



**Project Consulting Al Solutions Executive Summary** 

#### **Summary**



- 1 PJC Market Positioning & Value Proposition
- 2 Scientific Collaborations and R&D Projects
- 3 Industrial Partnership and SCM Solutions Data Privacy GDPR
- 4 Innovative PJC Solutions: Artificial Intelligence and 3-Level Approach
- Our Strengths: Competence & Innovation
- 6 References

#### **Summary**



- 1 PJC Market Positioning & Value Proposition
- 2 Scientific Collaborations and R&D Projects
- 3 Industrial Partnership and SCM Solutions Data Privacy GDPR
- 4 Innovative PJC Solutions: Artificial Intelligence and 3-Level Approach
- Our Strengths: Competence & Innovation
- 6 References

### PJC - Market Positioning & Value Proposition



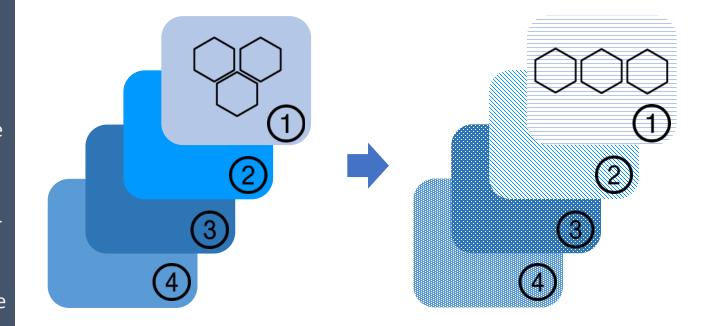


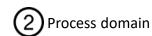
**Project Consulting Market Positioning** 

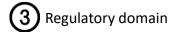
- We manage complexity by analyzing needs (functional, regulatory, security, privacy), identifying risks and areas of intervention, designing solutions and integrating them into the customer's business processes.
- We design complete solutions, selecting Best-in-Class technologies and integrating them with our solutions.
- We use Artificial Intelligence to design Innovative Services capable of enhancing the Customer's technological assets, guaranteeing their safety and expanding their business.

Initial assessment of the Customer context and relationships between the different domains

Identification of uncovered areas and "perturbations" generated by the introduction of new features in the context of the Customer









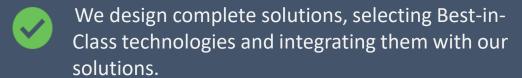
### PJC – Market Positioning & Value Proposition



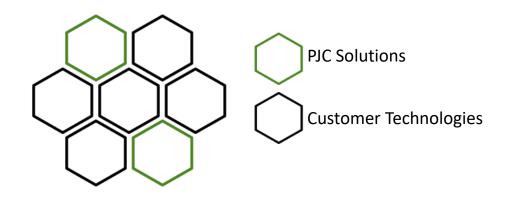


#### **Project Consulting Market Positioning**





We use Artificial Intelligence to design Innovative Services capable of enhancing the Customer's technological assets, guaranteeing their safety and expanding their business.



#### 1) INTEGRATION FOR INNOVATION

Project Consulting solutions integrate with the technologies already present at the Customer, to enhance their functionality.

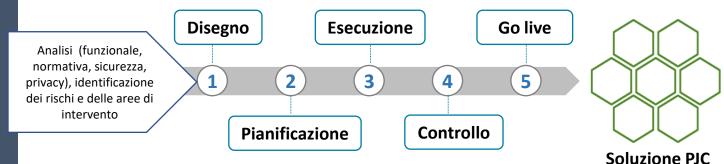
### PJC – Market Positioning & Value Proposition





#### **Market Positioning scelto da Project Consulting**

- We manage complexity by analyzing needs (functional, regulatory, security, privacy), identifying risks and areas of intervention, designing solutions and integrating them into the customer's business processes.
- We design complete solutions, selecting Best-in-Class technologies and integrating them with our solutions.
- We use Artificial Intelligence to design Innovative Services capable of enhancing the Customer's technological assets, guaranteeing their safety and expanding their business.



#### 2 INNOVATION DESIGN & PROJECT MANAGEMENT

Le competenze progettuali, architetturali e di innovazione di Project Consulting garantiscono al Cliente la fornitura di soluzioni end-to-end.

#### **Summary**



- 1 PJC Market Positioning & Value Proposition
- 2 Scientific Collaborations and R&D Projects
- 3 Industrial Partnership and SCM Solutions Data Privacy GDPR
- 4 Innovative PJC Solutions: Artificial Intelligence and 3-Level Approach
- 5 Our Strengths: Competence & Innovation
- 6 References

#### **Scientific Collaborations**



#### **Sectors**

- Biomedical
- Engineering
- Security

#### **Scientific Partners**

- Università di Roma La Sapienza
- Università di Roma Tor Vergata
- Università degli studi della Campania Luigi Vanvitelli
- Università degli studi di Napoli Federico II
- O Università di Chieti e Pescara G. D'Annunzio
- Università del Salento
- Istituto Superiore di Sanità
- Centro Fermi

















## Research & Development Projects: "Life Sciences"



In 2014, the company began investing in the Artificial Intelligence sector by significantly expanding its Research & Development structure, which since 2010 had been collaborating with various research institutions in the context of funded projects.



SHAPE
A New Theoretical Framework of the Microgravity-Cell Interaction (ASI funded)

# SHAPE A New Theoretical Framework of the Microgravity-Cell Interaction (ASI funded)

Among the research projects completed (2014-2018) of particular importance was the SHAPE project, winner of the call of the Italian Space Agency for biomedicine issued in 2012. Ranked in first place, as Prime Contractor PJC managed the entire I designed and created the Data Analysis WP. SHAPE, based on the concept of System Biology, aims to define a theoretical model capable of explaining the interaction between the gravitational field and living organisms.











# Research & Development Projects: "Life Sciences"





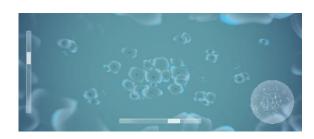






#### **CCI – Cancer Cell Investigation**

- Solution dedicated to the detection of cervical
   Unified platform for data management and cancer cells, through automatic analysis of paptest slides.
- Research activity carried out in collaboration with the Vanvitelli University of Naples.
- Coming to the release of the CCI 1.0 release.





- archiving services, multimodal analysis support for multi-center collaboration.
- Research carried out in collaboration with the Fermi Center.
- · Clinical and diagnostic research as areas of application

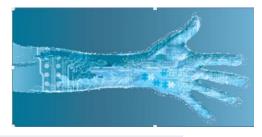
#### **BIANCA**

- Identification, validation and based on Machine commissioning algorithms Learning applied to Breast Cancer for to classify biological tissues starting from mammography images
- Research carried out in collaboration with the La Sapienza University of Rome and the University of Naples Federico II.



#### **HPC** for wearable applications

- Technologies of Intelligence Artificial applied for processing of data from from a wearable device
- Research activity carried out in collaboration with the University del Salento and financed by Eurolab4HPC TTP Proposal of **European Community**



#### **Summary**



- 1 PJC Market Positioning & Value Proposition
- 2 Scientific Collaborations and R&D Projects
- 3 Industrial Partnership and SCM Solutions Data Privacy GDPR
- 4 Innovative PJC Solutions: Artificial Intelligence and 3-Level Approach
- 5 Our Strengths: Competence & Innovation
- 6 References

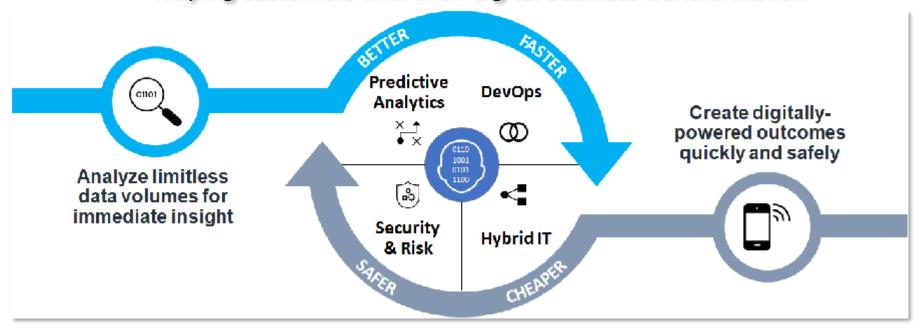
### **Industrial partnership**





#### The Value of Micro Focus

Helping customers with their digital business transformation



"The main problem today, in the security field, is the consolidation of single points of control and having a global approach to security for the protection of applications, data and identities is what Micro Focus offers." Pierpaolo Alì, Director of Southern Europe Security, Risk & Governance - Micro Focus Universe 2019 - Vienna

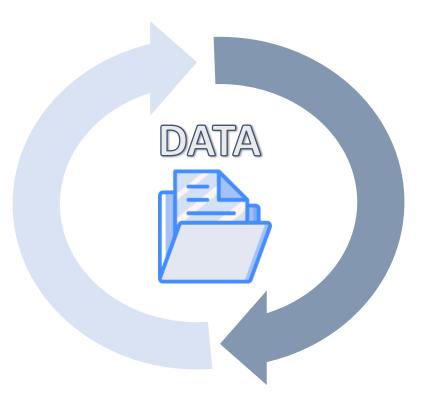
### **Data Governance**



The Data Security solutions proposed by MicroFocus are characterized by a "Data-Centric" approach, which guarantees end-to-end data protection, in compliance with the privacy laws and regulations (GDPR).

### SECURE CONTENT MANAGEMENT

- Discovery of sensitive, structured and unstructured data through IT infrastructures
- Data analysis and classification
- The discovery of information in all repositories allows compliance with the legislation on the "right to be forgotten"



### DATA PROTECTION & PRIVACY

- Protection of sensitive data, reducing the risk of "Data Breach"
- Integration with systems of "Identity & Access Management", thus ensuring access to data in based on the "need to know" principle
- Management of encryption keys with "Identity Based technology Encryption"

#### **Summary**

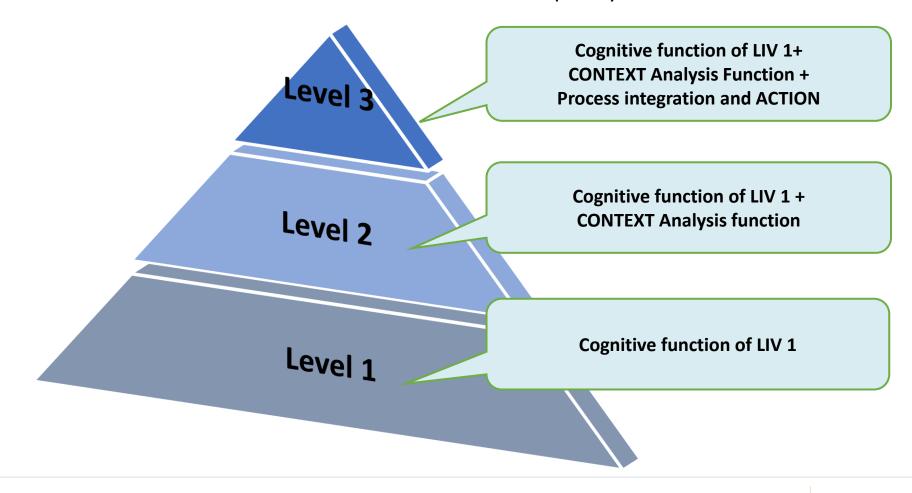


- 1 PJC Market Positioning & Value Proposition
- 2 Scientific Collaborations and R&D Projects
- 3 Industrial Partnership and SCM Solutions Data Privacy GDPR
- Innovative PJC Solutions: Artificial Intelligence and 3-Level Approach
- Our Strengths: Competence & Innovation
- 6 References

# PJC – Artificial Intelligence at 3 levels of complexity



Project Consulting solutions are based on Artificial Intelligence algorithms that present "cognitive abilities" divided into three different levels of complexity.



14/01/2021



AIVA is based on specialized Artificial Intelligence algorithms for video analysis, and includes Level I, II and III functionalities.

- Level I skills
  Integrated use of machine learning and deep learning algorithms for detection, recognition, segmentation
- Level II skills
  Detection, Recognition and Segmentation,
  applied to the recognition of complex situations
- Level III skills
  Detection, Recognition and Segmentation,
  applied to the recognition of complex situations
  and integrated into business and / or M2M



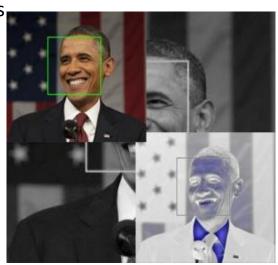


AIVA is based on specialized Artificial Intelligence algorithms for video analysis, and includes Level I, II and III functionalities.

- **②**
- Level I skills
  Integrated use of machine learning and deep learning algorithms for detection, recognition,
- Level II skills
  Detection, Recognition and Segmentation,
  applied to the recognition of complex situations
- Level III skills
  Detection, Recognition and Segmentation,
  applied to the recognition of complex situations
  and integrated into business and / or M2M

#### **Level I skills examples**

- Face detection
- Face recognition
- People detection
- Pet detection
- Multiple object detection
- Object correlation
- Human body Motion Detection
- Detection of the position of objects
- Detection of the speed of objects



segmentation

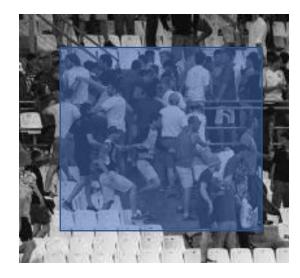


AIVA si basa su algoritmi di Intelligenza Artificiale specializzati per la videoanalisi, ed include funzionalità di Livello I, II e III

- **Level I skills**
- Integrated use of machine learning and deep learning algorithms for detection, recognition, segmentation
- Level II skills
  Detection, Recognition and Segmentation,
  applied to the recognition of complex situations
- Level III skills
  Detection, Recognition and Segmentation,
  applied to the recognition of complex situations
  and integrated into business and / or M2M

#### **Level II skills examples**

- Detection of the state of anxiety
- Detection of improper use of a device
- Detection of violence scenes
- Detection of an abandoned and / or misplaced object
- Detection of abnormal behavior
- Prediction of access flows to an area
- Flow management in a crowded area



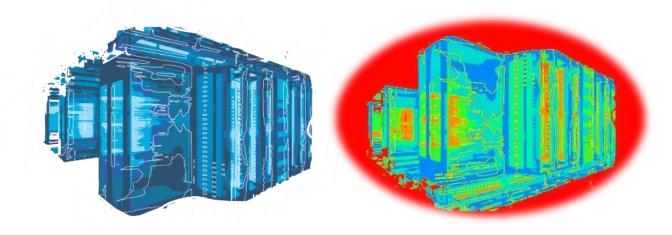


AIVA si basa su algoritmi di Intelligenza Artificiale specializzati per la videoanalisi, ed include funzionalità di Livello I, II e III

- **Level I skills**
- Integrated use of machine learning and deep learning algorithms for detection, recognition, segmentation
- Level II skills
  Detection, Recognition and Segmentation,
  applied to the recognition of complex situations
- Level III skills
  Detection, Recognition and Segmentation,
  applied to the recognition of complex situations
  and integrated into business and / or M2M

#### **Level III skills examples**

- Optimization of cooling equipment based on IR images (integration with cooling systems)
- Monitoring and management of areas (IT and Security) with privileged access (integration into authorization processes)
- Flow monitoring and management in hospital pathways
- Inventory update on a predictive basis





AIVA-MDA (Multimedia Data Analyser) is a forensic analysis support solution, based on Artificial Intelligence algorithms specialized in the analysis of multimedia content



MDA is the artificial intelligence solution proposed by Project Consulting for the off-line analysis of multimedia content.



By analyzing a reference multimedia dataset (for example a recovered HD), MDA is able to classify, without supervision, the data within specific "classes of interest", automating and speeding up all detection and recognition operations





AIVA-MDA (Multimedia Data Analyser) is a forensic analysis support solution, based on Artificial Intelligence algorithms specialized in the analysis of multimedia content



MDA is the artificial intelligence solution proposed by Project Consulting for the off-line analysis of multimedia content.



By analyzing a reference multimedia dataset (for example a recovered HD), MDA is able to classify, without supervision, the data within specific "classes of interest", automating and speeding up all detection and recognition operations





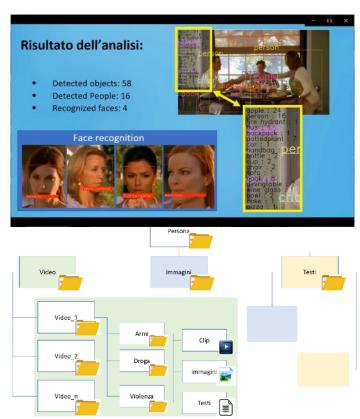
AIVA-MDA (Multimedia Data Analyser) is a forensic analysis support solution, based on Artificial Intelligence algorithms specialized in the analysis of multimedia content



#### Simple analysis

- Face detection
- Face recognition
- People detection
- Pet detection
- Multiple object detection
- Object correlation
- Human body Motion Detection
- Detection of the position of objects
- Detection of the speed of objects







AIVA-MDA (Multimedia Data Analyser) is a forensic analysis support solution, based on Artificial Intelligence algorithms specialized in the analysis of multimedia content



#### Contextual analysis

- Detection of the state of anxiety
- Detection of improper use of a device
- Detection of a request for help
- Detection of violence scenes
- Detection of an abandoned and / or misplaced object
- Detection of "abnormal behavior"





The AIVA-GATE Solution carries out the detection and classification of goods in the phase of passage through a gate.



Exposure of API for integration with customer software

Automatic reading of barcodes



### **AIVA** pre-trained modules: AIVA-GREEN



AIVA-GREEN is a software platform that, using specialized Machine Learning algorithms for video analysis, is able to perform an automatic recognition of the abandonment of objects of various kinds in unsuitable or unauthorized places for the delivery of waste.



#### **AIVA-GREEN**

- Recognizes the presence of a person
- Recognizes a locomotion object (bicycle, moped, car, truck, etc.)
- Recognizes a license plate (Car, motorcycle)
- Recognizes a person who leaves one or more objects in an unauthorized place; for example the abandonment of garbage in areas and places not used for waste collection
- Recognizes the abandonment of a refusal from a vehicle
- Is able to process the different video formats
- Keeps track of the videos and frames processed in a database

#### AIVA-GREEN: FUNCTIONAL DIAGRAM

#### **GUI MODULE**

AUTHENTICATION INTERFACE USER

VIDEO UPLOAD INTERFACE

RESULTS DOWNLOAD INTERFACE

USER NOTIFICATION SYSTEM

#### **BACKEND MODULE**

LOGIN SYSTEM MANAGEMENT.

DOWNLOAD VALIDATION AND ANONYMIZATION OF INPUT DATA

CREATION AND UPLOAD
OF COMPRESSED
ARCHIVES WITH RESULTS

SCHEDULING OF THE ANALYSIS OPERATIONS

#### AI ENGINE

IDENTIFICATION OF EPISODES OF ABANDONMENT OF WASTE WITHIN CCTV FILMS

ANALYSIS OF EPISODES OF ABANDONMENT OF WASTE FOUND.

License plate reading
 Recognition of well-known faces



#### **AIVA** pre-trained modules: AIVA-ZONEGUARD



AIVA-ZONEGUARD is the AIVA module that detects people within a video surveillance area and recognizes their identity.



The AIVA-ZONEGUARD module offers the following basic functions:

- F1) Management of image and video input reception;
- F2) Management of videostreaming input reception;
- F3) Analysis and processing of the input for "detection" of people;
- F4) Output production of the analysis result, which can be provided in the following ways:
  - a) API, which can be called up by external systems;
  - b) "User" graphic interface, which offers additional features of:
    - 1. Input / output folder configuration
    - 2. Original frame view and extracted information (person, timestamp)
    - 3. Search information by "date / time"
    - 4. Report production by date / time
- F5) Storage of the extracted information in an SQL database
- F6) Storage of snapshots containing people, in a file archive with user-definable directory



### **AIVA** pre-trained modules: AIVA-COURIER

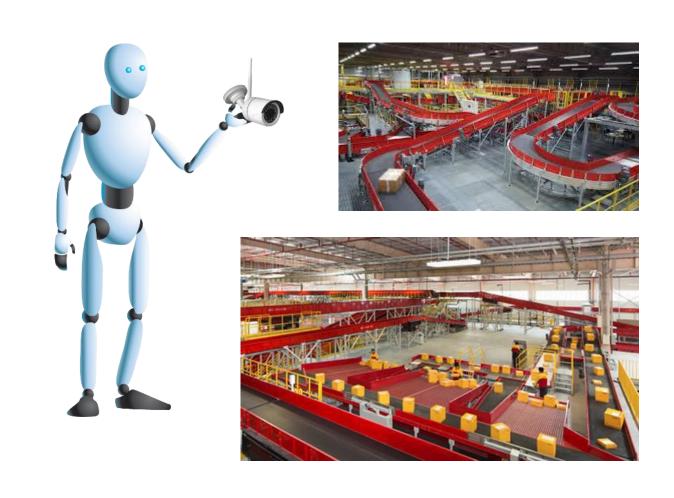


The AIVA-COURIER solution is a software platform which, using specialized Machine Learning algorithms for video analysis, is able to verify, in real time, any incorrect positioning of the packages on the conveyor belt which would cause a loss of these, as they are not recognized as separate packages and therefore not sorted correctly. At the same time, this solution is able to detect the presence of envelopes that should not be present on the conveyor belt.

These algorithms, through specific training courses, allow the system to actively learn the various situations and then be used in the video analysis phase with recognition of typical situations.



- Monitoring of parcel tracking on belts;
- Optimization of transport on forklifts;
- Reporting of incorrect actions in the management of goods;
- Reporting of behavior erroneous or illegal, etc





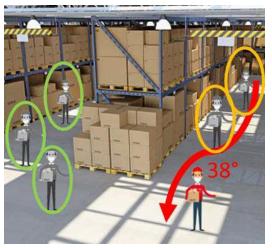
AIVA F2 fully automatically analyzes video streams from a network of cameras and, based on an integrated set of computer vision, machine learning, deep learning and analytics algorithms, is able to support companies in complete management and automatic anti-Covid19 protocols.

AIVA F2 is able to extract a large amount of information, enhancing your video surveillance system. Contact us to evaluate the potential together of your video system or to design a new one, designed from the start to manage in a way integrated all the features you need!



- control of social distancing;
- use correct PPE;
- staff temperature control;
- automatic reconstruction of contacts, in case of contagion.



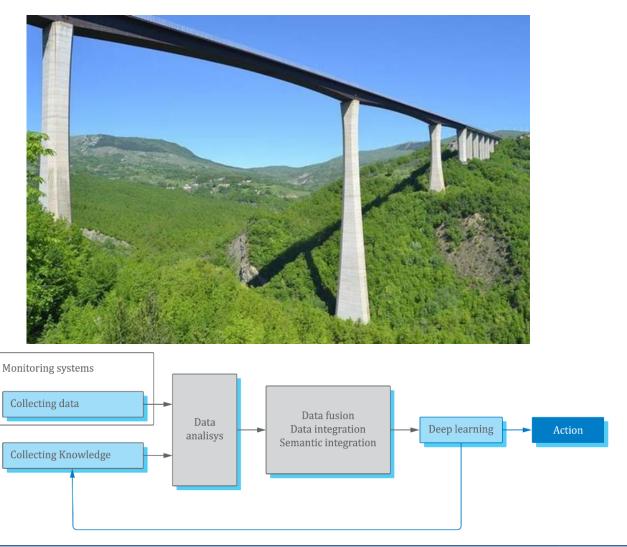




### AIDA-SHM: AI Data Analysis for Structure Health Monitoring



AIDA-SHM AIDA-SHM is a turnkey system to monitor the integrity of structures such as bridges and viaducts, predict structural damage and allow the optimization of preventive maintenance, in order to reduce the costs of highly specialized personnel. The AI engine of AIDA-SHM uses powerful artificial intelligence algorithms to extract information, discover associations and correlations between data and events and define representative models of the evolution and deterioration of structures; it differs profoundly from the paradigm of statistical analysis, which defines probabilistic models based exclusively on the frequency of events.



### AIDA-SHM: AI Data Analysis for Structure Health Monitoring



The highly innovative elements of AIDA-SHM are:

use of the passive acoustic emission technique;

- analysis of the acoustic signal and all other parameters through an automatic learning engine (Artificial Intelligence AI);
- connection of the sensors through a satellite IoT network.



Acquisition

Transmission

Integration, analysis and processing

Action



### AIDA-SHM: AI Data Analysis for Structure Health Monitoring



#### **Application fields:**

- Structural monitoring of viaducts
- Structural monitoring of buildings
- Structural monitoring of cultural heritage
- Measurement of the aging of reinforced concrete
- Support for structural measures
- Geological instability monitoring
- Support for early seismic warning

#### **AIDA-SHM** manages:

- sensors data: Acoustic Emission, temperature, vibration, humidity, position, air composition, noise, light, fire, water, infrared, imaging, displacement;
- regional data: position, altitude, terrain, design, geo-location;
- historical data: age, restructuring, structural variation, damage.





SPHERA is the artificial intelligence solution for predictive maintenance and resource optimization in Data Centers.

SPHERA uses data from current monitoring systems (agents and sensors placed in the data center to monitor systems and applications) and data from Trouble Ticket Management (TTM) systems.







Using a mixed technology based on analytics, machine learning and deep learning algorithms, SPHERA analyzes all the data acquired by the monitoring systems in order to extract the information necessary to optimize the system maintenance processes, energy consumption and Trouble management. Ticket.



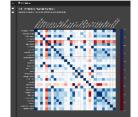
In order to operate SPHERA only needs to have access to the data output channel of the monitoring system and current ITSM.

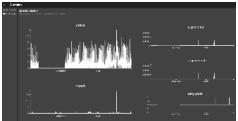


SPHERA acquires parameters from devices but does not interfere with them or modify the operation provided by the manufacturer, to safeguard the guaranteed functionality and the guarantee of the components themselves.

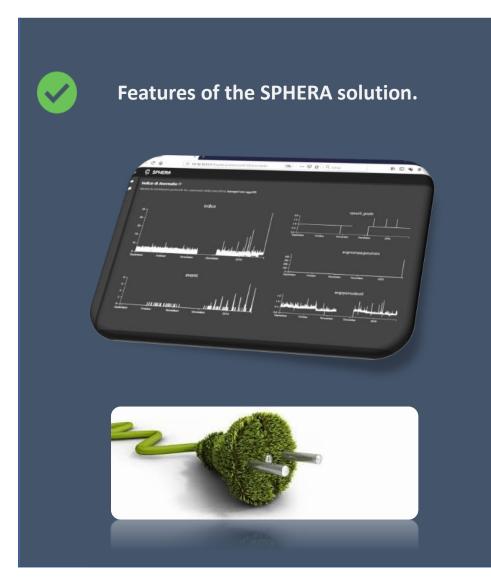






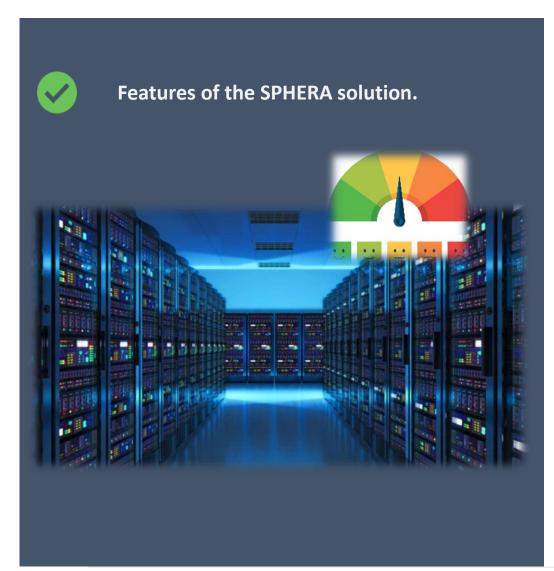






- Dynamic measurement of the correlation of events and parameters within the same device / system and between different devices / systems.
- Prediction of the individual parameters based not only on their history but taking into account the correlations (independently identified by the machine learning engine).
- Availability of a list of priority actions based on the actual operation of the data center (proposed automatically by the machine learning engine).
- Measurement of the quality of functioning of systems and subsystems and their future estimation on the basis of the dynamic clustering produced by the AI algorithms.
- Measurement of current energy consumption and its prediction.
- SPHERA does not introduce complex GUIs and therefore does not require additional training costs.
- The analysis through the machine learning engine on the data of the TTM systems allows the improvement of the classification of incidents.
- The analysis of the data coming from the TTM systems and their processing using a machine learning engine allows, upon the arrival of a new incident, to suggest the most appropriate treatment for solving the problem, based on the success of the treatments of similar cases previous.





- At the explicit request of the customer, the SPHERA system can be used to perform transfer learning on synthetic data specially created by PJC for predictive simulation. This is a particularly effective point when you want to simulate particular operating conditions within the data center that have never occurred, for example to predict the consequences of a failure or a peak in workload. In this sense, SPHERA can become an important tool for planning future expansions of the data center or its replicas.
- SPHERA enhances the use of current monitoring systems, with consequent enhancement of the asset.

#### **Summary**



- 1 PJC Market Positioning & Value Proposition
- 2 Scientific Collaborations and R&D Projects
- 3 Industrial Partnership and SCM Solutions Data Privacy GDPR
- 4 Innovative PJC Solutions: Artificial Intelligence and 3-Level Approach
- Our Strengths: Competence & Innovation
- 6 References

### **Our Strengths: Competence & Innovation**





#### Delivery team with experts from:

- IT Governance
- Security Governance
- Application Delivery Management
- Digital Transformation

#### **Research & Development Team with:**

Data Scientists experts in AI, Machine Learning and Analytics



- Development flexibility thanks to microservices
- Modularity of solutions based on microservices
- Efficiency in managing application solutions by integrating containerized microservices
- Container orchestration systems
- Continuous release and integration of new features

#### **Summary**



- 1 PJC Market Positioning & Value Proposition
- 2 Scientific Collaborations and R&D Projects
- 3 Industrial Partnership and SCM Solutions Data Privacy GDPR
- 4 Innovative PJC Solutions: Artificial Intelligence and 3-Level Approach
- 5 Our Strengths: Competence & Innovation
- 6 References

#### References

Web site

https://www.pjc.it/en/home-en/

**AIVA** 

https://www.pjc.it/en/aivaen/

**AIDA-SHM** 

https://www.pjc.it/en/aida-shm/

**SPHERA** 

https://www.pjc.it/en/sphera-3/

