

MOOVA
RAIL_INFRASTRUCTURE
SOLUTIONS
DIGITAL_RAILROAD

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MOOVA PRODUCTS AND SOLUTIONS

MOOVA is AlmovivA's platform for integrated, modular and seamless mobility, capable of managing different transport modes through a single, advanced technological framework for fast mobility, its modeling and control.

Rail Infrastructure is the suite of solutions, based on the products of the MOOVA Platform, dedicated to digitalizing the world of rail infrastructure, to improve the services provided to railway companies, the safety of operation and the efficiency of operational processes. The suite is designed to plan, schedule and manage rail traffic and station services, support the infrastructure lifecycle and its maintenance.



1. DIGITAL SOLUTIONS FOR RAIL INFRASTRUCTURE

Target Market

MOOVA's Rail Infrastructure Solutions comprehensively and innovatively address the Infrastructure Managers and authorities with responsibility for rail infrastructure and stations as access nodes for mobility services.

They enable the management of all infrastructure components and related services, realizing a unified digital representation that allows integrated management of rail capacity and movement, infrastructure efficiency, infomobility and other services provided at stations and rail facilities.

Effective event management enables proactive and informed management of critical situations and abnormal events.

To whom it is addressed



Infrastructure Manager



Authority

BENEFITS_

MOOVA Rail Infrastructure solutions represent a comprehensive suite of end-to-end solutions based on deep industry expertise, high-quality IT services, products, and strategic partnerships. They are able to adapt to the size and organizational complexity of different operational scenarios, from single operator to interconnected and multi-company entities.

They rationalize resources, improve punctuality, ensure constant vigilance over the state of infrastructure and the safety of people, and enable the provision of services (e.g., infomobility) to passengers to improve their travel experience.

They improve control and asset management processes with significant spin-offs in terms of operational efficiency and cost containment.



2. INTEGRATED, SEAMLESS SOLUTIONS_

In a market characterized by multiple and diverse Business needs and a strong and continuous drive for innovation, MOOVA Rail Infrastructure solutions are an immediate, effective and flexible response to the needs of rail infrastructure stakeholders.

They combine professional skills and specialized expertise, understanding of innovation trends and use of the necessary digital technologies. Decades of experience and in-depth knowledge of the scope of operations.



END-TO-END
SOLUTIONS

VISION AND
KNOWLEDGE

ADVANTAGES
OF ASSETS



**SERVICE
END-TO-END**

Design, development and delivery
of end-to-end services



INTEGRATION

Experience and ability to integrate
their own projects with those
of third parties to preserve the value
of previous business investments



OPERATION & MAINTENANCE

Customer support in operational processes
and guarantee of continuity of services,
up to the provision of models
of full outsourcing



PROCESSES CORE

Technical skills and business process
knowledge of the multimodal
transportation market



DIGITAL TRANSFORMATION

Strategic observatory on mobility trends
and long-term vision on market evolution



CONSULTING

Constant monitoring and presence
on the market to promptly identify
the best available technologies



MOOVA

Platform built with modular
logic that makes its products
potentially separable or integrable



BEST PRACTICE

Availability of expertise-born, reusable
assets that reduce time to market
and increase the quality of services offered



PARTNERSHIP

Strategic alliances with major
market players in innovation
and transport services

3. MOOVA SOLUTIONS FOR A DIGITAL RAILWAY_

- Innovative solutions to improve services to railway companies, enhance utilization of rail capacity, and reduce the impact of failures and anomalies on the network
- The infrastructure lifecycle gets digital with the digital twin, a comprehensive and up-to-date view of the asset that improves integration between traffic management and infrastructure management, increasing its effectiveness and sustainability
- Integrated surveillance systems, early warning, risk analysis, decision support, to protect passengers, staff and infrastructure
- Operational excellence through advanced, integrated planning, scheduling, traffic and maintenance management solutions



**CONTROL
ROOM**

**INFORMATION
HUB**

**NETWORK
AND SERVICE
PLANNING**

**TRAFFIC
MANAGEMENT**

**CENTRALIZED
TRAFFIC
CONTROL
(CTC)**



TRAFFIC PLANNING, TRAFFIC MANAGEMENT, TRAFFIC CONTROL_

It supports the processes of planning, operational management and control of rail traffic.

Enables multilevel rail network configuration underlying service timetable planning and scheduling of temporary infrastructure unavailability at all stages of their life cycle.

Enables real-time traffic supervision, assisted management of disruption and situations and short-term trains rescheduling. Traffic control is supported by CTC systems, integrated with operations management, which provide synoptic (Train Describer) and train routing capabilities.

MOOVA PRODUCT_

- Control Room
- Information Hub
- Network and Service Planning
- Traffic Management
- Centralized Traffic Control (CTC)

KEY COMPETENCES_

- Significant experience in the design and development of traffic management and command and control systems.
- In-depth knowledge of business processes and standards in the field.
- Ability to define solutions that integrate existing systems and services in order to preserve previous business investments.

DISTINCTIVE FEATURES_

It supports the entire process in an integrated and configurable way, providing flexibility in adapting to the client's organization and avoiding low-value-added activities.

It uses a standard multilevel network model that provides the correct level of information for different functionalities and enables interoperability with systems of different operators.



It offers a modular solution that can be used in both complex and more limited scenarios, fitting easily into environments where legacy systems are present.



PASSENGER EXPERIENCE_

Solution for automatic delivery of public information through audio and video channels, in multilingual and multiprotocol communication to different devices.

It is capable of delivering immediately updated content with respect to the progress of mobility services, thanks to integration with production systems.

It enables integrated delivery of information about other mobility services related to the rail mode (e.g., public transport and sharing mobility information available on video inside the station).

It is modular, capable of adapting to simple and complex systems, and highly configurable to meet different needs.

MOOVA PRODUCT_

- Control Room
- Information Hub
- Passenger Information System
- Device Management

KEY COMPETENCES_

- Twenty years of experience with over 1800 stations implemented and managed in Italy and abroad.
- Provision of E2E solutions, including both the design and implementation of the plant and the necessary Hw and Sw components, and the subsequent management.
- Provision of solutions integrated with existing systems and services in order to preserve previous company investments.



DISTINCTIVE FEATURES_

It supports the entire travel experience, offering information for the different types of mobility services, for accessibility to rail infrastructure, for ancillary services used during the journey.

It is multi-channel, capable of exploiting audio and video devices, mobile devices, totems and smart objects.



A complete E2E infomobility solution, both through specific provision and integration with existing devices and systems.



SAFETY & SECURITY_

An integrated solution offering a unified vision to support the management of rail infrastructure security, it combines advanced technologies, consolidated processes and specialist skills.

It extends the role of the video surveillance system, integrating the VMS with advanced video analysis functions (recognition of abandoned objects, advanced anti-intrusion system, obstacle detection systems on the tracks, people monitoring) to provide alerts and suggest actions for access control, assembly, intrusion, tampering, fire, etc.

It manages access control via automatic gates and turnstiles through dematerialised (QR, EMV, PNR) and physical (magnetic stripe, smart card, chip on paper, bar code) tickets. It ensures the planning of gate openings and closures and the management of related information. It enables real-time people counting, area occupancy density, passenger flow, etc.

MOOVA PRODUCT_

- Control Room
- Information HUB
- Smart Station
- Device Management

KEY COMPETENCES_

- Provision of E2E solutions, which include both the design and construction of the plant and the necessary Hw and Sw components, as well as the subsequent management.
- Provision of integrated solutions with existing systems and services in order to preserve previous business investments.



The algorithms used do not require any specific prerequisites for the cameras used, allowing previous infrastructure investments to be valorised.

Correlation of video streams with other data from heterogeneous sources for the identification of critical situations clearly exposed through a single interface.

Historizing all information related to commands, alarms and system status enables specific analysis and advanced reporting.

Integrated management and monitoring of access in real time, planning of opening and closing of gates.



DISTINCTIVE FEATURES_

Proprietary video analysis algorithms enable a wide range of customisations such as detection of people on tracks, abandoned objects, vandalism/hijacking, weapon detection, fire detection, tracking and re-identification of people, and detection in interdicted areas.



BUILDING MANAGEMENT_

A solution that provides real-time monitoring, command and control of civil and technological installations and sensors in railway stations, to improve energy efficiency and contain operating costs.

It generates alarms and notifications in the event of anomalies and supports the management of consequent interventions.

It enables the analysis of collected data to identify trends and identify relevant improvement actions.

It Ensures real-time monitoring and control of energy, water and gas consumption, allowing any possible waste or malfunctioning of facilities to be identified.

MOOVA PRODUCT_

- Control Room
- Information Hub
- Smart Station
- Device Management

KEY COMPETENCES_

- Proven experience with over 200 stations built and managed in Italy and abroad.
- Supply of E2E solutions, which include both the design and construction of the plant and the necessary Hw and Sw components, as well as the subsequent management.
- Provision of integrated solutions with existing systems and services in order to preserve previous business investments.
Direct production of the Edge IOT components used in the solution.



DISTINCTIVE FEATURES_

Wide range of systems that can be integrated into the system with the possibility of easily extending it to other types: escalator systems, cameras, anti-flooding pumps, gates, doors, gates, fire-fighting, anti-intrusion, air conditioning systems, special tunnel systems, environmental sensors (also with LoRa protocol), lighting lines, electrical panels, electrical substations, ticket-issuing machines, access control systems using keys mechatronics, etc.



The use of Automatic Speech Recognition and Natural Language Processing technologies enable voice command and control functions, simplifying operations during the monitoring process.



ASSET MANAGEMENT_

Solutions dedicated to managing the entire lifecycle of railway assets, from design to decommissioning.

Through technological and innovative solutions such as Digital Twin, it improves asset performance, reducing maintenance costs to increase the availability, safety and reliability of the railway infrastructure.

It supports the planning and management of investments and the supply chain of materials and spare parts.

MOOVA PRODUCT_

- Control Room
- Information Hub
- Infrastructure Maintenance
- Predictive and Optimized Maintenance
- Asset Digitalization

KEY COMPETENCES_

- Twenty years of experience with over 2M managed assets in Italy and abroad.
- Provision of end-to-end (E2E) solutions, including design, building, and management of the entire lifecycle.
- Provision of integrated solutions with existing systems and services in order to preserve previous business investments.



DISTINCTIVE FEATURES_

Supports the entire asset lifecycle through solutions that natively integrate and specialise Almviva products and market-leading platforms in the railway context.

Modular solutions that can be adapted to the specific needs of the customer according to a progressive evolution path that follows the changing needs of the business and the continuous improvement of processes.



The Digital Twin concept makes it possible to realise a single, updated and integrated digital view of the railway infrastructure and its components fed into and supporting the processes required for asset lifecycle management.



SHM_

Solution for monitoring railway infrastructure and critical works (bridges, viaducts, tunnels) to support a continuous process of analysis, preventive maintenance and monitoring for network safety and efficiency SHM provides the tools to:

- Carry out continuous monitoring of the asset's state of health in order to identify defects or problems;
- Provide information to assess the level of degradation of the asset and its residual life;
- Automate inspection activities;
- Integrate all information, data and events processed at local level allowing to give systemic view and contribute to the complete picture complete picture of all infrastructure components.

MOOVA PRODUCTS_

- Control Room
- Information HUB
- Asset Digitalization

KEY COMPETENCES_

- Structural skills to define the infrastructure monitoring project.
- Knowledge of technological tools to carry out monitoring.
- Modal (OMA algorithms) and infrastructure risk analysis skills.
- Design and installation of field components.
- Use of the main Modern IT paradigms for IoT. Operation and maintenance of field and core systems.



Assessment of the condition of the work and the degree of deterioration.

Predictive analysis of structural behaviour for early detection of damage and abnormal degradation processes. Generation of alarms on deviations from the normal parameters of the structure, such as excessive vibrations or unexpected deformations.



DISTINCTIVE FEATURES_

Data collection through IoT/Big Data platforms.
Use of AI/Machine Learning models and algorithms for correlation and interpretation of data and generation of information on working conditions.



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