



Next Generation AKIS Integrating LLMs JackDaw for Policy and Advisory Innovation

Karel Charvat
Czech Centre for Science and Society



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Why AKIS Needs to Evolve LLM

O1- Emergence of multilingual, domain-adapted LLMs enables conversational, regulation-aware advisory services

O2- Legacy AKIS architectures focus on data integration, not on contextual reasoning or natural-language communication.

O3- Fragmented toolchains prevent interoperability and multilingual inclusion

O4 - Advisers and farmers need faster, explainable insights linked to local regulatory and scientific sources.

O5 - JackDaw from PoliRuralPlus provides a scalable GeoLLM model that bridges these



From Data to Wisdom: The AKIS Paradigm Shift

Limitations of Traditional AKIS

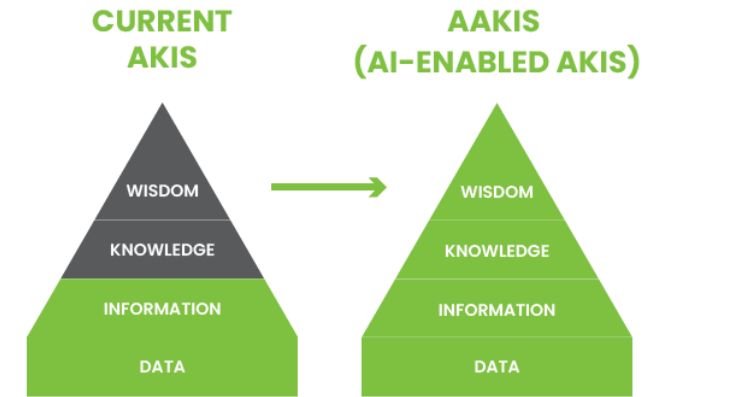
Conventional systems focus on data aggregation and dissemination, lacking contextual reasoning and multilingual communication essential for real-time advisory use.

The LLM Opportunity

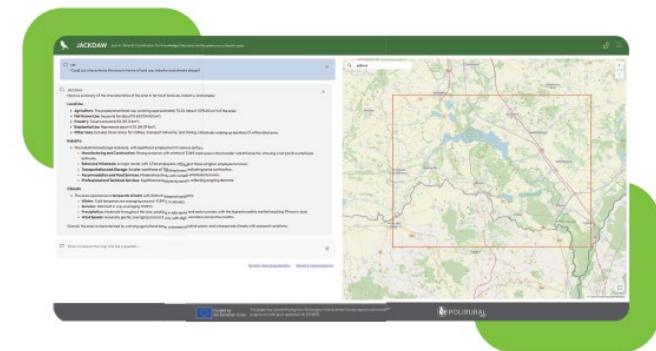
Recent large language models (Mistral, LLaMA, DeepSeek, Gemma) enable contextual reasoning, cross-lingual dialogue, and transparent advisory explanations, supporting the 'knowledge to wisdom' transition.

JackDaw as an Integrator

Developed under PoliRuralPlus, JackDaw connects global language models with local spatial intelligence, transforming advisory interaction into contextual, location-aware decision support.



» Advisory Wisdom, Built In



» Spatially Aware Advisory AI

JackDaw: Bridging Global Models and Local Data

Geo-Contextual Reasoning for Agricultural Advisory

JackDaw integrates large language models with real-time geospatial data sources, enabling chat-based, spatially contextual conversations.

The system links LLM reasoning with GIS datasets, IoT sensors, and Sentinel imagery, providing localised insights grounded in actual field conditions.

This fusion of semantic and spatial intelligence ensures that advisory outputs are both precise and actionable.



» Parcel-level advice,
explainable and auditable

How LLMs Transform Farmer–Advisor Communication



Modern LLMs support real-time multilingual dialogue, simplifying access to EU and national agricultural knowledge. Advisors and farmers can interact in their native languages, reducing miscommunication and ensuring equitable knowledge dissemination.

Why JackDaw Strengthens AKIS Integration



JackDaw's modular API layer enables seamless integration with AAKIS services and external tools, including GIS dashboards, regulation databases, and field-monitoring systems.

Thematic RAGs in AKIS

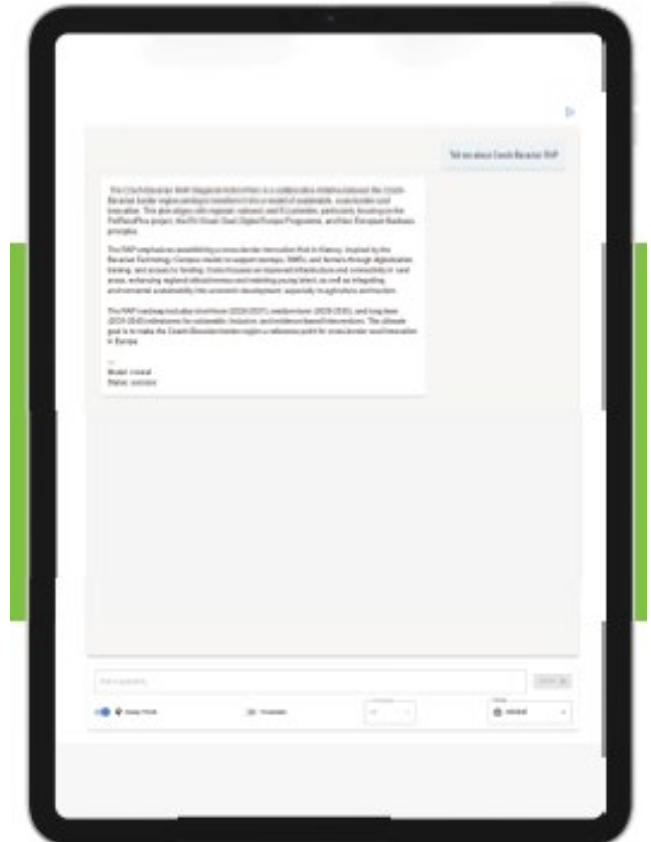
01 - Scientific RAG: Links advisory reasoning to peer-reviewed agronomy literature and experimental data.

02 - Legislation RAG: Extracts relevant clauses from CAP, AI Act, and environmental directives for compliance support.

03 - Regulation RAG: Provides national-level procedural guidance and risk thresholds.

04 - GeoRAG: Integrates real-time Sentinel, IoT, and meteorological data for spatially grounded recommendations

05 - Policy RAG: Summarizes current and upcoming regulatory frameworks affecting rural development.



Expected Systemic Benefits

Efficiency & Fairness

Automated retrieval and multilingual understanding reduce workload while ensuring equitable access to advisory support across all EU languages.

Transparency & Compliance

Every AI-generated recommendation is traceable to its data and legal source, meeting AI Act and CAP audit standards.

Sustainability & Inclusiveness

GeoLLM integration supports climate-smart farming, lowers emissions through optimised inputs, and empowers rural communities through explainable AI.

Integration Roadmap within AKIS

Technical and Policy Alignment

The integration of LLMs and JackDaw aligns with AKIS Pillars 2 (Data-to-Wisdom Chain) and 3 (Federated Architecture). The approach maintains compliance with GDPR, AI Act, and Data Act through policy-as-code mechanisms.

Name of the project:

Fostering Sustainable, Balanced, Equitable, Place-based and Inclusive Development of Rural-Urban Communities' Using Specific Spatial Enhanced Attractiveness Mapping ToolBox

Thank You for Your Attention



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