ZAMBIA REVENUE AUTHORITY | *My Tax Your Tax Our Destiny*

Institutionalising AI in Tax Administration

My Tax, Your Tax, Our Destiny

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Zambia Revenue Authority | July 2026

FORUM ON THE FUTURE OF TAX REFORM

01

What the AI Unit Is About

The AI Unit at Zambia Revenue Authority (ZRA) drives innovation by embedding intelligence into systems to boost efficiency, improve compliance, and optimize revenue collection. We are in IPM, a department responsible for building digital solutions.

1

Detect

- Identify non-compliance, fraud, and evasion at scale
- Risk score every customs declaration and VAT return in real time
- Flag anomalies invisible to manual audit teams

2

Automate

- Reduce manual, repetitive processing tasks across tax administration
- Free analyst time so they focus on high-value, complex cases
- Embed AI into existing ZRA operational workflows

3

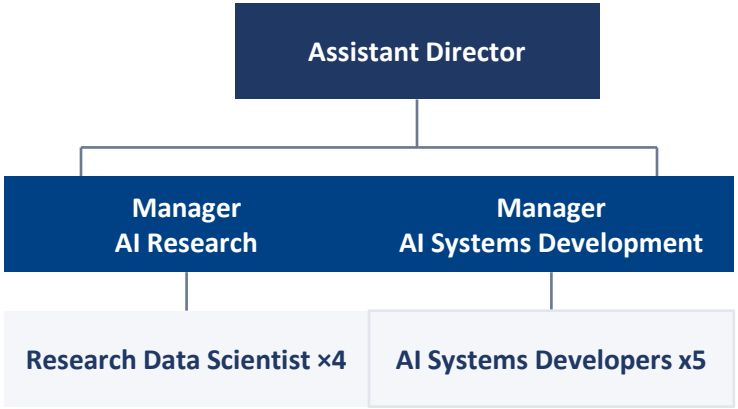
Innovate

- Continuously research and pilot emerging AI technologies relevant to tax administration
- Build internal capability, not just buy external tools
- Drive ZRA to frontiers of digital innovation

02

Our Team & Competencies

The AI Unit consists of 12 personnel headed by the Assistant Director, who reports to the Director under the Innovation and Project Management (IPM) Department. The unit has two streams: AI Research and AI Systems Development.



Current Competencies

- Machine Learning & Data Science
- Computer Science / Software Engineering
- Data Engineering
- Business Domain Expertise
- Research Skills
- Communication Skills

Found within the IPM Department

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ZRA Strategic Pillars

1

Tax Compliance

Identify tax compliance challenges and revenue gaps

- Informal sector
- Under declarations and undervaluation
- Misclassifications
- Fraudulent refund claims

2

Process Efficiency

Automate processing of huge volumes of data. Automate manual processes. Smarter decision making.

- Analyses to identify non-compliance
- Customs shipments
- Customer communications
- Processing refunds

Customer Satisfaction

Meeting modern taxpayer needs

- Taxpayer education
- 24/7 Support system
- Efficient systems

04

Solutions Developed – Nudging System

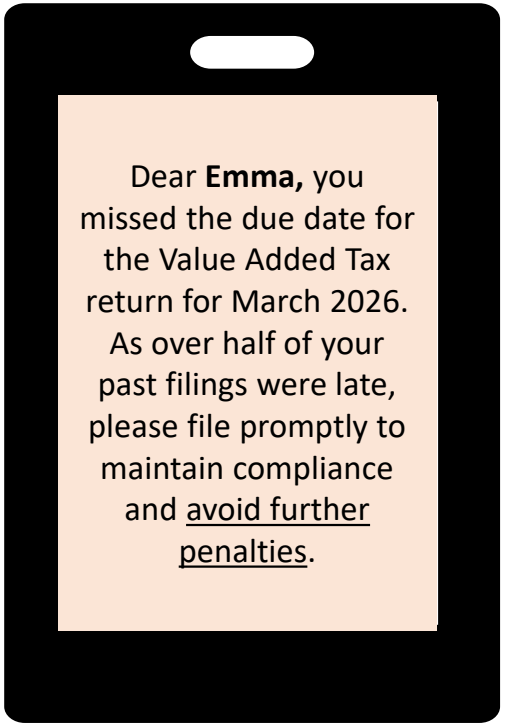
Automated Nudging System

Automated SMS and email nudging system that identifies non-compliant taxpayers and sends timely, personalised behavioural prompts — covering Provisional ITX filing and Smart Invoice variance compliance categories.

- On-time filing
- Smart Invoice Utilization

Value Gained

Earlier, lower-cost intervention — shifting ZRA from reactive enforcement to proactive compliance prompting before debt accumulates



04 Solutions Developed – Chatbot

Zax Chatbot

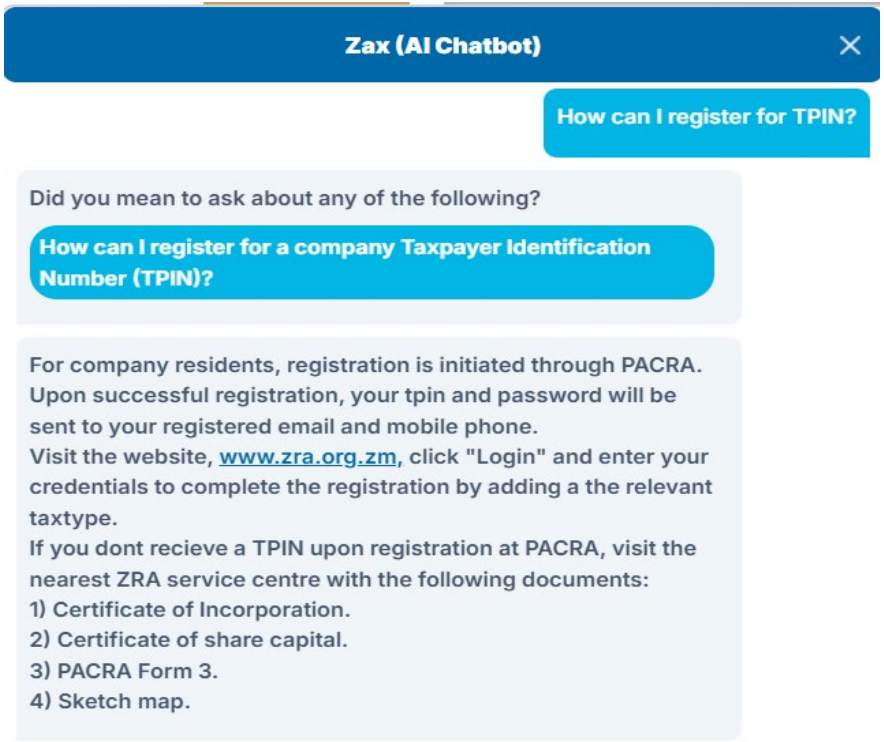
AI-powered conversational assistant handling taxpayer inquiries e.g TPIN registration, return filing guidance, refund status, and compliance queries.

- Web access
- WhatsApp access

Value Gained

An AI-powered conversational assistant improves taxpayer service delivery by providing instant, and 24/7 support while reducing operational workload and increasing tax compliance.

- Over 120,000 questions answered
- Customer satisfaction
- Efficiency gains



04

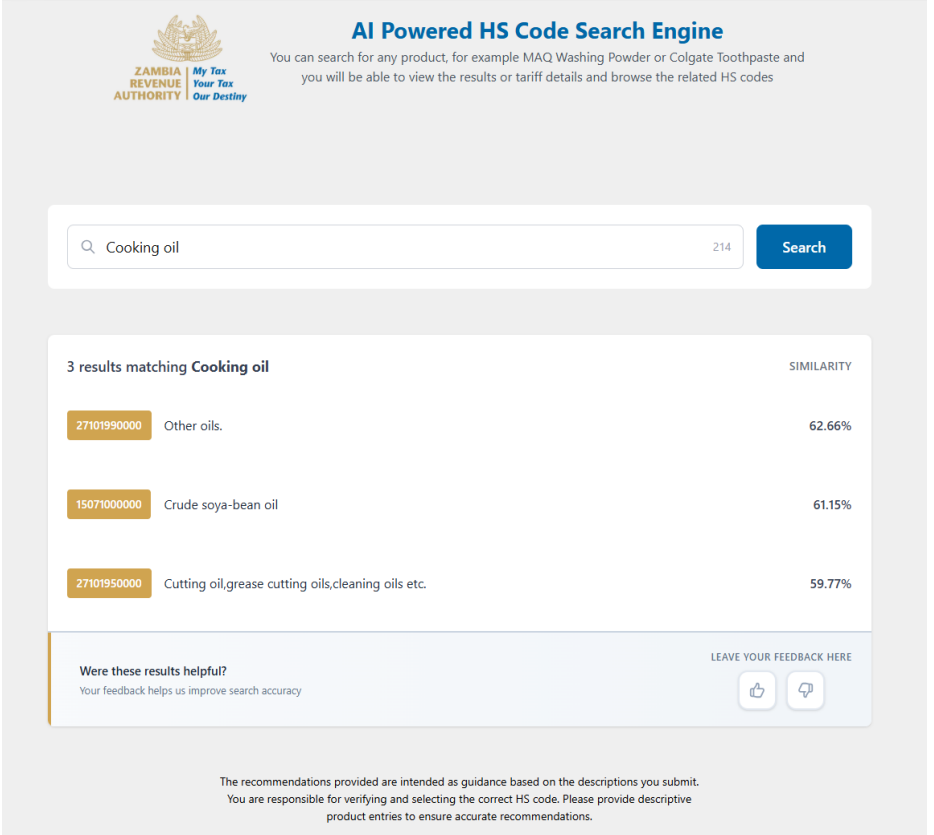
Solutions Developed – HS Code Search Portal

AI HS Code Recommendation Tool

Solution that automatically recommends the correct Harmonised System (HS) commodity code for customs declarations based on goods descriptions — currently deployed and in active use at ZRA.

Impact

- Reduced mis-classification of goods at the border
- Faster customs clearance processing
- Improved duty yield accuracy



05

Pipeline

Nudging System Extensions

P1

- More data
- More intelligence
- Expanded objectives

Anomaly Detection: VAT Tax Gap & Mining Sector

P1

Three-part initiative: (1) Quantify VAT tax gap; (2) Identify inconsistencies between import data and VAT output patterns; (3) VAT analysis in the mining sector.

Zax — Generative AI Platform

P2

Secure generative AI development, test, and deployment environment (Zax), enabling ZRA to run LLM-based applications in a data-sovereign, controlled environment without exposing taxpayer data externally.

More…

P…

Plus more solutions…

06

Innovation Cycle

1 Ideate

- Problem identified from operations, ZRA mandate, and staff suggestions.
- Prototypes developed iteratively.

2 Design

- Feasibility assessed against data availability and AI applicability.
- Data sources mapped. ML approach selected.
- Architecture designed.
- Success metrics defined. Ethical and legal risks assessed.

3 Build

- Models trained, validated and tuned.
- Application built.

4 Validate

- Internal QA with domain experts.
- Rigorous testing with real ZRA data.
- Performance benchmarked.
- Business stakeholders review outputs before deployment.

5 Deploy

- Deployed to ZRA production environment.
- Staff trained.
- Performance monitoring. Feedback loop established for system improvement.

Keep stakeholders in the loop

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Some Challenges



GPU & Compute Infrastructure

- Most advanced AI workloads (LLM, Computer Vision, Deep Learning) require expensive GPU compute not currently available within ZRA's infrastructure
- Cloud GPU access is constrained by data sovereignty concerns — sensitive taxpayer data cannot be readily sent to external cloud providers
- **Workaround**: CPU-based models (classical ML) and lightweight architectures; GPU acquisition is a strategic priority.



Legal & Regulatory Constraints

- Zambia Data Protection Act places obligations on how taxpayer data may be processed, stored and shared — AI systems must be designed with compliance built in from the start
- Potential violations of human rights (false positives, misleading information, etc)
- **Workaround**: Human-in-the-loop designs



Data Quality & Data Readiness

- Legacy siloed systems (ASYCUDA World, TaxOnline II, Smart Invoice) were not designed with ML in mind — data completeness, consistency and timeliness vary significantly
- Missing values, duplicate records, and inconsistent entity identifiers (TPIN, consignee names) require extensive preprocessing before data can be used for model training
- **Workaround**: Quick wins, intelligent automations, carefully plan long term solutions.

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Key Lessons

1 Management Support

- ZRA's drive to be data driven
- Appetite for efficiency
- Focus on ROI

2 Stakeholder Engagement

- Identify correct stakeholders
- Identify real pain points (distinguish from nice to have)
- Align incentives
- Involve at all stages
- Give ownership

3 Prototype

- Prototypes developed iteratively
- Demonstrate how the “real thing” will look
- Involve right users

4 Monitor

- Post implementation performance
- Story told through numbers is always better
- Focus on ROI

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Key Lessons

The Pessimist	The Realist	The Hyped
• We aren't ready • AI is too risky • We aren't able • AI not needed	• Considers realities • Manages risks • Realistic use cases • Focused on ROI	• Ignore realities • Overlook risks • AI for everything • Prophets of doom

Value creation

Conclusion

The AI Unit is building the institutional capability for Zambia to lead AI-driven tax administration in ZRA — closing the revenue gap, automating compliance, and delivering better services to Zambian taxpayers.

Final Thought



- *AI has an important role to play in tax administration reforms*
- *ZRA remains ready to collaborate with other tax administrations through bi-directional knowledge sharing*

Thank You

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Questions & Discussion

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