I·HI THINK-TANK

Policy Brief 1.

A Human-Centred AI Roadmap for Efficient, Secure and Future-Ready Public Administration in North Macedonia

Introduction

This proposed roadmap was developed by the **I-HI Think Tank** during January 2026, based on a review of a wide range of relevant materials, empirical evidence, international analyses, and forward-looking projections related to the introduction of Artificial Intelligence in public administration.

The document is intended to serve as an initial framework for informed policymaking. However, its true value will emerge through an **open, inclusive, and evidence-based public debate**. It is essential that all key stakeholders be engaged in this process — including public institutions, academia, the private sector, civil society, technology experts, and citizens.

Given the speed of technological change and its direct impact on governance, the economy, and society, **the debate should begin as soon as possible**, enabling the country to build a timely, strategic, secure, and human-centred direction for AI development.

Executive Summary

Artificial Intelligence is rapidly redefining how governments operate worldwide. States that adopt AI strategically are improving service delivery, reducing administrative burdens, strengthening policy design, and optimizing public spending. Those that delay risk institutional inefficiency, talent loss, and widening competitiveness gaps.

North Macedonia has already taken important steps toward digital transformation through the establishment of the Ministry of Digital Transformation and the development of national digital strategies.
However, public administration still faces structural challenges including fragmented digital services, limited interoperability, modest uptake of e-services, and uneven institutional capacity.

The introduction of **human-centred AI** represents a historic opportunity to accelerate modernization while safeguarding citizens' rights, dignity, and trust.

This policy brief proposes a pragmatic, risk-aware roadmap for introducing AI across government institutions — balancing urgency with responsibility, innovation with oversight, and efficiency with ethical governance.

The central message is clear:

AI adoption is no longer optional for modern governance, but the manner of its introduction will determine whether it **strengthens** or **destabilizes public trust.**

Why AI Matters for Public Administration

Governments globally are transitioning from analog bureaucracies to intelligent administrations capable of anticipating needs, managing complexity, and responding faster to citizens.

AI should not be viewed as a technological luxury but as a **core governance infrastructure** — comparable to electricity or the internet.

Properly deployed, AI can:

- Reduce administrative workload
- Improve citizen access to services
- Support evidence-based policymaking
- Strengthen fraud detection
- Optimize resource allocation
- Increase institutional responsiveness

Most importantly, AI allows civil servants to **shift from repetitive procedural work toward higher-value human tasks** such as problem solving, social support, and strategic planning.

AI does not replace public servants — it augments them.

Current Readiness in North Macedonia

North Macedonia has made progress in digital foundations and is assessed by UNDP as being in a **"systematic" phase** of digital readiness (i.e., digital tools are applied more consistently, but key enabling gaps remain). At the same time, SIGMA/OECD notes that **service digitalisation remains low**, with the national portal listing **264 e-services** and about **130,000 registered users (as of July 2024)**—a modest uptake relative to population; it also highlights weak central coordination and uneven quality across institutions.

Human-centred AI (with safeguards) can accelerate service delivery, reduce administrative burden, and improve policy and inspection capacity—*but only if* government first strengthens core enablers: **eID adoption, interoperability, data governance, cybersecurity, and cross-government coordination**. SIGMA explicitly flags these as weak points (e.g., interoperability use is "very modest" and free universal eID is not yet in place).

AI as capacity multiplier – Why AI Matters for Public Administration

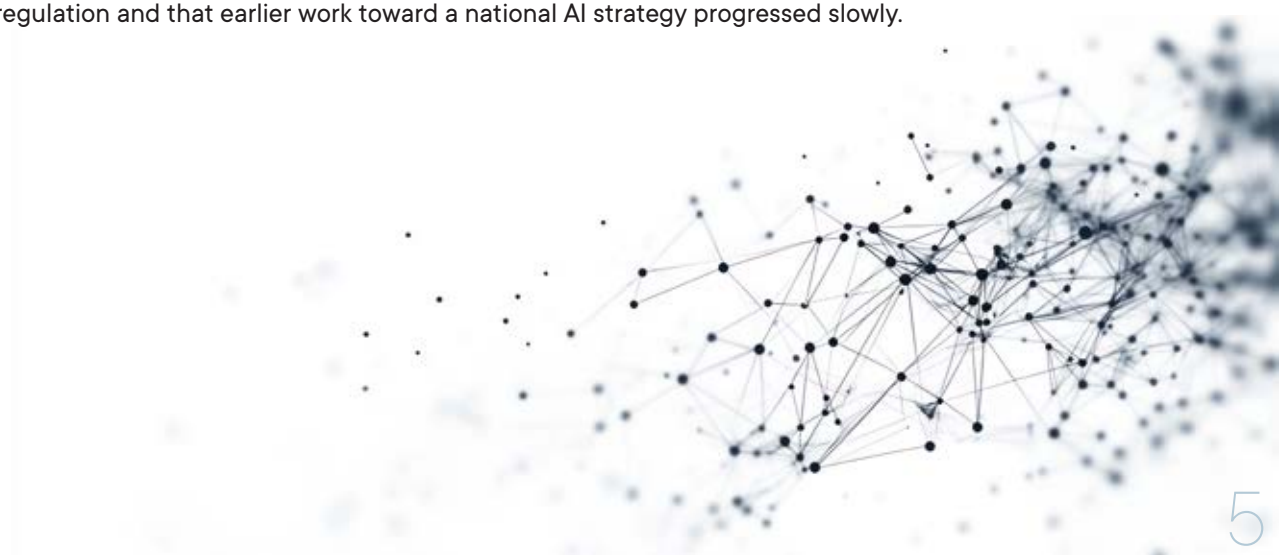
AI is best viewed as a **capacity multiplier** for government: it automates high-volume routine work (drafting, summarising, classification, triage), improves **24/7 citizen support**, and strengthens **risk detection** (fraud, irregular procurement patterns, compliance anomalies). This aligns with the typical government AI use-cases described by the World Bank (citizen engagement, compliance/risk, anti-corruption/fraud, business process automation, analytics for policy).

What's already in place (signals of readiness)

- A dedicated **Ministry of Digital Transformation (MDT)** was formed in June 2024, with a mandate for digitalisation and service delivery steering.
- A national e-services portal (**uslugi.gov.mk**) is functional and user numbers have increased (tripled over 3 years), but uptake is still limited.
- Strategic frameworks exist/are evolving (e.g., the **Roadmap for Digital Transformation 2024–2030**, and SMART/MK 2030).

Gaps that block safe scaling of AI

- **Low service digitalisation and weak service design capacity** (SIGMA indicator on "enablers for user-centric services" is low; central steering is weak).
- **Interoperability usage is modest**, eID rollout and cybersecurity approach need strengthening.
- **AI-specific governance is underdeveloped**; credible analyses note North Macedonia lacks AI-specific regulation and that earlier work toward a national AI strategy progressed slowly.



Current Readiness in North Macedonia – IN SHORT

North Macedonia is positioned at an important digital crossroads.

Positive developments include:

- Creation of the Ministry of Digital Transformation
- National digital transformation frameworks
- Expanding e-service infrastructure
- Growing awareness of digital governance

However, several structural constraints remain:

- Limited service digitalization
- Weak interoperability between institutions
- Uneven data governance practices
- Low adoption of electronic identity tools
- Fragmented coordination across ministries

These gaps do not argue against AI adoption — they argue for **structured and carefully sequenced introduction.**

Delaying adoption until "perfect readiness" emerges would likely result in technological dependency rather than sovereignty.

High-Impact Use Cases (practical, near-term)

1. Citizen services "AI front desk" (multilingual)

- 24/7 Q&A, guided e-forms, appointment help, status tracking, complaint routing
- Reduces call-centre load; improves access (including for rural users and persons with disabilities if designed properly)

2. Document automation for ministries

- Drafting and summarising policy memos, meeting minutes, consultations, responses to citizens
- **Human-in-the-loop** approval required; audit trails mandatory

3. Case triage & workload routing (social protection, employment, inspections)

- Prioritisation of cases by urgency and vulnerability
- Must be carefully constrained to **support** decisions, not replace legal judgement

4. Fraud / anomaly detection (tax, customs, procurement)

- Pattern detection on open/internal datasets; red-flagging anomalies for investigators
- Requires strict governance to avoid politicised targeting

5. Policy analytics & forecasting

- Scenario modelling, policy impact synthesis, evidence mapping
- Strong documentation of assumptions and uncertainty

Risks and Safeguards (Human-Centred AI)

Main risks: privacy breaches, bias/discrimination, opacity, over-automation, vendor lock-in, cyber risk, and "automation bias" (humans trusting outputs too much).

High-Impact Government Use Cases - IN SHORT

The most successful governments begin with **low-risk, high-impact applications** rather than experimental deployments.

Priority domains include:

Citizen Interaction

AI-supported virtual assistants can provide 24/7 multilingual support, guide citizens through procedures, and reduce waiting times.

Administrative Automation

Drafting documents, summarizing reports, processing forms, and routing requests can be significantly accelerated.

Case Management

AI can help prioritize social cases, employment services, and inspection workflows — always under human supervision.

Fraud and Risk Detection

Pattern recognition can support auditors and investigators in identifying irregularities earlier.

Policy Intelligence

AI tools can synthesize large datasets, simulate policy outcomes, and enhance strategic planning.

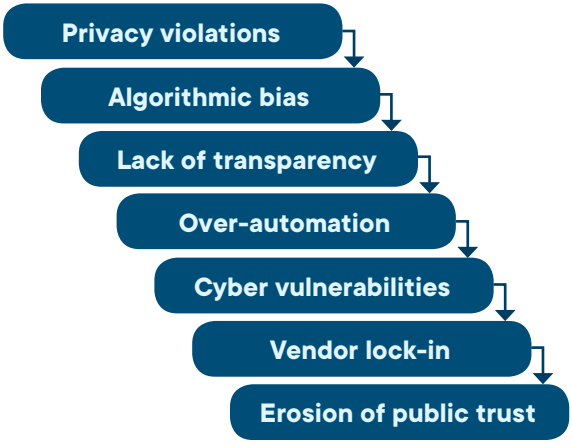
Safeguards that should be non-negotiable:

- **AI governance standard** across government: roles, approvals, audit logs, model risk tiers
- **Human-in-the-loop** for any decisions affecting rights/benefits/sanctions
- Privacy-by-design (DPIAs), security-by-design, and procurement rules that require transparency
- Clear public communication: what AI does, what it doesn't do, and how to appeal outcomes
- Alignment path toward EU AI Act principles (risk-based approach), as recommended in EU-alignment analyses.

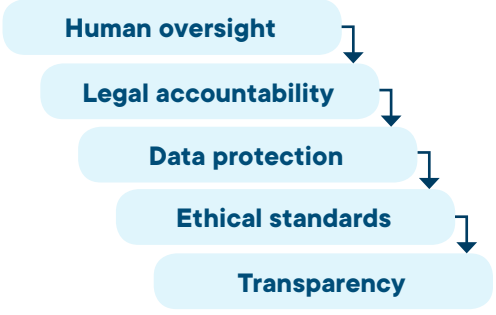
Risks and Safeguards

AI introduces transformative benefits but also systemic risks if deployed without governance.

Key risks include:



Therefore, AI must be introduced within a **Human-Centred Governance Framework** grounded in:



The objective is not merely smarter government — but **trustworthy government.**

Implementation Roadmap (practical steps)

Phase 0 (0–6 months): "Enable & Govern"

- Establish a **Government AI Steering Unit** (MDT + MPA + MoF + data protection + cybersecurity)
- Adopt a **whole-of-government AI policy**: allowed uses, prohibited uses, risk tiers
- Create an **AI procurement & vendor standard** (interoperability, portability, auditability)
- Build training: "AI basics for civil servants" + "AI risk & accountability"

Phase 1 (6–18 months): "Pilot with Proof"

- Launch 3–5 pilots that are *low-risk* and *high-volume*:
  - AI front desk for uslugi portal (information + navigation, not legal decisions)
  - Document summarisation and drafting for internal use (with approvals)
  - Back-office classification (incoming mail, forms, registry triage)
- Build measurement: time-to-service, backlog reduction, satisfaction, error rates

Phase 2 (18–36 months): "Scale & Integrate"

- Expand pilots across ministries with shared components (identity, interoperability, logging)
- Add advanced use cases (fraud/anomaly detection, inspection targeting) with strict oversight
- Institutionalise: permanent AI roles, budget lines, monitoring, and independent audits

Indicative roll-out, cost, and efficiency impact (2026–2029)[1]

Ministry / cluster (all ministries covered)	2026 (Enable + 1 pilot)	2027 (Scale to 2–3 uses)	2028 (Integration + advanced)	2029 (Mature ops)	Indicative cost range (4 yrs)	Indicative efficiency gain (admin workload)	Where savings come from
PM Office + Government Secretariat	✓	✓	✓	✓	€0.4–1.0M	8–15%	drafting/summaries, workflow triage
Digital Transformation (MDT) + Public Administration (MPA)	✓✓	✓✓	✓✓	✓✓	€0.8–2.0M	10–20%	shared AI services, standards, training
Finance (MoF) + Treasury	✓	✓	✓	✓	€0.6–1.5M	5–12%	document automation, analytics
Economy / Labour / Employment	✓	✓	✓	✓	€0.5–1.2M	8–18%	case triage, citizen support
Social Policy / Social Services	✓	✓	✓	✓	€0.6–1.6M	8–18%	case routing, intake support (HITL)
Education & Science	✓	✓	✓	✓	€0.4–1.1M	6–12%	stakeholder comms, document loads
Health	✓	✓	✓	✓	€0.6–1.8M	5–10%	admin documentation support (not clinical decisions)
Interior	✓	✓	✓	✓	€0.6–1.8M	4–10%	back-office automation, reporting
Justice	✓	✓	✓	✓	€0.5–1.4M	5–12%	legal research support, summarisation (guardrails)
Foreign Affairs	✓	✓	✓	✓	€0.4–1.0M	6–12%	briefs, translation support, summarisation

1 **How to read this table:**

- Costs are **ranges** based on typical public-sector AI introduction components (governance, pilots, training, integration, security), not a substitute for a detailed budget.
- Savings are shown as **potential administrative-effort savings** (time) converted into budget effect only after process re-engineering (otherwise savings remain "time freed" not money saved). This is consistent with OECD/World Bank framing that benefits depend on implementation quality and process redesign.

Ministry / cluster (all ministries covered)	2026 (Enable + 1 pilot)	2027 (Scale to 2–3 uses)	2028 (Integration + advanced)	2029 (Mature ops)	Indicative cost range (4 yrs)	Indicative efficiency gain (admin workload)	Where savings come from
Defence	✓	✓	✓	✓	€0.4–1.2M	4–8%	admin workflows (security constraints)
Transport & Communications	✓	✓	✓	✓	€0.4–1.2M	6–12%	permits workflow triage, analytics
Environment / Climate	✓	✓	✓	✓	€0.4–1.2M	6–12%	monitoring synthesis, reporting
Agriculture	✓	✓	✓	✓	€0.4–1.1M	6–12%	subsidy paperwork support, citizen Q&A
Culture	✓	✓	✓	✓	€0.25–0.7M	6–10%	grant docs, communications
Local Government coordination (interoperability + municipalities)	✓	✓	✓	✓	€0.8–2.5M	8–15%	shared intake/chat, standard forms

Total indicative envelope (all ministries + shared systems, 4 years): roughly **€8M–€22M** (The large range in the estimates is because it depends on: in-house vs vendor, cloud/on-prem, cybersecurity level, depth of integration, and whether you build shared "government AI platform" once or repeat procurement per ministry).

- Present savings as **(a) time freed**, then show how that converts to **(b) budget savings** only if government commits to process redesign, consolidation, and/or attrition-based staffing plans.
- SIGMA's diagnosis (fragmentation, low digitalisation, weak performance monitoring) indicates that what is needed is first focus on **standardisation + measurement**, otherwise AI won't scale well.

North Macedonia has strategic momentum for digitalisation (Roadmap 2024–2030; SMART/MK 2030) and institutional changes (MDT created in 2024).

However, SIGMA/OECD reports that digitalisation of services is still low (264 e-services listed on the national portal) and uptake remains modest (~130,000 registered users by July 2024), with uneven quality control and weak central coordination—conditions that also limit safe AI deployment at scale.

Implementation Roadmap

Phase 1 — Foundations (0–6 months)

- Establish a Central Government AI Coordination Unit
- Adopt national AI governance guidelines
- Define risk tiers for AI use
- Launch civil servant training programs
- Develop procurement standards

Phase 2 — Controlled Pilots (6–18 months)

Deploy AI in carefully selected environments:

- Citizen service assistants
- Internal document automation
- Workflow classification
- Administrative analytics

Measure outcomes rigorously.

Phase 3 — Scaled Integration (18–36 months)

- Expand successful pilots
- Integrate shared AI infrastructure
- Institutionalize monitoring
- Introduce independent audits

AI becomes part of standard administrative architecture.

Policy Recommendations

Toward Human-Centred Intelligent Governance

The introduction of Artificial Intelligence across public administration is no longer a matter of experimentation — it is a strategic necessity.

However, modernization must not come at the expense of human dignity, workforce stability, or democratic accountability.

North Macedonia should pursue AI that increases institutional efficiency while simultaneously protecting human wellbeing, professional roles, and citizen rights.

Below are prioritized recommendations ranked from highest strategic importance to operational support.

1. Treat AI Adoption as a Strategic State Priority

In a rapidly developing technological world, governments that fail to adopt AI risk institutional stagnation.

AI is becoming the operational backbone of competitive administrations.

Recommendation:

Formally recognize AI as critical governance infrastructure within national development priorities.

Delay will cost more than adoption.

2. Implement Human-Centred AI as the Non-Negotiable Standard

Efficiency must never override ethics.

Human-centred AI ensures:

- decisions remain accountable
- citizens retain agency
- systems remain explainable
- institutions remain trusted

Recommendation:

Adopt a Human-Centred AI Charter applicable across ministries.

3. Move Fast — But Move Safely

The greatest risk is not rapid adoption — it is uncoordinated adoption.

Governments should accelerate deployment while embedding safeguards from the start.

Recommendation:

Pursue **rapid but controlled implementation** anchored in:

- cybersecurity
- data protection
- AI ethics
- legal oversight

Speed and caution are not opposites — they are complements.

4. Recognize That Long-Term Savings Will Outweigh Initial Costs

AI introduction requires investment, yet the structural savings are significant when properly implemented.

Savings derive from:

- reduced manual processing
- fewer administrative errors
- optimized staffing allocation
- faster service delivery
- lower operational friction

AI should be viewed as a **productivity multiplier**, not a budgetary burden.

5. Launch a National Communication Effort — The "AI Mode" Transition

Public misunderstanding is one of the largest barriers to technological reform.

Citizens and civil servants must understand:

- why AI is needed
- what it will change
- what it will NOT change
- how rights remain protected

Recommendation:

Initiate strong communication campaigns framing AI as a tool for better governance — not surveillance or replacement of workers.

Transparency builds legitimacy.

6. Protect the Workforce and Promote Augmentation — Not Replacement

Fear-driven resistance can derail reform.

AI should elevate civil servants, freeing them from repetitive tasks and enabling more meaningful work.

Recommendation:

Create reskilling and upskilling programs early.

No workforce should feel technologically abandoned.

7. Establish Continuous Monitoring and Citizen Safeguards

AI governance is not a one-time regulatory exercise — it is an ongoing responsibility.

Recommendation:

- Create independent oversight mechanisms
- Conduct algorithmic audits
- Maintain appeal pathways
- Monitor bias and unintended effects

Government must remain the guardian of citizens in the age of intelligent systems.

8. Build Shared Infrastructure Rather Than Fragmented Solutions

Uncoordinated procurement leads to inefficiency and dependency.

Recommendation:

Develop a centralized government AI platform enabling shared services across ministries.

This reduces costs and improves security.

9. Strengthen Data Governance Before Scaling Advanced AI

AI is only as reliable as the data that feeds it.

Recommendation:

Prioritize interoperability, data quality frameworks, and secure data exchange protocols.

Good data is national infrastructure.

10. Align Early With European Regulatory Trajectories

Alignment with emerging European AI governance standards will:

- support accession processes
- attract investment
- reduce future compliance costs

Recommendation:

Design policies compatible with EU regulatory philosophy from the outset.

Indicative Timeline, Costs, and Efficiency Gains

(Strategic estimate — not a procurement budget)

Period	Focus	Estimated Investment	Expected Efficiency Gain
Year 1	Governance + pilots	€2–4 million	5–10% workload reduction
Years 2–3	Scaling across ministries	€4–10 million	10–20% efficiency increase
Years 4–5	Mature intelligent administration	€6–12 million	Up to 30% productivity gain

Projected Long-Term Effect:

Substantial operational savings, faster services, and more strategic public institutions.

The cost of inaction, by contrast, compounds annually.

Conclusion

Artificial Intelligence represents one of the most consequential governance transformations since the digital revolution.

For North Macedonia, the question is no longer **whether** AI will shape public administration — but **whether the country will shape its AI future deliberately and responsibly.**

A human-centred approach allows the state to become:

- faster
- smarter
- more responsive
- more resilient

without losing sight of the fundamental purpose of governance:

to serve people with dignity, fairness, and foresight.

The opportunity is immediate. The responsibility is profound. The time to act is now.

Selected References

- **SIGMA (OECD & EU)** — Public Administration diagnostics: fragmentation, digitalisation, performance monitoring. *OECD/SIGMA analyses on public sector reform and digital capacity.*
- **UNDP Digital Readiness Assessment** — Placement of North Macedonia in systematic phase of digital transformation. *UNDP country digital readiness functional analysis.*
- **National Digitalisation Frameworks** — *Roadmap for Digital Transformation (2024–2030)* and *SMART/MK 2030* strategic vision guiding national digital reforms.
- **Ministry of Digital Transformation (MDT), North Macedonia (2024)** — Institutional change establishing digital coordination mandate. *Government decree establishing MDT.*
- **National e-Services Portal** — Official listing of digital public services (~264 services) and user uptake (~130,000 users). *uslugi.gov.mk official portal data.*
- **EU AI Act** — Emerging European regulatory standard providing a risk-based governance framework for AI, relevant for alignment and compliance. *European Union regulatory proposal on artificial intelligence.*
- **World Bank GovTech & AI** — Global use cases detailing AI applications in government: citizen services, fraud detection, automation. *World Bank publications on GovTech and AI adoption.*
- **NIST AI Risk Management Framework** — International guidance on AI risk categorisation, auditability, and governance best practices. *NIST AI RMF document.*
- **Algorithmic Accountability & DPIA Guidelines** — International best practices for privacy-by-design, data protection impact assessment, and algorithmic bias monitoring. *Global references on privacy and accountability frameworks.*

Annotated Reference List

- **UNDP — Digital Readiness Assessment**

  United Nations Development Programme (UNDP). Digital Readiness Assessments.
  https://www.undp.org/digital

  Why it was used:
  Provides the analytical basis for positioning North Macedonia in a "systematic" phase of digital readiness, supporting the brief's argument that foundational progress exists but enabling gaps remain.

- **SIGMA / OECD — Public Administration and Digital Government Analysis**

  SIGMA (OECD & European Union). Public Administration Reviews and Digital Government Assessments.
  https://www.sigmaweb.org

  Why it was used:
  Supplies evidence on low service digitalisation, weak coordination, modest uptake of e-services, and fragmented performance monitoring — all central to the brief's diagnosis of structural constraints affecting safe AI deployment.

- **World Bank — AI Use Cases in Government**

  World Bank. Artificial Intelligence for Public Sector Innovation.
  https://www.worldbank.org/en/topic/digitaldevelopment

  Why it was used:
  Supports the framing of AI as a "capacity multiplier" and validates typical government use cases such as citizen engagement, fraud detection, compliance, automation, and policy analytics.

- **Government of North Macedonia — National Digital Strategies**

  Roadmap for Digital Transformation 2024–2030
  SMART/MK 2030 National Development Framework

  Why they were used:
  Establish the strategic momentum for digitalisation and demonstrate that institutional groundwork already exists for scaling intelligent governance.

- **National e-Services Portal (uslugi.gov.mk)**

  https://uslugi.gov.mk

  Why it was used:
  Acts as a measurable indicator of digital infrastructure maturity while also illustrating the gap between service availability and citizen uptake (~130,000 users).

- **Ministry of Digital Transformation (North Macedonia)**

  Institution established June 2024

  Why it was used:
  Signals institutional readiness and political commitment to digital governance reforms — a key prerequisite for AI coordination across government.

- **EU AI Act — Risk-Based Regulatory Model**

  European Union Artificial Intelligence Act
  https://artificialintelligenceact.eu

  Why it was used:
  Provides the normative governance direction for aligning national AI policy with emerging European regulatory standards and risk-tiered oversight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