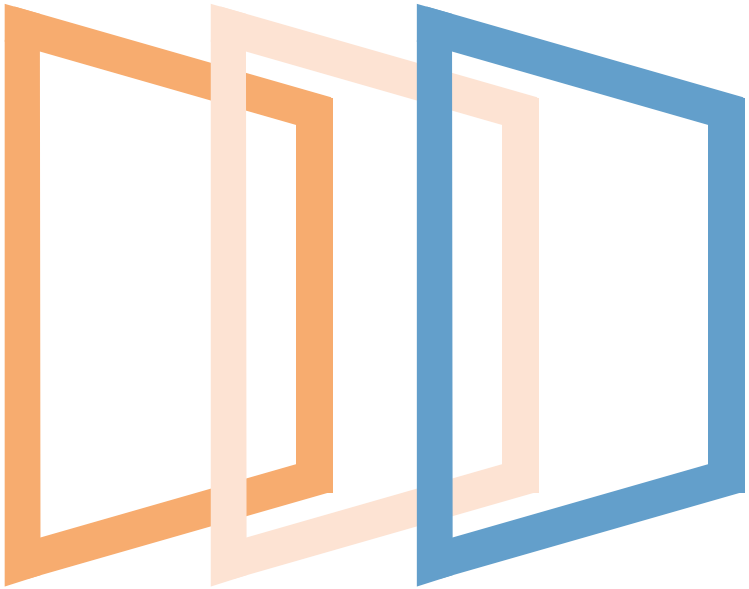
Onesait Efficiency Use cases

Smart Energy



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An Indra company

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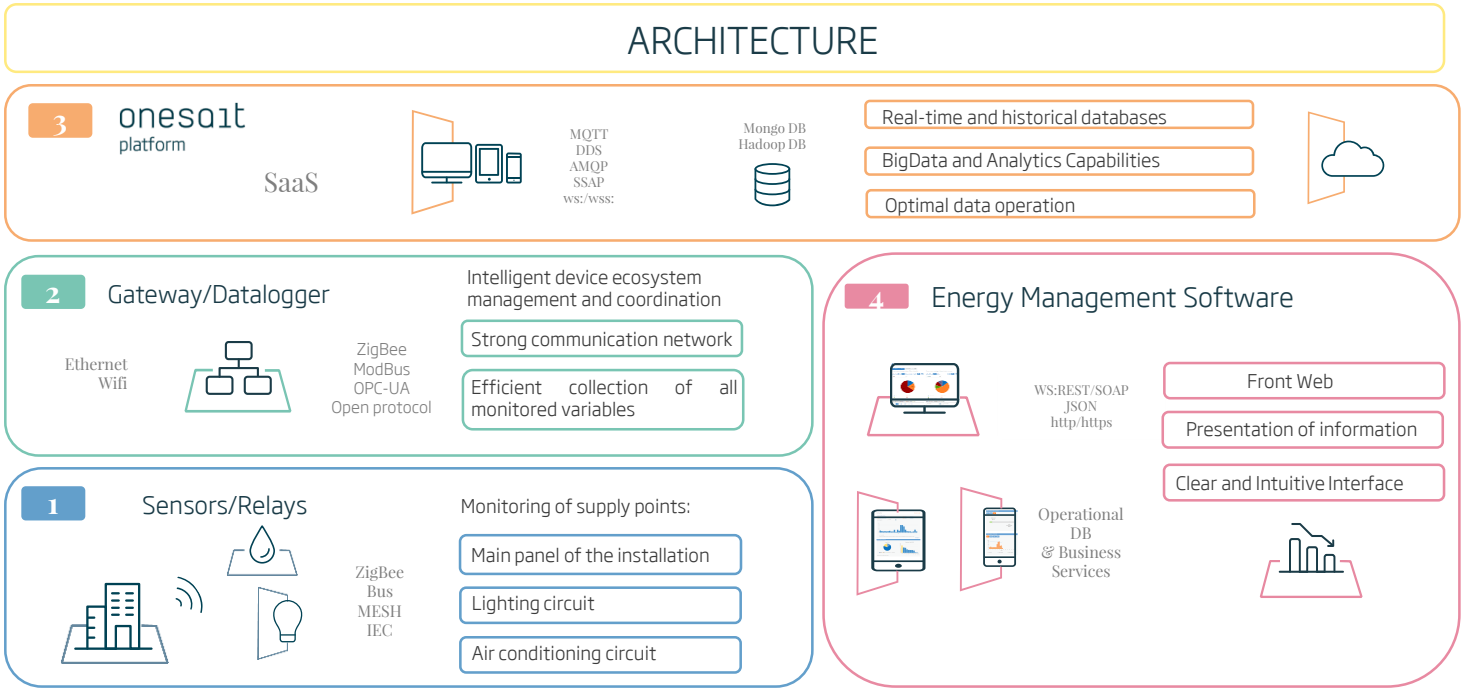
Architecture

01

01. Architecture

End to End service from solution design, provision and installation of devices, platform and operation set up, up to service maintenance



Functional details

02

02. Functional details

ONESAIT PROSUMERS

SMART ENERGY PLATFORM

- **Personalized Widgets** for quick access to platform functions and displays an overview of the most important consumption variables (electricity, water, gas, etc.)
- **Generates Energy Conservation Measures (ECM)** based on end-users consumption habits
- **Real-time visibility with intelligent and dynamic control** monitoring of consumption and KPIs at each supply point, both individually and aggregated by different levels of labels.
- **Personalized reports** with temporary details to choose and receive them periodically by email
- **Alert configuration & management** and event scheduling that allows the location of anomalous behaviors that involve an extra cost.
- **Multi device management** allows system access through web and mobile applications
- **Integration with different systems** thanks to the advanced architecture of our node#1. BMS, PLC, CCTV, etc.
- **Remote functionalities** control over the actuators deployed at the supply points, from anywhere and at any time
- **Invoice module**[1] that runs billing simulations and presents a breakdown of the invoice by nature of costs
- **Document repository** based on ISO 50001

[1]Depends on geography

Use case: Public Administration (Educational)

03

03. Use case: Public Administration (Educational)

“Energy Efficiency Award in the category of Public Entities in Colombia, Andesco, as well as the enerTIC Awards in the category SMART International Projects.”

- **SENA National Learning Service**, is a public establishment in Colombia which offers free training to millions of Colombians who benefit from technical, technological and complementary programs focused on the economic, technological and social development of the country.

  - ✓ **Project duration:** 3 years. Beginning December 2015.
  - ✓ **No. of centres** where it has been implemented: 28 sites (100 additional sites planned for the next phase).Monitoring and Control of Electricity, Water and Gas (243 points monitored).
  - ✓ **Onesait Efficiency Solution:** Installation of IoT Equipment and the Minsait energy efficiency software which is our energy monitoring and control platform
  - ✓ **Internal Audit and Accompaniment ISO 50001 Certification**

- **Methodology:**

  1. **Site survey:** A technical visit will be made to each site in order to gather information and carry out a correct dimensioning of the installation.
  2. **Logistics and supply** of equipment to each site
  3. **Installation** of equipment and **commissioning** of the platform (Look & feel, installation feature, user registration…)
  4. **Training** users in the use of the platform to achieve the desired savings or hiring a **consulting service** given by an energy manager.
  5. **Maintenance and support**

03. Use case: Public Administration (Educational)

Actions: Through the efficient use of the platform, corrective measures were taken and savings conclusions were obtained by identifying the points of greatest consumption where energy inefficiencies or unwanted consumption are found during non-working hours.

Implementing minimum or no investment measures :

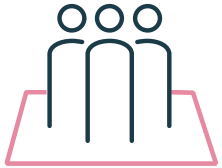
It would lead to annual **reductions of 6.3%** of the energy bill with an immediate return on investment.

Including improvements in the habits of using A/A and lighting equipment, and establishing maintenance programs for these.

Implementing low-investment measures:

It would result in annual savings **reductions of 26.5%** of the energy bill with a return on investment of 1.7 years.

Including changes from central to individual air conditioning systems; replacement of fluorescent technology luminaire panels with LEDs, automatic on/off control, replacement of standard equipment for high efficiency.



Benefits:

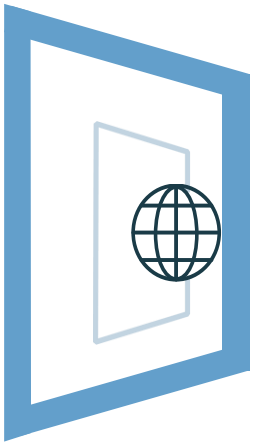
- **Reductions of 21%** in electricity, gas, and water consumption
- Optimization of the installed powers
- Optimization of the use of equipment (15-20% increase of service life)
- Dynamic and intelligent Control for each supply and consumption point in real time

Use case: Bank office

04

04. Use case: Bank office

BBVA Bancomer, is a Mexican financial entity belonging to the BBVA Group, witha trajectory of 46 years of experience and more than 2000 branches throughout the country.



A Proof of concept of Minsait´s Onesait Efficiency solution is performed by monitoring a bank office in the town of Barranquilla.

Target: The aim is to carry out a 3-month test that could verifiy the energy savings potential in a bank office and could identify inefficiencies. This is demonstrated trough the Minsait´s Onesait Efficiency Platform, which is an Energy Management System that helps users to reach targets of reducing consumption and identifying the critical points of the branch.

Once the solution has been implemented, data and energy consumption are measured and analyzed during the three months period. After that, an energy specialist prepares consulting reports identifying different measurement variables:

- Maximum consumption and total demand data for the analyzed period have been measured.
- The base lines are obtained with the study of these consumptions through the platform
- The evolution of climate consumption is studied
- Cooling Degree Days (CDD is a measurement designed to quantify the demand for energy needed to cool a building. It is the number of degrees that a day's average temperature is above 65 Fahrenheit (18 Celsius), which is the temperature above which buildings need to be cooled. It is defined as the sum of the hourly differences of the maximum average outdoor air temperature above a base cooling temperature estimated at 24°C, with respect to this value for all days of the year.

04. Use case: Bank office

BBVA Bancomer

Results:

- The consumption in **air conditioning** constitutes **70%** of the consumption of the branch, therefore, it is in this energy use where it must be controlled to achieve significant energy savings.
- On the lighting loads of the branch, some **nocturnal lighting consumptions** are identified for which the hours of **use can be optimized**.
- According to the inventory reports, they have machines for refrigeration for a total of 62TR. The estimated maximum demand in air conditioning is estimated to be 110 kW. The COP (Coefficient Of Performance) for this maximum demand is very low (close to 2). It is worth evaluating the **replacement of refrigeration equipment** by more efficient ones.
- It is observed that the consumption in refrigeration is higher in the morning, when the external temperature is lower, and the internal temperature is higher due to the thermal inertia. It should be evaluated to **implement some free cooling** technique to reduce the thermal load of air conditioning in the opening of the office.
- It is estimated **that 80kWh per day is required to reduce 1°C** the internal temperature respect to the external temperature. Reducing 1°C in the office set point temperature can report annual savings of about 3.600 USD (about 20,000 kWh/year)

Bank branches consume energy from three main branches: lighting, air conditioning and installed equipment, which means that the banking sector has great potential for energy savings and it is important to identify sources of consumption in order to apply corrective measures that induce energy and economic savings.

Use case: Business office

05

05. Use case: Business office

- **Entel** is one of the **largest telecommunications company** with thousands of customers in Peru. Their interest in Minsait's Energy Efficiency solution is to sell it to their customers as a service for SMEs.
- A **proof of concept** is developed to demonstrate saving potentials in an Entel business office, the goal is to check the savings that can be obtained by Entel's SME clients and see the value of the business.

- Once the solution has been implemented, data and energy consumption are measured and analyzed during the three months. After that, an energy specialist prepares consulting reports **identifying different measurement variables**:
  - ✓ Consumption data and maximum demands for the period analyzed.
  - ✓ Projection of expenditure with standard tariff criteria
  - ✓ Energy Consumption Baselines
  - ✓ Significant KPIs
  - ✓ Conclusions on the recorded information and proposal of next steps.

Conclusions:

- It can be seen that consumption in outlets is low (less than 900W), which corresponds to a low quantity of electronic equipment. This fact may cause a slight **disturbance to the energy analysis**.
- The consumption of the **air handler is 48% of the total** measured consumption, savings could be achieved by establishing greater control over the air handler, or by automating the thermostat switch-off program during non-work periods.
- It is possible that **lights are being switched on in periods where no staff is working** in the office, generating an expense unnecessary energy.

05. Use case: Bank office

Next steps:

- Collect useful **information to calculate energy KPIs** which let us stablish some ECMs Energy Conservation Measures.

- Establish an air **handler shutdown policy** at the end of the process. It is estimated that the savings in energy consumption in the handler turning it off or keeping it at the minimum power during the periods where there are no staff in the office would be 15.07% of the consumption in this concept, which accounts for **7.08%** of the total consumption measured in the pilot.

- Establish a policy for **switching off luminaires** at the end of the test. working day. If this policy is not easy to implement, the Onesait Efficiency solution is a system which allows the programming of the Switching the luminaire system on and off.

- The possibility of **reducing the temperature of the climate** by 1ºC has been evaluated, according to various studies can lead to savings in the consumption of the climate of between **7% and 8%.** For this specific case, in which they have a centralized air-conditioning system for the entire building, this saving measure will affect the consumption of the handler since it will be will reduce the flow of air needed to temper the office.

If the measures of direct application provided were to be carried out in the past, direct savings on consumption could be achieved. of around 13.78%, these measures are easy to implement. in terms of low-cost equipment installation or by staff awareness or habits change.

Other Use Cases

06

06. Other Use Cases

Restaurant	• Efficient fryer on/off programming saves about 3,15%	The typical fryer in a restaurant consumes more than 11,000 kWh of energy per year and are on for 75% of the restaurant's hours.
	• Sequential machine start-up to avoid peak demand saves about 1,95%	The maximum demand of a restaurant occurs when starting all the ovens, fryers, etc... By controlling its sequential ignition, the maximum demand can be reduced by about 5 kW
	• Optimization of restaurant comfort temperature saves about 1,40%	It is estimated that a reduction of the comfort temperature by 1ºC will save up to 7% of consumption in this concept.
Shopping Center	• Improvements in employee awareness, monitoring of awareness plans 1,91%	Inefficient uses of compressed air (floor sweeping, drying or cooling of parts, etc.) are very common in big malls. By controlling consumption we can detect and prevent these energy wastages.
	• Negotiation of general expenses of the facility based on registered consumption 15%	Obtaining the actual consumption will allow you to negotiate a fair price for the general energy costs.
	• Elimination of standby consumption saves about 1,80%	It is common to find residual or ghostly consumptions
Hotel	• Detection of inefficiencies on air conditioning and thermal devices saves about 3,12%	It is common unnecessarily open doors or windows, thermal energy drains,... This are inefficiencies that an energy management platform can detect and correct.
	• Detection and elimination of water leaks 2,18%	The hotels have high water consumption due to swimming pools or laundries among others. Installing meters controlled by a platform we can induce an economic saving.
	• Savings on electricity bills 10%	Identifying KPIs and applying energy saving measures

Value for Intel

07

07. Value for Intel

1 | Gateway Node#1

- Node#1 combines a powerful **processor, of Intel Atom family** with x64 architecture, low power consumption and high security level thanks to hardware encryption with TPM.
- SoC architecture allows to offer a **flexible solution regarding radio communications**, being able to integrate Wi-Fi, Bluetooth 4.0, 3G/4G, zWave, Built-in ZigBee communication, etc., thanks to a MiniPCIe slot enabled for communications expansion.

2 | Cloud Infrastructure

- Intel® technology provides a **trusted infrastructure** through a set of platform security technologies.
- The infrastructure is hardware-based and integrated directly into the **platform base**
- **Intel's virtualization technology** abstracts hardware and allows you to manage a wide variety of workloads while being able to migrate freely between infrastructures and scale.

3 | Benefits

- **Each site** needs at least **one Gateway** Node#1.
- The **more Internet-connected** devices and signals move into the cloud, **the bigger number of Intel microprocessors** are used.
- Example of value estimation based on Endesa´s case:
  - 180.000 new users per year
  - 180.000 Gateway Node#1 (Cloud Services Enabler)
  - 1 core per 4 users, 45.000 cores

Mark Making the way forward

An Indra company