



Our Ref: 2199 /RRA/HR/2025

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## CALL FOR IT EXPERTS

Rwanda Revenue Authority invites qualified, self-motivated and experienced IT professionals to express their interest in providing Services in the areas of: IT Architect for the Domestic Tax System Project, IT Developer for Domestic Tax System Revamp and AI/ML Expert.

### 1. IT ARCHITECT

**Duty Station:** RRA Head Quarter, Kigali, Rwanda

**Duration :** Initial 3 months (with possibility of extension)

#### 1. Background

The Rwanda Revenue Authority (RRA) has operated its core tax systems for more than 10 years. These systems which significantly support revenue mobilization currently run on a monolithic architecture. Over time, several limitations have emerged, including performance degradation, integration challenges, and architectural inflexibility. To address these issues, RRA is undertaking a modernization effort to transition the domestic tax system to a modern microservices-based architecture.

This strategic transformation aims to:

- ✓ Improve system performance and scalability
- ✓ Enable smoother integration with external systems
- ✓ Enhance maintainability and flexibility of tax services
- ✓ Strengthen automation and data accuracy

#### 2. Objective of the Assignment

The objective of this assignment is to lead and technically guide the transition of the systems to a **microservices architecture**, ensuring that design, development, deployment, and security align with international best practices.

### 3. Scope of Work

Under the supervision of the Project Management, the Architect will:

#### System Architecture Design

- ✓ Define the **overall microservices architecture** for existing domestic systems, including key components: API Gateway, SSO, Event Sourcing, Discovery, Monitoring, and Configuration Services.
- ✓ Develop service decomposition models aligned with RRA's core tax functions (registration, returns, payments, refunds, etc.).
- ✓ Design for **security, scalability, and performance**, incorporating CI/CD practices and containerization (e.g., Docker, Kubernetes).

#### Implementation Guidance

- ✓ Lead architectural decision-making for platform selection and technology stack (e.g. Spring Boot, PostgreSQL/MySQL, and Docker Swarm).
- ✓ Support setup of **development, test, and production environments**, including infrastructure and monitoring tools.
- ✓ Establish architectural standards, documentation templates, and service contracts for micro services.

#### Quality Assurance & Risk Mitigation

- ✓ Conduct architecture reviews, ensure system resilience, and fault tolerance.
- ✓ Address and mitigate architecture-related risks including SSO incompatibility, data migration, and environment segregation.
- ✓ Ensure compliance with **ISO security standards** and OWASP guidelines.

#### Capacity Building

- ✓ Provide coaching and mentorship to internal IT teams on microservices principles, DevSecOps practices, and secure system design.
- ✓ Support the upskilling of development and operations teams to adopt modern software practices and tools.

### 4. Deliverables

- ✓ Detailed RRA domestic tax system **microservices architecture blueprint**
- ✓ Service decomposition and data models for each module

- ✓ Documentation of technical standards and integration interfaces
- ✓ Reports on system environment readiness and risk mitigation strategies
- ✓ Workshop sessions and capacity-building reports
- ✓ Monthly progress reports to the PM

## 5. Required qualifications skills and competences;

- ✓ Bachelor's or Master's Degree in Computer Science, Software Engineering, or related field
- ✓ At least 7 years of professional experience in system/software architecture
- ✓ Minimum of 3 years designing and implementing **microservices architectures**
- ✓ Proven expertise with: Backend (Java/Spring Boot), Frontend frameworks (Angular, Vue, or React), API design and security protocols, Containerization and orchestration (Docker, Kubernetes), CI/CD and DevOps toolchains (GitLab, Jenkins) and Monitoring tools (Grafana, Prometheus, ELK stack)

## Desirable

- ✓ Familiarity with tax or revenue systems
- ✓ Knowledge of ISO 27002 and cybersecurity implementation
- ✓ Experience working with public sector organizations or donor-funded projects

## 6. Reporting and Supervision

The Architect will report to the PM and collaborate closely with:

- ✓ Commissioner, IT and Digital Transformation
- ✓ Business Analysts
- ✓ Backend and Frontend Developers
- ✓ DevOps Engineers
- ✓ Cybersecurity Experts



## 2. LEAD IT DEVELOPER

**Duty Station:** RRA Head Quarter, Kigali, Rwanda

**Duration :** Initial 3 months (with possibility of extension)

### 1. Background

RRA is transitioning its core domestic tax systems from a monolithic architecture to a modern microservices-based architecture to improve system performance, scalability, integration capabilities, and maintainability. This transformation is critical to sustaining efficient tax administration and supporting digital transformation efforts.

### 2. Purpose of the consultancy

The Lead Developer will provide technical leadership in designing, developing, and deploying the microservices architecture. This role involves managing a team of backend, frontend, and full-stack developers, ensuring alignment with DevOps, security standards, and Agile methodology.

### 3. Key Responsibilities

- ✓ Lead the end-to-end development of the domestic tax system microservices, ensuring architectural consistency and code quality.
- ✓ Supervise, mentor, and coordinate the team of developers and testers.
- ✓ Guide the refactoring of monolithic modules into standalone microservices.
- ✓ Ensure integration of CICD pipelines, container orchestration (e.g., Docker, Kubernetes/Swarm), and version control.
- ✓ Collaborate with business analysts, DevOps, QA, and UI/UX designers to translate business requirements into scalable microservices.
- ✓ Lead technical decision-making on frameworks, libraries, tools (e.g., Spring Boot, GitLab, PostgreSQL/MySQL), and ensure their proper usage.
- ✓ Implement robust API designs following RESTful principles and ensure secure communication between services.
- ✓ Oversee code reviews, testing strategies (unit, integration), and documentation processes.

- ✓ Promote adoption of DevSecOps principles and ensure compliance with ISO27002:2022 cybersecurity controls.
- ✓ Assist in developer capacity-building and knowledge transfer to internal teams.
- ✓ Monitor system performance and troubleshoot complex issues during development and deployment.

#### **4. Required qualifications skills and competences;**

- ✓ Bachelor's Degree (or higher) in Computer Science, Software Engineering, or a related field.
- ✓ At least 5 years of experience in full-stack development, including leading technical teams.
- ✓ Proven experience in microservices architecture design and implementation.
- ✓ Strong hands-on knowledge of: Java/Spring Boot (Backend), JavaScript frameworks (VueJS, Angular, NodeJS), PostgreSQL, MySQL, or Oracle and Docker, GitLab, CICD tools.
- ✓ Familiarity with container orchestration (e.g., Docker Swarm or Kubernetes).
- ✓ Understanding of Event-sourcing, API Gateway, Service Discovery, and Configuration Services.
- ✓ Experience with monitoring tools (Grafana, Prometheus, Kibana, etc.).
- ✓ Strong knowledge of secure software development practices (OWASP Top 10).

#### **5. Desired Skills and Competencies**

- ✓ Excellent leadership, communication, and team management skills.
- ✓ Strong analytical and problem-solving abilities.
- ✓ Ability to work in a fast-paced, agile, and evolving technical environment.
- ✓ High integrity and attention to detail.

#### **6. Deliverables**

- ✓ Microservices developed and deployed per module schedule.
- ✓ Development documentation and API specifications.
- ✓ Code review reports and performance benchmarks.
- ✓ Knowledge transfer materials for internal capacity building.

### 3. AI/ML EXPERT

**Duty Station:** RRA Headquarters, Kigali, Rwanda

**Duration:** Initial 3 months (with possibility of extension)

#### 1. Background

The Rwanda Revenue Authority (RRA) is committed to leveraging advanced data analytics, artificial intelligence (AI), and machine learning (ML) to improve taxpayer compliance, enhance service delivery, and optimize revenue collection. As part of this strategic initiative, RRA seeks to engage an **AI/ML Expert** with expertise in developing and deploying AI/ML models in operational environments, particularly within tax administration contexts.

The primary objective of this assignment is to provide **hands-on technical support** in the **design, development, testing, and deployment** of AI/ML solutions, and to ensure that RRA's **infrastructure, strategy, and governance frameworks** are ready for sustainable AI/ML adoption.

**Specific objectives include:**

- ✓ Develop and deploy AI/ML models for priority tax administration use cases.
- ✓ Assess and recommend improvements to RRA's IT infrastructure for AI/ML readiness.
- ✓ Review and refine the RRA Data Science Strategy and Data Governance Framework to ensure completeness, alignment with best practices, and readiness for implementation.

#### 3. Scope of Work

The expert will be responsible for:

##### A. AI/ML Solution Development

- ✓ **Needs Assessment & Solution Design:** Review RRA's data sources, systems, and analytical capabilities; identify AI/ML opportunities aligned with RRA's strategic priorities; propose AI/ML models and solutions tailored for tax administration use cases.
- ✓ **Model Development & Testing:** Clean, preprocess, and structure datasets for ML training and testing; select appropriate algorithms and evaluation metrics; train, validate, and optimize AI/ML models.
- ✓ **Deployment & Integration:** Deploy models into RRA's operational environment; integrate AI/ML outputs with existing tax administration systems; ensure model performance monitoring and maintenance.

- ✓ **Capacity Building:** Provide on-the-job training for RRA data scientists and analysts; document methodologies, workflows, and deployment processes; support creation of reusable AI/ML development templates and best practices.

## **B. Infrastructure Readiness Assessment**

- ✓ Conduct a comprehensive review of RRA's IT infrastructure, including data storage, processing capacity, cloud readiness, and security controls, to determine suitability for AI/ML workloads.
- ✓ Identify infrastructure gaps and recommend upgrades or new solutions to support large-scale AI/ML deployment and integration.
- ✓ Provide a roadmap for infrastructure scaling in line with anticipated AI/ML demands.

## **C. Strategic & Governance Review**

- ✓ Review and refine the RRA **Data Science Strategy** to ensure it is aligned with international best practices, emerging AI/ML trends, and RRA's operational needs.
- ✓ Review and refine the **Data Governance Framework** to assess completeness, effectiveness, and readiness for implementation.
- ✓ Recommend enhancements to ensure robust data quality management, privacy compliance, and secure AI/ML operations.

## **4. Deliverables**

- ✓ Inception report with detailed work plan and AI/ML opportunities assessment.
- ✓ IT infrastructure readiness assessment report with recommendations and upgrade roadmap.
- ✓ Revised and validated **Data Science Strategy** and **Data Governance Framework** documents.
- ✓ At least **two fully functional AI/ML models** deployed in production.
- ✓ Documentation of model development and deployment procedures.
- ✓ Capacity-building workshops for RRA staff.
- ✓ Final consultancy report summarizing outcomes, lessons learned, and recommendations.

## 5. Required qualifications skills and competence;

- ✓ Advanced Degree in Data Science, Computer Science, Artificial Intelligence, or related field.
- ✓ Minimum 5 years of hands-on experience in AI/ML model development and deployment.
- ✓ Proven experience in infrastructure assessment and technology road mapping for AI/ML readiness.
- ✓ Expert in Python with strong knowledge of libraries such as NumPy, pandas, scipy, and Scikit-learn, and familiarity with software development best practices including version control (Git), testing, and packaging.
- ✓ Expertise with distributed computing tools (Apache Spark, Dask, Hadoop), cloud platforms (AWS, GCP, Azure ML services), and handling millions or billions of records efficiently.
- ✓ Familiarity with CI/CD for ML pipelines, model monitoring, versioning, and deployment using tools such as FastAPI/Flask , MLflow, Kubeflow, Airflow, Docker, and Kubernetes
- ✓ Strong experience with text preprocessing, embeddings (Word2Vec, GloVe, BERT), large language models (GPT, LLaMA, etc.), prompt engineering, and frameworks such as Hugging Face Transformers, LangChain, and OpenAI API
- ✓ Expertise in machine learning and neural networks, including feedforward networks, CNNs (computer vision), RNNs/LSTMs/Transformers (time series, NLP), transfer learning, and fine-tuning large models, using frameworks such as TensorFlow, PyTorch, and Keras.
- ✓ Proficiency in testing frameworks (pytest, unittest), code formatting and linting tools (black, isort, flake8), interactive coding and notebooks (Jupyter, IPython), API interaction (requests, aiohttp), and web scraping/parsing libraries (BeautifulSoup4, lxml, Scrapy).
- ✓ Strong understanding of data governance, data management, and AI ethics.
- ✓ Excellent communication and capacity-building skills.

## HOW TO APPLY:

Interested candidates should submit below application documents in PDF format to [recruitment@rra.gov.rw](mailto:recruitment@rra.gov.rw) : Curriculum Vitae, a copy of the Identity Card/ Passport, a copy of the Degree Certificate and other relevant professional certificates as per the required qualification not later than **03/10/2025**.

**BATAYIKA Emery**

**Assistant Commissioner in charge of Human Resources**