

KALIOPE

SICE has developed a platform that operated as a transversal axis and brain of each smart project that covers the challenges of smart planning, administrating, and governing of the different bodies of a groups of municipalities or a region, maximizing the economic opportunities while minimizing environmental impact.

The platform receives and monitors the information gathered from citizens, sensors and systems belonging to multiple municipal services, it then develops and crossed analysis of the data, providing a holistic and added-value focus by implementing prediction and simulation tools.

It is a completely open solution that harnesses the latest artificial intelligence technologies, enabling the analysis of large quantities of information using **Big Data** applications, as the base to make decisions, applying predictive models to anticipate the future needs of citizens.

Another goal of the initiative based on SICE's Smart Concept implies involving the citizen in the process to decide the allocation of the public budget. To achieve this, it creates a citizen participation portal in which they can propose and vote initiatives. The platform also has an Incident Management System, which will open another digital communication channel between the citizen and the administration. This channel will allow them to report any problem or need easily through a simple mobile app, while improving coordination between departments when addressing an event or incident.

In short, KALIOPE is more than a comprehensive management platform for all the city's smart systems. Based on Quality of Service (QoS) indicators, which are easy to measure, the platform established active communication channels with citizens that result in the improvement of the coordination and efficiency of services.

KALIOPE becomes, therefore, the cornerstone of **SMART CONCEPT** by SICE that must integrate all the services and systems of each project.

SMART CONCEPT BY SICE

SICE's new SMART CONCEPT seeks to break down the barriers of smart cities and commit to a broader concept, providing this same intelligence to a group of municipalities, a region, a community or even, in the future, a country. In short, regions or territories sharing common characteristics, their own identity, or certain elements or ties that bring them together somehow. These ties could be tourism, a shared natural environment, the same social strategy or structure, etc.

Many of the proposals included in SICE's Smart Concept have been implemented and have been providing services to citizens for a long time. The current goal is to provide these services with more intelligence and, above all, interconnect them with the goal of achieving sustainable development.

SICE has been developing an applying these technologies for years, thus becoming a benchmark pioneering company in the Smart concept.

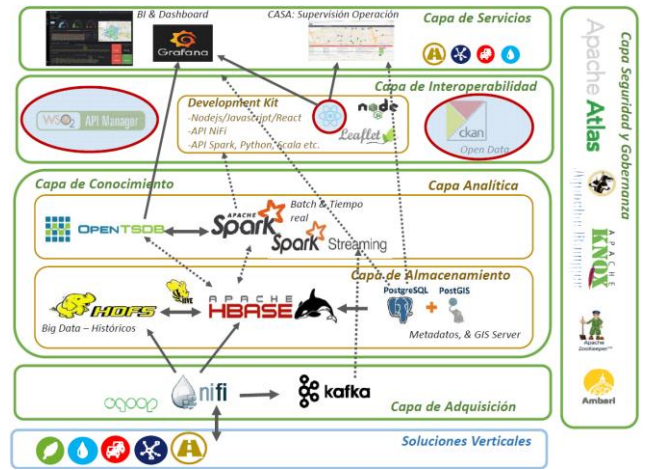
ARCHITECTURE OF THE PLATFORM

The logic and components architecture that makes up the platform is based on the use of open non-proprietary standards, which guarantee interoperability and portability of all our solutions and systems, the security and administration possibilities to configure delegated operative management.

KALIOPE has been created following the layer model defined in standard UNE 178104 Comprehensive Systems for a Smart City Management, while complying with all the technical and functional requirements described in the standard.

In general, KALIOPE is based on these three pillars:

- A data acquisition and distribution layer that acquires, processes and integrates the information from different IoT devices that are part of each of SICE's vertical solutions.
- A Big Data, analytics and interoperability layer, where extensive big data is processed, transforming them into useful aggregate data. It develops real-time and archived analyses of historic data to respond instantly to events that when these take place.
- A services, security and governance layer, where applications are deployed that allow to manage, monitor and control systems and equipment that make up smart vertical services, while managing and controlling audit and security services and the dashboard to monitor these systems.



The main characteristics of the platform are:

- ✓ Dashboard based on GRAFANA.
- ✓ Supervision application / Snapshot or City Photo, an ad-hoc development, CASA (City Assets and Snapshot Application), that enables real-time monitoring, reporting, operator analysis, etc.
- ✓ Artificial Intelligence Capacities, Apache Spark (the component) and programable algorithms (Python / Java Scala / R).
- ✓ Big Data Capacities, based on Big Data storage. NoSQL (Apache HBASE and HDFS).
- ✓ Acquisition / Simple vertical integration and IoT devices thanks to Apache NIFI (connectors http/https, XML-SOAP, REST-API, JDBC, txt, csv, MQTT - IoT associated).

COMPREHENSIVE MANAGEMENT OF SYSTEMS

