ALTAILIA turns Big Data into Smart Data and enables businesses to make sense of it to improve decision-making by faster and better insights, optimize business processes, and successfully compete saving time and money.

**PLATFORM OVERVIEW**

Organizations are racing to implement Big Data architectures by using different Big Data facilities currently available. But this is not enough. What’s needed is a **smart high-scalable architecture** that combines the ability to simply collect, join, consolidate, store and manage web and enterprise, structured and unstructured Big Data with the ability to process **explicit data semantics** (e.g. semantic extraction and annotations, natural language processing) and **implicit data semantics** (e.g. machine learning, inference). So developers can make better sense of data for applications and users can get faster business insights for more informed decisions and optimized business processes.

**MANTRA** is a powerful, easy-to-use, holistic Smart Data Platform for today’s enterprises’ digital ecosystem (Fig.1).
As sketched in Figure 2, MANTRA is founded on algorithms that enable to:

- Capture and acquire data from various structured and unstructured enterprise (internal) and web (external) data sources having heterogeneous formats (based on patent pending methods).
- Ingest, integrate, aggregate, harmonize, semantically enrich, and analyze big data.
- Search, explore and visualize Big Data.

The platform is a unique blend of patent pending approaches to web and document data capture, information extraction, semantic analysis of natural language contents, cloud based infrastructures and Big Data management architecture. MANTRA is based on the Contextual Workflow approach that enables to develop applications as composition of MANTRA APPs. Each MANTRA APP is a program providing a specific set of functionalities (e.g. data capture, acquisition, analysis; semantic enrichment) that abstract and hide the complexity of performed activities to users.

MANTRA allows customers to address many application problems and business use cases by a single, unique, powerful, and highly scalable technology.

**MANTRA KEY FEATURES**

- Semantic enrichment based on artificial intelligence, NLP, machine learning, knowledge representation (*patent pending*).
- Easy-to-use, highly scalable “Smart” Web Scraping & Document Data Capture.
- Contextual Workflow and APP based paradigm for solution development (transcends ETL).
- Accelerated development of Big Data Projects.
- Designed to hide the Hadoop complexity.
- Data wrangling, harmonization, linking, normalization, alignment methods.
- Rich dynamic Smart Data driven APPs and Mashboards.
- Search and querying by concepts based on Semantic NLP methods.
- Data analytics capabilities based on efficient in-memory machine learning approaches.
- High-level programmable APIs.
- Cloud, highly scalable Big Data architectures (Cloudera compliant) based on full Hadoop stack with Spark.
With Smart Data you can generate better insights faster to do things like this...

TECHNOLOGICAL ADVANTAGES

Scalability, flexibility, modularity, extendibility, accuracy and efficiency.

This way MANTRA enables customers to:

- Make sense of both structured and unstructured data.
- Find facts and insights into data lakes in days not months.
- Use semantic enrichment to enhance Big Data solutions.
- Turn Hadoop into the brain of an organization.
- Understand data regardless of employees skills and job positions.
- Make faster, better, more informed decisions.
- Optimize business processes.

SOLUTIONS

On top of MANTRA ALTILIA has developed three vertical business solutions:

- **Price, Product and Competitive Intelligence** to harmonize product data coming from heterogeneous internal and external sources in order to automatize pricing strategies and decision making, determine the best promotions, get deep insights into brands and product perception, optimize assortment, improve product marketing and positioning, monitor price violation.

- **Customer Intelligence** that enable to harmonize customer data coming from many different internal and external sources in order to obtain insight on customer that can improve customer satisfaction, reduce customer churn, obtain better customer segments, and improve customer operations and marketing activities.

- **Smart Data Intelligence** that enable many different applications of Big Data in any industry.
HOW IT WORKS

MANTRA comprises three key layers, as shown in Figure 3:

- **Contextual Workflow layer.**
- **Smart Data Memory layer.**
- **Interaction layer.**

It is offered as a hybrid cloud platform: all layers can be deployed in both public and private cloud infrastructures, so MANTRA features can be provided in SaaS mode.

The **Smart Data Memory layer** provides highly scalable storage and processing support to manage structured and unstructured data. It is composed by the Hadoop stack with Spark for high speed and in-memory Big Data harnessing. This layer can be based indifferently on the open source Apache Hadoop stack distribution or on the Cloudera Hadoop Distribution. It integrates: H2O from Oxdata an in-memory facility for machine learning and predictive analytics on Big Data, and a semantic search engine, developed in ALTILIA, extending Apache Solr with semantic NLP querying facilities.

The **Contextual Workflow layer** provides MANTRA APPs that implement approaches and algorithms designed to process web and enterprise heterogeneous Big Data. The Contextual Workflow layer enables easy data acquisition, harmonization, semantic enrichment, and analytics by fast, accurate and high-scalable execution of workflows obtained as composition of MANTRA APPs.

According to their nature, **APPs and Services** are organized in five different sets, as defined in the **M.A.N.TR.A. Paradigm**.
MANTRA NORMALIZE APPs and Services execute automatic and rule based semantic data annotation and extraction founded on natural language processing (i.e. sentiment analysis; keyword, entity, topic, information extraction; co-occurrence analysis; semantic indexing). By NORMALIZE APPs and Services users can automatically recognize information contained in web pages, flat text, and document having complex document layouts such as brochures, magazine and tables.

MANTRA TRANSFORM APPs and Services filter, combine, link, integrate, harmonize Smart Data to create schema-agnostic views and queries to enable analysis and inference and allow Smart Data delivering in the form needed by the user. Transformation APPs and Services also enable triplification and semantic querying by SPARQL.

MANTRA ANALYZE & ACTUATE APPs and Services provide very efficient and scalable supervised and unsupervised, descriptive and predictive machine learning algorithms (e.g. classification, clustering, categorization, statistics, association rules) easy to apply to Smart Data. ANALYZE & ACTUATE APPs and Services also enable to aggregate and prepare Smart Data and analysis results for visualization by rich, dynamic and multidimensional Mashboards, as well as for feeding third party systems and applications.

MANTRA ACQUIRE APPs and Services enable to ingest data by:

- High precision automatic semantic data extraction algorithms for unstructured and semi-structured web and enterprise sources such as: e-commerce web sites (e.g. Amazon, Ebay, Bestbuy, Vente-privee), company and institutional web sites, online media (e.g. newspapers, blogs, forums), social media, web portals (e.g. Wikipedia), emails, CRM communications, etc.
- The ability to connect:
  - Social media (e.g. Twitter, Facebook, Pinterest, YouTube, Instagram, Foursquare, Reddit, Google+).
  - Web content providers (e.g. open data portals, linked data providers).
  - Subscription content providers (e.g. Wordpress, LexisNexis, Factual).
  - Enterprise data sources and applications (e.g. ERP, CRM, CMS, DMS, machine and user generated logs, pixel tag data).

HIGHLIGHTS

- Highly scalable architecture for high performance contextual workflows.
- Schema-agnostic data management.
- Semantic unstructured data processing.
- 10x accurate information extraction.
- 100x faster machine learning algorithms.
- 100x faster in memory data processing (queries and aggregations).
The **INTERACTION layer** includes:

- An extensive, intuitive and powerful **API** that enables Developers to directly embed platform functionalities (Contextual Workflows, APPs and Smart Data) into third-party applications and systems.

- A **GUI** for Analysts that provides friendly facilities (drag&drop and point-and-click tools) to visually interact with the platform in order to:
  - Design web scraping and data extraction tasks/rules.
  - Design analytical models.
  - Design and execute Contextual Workflows. (Fig. 4)

- An extensive and innovative **MASHBOARD** (multi device accessible) for Business Users to get real-time deeper insights and make sense of Smart Data for more informed decision making (Fig. 5).

- A **CONSOLE** for Administrators to manage the platform by activities such as monitoring installed nodes, checking cluster status, and controlling users/access rights.

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As Big Data refers to any market field, ALTILIA’s MANTRA Platform allows to power **Smart Strategies and Solutions** for any industry such as eCommerce, Publishing & Media, Financial Services, Telcos, Utilities, Retail, Government & Public Sector, Market Research, etc.

To learn more about Solutions and ALTILIA’s Customer Use Cases see www.altiliagroup.com

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**DEMO CENTER**

Go to Demo Center on [http://www.altiliagroup.com/demo-center-menu](http://www.altiliagroup.com/demo-center-menu) to try online some APPs and experience their most important features by the Workflow Designer or the API services.

**Online API DEMO is available for the following APPs:**

- **Article Extractor**: Extracts clean text from web pages containing articles.
- **News Extractor**: Extracts all news available in the home page of an online newspaper.
- **Product Extractor**: Extracts all product instances from e-commerce web pages.
- **Threads Extractor**: Extracts threads lists from blogs and forum home pages.