Smart management of art spaces

SMART MUSEUM

a2a
smart city

SMART MUSEUM

System architecture of smart museum management:

01

SERVICES
Displaying information on maps,
sending specific alerts,
remote systems
management, intelligent actuators

02

BIG DATA ANALYTICS
Support for the management
and use of
connected services

03

DATA TRANSMISSION
LoRaWAN technology allows
to remotely control data
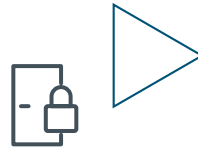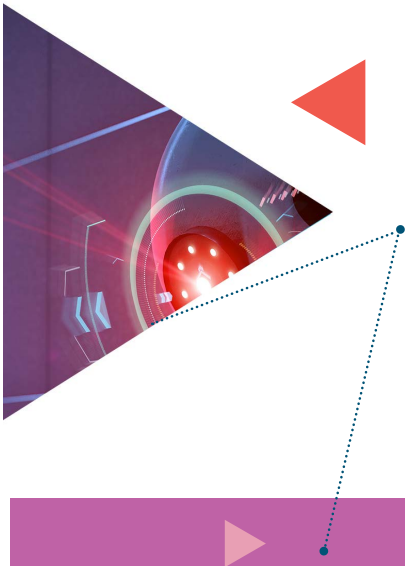recorded by sensors

04

SENSORS
Low energy consumption detectors
and measuring devices

SMART MUSEUM

A2A Smart City has developed a technologically advanced system to monitor entry through doors and windows, preventing intrusion, theft or unauthorized access to premises.

Antintrusion solutions

IoT technology provides authentication solutions for managing entry points and cuttin-edge anti-intrusion solutions, easily integrated with traditional security systems. Safety nets, based on sensors with long battery life and not easily measurable, enable alarms, sirens, video cameras and alerts to the police.

Information and alarms can be managed from mobile devices or a centralised cloud-based software.

Anti-intrusion sensors also make it possible to constantly monitor the status of the building's entry points, reducing energy bills and heat loss.
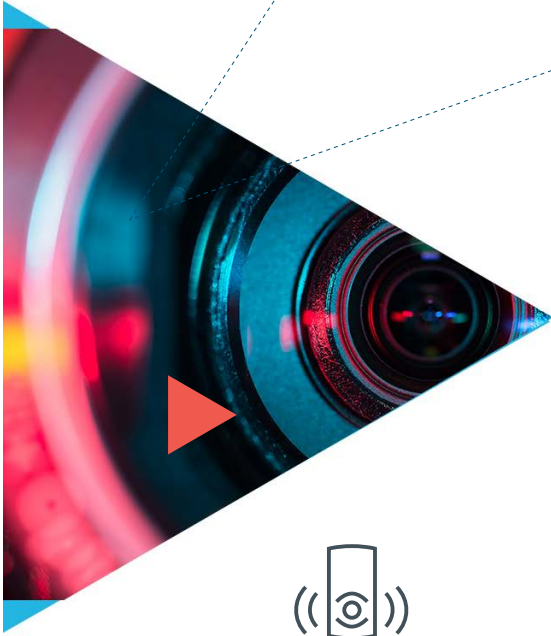
Advantages

- Non intrusive solution

- Ease to install

- **Efficient Network**
Sensors connected to the LoRa network are independent of the local internet connection and powered by standalone battery.

- **Energy Efficiency**
Constant monitoring of energy loss and definition of optimal routes.

CCTV and videoanalysis

A technologically advanced video surveillance service ensures greater security. Hi-tech sensors capture ultra-high-definition images and integrate video analytics algorithms, a fundamental part of modern IoT technology. The cameras are interconnected and converge on a centralised operational platform, where all the information acquired is processed.

Aggregation and processing of data allows a shift from a reactive to a proactive management approach. The repressive model becomes a preventive model, which anticipates and intervenes promptly with specific types of events, such as abandoned objects.

Advantages

– Cost reduction
By optimising video streams on the network, loads and the storage space are considerably reduced.

– Time saving
Simpler monitoring and recordings searching.

– Efficiency
Automatic video monitoring to detect security breaches and prevent crime.

– Added value
Integrating video data into other systems (such as head count using cameras at entrances).

The value offer of A2A Smart City provides an "all-inclusive" service and maintenance of the system with possible remote control services through alarm signals received from the video surveillance system for the correct operation of the DVR.

SMART MUSEUM

Safeguarding artefacts
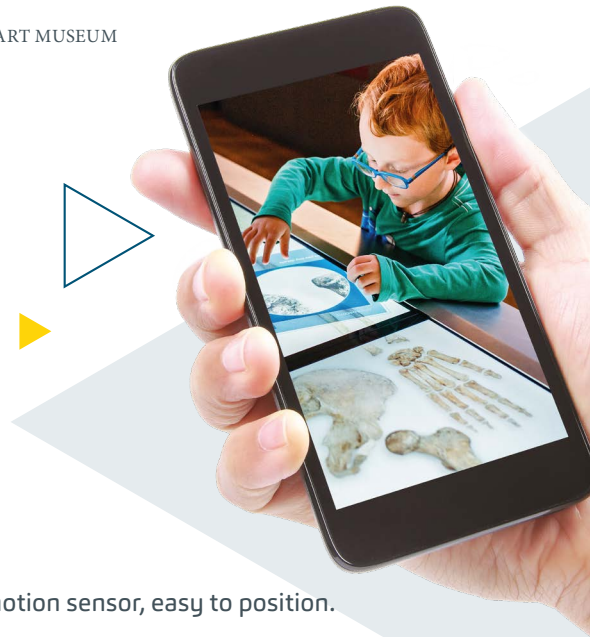
WINDOW TAG

The system consists of a small TAG motion sensor, easy to position.
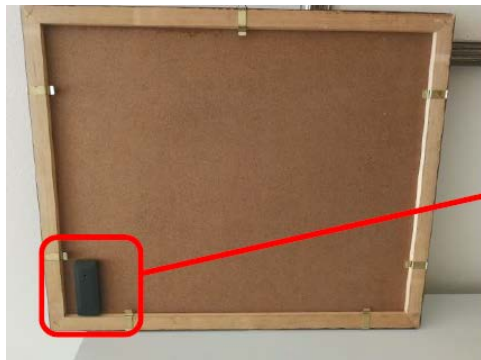
VIBRATION SENSOR

WEIGHT AND PRESSURE SENSOR

Sensor is integrated within the plinth (same colour and size as the plinth), it activates an acoustic alarm and warns the supervisor of contact or removal of the art piece from the plinth.

Accelerometer sensor

An accelerometer sensor is ideal for the protection of panels , able to capture a slight displacement on any of the 3 axes (horizontal, vertical and diagonal).

Safeguarding artefacts
LASER CURTAIN

Safeguarding artefacts
FLOOD PREVENTION SENSOR

The installation of flood prevention sensors monitors the conservation conditions of the artworks and allows rapid detection of water leaks.

Safeguarding artefacts
CONTEXT CAMERAS

Installation of Panoramic Cameras (Fi- shEye view) on ceilings.

Benefit

• Context cameras are always available, even if partitions are moved (temporary installations that often make redundant fixed cameras installed in corners)

• Overview of each room (entrances and artworks are both within the video frame)

• Video-analysis functions available

Centralised System

All devices can be visualised through the management software where all types of devices can also be integrated, including video streams.

Operators will be managing the software in a dedicated control room for a constant monitoring of all museum sites.

Supervision

In addition to the installed system, a centralised supervision system is needed to interact with each device and display alerts in real time.

Fire prevention and gas & fume detection solutions

An efficient IoT sensor network enables the constant monitoring of spaces, reducing to a minimum the timeframe to **detect an emergency and understand its gravity**: quickly identify flames, heat, fumes, gas leaks, speeding up responses and minimising the impact and risks for individuals and companies.

Advantages

– **Sensors** detect flames, smoke or gas leaks.

– Identify temperature **variations associated with fires**.

– Periodically send **measurements on the status of the building** (temperatures, detection of gas ...) with reliable and secure communication, thanks to the LoRa network.

– Works on **very low power thresholds**, batteries can last over 20 years.

The LoRa™ Alliance is a non-profit association for the support, development and standardisation of the LoRaWan communication protocol. The LoRa Alliance members include companies from all over the world.

A2A Smart City has been a member of the LoRa Alliance since December 2015: as a member of the LoRa Alliance, A2A can create LoRaWAN points across Europe in agreement with other members of the organisation. A2A Smart City recommends the use of a **1.0.2. standard** LoraWAN network, the latest version available exclusively to members of the Lora Alliance, already in use in Lombardy and with the potential to be extended to other countries. All technological solutions proposed are implemented following the LoRaWAN™ standard, a technology that operates in radio frequency on an electromagnetic spectrum between 867 and 869 MHz.

LoRaWAN NETWORK

SECURITY

LOW COST

LONG RANGE

HIGH CAPACITY

LOW POWER

STANDAR-DIZED

GEO-LOCATION
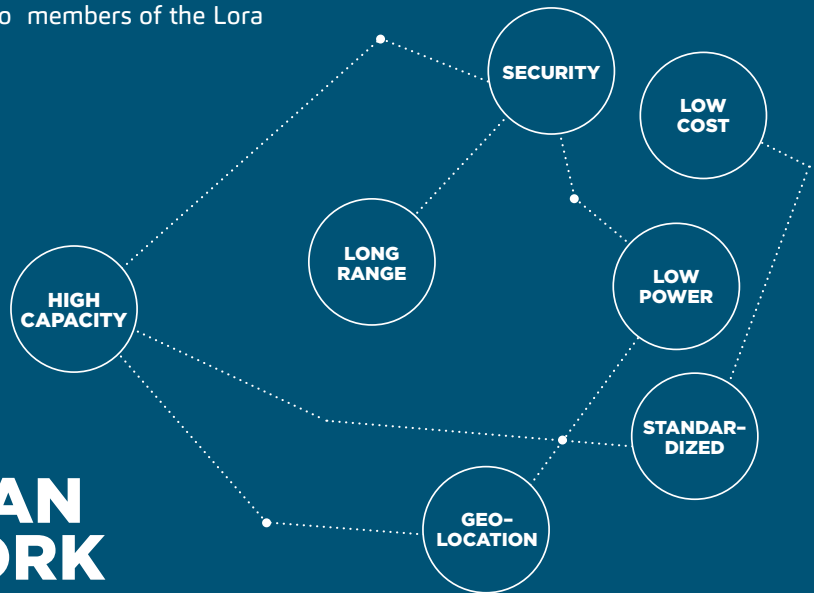
– **Long Range**: wide coverage, throughout the urban area, one gateway has a coverage range of 5km in urban areas and 10km in extra urban areas.
– **Low Power**: the sensor batteries can last for up to 10 years without requiring con nection to the electricity grid.
– **High Capacity**: supports millions of messages for every monitoring station/sensor.
– **Geolocation**: enables the support of the geo-location service without GPS and wi thout additional battery consumption.

– **Standardized**: the LoRaWAN network ensures interoperability between applications, IoT service providers, and telecommunications service providers.
– **Security**: the LoRa standard ensures privacy and data protection via a data encryption system (Embedded end-to-end AES-128 encryption).
– **Low Cost**: low cost solution, the infrastructure and nodes have low maintenance costs and are low in energy consumption.

The concept of Smart Museum derives from the need to provide effective protection with minimal visual intrusion in places such as museums where the centre pieces are the artworks.

In addition to devices for the monitoring of artworks to prevent theft and vandalism, our solution also ensures the detection of environmental risk (flooding, fires, etc.) and the continuous monitoring of the whole museum building.

Smart Museum builds on the extensive Security-related experience gained by A2ASmartcity in the field of city security, for large organizations and business customers.

25 MANAGED MUSEUMS SITES

4789 INTRUSION SENSORS

2876 SMOKE SENSORS

31 CENTRAL FUMES

5 CONTROL CENTRES

35 INTRUSION CENTRAL UNITS

82 DVR

1203 TLC

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