



Artificial Intelligence Solutions

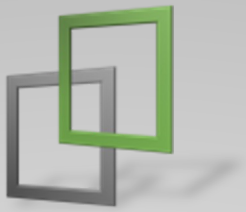
Industrial use cases



Revelis is an innovative startup founded in 2019

Revelis' mission is to create Artificial Intelligence applications enabling the optimization of production processes, the predictive maintenance of plants, the improvement of people's performance and in general the increase in the quality of life. Revelis, thanks to the specific experience of its operating structure and close collaboration with the world of research, is able to integrate inductive and deductive data analysis techniques

Revelis



Manufacturing

Predictive Maintenance



The Problem

Failures and breakage's management, when not properly managed, leads to higher costs, due to plant shutdowns, as well as the need, sometimes, to replace the entire machinery subject to maintenance.

At the same time, "preventive" maintenance policies lead to unnecessary costs and inefficiencies due to the replacement of components that are still functional, without avoiding sudden breakdowns of subsystems at the end of their life.

This means that is necessary to implement maintenance policies allowing timely intervention on components with a low residual life, in order to minimize downtime and maximize the effectiveness of interventions.

The Solution

Revelis developed **RAISE^{PREMAP}**, a Big Data Analytics platform that combines machine learning and neural networks to allow the failures prediction in electro-mechanical systems.

RAISE^{PREMAP} main features are the following:

- ☐ Acquisition and storage of large amounts of data from IoT sensors
- ☐ Plant monitoring through operational dashboards and OLAP multidimensional analysis
- ☐ Anomalous behavior detection through outlier detection techniques
- ☐ Failure prediction, by evaluating the residual useful life of the individual components and sub-systems
- ☐ Failures prediction explanation, useful to sketch out maintenance operations

Benefits

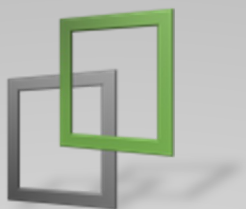
- ☐ Maintenance/repairing Cost reduction
- ☐ Maintenance process optimization
- ☐ on-premise and/or cloud-based platform
- ☐ Edge computation of failure prediction models

Maintenance and fault prediction

The maintenance of machinery in industrial and civil plants is essential to guarantee the correct functioning of the same.

The availability of advanced IoT sensors, able to send data over the Internet and to implement decision-making models, now make possible to monitor the plants more closely, and enables the application of Artificial Intelligence techniques aimed at predicting faults





Banking and Finance

RegTech and Anti-Money Laundering

Suspicious transaction reporting

The fight against money laundering and financial terrorism is carried out by the Financial Intelligence Units, which analyze suspicious transactions and initiate subsequent investigations and repression. All financial intermediaries are obliged to send a report to the FIU when "they know, suspect or have reasonable grounds for suspecting that money laundering or terrorist financing operations are in progress or have been carried out or attempted"



The Problem

The FIU directives define appropriate Risk Indicators, the calculation of which involves numerous information sources.

This is a complex activity, which requires the use of sophisticated statistical techniques for customer segmentation and What-If analysis.

The huge amount of daily electronic transactions makes today the problem of AML monitoring a Big Data Analytics application, which can only be effectively addressed through the application of Artificial Intelligence techniques and the availability of IT platforms that enable large storage volumes of data and their distributed processing.

The Solution

Revelis developed **Moneying**, a platform for the identification and the automatic reporting of AML phenomena to the FIU.

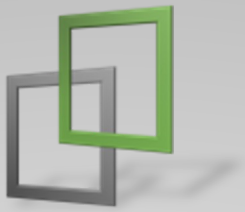
Moneying main features are:

- Discovering recycling scenarios by statistical techniques for user profiling and forecasting of phenomena
- Customer risk profile evaluation
- Enabling AML reporting to FIU
- Enabling a parametric risk index evaluation
- Creation of "electronic dossier" for each customer
- Enabling interaction with investigating bodies

Benefits

- ☐ Compliance with AML regulations
- ☐ Customer behavioral analysis
- ☐ Automatic analysis and reporting of suspicious operations





Geo-Spatial Intelligence

ANTHROPIC AND NATURAL TARGETS MONITORING

The hydro-geological instability is taking on the contours of a worldwide problem. Local authorities must monitor large portions of territories to prevent critical situations related to natural phenomena (landslides, landslides) or to structural problems of public works (bridges, viaducts)



The Problem

The monitoring of the territory is one of the main tasks of Public Administrations, which have to verify the existence of dangerous situations for the population, due to hydro-geological instability phenomena or to any structural instability of public buildings, roads or bridges.

The reduced budgets available to administrations, and the big size of the territories to be monitored, make impossible to have effectively preventive action. The availability of an IoT infrastructure able of measuring stability values, together with a platform for generating alarms, can represent the keystone in contrasting dangerous situations.

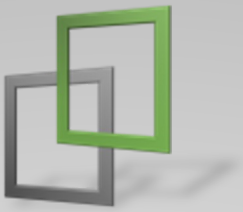
The Solution

Revelis developed **MAITAN**, an IoT intelligence platform that allows the monitoring of anthropic and natural targets, enabling the automatic generation of alarms in case of potentially dangerous situations. MAITAN's main features are:

- Automatically acquisition and storage of Big Data from an IoT network installed throughout the territory
- Risk KPI evaluation for each monitored target
- Alarms generation in the presence of dangerous situations
- Monitoring dashboard for public administrations employees allowing to have an overview of the targets and the state of danger

Benefits

- ☐ Real-time monitoring of anthropic and natural targets
- ☐ Cost reduction in terms of personnel assigned to territory control
- ☐ Automatic generation of alarms and early warning management



Water resources monitoring

Water resources monitoring is one of the most delicate tasks for Public Administrations. In many cases, failures in the water supply network or illegal connections to the water network cause economic losses for the municipalities and the managers of the aqueducts.



Water consumption monitoring



The Problem

Water losses due to faults on the network or theft of water mean that it is necessary to purchase the lost water from third parties (wholesalers), with big economic losses.

Furthermore, the lack of meters installed, without which it is not possible to correctly account and invoice water consumption, causes an economic and financial imbalance of management. The lack of meters also has the effect of amplifying the problem of water losses (especially the apparent ones, i.e. the volume of water distributed but not invoiced), encouraging waste.

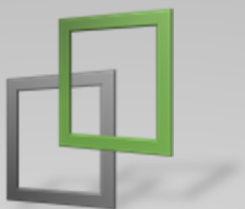
The Solution

Revelis developed **Hydrocontrol**, an Artificial Intelligence platform that allows the monitoring of water consumption across the entire distribution network, allowing the volume of leaks to be assessed in real time and to predict failure scenarios. Hydrocontrol offers features for:

- Measure water consumption in real time, with reference to users (commercial and domestic)
- Interact with sensors allowing the measure of the incoming and outgoing flow
- Evaluate the "Water balance", identifying the presence of "pathological" losses due to breakage or theft of water
- Identify anomalous consumption scenarios by users, due to probable leaks

Benefits

- ☐ Cost savings
- ☐ Improvement of service and citizen satisfaction
- ☐ Minimization of downtime on the network



Security measures monitoring to reduce the risk of contagion from COVID-19

By applying Computer Vision techniques is possible to allow the monitoring of security measures in offices and public places.

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Workplace Security



The Problem

To reduce the risk of contagion from COVID-19 is very important to respect two fundamental rules:

- social distancing
- the use of the protective mask

On the other hand, interaction with family members, friends or colleagues naturally leads each of us to let our guard down, thus favoring the spread of the infection.

It is therefore necessary to have automatic tools for monitoring security measures.

The Solution

Revelis developed **ai-Guard**, a software solution that uses computer vision techniques to monitor compliance with security measures against the COVID-19 infection.

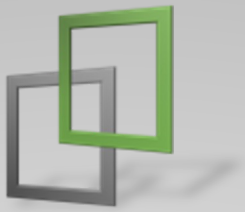
ai-Guard main features are:

- processing, through a neural network, of the images acquired by a camera
- recognizing the use of facial masks and the compliance with social distancing
- sending an acoustic warning in case of potentially dangerous situations.

ai-Guard is available both as a software platform (ai-Guard Server) and as a "ready-to-use" device, useful in smaller contexts (e.g. open-space offices, commercial establishments, waiting rooms in a hospital).

Benefits

- ☐ Compliance with the safety rules
- ☐ Automatic and interactive monitoring
- ☐ Contagion risk reduction



Telco and Contact Center

Ticket Management Automation



Trouble ticket automatic management

Natural Language Processing techniques and Artificial Intelligence have a fundamental role in optimizing the management of relationships with customers, allowing to respond more quickly and effectively to their needs

The Problem

The quality of ticket management within a Service Desk / Contact Center depends on the experience of the operators.

The most frustrating experience for a customer is to receive different responses from different operators in the face of the same request, and this phenomenon is amplified when there are multiple channels of contact with the company (website, email, social network).

Automatic tools must be made available to Contact Center and Help Desk operators to "retrieve" the knowledge from tickets already managed, in order to optimize the classification and response phases to customer requests.

The Solution

Revelis developed **ARTICA**, a Text Analytics platform that uses Natural Language Processing algorithms in combination with machine / deep learning models to analyze tickets from customers and support their resolution.

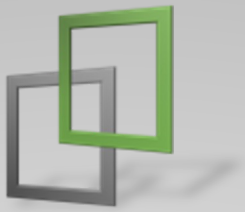
ARTICA offers features for:

- Acquisition and storage of large amounts of textual data
- Analysis of texts by NLP techniques
- Automatic classification of tickets
- Suggestion of the best response to provide to the customer
- Managing the interaction on separate channels (email, social network)

Benefits

- ☐ Higher service quality
- ☐ Standard management of requests
- ☐ Automation of classification and customer responses





Telco and Contact Center

Customer profiling

In a call center or help desk, the diagnosis and resolution of problems from customers can be strongly influenced by information on the customer's profile, which directs the resolution strategy, the urgency, the skills necessary to provide the answer

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Dynamic Customer Profiling



The Problem

Calls incoming at call centers follow predefined and non-personalized routes through automatic responders (IVR), with a double disadvantage:

- each call must follow the entire route, with consequent long response times and line clogging
- the operator to whom a call is assigned is not necessarily the most suitable to provide the requested advice.

Therefore, there is a need of tools that automatically assigning a profile to the customer during the call, allowing to optimize the management of the same

The Solution

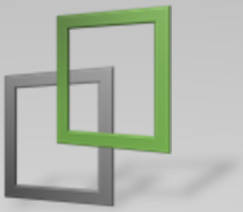
Revelis offers technological solutions to customize the "path" followed by calling users, trying to anticipate their intentions.

In that way, taking advantage of the knowledge of the user's profile, automatically forwards the call to a "competent" telephone operator with a minimum number of intermediate steps.

User profiles can be evaluated automatically or can be predefined according to rules set by call center managers, through simple interfaces that do not require technical skills for their use.

Benefits

- Higher quality of service as the user has a high probability of obtaining satisfactory answers (customer satisfaction)
- Improved efficiency of the service thanks to the optimization of the use of telephone lines which induces low call response times.



Workforce Scheduling



The Problem

In manufacturing and logistics sector, the formulation of work shifts is a complex task, since the shifts depend on forecasts on the arrival times of goods and on various contractual and extra-contractual constraints.

The use of simple tools, such as excel sheets, makes work less efficient, because it is based on the experience of the planners, and does not allow to systematically verify that the planning constraints are respected.

Therefore, simple tools are needed that, using the same reasoning mechanisms as humans, allow to produce admissible solutions to the planning problem in a very short time, while still allowing the operator to manually modify the calculated shifts.

The Solution

Revelis developed **i-Plan**, an automatic reasoning platform which, on the basis of "strong" and "weak" constraints, allows the automatic calculation of work teams in logistics contexts.

i-Plan offers features to:

- Define the allocation needs (metaplanes)
- Automatically calculate work shifts, in compliance with contractual and extra-contractual obligations
- Allow scheduling staff to manually change calculated shifts
- Realize in a short time the allocation of personnel on single, daily, weekly, monthly shifts

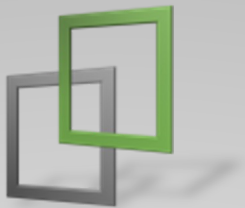
Benefits

- ☐ Processing time reduction
- ☐ Compliance with contractual and extra-contractual obligations
- ☐ Flexibility of the platform and possibility to customize it

Workforce management

The management of staff shifts can be a very complex problem, because it can lead to the violation of contractual obligations.

Artificial Intelligence can allow to optimize this type of activity, providing valuable support for personnel planning managers



Process Intelligence

Identification of process variants

In large public and private organizations, operational and business processes are supported by different software platforms and their execution determines a large number of "variants", that is, different execution modes. The application of Process Mining techniques, allowing the identification of variants and the resolution of bottlenecks, can determine a decisive competitive advantage for companies and public administrations.



The Problem

Operational or business processes require, in many cases, the use of a number of software tools, and provides users with different degrees of freedom in choosing the actions to be implemented.

This scenario implies that, in the face of well-defined standard procedures, there are different "variants" of the processes in reality.

These variants do not always comply with company standards and are often characterized by the presence of bottlenecks.

For public and private organizations, it is therefore necessary to fully understand the actual execution of processes, which enables any re-engineering and optimization processes.

The Solution

Revelis developed **ProMETeO**, a platform based on Rialto™ that allows the analysis of processes starting from the "logs" of the company information systems.

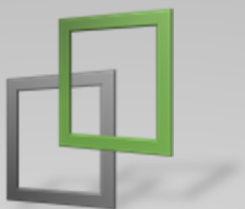
In particular, log analysis is based on Process Mining techniques that allow the reconstruction of processes starting from the individual "traces" and the application of clustering techniques.

ProMETeO provides features for:

- Identify process variants
- Visual analyze the variants
- Identify bottlenecks
- Verify compliance of processes with respect to the provisions of company standards

Benefits

- ☐ Reconstruction of processes and variants
- ☐ Visual analysis
- ☐ Availability of dashboards for process analysis
- ☐ Automatic compliance check to support process re-engineering processes



Medical records and reports analysis

Health records are managed by complex IT systems. The automatic classification of reports and medical records enables: (i) a more efficient research process; (ii) epidemiological analysis reporting, and (iii) a powerful support of doctors in the diagnosis and application of health protocols

Medical Records Classification



The Problem

Clinical documentation, although in digital format, is difficult to find and read by healthcare personnel who must quickly make the right decisions regarding the treatment of patients. Text analysis requires the understanding of the terms in the application domain. The categorization of documents is an activity with an higher percentage of errors when done manually. Furthermore, the difficulties in finding health documentation make the process of diagnosing and treating patients more difficult and complex.

The Solution

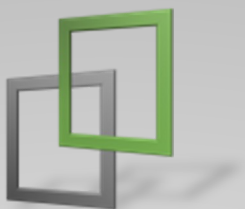
Revelis developed **MeDICA**, a platform based on Rialto™ that enables the analysis and automatic classification of health documentation (reports, medical records) based on the Thesaurus Mesh of the National Library of Medicine.

MeDICA offers features for:

- acquiring and processing documentation of heterogeneous format
- text analysis and concept extraction
- automatic document classification, enabling a multidimensional search of documents (by categories, concepts, metadata and keywords)
- epidemiological analysis reporting

Benefits

- ☐ Integrability to any Health Record platform
- ☐ Higher precision and efficacy of document research
- ☐ Web dashboards for epidemiological analysis



Energy Management

Prediction of consumption and energy production

IoT technologies for metering enable the acquisition of a huge quantity of data about the consumption and production of energy. These data, properly processed, are a valuable source of information to be exploited for the optimization of energy management and for the detection of fraud.



The Problem

The monitoring of electricity consumption, as well as production from renewable sources, today poses an important technological challenge about the ability to store and analyze Big Data products in real time.

In particular:

- Energy companies and ESCo need to identify the consumption profiles of their customers, in order to propose personalized offers and to be able to identify and prevent fraud
- Energy-intensive organizations must have predictive models of energy production from renewable sources and consumption, in order to optimize the supply from the electricity market

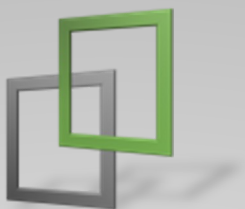
The Solution

Revelis developed **EMPhaSys**, a platform based on Rialto™ with capabilities of storage and processing of time series from electronic meters, enabling the following functions:

- Customer Segmentation: identification of typical consumption profiles of customers;
- Customer Behavior Prediction: short-medium term forecast of customer behavior with reference to energy withdrawals;
- Production Prediction: short-medium term forecast of energy production from renewable sources;
- Fraud Detection: identification of anomalies in the supply of energy and fraudulent activity.

Benefits

- ☐ Improvement of customer satisfaction & retention through tariff plans and ad hoc services in response to consumption habits
- ☐ Reduction of economic losses by identifying anomalous behavior and energy fraud
- ☐ Advanced support for the management of Smart Cities and Smart Grids through the knowledge of typical consumption and production profiles



Banking and Finance

Data Quality

Data quality analysis

Both organizations that manage large quantities of files and companies that produce numerous types of products can optimize their processes by analysing data coming from production processes. It is therefore essential that any problems in the data are identified and resolved, in order not to compromise the effectiveness of the decisions taken



The Problem

In different industrial sectors (i.e. banking or manufacturing), decisions are based on data coming from automatic procedures that massively process information of various types. It is possible that these data suffer from poor quality problems, because some information is missing or inaccurate in the processing.

In these cases, to maximize the effectiveness of decision-making processes, it is first necessary to remove all Data Quality problems, making integrated and standardized information available to decision makers to support strategic assessments.

The Solution

Revelis, through its **Rialto™** platform, enables Data Quality analysis in heterogeneous contexts.

Rialto™ allows data scientists to perform all the steps in the CRISP-DM methodology, such as:

- Data Acquisition & Integration
- Data Cleaning
- Modeling
- Evaluation
- Actuation

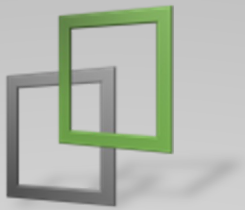
Thanks to the application of descriptive analysis techniques, both based on statistics and on multivariate models, Rialto™:

- allows you to quickly identify data problems, the presence of anomalous situations or missing data scenarios
- provides features to remedy data quality problems and make the analysis process more effective

Benefits

- ☐ Flexible and ease to use
- ☐ Ability to customize the analysis based on the customer's application context
- ☐ Features for remediation of data issues





Quality Control



The Problem

Quality check of large quantities of products is difficult and expensive, because it requires the use of specialized personnel and cannot be performed on the entire production, but only on a sample basis.

This problem becomes even more evident in the case of products that require the assembly of numerous components, which must be positioned correctly to ensure the assembled system works in the way it was designed.

The verification of the coherence between the design and the finished product can be carried out in an exhaustive way only through automatic agents able to visually analyze the objects with the same logic of a man.

The Solution

Revelis developed **Colibri**, a platform that uses neural networks to implement Computer Vision techniques and enable quality analysis in the industrial sector.

The neural networks are trained on the basis of datasets of the customer's products, thus guaranteeing complete customization of the solution.

Colibri main features are:

- Automatic analysis of industrial products images
- Identification of basic components and their position
- Automatic check for the absence of components necessary for the final product
- Compliance verification with respect to design

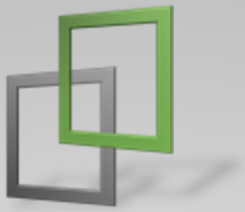
Benefits

- ☐ Automatic product analysis
- ☐ Comprehensive batch analysis
- ☐ Verification of compliance with the design to be implemented

Quality check of industrial production

Massive industrial production requires careful quality check before placing final products on the market.

Computer Vision techniques enable very precise automatic controls, allowing products' exhaustive verification by intelligent agents able to identify imperfections or differences with respect to the design to be implemented



Digital Marketing



The Solution

Revelis develops solutions based on **Rialto™**, making possible to acquire and normalize information from different information sources, and to profile contacts.

Through Data Integration and profiling techniques, it is possible to provide functionalities for:

- Automatic acquire information on contacts;
- Integrate contact information and resolve problems related to redundancies or inconsistencies
- Identify 'families' of contacts with a similar behaviors or characteristics
- Support digital marketing campaigns through advanced search capabilities

The Problem

Extracting value from the Customer Base is one of the main problems of all organizations, small and large, public or private.

The enormous amount of data relating to prospect contacts is often not usable, because it is managed by different tools, there are redundancies or inconsistencies, there is no information useful to reach prospects, there is no knowledge about the preferences of prospects and leads.

This is why digital marketing process is complex, both in the case of private organizations that aim to sell products and services, and in the case of public organizations that intend to carry out fundraising activities.

Benefits

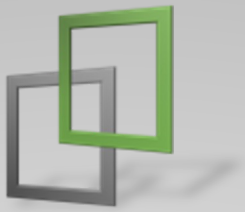
- ☐ Integration and normalization of the customer base
- ☐ Automatic acquisition of information from external sources
- ☐ Contact profiling
- ☐ Advanced information search

Contact network development and target customer profiling

The identification of "prospects" and "leads" is a task that today assumes great importance for both private companies, in order to increase the commercial network, and public organizations, in order to promote fundraising campaigns.

Big Data Analytics techniques allow the integration of data from heterogeneous sources and profiling, enabling the creation of personalized marketing campaigns.

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Business Process Management

Business process automation

Companies and Public Administrations manage enormous quantities of files through heterogeneous software tools, combining manual activities with automated ones. Business Process Management solutions are useful to govern the execution of various activities, enabling the monitoring of tasks and completion time reduction



The Problem

The management of practices in an organization is based on standard procedures, supported by heterogeneous tools available to executors.

This scenario means that, on the one hand, it is complicated to carry out the processes consistently with the defined procedures, and on the other hand it is very difficult to keep under control the progress of individual cases, the workload of individual employees, the presence any problems or bottlenecks that reduce productivity.

It is therefore necessary to have flexible and efficient software tools that make it possible to model business processes in a simple way, automate the assignment and review mechanisms and provide dashboards for monitoring ongoing practices.

The Solution

Revelis developed **SmartFlow**, a platform for business processes distributed execution.

SmartFlow provides features for:

- Model business processes
- Manage the automatic assignment to employees according to workload optimization logic
- Manage the overall execution of the process between different offices and employees
- Monitor the progress of individual cases
- Analyze data related to individual processes, using Business Analytics techniques

Benefits

- ☐ Customization of the solution based on business needs
- ☐ Automation of assignments and process phases
- ☐ Data analytics to support the evaluation of productivity and the analysis of the overall trend



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