ARGO, the extended platform for managing and monitoring the life cycle of infrastructures. The case of Autostrade per l'Italia.

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About us

We are leaders in the development and integration of **ITS Solutions**, **Tolling** and **Infrastructure Management** and **Autostrade per Italia's** center of excellence for research and innovation.

We are digital engineers for mobility: we design, integrate and implement innovative solutions to design the future, which for us is already intelligent, sustainable and powered by an invisible but ever-present technology.

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Tech the Future

The challenge

Critical infrastructures like bridges, **need to be inspected and maintained** throughout their life-cycle to ensure their safety and serviceability.

The infrastructure inspection and maintenance processes have evolved over time, passing from **manual inspections to inspections carried out partly manually and partly supported by technological aid**.

Emerging technologies can be applied **to support proactive monitoring and maintenance processes.**

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Main Goals

Full digitization of inspection process

Transparency and data control

Increased **productivity** and **efficiency** of **inspection processes**

Health monitoring of infrastructures

Modular and scalable platform

Analytics and reporting on assets and defects

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ARGO

is the extended
technological platform
for **managing and monitoring
infrastructure life cycle**.
All the potential
of Digital Engineering
in a single solution

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Platform

Digital Inventory

Monitoring and IoT

Inspection Process

Digital Twin

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ARGO
for Autostrade per l'Italia

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Autostrade per l'Italia Group
The largest toll road operator in Europe

2,855 km
motorway
network

2,7 M
daily
users

2,1 M
daily vehicle
transits

7,700
employees

5
motorway
concessions

422 km
tunnels

218
service
areas

271
toll
stations

2,097
bridges and
viaducts
1,947 ASPI

16
toll higway

3,0 bn
operating
revenues

630 M
EBITDA

517 M
operating
cash flow

575 M
investiments
in operations

1,8 bn
equity
as of 31.12.2020

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Digital Inventory

**Digital archive
of infrastructures**
based on IBM
Maximo technology

**4 levels
hierarchy**

Data Governance models,
data and quality
information **control**

2,000 bridges

1,800 overpasses

650,000 components

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Building Information Modeling
automatically generated from data stored

2,000+

BIM

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Inspection Process

ARGO allows **planning inspections** and **maintenance activities** with near real time updates

In 2021

2,000 inspections

150,000 photographs

In 2022

8,000 inspections planned

THE INSPECTION PROCEDURE

1
Add the defect or its absence for each infrastructure's component

2
For each defect, associate photographs and precise geo localized positioning on each components

3
In order to **complete** the inspection, **inspect all components**

4
BIM for helping navigating the infrastructure

5
The **digital signature by the inspector** and the **complete tracking of the activity** performed

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Pilot of Settefonti Viaduct

Digital Twin

Drones are equipped with **high-definition cameras and LIDAR lasers**

3d-scan of viaduct turned into millions of georeferenced points associated to **each component**

Digital Twin integrated with the existing simplified BIM
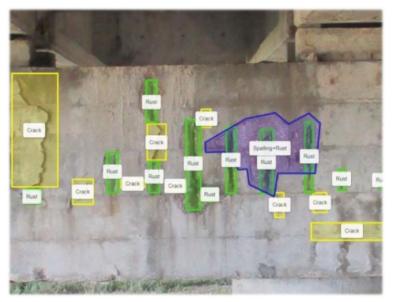
The inspector is able to **carry out inspections remotely**

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Artificial Intelligence for Damage Recognition

The operator's decisions are supported by the applications of **Image Recognition algorithms. Timely analysis of pictures** and **identification of defects**

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Monitoring and IoT

- **13 Types** of sensors

- **630 sensors installed**

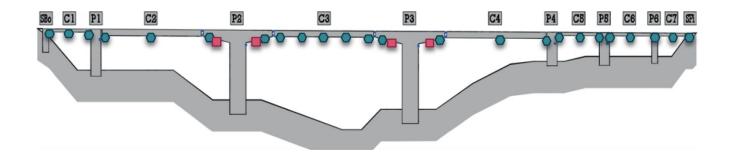- Defined the **optimal layout** of the monitoring system

- Identified **most significant structural parameters**

- **Monitoring the dynamic and static behavior** of the structure as well as **global and local phenomena**
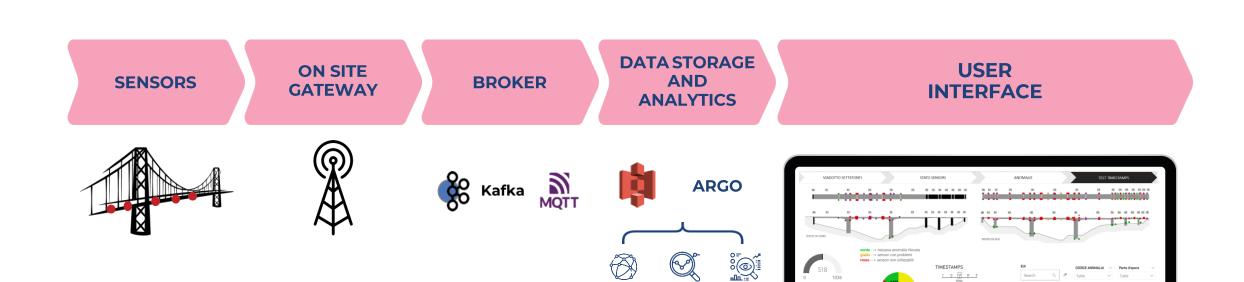
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IoT architecture and interface

All in a single integrated platform

Digital Inventory

Structural Health Monitoring

Inspection Process

Cost and Time Optimization

ARGO

Structure Assessment

Maintenance Planning

Predictive Models

Deterioration Modeling

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Thank you

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