3. **ML Frameworks:** TensorFlow, PyTorch, Keras, XGBoost, LightGBM, Hugging Face Transformers for model development
4. **Data Processing:** Advanced pandas, Apache Spark (PySpark), data wrangling, and large-scale data manipulation techniques
5. **Statistical Analysis:** Hypothesis testing, regression analysis, experimental design, and statistical modeling techniques
6. **Visualization Tools:** Matplotlib, Seaborn, Plotly, Tableau, Power BI for data exploration and results communication
7. **Feature Engineering:** Feature selection, dimensionality reduction (PCA, t-SNE), feature scaling, and data transformation techniques
8. **Model Evaluation:** Cross-validation, performance metrics, ROC curves, confusion matrices, and model interpretability (SHAP, LIME)
9. **Database Technologies:** SQL databases, NoSQL systems, and data warehouse querying for analytics and model training

1.10 Data Engineer

Designation	**Data Engineer**
No. of Positions	**2**
Qualifications	**B.Tech. (CS and IT preferred) /M.S./M.Tech.**

Key Responsibilities:

1. Build and maintain scalable data pipelines for AI/ML model training, validation, and real-time inference workflows
2. Design and implement ETL/ELT processes for diverse government data sources and citizen service platforms
3. Implement comprehensive data quality checks, validation frameworks, and automated monitoring systems
4. Create and optimize database schemas, data models, and storage solutions specifically designed for AI applications
5. Develop real-time data streaming solutions enabling live model updates and dynamic citizen service responses
6. Build data APIs and microservices for seamless integration with frontend applications and AI model consumption
7. Monitor data pipeline performance, implement alerting systems, and ensure high availability across environments
8. Collaborate with AI/ML engineers on feature engineering, data preparation, and model training data requirements
9. Implement data governance frameworks, documentation standards, and metadata management for compliance
10. Optimize database queries, data processing workflows, and storage costs for government-scale data operations
11. Support data migration projects and integration with legacy government systems and modern cloud platforms
12. Troubleshoot data quality issues, pipeline failures, and performance bottlenecks in production environments

Required Experience:

1. 3-6 years in data engineering, backend development, or data infrastructure roles
2. 2-3 years building and maintaining ETL/ELT processes and automated data workflows
3. Experience with large-scale data pipeline development and production data system management

Technical Skills:

1. **Core Programming:** Python for data processing, SQL for database operations, basic Scala/Java, shell scripting for automation
2. **Data Processing:** Apache Spark for distributed computing, pandas for data manipulation, Apache Airflow for workflow orchestration
3. **Database Systems:** PostgreSQL for relational data, MongoDB for document storage, Redis for caching, basic Elasticsearch for search
4. **Cloud Data Platforms:** AWS (S3, RDS, Lambda, Glue), Azure (Data Factory, Storage, Synapse), GCP (BigQuery, Cloud Storage, Dataflow)
5. **Streaming Technologies:** Apache Kafka for event streaming, AWS Kinesis for real-time data ingestion, stream processing frameworks
6. **API Development:** REST API design and development, data service creation, microservices architecture for data access
7. **DevOps Tools:** Docker for containerization, Git for version control, data modeling tools, basic infrastructure automation
8. **Data Quality:** Data validation frameworks, automated testing for data pipelines, data profiling and monitoring tools
9. **Performance Optimization:** Query optimization, indexing strategies, data partitioning, and caching mechanism
10. **Monitoring & Alerting:** Pipeline monitoring, performance metrics, error handling, and incident response procedures

1.11 MLOps Engineer

Designation	**MLOps Engineer**
No. of Positions	**2**
Qualifications	**B.Tech. (CS and IT preferred) /M.S./M.Tech.**

Key Responsibilities:

1. Design and implement comprehensive CI/CD pipelines for automated ML model training, validation, and deployment workflows
2. Set up model versioning systems, experiment tracking frameworks, and artifact management for reproducible AI deployments
3. Deploy ML models to production environments with comprehensive monitoring, logging, and performance tracking capabilities
4. Implement automated testing frameworks for ML models, data pipelines, and integration points ensuring reliability
5. Create scalable infrastructure for model serving, auto-scaling, and load balancing across government AI services
6. Monitor model performance metrics, implement drift detection systems, and maintain overall system health dashboards
7. Automate routine MLOps tasks including deployment processes, model updates, and infrastructure provisioning
8. Collaborate with development teams on DevOps best practices, code quality standards, and deployment strategies
9. Implement security measures, access controls, and compliance frameworks for ML model deployment in government context
10. Create comprehensive documentation, operational runbooks, and knowledge transfer materials for production systems

Required Experience:

1. 3-5 years in DevOps, Site Reliability Engineering (SRE), or backend engineering roles
2. 1-2 years of specific experience with ML model deployment, MLOps practices, and production AI system management
3. 2+ years hands-on experience with cloud platforms, containerization, and infrastructure automation

Technical Skills:

1. **Core Technologies:** Python for automation scripting, Bash scripting, YAML/JSON configuration management, Linux systems administration
2. **MLOps Platforms:**MLflow for experiment tracking, basic Kubeflow for ML workflows, model registry and artifact management
3. **Containerization:** Docker for model packaging, Kubernetes for orchestration, container registries (ECR, ACR, GCR)
4. **Cloud Platforms:** AWS/Azure/GCP ML services, compute instances, storage services, and managed AI/ML platforms
5. **CI/CD Tools:** Jenkins for automation, GitLab CI/CD, GitHub Actions for deployment pipelines, automated testing frameworks
6. **Infrastructure-as-Code:** Terraform for cloud resource provisioning, CloudFormation, infrastructure automation and version control
7. **Monitoring & Observability:** Prometheus for metrics, Grafana for dashboards, ELK stack for logging, alerting systems
8. **Networking:** Load balancing, API gateway configuration, service mesh basics for microservices communication
9. **Performance Optimization:** Resource monitoring, cost optimization strategies, auto-scaling configuration

1.12 AI QA Engineer

Designation	**AI QA Engineer**
No. of Positions	**1**
Qualifications	**B.Tech. (CS and IT preferred) /M.S./M.Tech.**

Key Responsibilities:

1. Design and execute comprehensive testing strategies for AI services including functional, performance, and bias testing
2. Create detailed test plans, test cases, and regression testing suites specifically tailored for AI/ML applications and government use cases
3. Perform model validation testing, data quality assessment, and AI output accuracy verification against business requirements
4. Conduct fairness testing, bias detection, and ethical AI compliance validation for government AI applications
5. Maintain comprehensive logs of defects, issues, and resolution tracking across development, staging, and production environments
6. Collaborate with data scientists and ML engineers to establish testing protocols for model performance and reliability
7. Execute automated testing frameworks for continuous integration and deployment of AI services
8. Validate AI service integration points, API functionality, and data pipeline integrity
9. Monitor production AI systems for performance degradation, accuracy drift, and compliance violations

Required Experience:

1. 4-6 years in QA engineering with focus on AI/ML applications, data-driven systems, or government technology implementations
2. 2-3 years testing AI services, machine learning models, or automated systems in production environments

3. 3-5 years in test automation, regression testing, and quality assurance methodologies

Technical Skills:

1. **AI Testing:** Model validation, bias detection, fairness testing, AI output verification, and responsible AI compliance testing
2. **Test Automation:** Selenium, pytest, TestNG, Cypress for automated testing frameworks and continuous integration
3. **Programming Languages:** Python for test scripting, SQL for data validation, basic understanding of R for statistical testing
4. **Testing Tools:** Jira, TestRail, Postman for API testing, Jenkins for CI/CD testing pipelines
5. **Data Validation:** Data quality testing, ETL testing, data pipeline validation, and database testing techniques
6. **Performance Testing:** Load testing, stress testing, and performance monitoring for AI services and data processing systems
7. **Security Testing:** Data privacy validation, access control testing, encryption verification, and compliance audit support
8. **Cloud Testing:** AWS, Azure, GCP testing environments, cloud service validation, and multi-environment testing strategies
9. **API Testing**: REST API testing, GraphQL testing, microservices testing, and integration testing methodologies