



CYBER & SECURITY SOLUTIONS

# FORGE2KNOW

SECURE AND SOVEREIGN  
BIG DATA AND AI FOR DATA  
VALORIZATION

 **LEONARDO**

Governments, businesses, and organizations recognize data as a precious resource capable of offering insights, guiding decision-making, and enhancing the overall performance of business processes.

Leonardo designed the Forge2Know suite to address the challenges of integrated Big Data analytics and Artificial Intelligence governance.

Structured with 2 inter-operating but independent products, constituting the core platform and one intelligence components for high level data exploitation, Forge2Know integrates modern open-source technologies and proprietary modules, designed to ensure security, scalability and interoperability across environments.

### **Forge2Know.DataPlatform**

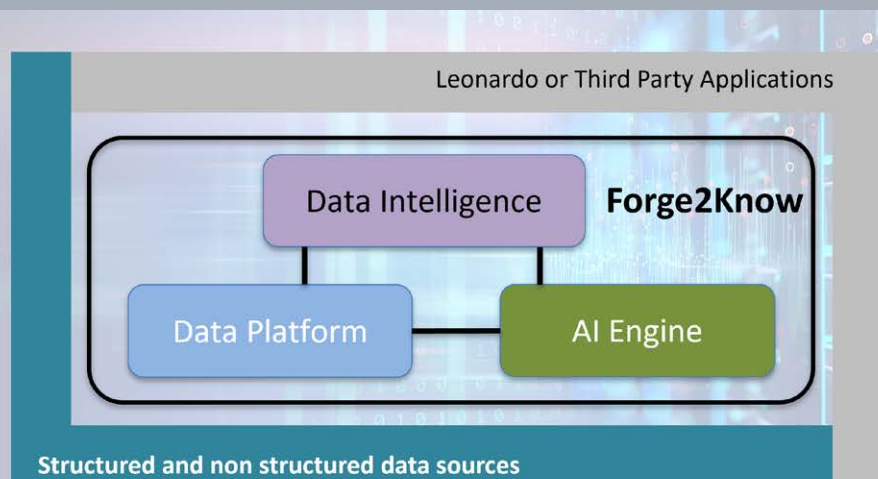
A platform containing tools to speed up and simplify Big Data governance, acquisition, processing and presentation.

### **Forge2Know.AIEngine**

A platform for the governance of AI models in terms of: Responsible AI, Repository (Model/Dataset), Distribution, Active Monitoring, Experience Collection, Benchmark Evaluation.

The two Forge2Know products can be used as fully operational standalone solutions, yet they complement each other to create a comprehensive and scalable platform that enables data transformation into strategic value, optimizing governance, processing and AI adoption with high standards of security and interoperability.

Both products constitute the enabling platform for **Forge2Know. DataIntelligence**, a cutting-edge solution that integrates crawling tools and advanced use of AI for OSINT and CLOSINT analysis enabling the collection, processing and analysis of large amounts of data from open or closed sources to support decisional processes.



## THE NEED FOR A DATA SUITE

- Data is a valuable resource and is the foundation of software products and project; some issues such as fragmentation, quality, traceability and protection could prevent a unified view and slow down their transformation into business value.
- Artificial intelligence is increasingly widespread within solutions and projects, but control, traceability and accordance to regulations problems may compromise data security, quality of results and create regulatory issues.

The Forge2Know suite was created to respond to these challenges, related to integrated Big Data analysis, data governance and Artificial Intelligence.

Organized as a set of cooperating products: two constituting the core technological capabilities about big data and AI, and one “consumer” platform that, leveraging the functionalities of the core components, provides an advanced solution in OSINT, CLOSINT and document analysis through the advanced use of Artificial Intelligence models.

Whichever the sector or the use case, modern analysis require strong technological capabilities matched extensive knowledge of operational domain. Forge2Know aim is to provide the tools and the environment to support data scientists, data analysts and domain experts to leverage big data power and adapt and specialize Artificial Intelligence models effectively in a secure way.

## THE TECHNOLOGICAL FOUNDATION

### FORGE2KNOW.DATAPLATFORM

Forge2Know.DataPlatform is Leonardo’s platform for the management, enhancement and enrichment of large volumes of data, with particular attention to the highest standards of security, scalability and interoperability. A useful tool for different categories of users who work with data, offering an integrated set of features that support data professionals in carrying out their tasks, it allows:

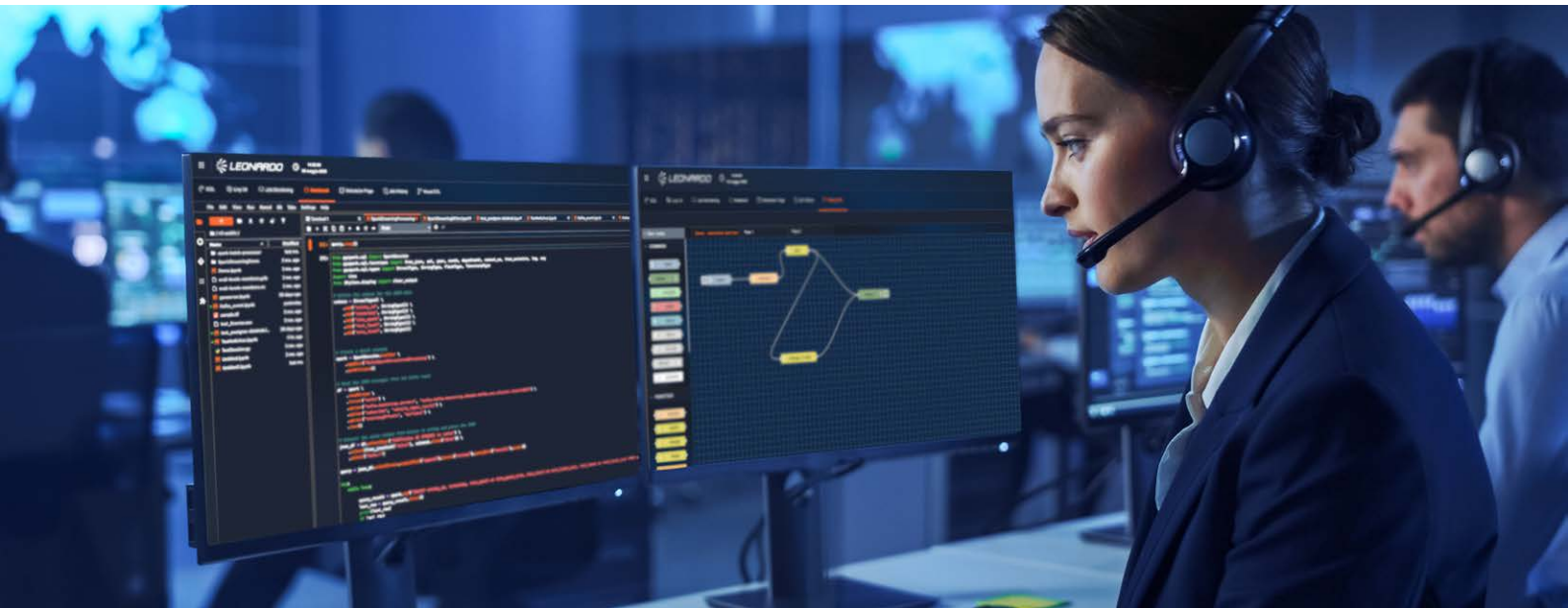
- integrated Big Data and Artificial Intelligence Management;

- extraction of maximum value from data;
- in-depth analysis of datasets of any size to identify trends and opportunities;
- automation of processes and more accurate forecasts;
- improved operational efficiency and smarter decisions support;
- secure data management with advanced encryption and continuous protection.

The platform integrates advanced open source technologies related to Big Data, combined with robust encryption and access control systems, to ensure maximum data security without compromise.

Forge2Know.DataPlatform main functionalities are:

- **DATA LAKE:** a ready-to-use multi tenant secure platform for ingesting, storing and retrieving structured, semistructured and unstructured data of any size.
- **DATA PROCESSING:** providing functions for real time and batch elaboration leveraging in-memory execution engine and horizontal scalability, parallel processing and also through vector db. Publish-subscribe capabilities, event management, scheduling and workload management as well as visual ETL (Extract Transform Load) and a Secure Query Engine further empower data processing capabilities.
- **DATA SECURITY AND GOVERNANCE:** implementing a single, secure and centralized reference point for data control. By leveraging search and discovery tools and connectors to extract metadata from any data source, it simplifies data lineage, data protection, analysis, and pipeline management, as well as accelerates ETL processes.
- **AI MODEL BUILD:** Set of tools and best practices aimed at developing and maintaining Machine Learning (ML) models reliably and efficiently.
- **PRESENTATION:** a module for visualizing and interacting with data through graphical data quality interfaces and business intelligence tools: tables, charts and other types of representations.



## FORGE2KNOW.AIENGINE

Forge2Know.AIEngine is Leonardo’s reference platform for the governance of AI models expressed in the following functions: Repository (Model/Dataset), Serving, Active Monitoring, Experience Collector e Benchmark Evaluation.

It is designed to ensure data protection, model security and respond to increasingly demanding regulations on artificial intelligence and is equipped with tools for:

- Digitally sign models to ensure their identity and integrity.
- Validation of the model with vulnerability rating level (AI Security).
- Verification of compliance with the European reference legislation on artificial intelligence. (AI Act).

The main functionalities of Forge2Know.AIEngine can be summarized as:

- **REPOSITORY:** providing tools for archival, and versioning of AI models keeping track of all relevant information including training datasets and registering and tracking download operations.
- **SERVING:** providing a delivery environment for inferences and inference pipelines with different options: centralized, decentralized online, and decentralized offline, allowing flexibility for AI usage in applications.
- **ACTIVE MONITORING:** providing tools for monitoring and controlling the operational status of models and nodes/hosts either via API or through a suitable HMI.
- **BENCHMARK EVALUATION:** offering tools for evaluating the performance of models in inference.
- **EXPERIENCE COLLECTOR:** supporting the collection experience while serving models.

The close integration between AIEngine and DataPlatform modules, allow to transform the AI model from a “static” asset to an operational business service.

AI models, created and trained in DataPlatform environment, can be stored in the AI Engine repository along with the training data and all the ancillary information to evaluate its security and compliance with the required policies.

The models thus inserted are made available, together with other models including third-party ones, within the repository, to be utilized by various professionals who require AI support for their activities taking advantage of the various mechanisms provided by the platform for the execution of the models, the collection of results and visualization tools. Results can either be transferred to other higher-level platforms (such as the DataIntelligence). for any further processing.

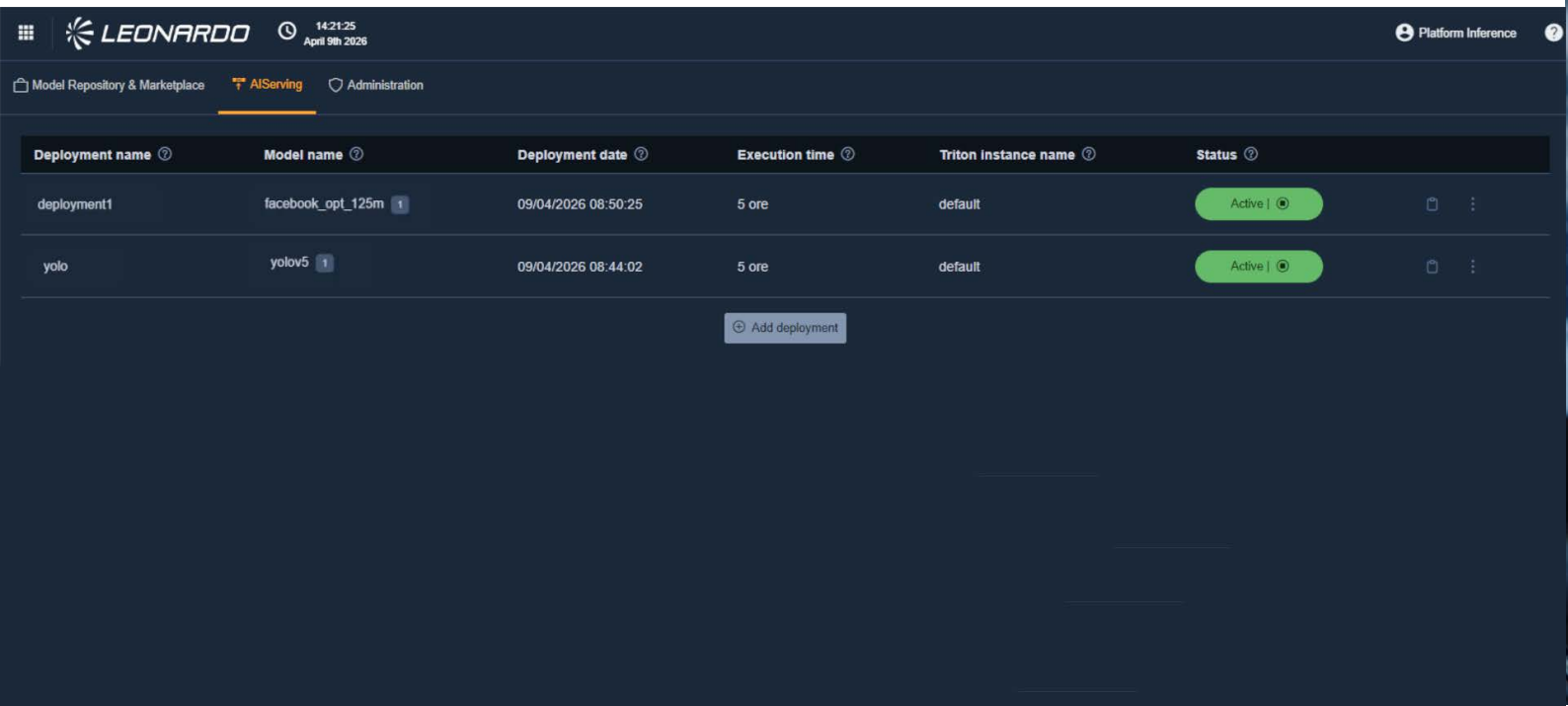
## FORGE2KNOW.DATAINTELLIGENCE

The platform aims to collect data from open (OSINT) and internal (CLOSINT) sources from various Cyber, Strategic (National/International) and Economic-Financial contexts, analyze them with enhancement processes (semantic and ontological analysis), providing the user with the tools to obtain useful information for their context.

Forge2Know.DataIntelligence has been created to be the software platform based on the products Forge2Know. DataPlatform and Forge2Know.AIEngine to offer advanced tools based on Artificial Intelligence to analyze data and transform them into information through a set of predefined analysis models.

The Data Intelligence Platform is mainly composed of the following functional blocks:

- **DATA ACQUISITION ENGINE:** orchestrating and collecting data from heterogeneous open (OSINT) and internal (CLOSINT) sources to make them available to transformation and valorization pipelines. The platform features connectors able to deal with various interface applicable to internal documents as



well as to web pages from domain in web or deep/darkweb or extracting data from social media.

- **DATA PLATFORM:** a robust and secure infrastructure designed to securely store, integrate and govern all ingested data. This functional block leverages Forge2Know. DataPlatform to provide core capabilities to data handling and governing.
- **AI CAPABILITIES:** powered by Forge2Know. AEngine, is the core component that, using AI agentic pipelines, AI models and advanced tools, allows the transformation of raw data into knowledge graphs. Detailed functions include:
  - AI powered semantic indexing of the corpus into Vector DBs.
  - Automated extraction of entities, relations and events.
  - Continuous knowledge graphs construction and update.
  - Agentic RAG (LLM)for advanced knowledge corpus querying.
  - MCP and tool driven agent to search data, query layers, generate analyses and turn raw data into actionable insight.
- **OPERATIVE ENVIRONMENT:** an innovative workspace for managing investigation cases, featuring an AI assistant for data exploration, knowledge graphs, providing:
  - Investigative and exploration case management with organization of sources.
  - Data segregation capability for case management and users.
  - Advanced AI agent able to work with all the platform data and tools (translation, summarization, analysis,...).
  - AI assistant with a human-in-the-loop approach
  - Reporting and data representation in cartography, knowledge graphs, customized tables and graphs.

## CYBER RESILIENCE

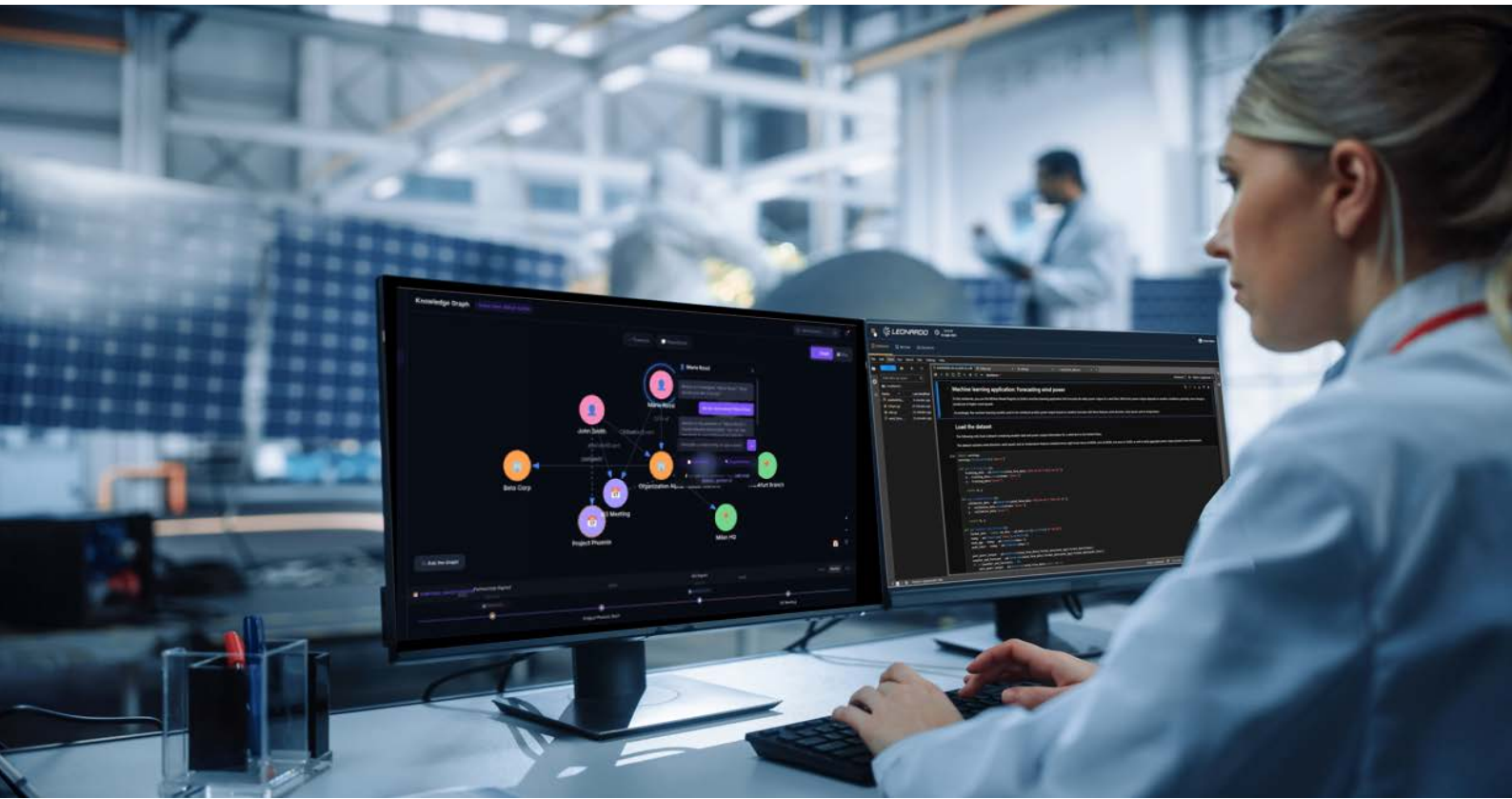
Security is paramount for data analysis given the potential sensitiveness issues and criticality of decisions supported by this product.

Forge2Know suite has thereafter been designed with a particular attention to cyber security and resiliency characteristics.

All modules take advantage of Leonardo secure development methodologies and have been realized according to a secure and resilient-by-design approach.

Security and resilience characteristics go beyond each individual software component and address the whole system, to provide overall protection features. Main cyber resilience features may be highlighted as follows:

- **DATA AT REST ENCRYPTION:** Protection of data when stored on disks, achieved through their encryption.
- **DATA IN TRANSIT PROTECTION:** Protection of the confidentiality of data in transit, with particular attention to communication over public networks.
- **INTER MODULAR COMMUNICATION PROTECTION:** Communication between the elements that make up the Forge2Know modules through private and secure channels.
- **HIGH RELIABILITY:** Intrinsically obtained modules (Kubernetes) or individual modules configured in High Availability (HA).
- **STATIC AND DYNAMIC CODE SECURITY:** SAST and DAST analysis of all software artifacts, including open-source.



## USE CASES

Data analysis and data driven decisions are becoming more and more common in all domain and market sectors: Forge2Know suite can be fruitfully applied to transform data in actionable information in several application fields. Forge2Know is designed to meet multiple needs, but each use case requires close collaboration with those who know the operational domain, to adapt and specialize Artificial Intelligence models effectively. Following, some examples of application of big data and AI guided analysis.

### ANTI FRAUD AND FINANCIAL CRIME DETECTION

Detection of fraud, money laundering and criminal schemes by correlating structured and unstructured data. AI detects hidden relationships, reduces false positives, and supports AML/KYC processes.

### GEOPOLITICAL AND SECURITY INTELLIGENCE

Analysis of geopolitical events, social instabilities and security risks that can impact operations, investments and people. Predictive models support scenario assessment and anticipation of escalation or crisis.

### INTELLIGENT ANOMALY DETECTION FOR POLICE OPERATIONS

Support to police forces in the identification of anomalous or high-risk subjects, assets, or activities through the use of artificial intelligence. The solution integrates information from open and restricted sources to analyze, correlate, and contextualize data related to movements, entities, locations, people, and events, enabling the detection of inconsistencies.

### OPERATIONAL OPTIMIZATION AND DECISION SUPPORT FOR MILITARY AND CIVILIAN CAMPUSES

Support for strategic and operational decisions on military and civilian campuses by integrating open and operational data. AI optimizes resources, predicts

operational loads, and reduces costs, improving safety, efficiency, and continuity.

### UNIFIED VIEW OF THE MILITARY SCENARIO

Integration of information from different military and civilian sources to provide the command with a single, up-to-date and consistent view of the operational and security situation.

The platform supports the military command in understanding threats, movements, capabilities and criticalities in the operational theater.

### MILITARY STRATEGIC DECISION SUPPORT

Analysis of alternative scenarios and intervention options to support military and military-political decisions.

The system makes it possible to assess the impacts, risks and costs of the different choices before their implementation.

### MANAGEMENT AND USE OF MILITARY RESOURCES

Support for the planning and deployment of personnel, vehicles and logistical resources to ensure operational readiness and sustainability of forces.

The platform helps optimize the use of military assets, reducing inefficiencies and maintaining operational capability over time.

### ENVIRONMENT MONITORING AND PROTECTION

Analysis of heterogeneous data originated from sensors, applications and databases related to environmental sector (meteorological, seismic, pollution,...) in order to provide unified data modeling monitoring and forecasting to prevent environmental risks.

### ADVANCED CYBER SUPPORT

Forge2Know constitutes an environment for collection of cyber information (intelligence and telemetry) to support via a set of cooperating AI agents, the operations implementing the phases of the NIST framework to protect and increment the resilience of a cyber infrastructure.

### F2K.DataIntelligence

Innovative platform for OSINT, CLOSINT to transform data into actionable insights leveraging DataPlatform and AIEngine

### F2K.DataPlatform

Secure platform to accelerate data governance, ingestion, big data processing, and valorization

### F2K.AIEngine

AI Governance platform: repository, serving, performance monitoring, experience collection and benchmarking

## KEY VALUES

### OPERATIONAL FLEXIBILITY, TURNKEY DESIGN

integration of sources, workflows and document access permissions, protocol, hardware management.

### HIGH INTEGRATION

Big Data and AI in a single platform, with integrated tools for batch, streaming, real-time and ETL processes, and the possibility of using structured query languages.

### DATA-CENTRIC SECURITY

simplified support for the data lifecycle and the main security and confidentiality policies (GDPR, CCPA, HIPAA): access control, data masking and authorization management.

### GOVERNANCE & SECURITY AI

Management and deployment of AI models while ensuring high standards of security and compliance. Focus on data protection and secure processing, traceability and transparency of the origin of models and their securing.

### DEPLOYMENT EVERYWHERE

Ability to operate on-premise, in the cloud, or in hybrid infrastructures.

### GEN AI

Generative models as valuable elements for an innovative approach to guide data analysis and support strategic decisions.

### ADVANCED CRAWLING

AI-driven crawling platform for interactive data collection from open and closed sources.



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