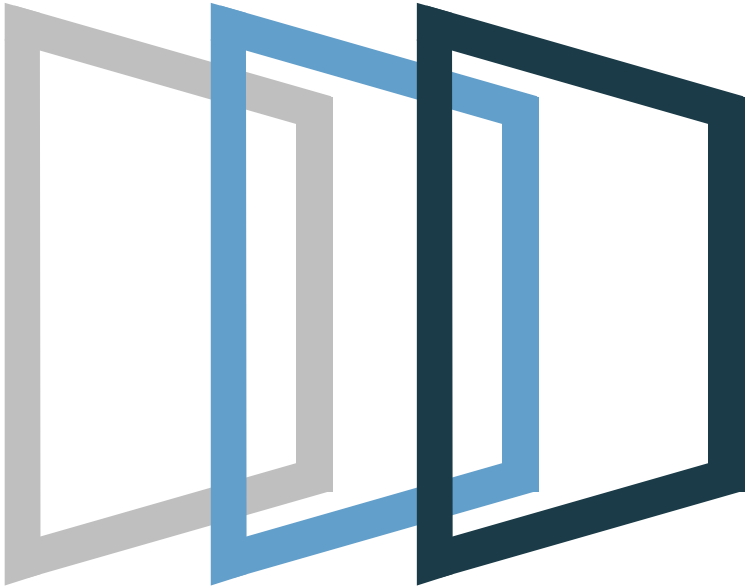
SMART CITIES & TERRITORIES

Strategic Approach



2022

minsait

An Indra company

We are a global technology company ...

indra minsait

Indra has always been a business project built with a long-term vision and based on the conviction that maintaining a company profile focused on innovation with a strong technological base, offering leading solutions to leading clients, allows us to generate higher growth and profitability rates. Thus being able to create value in the short, medium and long term.

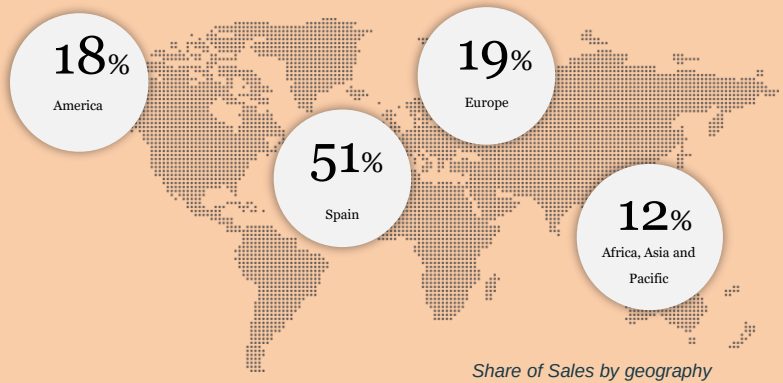
3.390 M€
Sales 2021

+52.000
Employees

225 M€
R&D&I

Projects in
+140 countries

... with an important worldwide presence ...



Share of Sales by geography

+20 thousand
Projects per year

+45 subsidiaries

… that provides technology for key operations in different industries through innovative solutions and services with impact on all domain of Smart Cities.

Transport & Mobility	**+2.500** Projects executed	**+ 100** Cities of over 50 countries operate mobility services with our solutions	**+ 98%** punctuality rate achieved in public transport by our technology
Security & Emergency	**+ 25 M** people protected through our Control Centers and solutions	**< 8 minutes** Response time of emergency issues achieved by our solutions	**+ 30M** security documents issued by our solutions
Energy & Water	**+150M** clients are managed by our technology	**+700** Generation plants optimized by our solutions	**+300** Utilities around the world make use of our services
Healthcare	**+50M** Patients treated with our solutions	**+5.600** Hospitals and healthcare centers use our solutions	**+100.000** Professionals using our systems
Public Administration	**+700** Projects in over twenty-six countries	**+100M** taxpayers are managed by our solutions	**+250.000** Officers work with our technology

More than 100 Municipalities are using our Smart Cities solutions to address the main challenges posed by urbanization

+ 150 Smart Solutions
implemented worldwide

An ecosystem that unites and makes available to our customers the impact we have been generating for more than 25 years:

+100.000
companies connected in the ecosystem with our solutions

+500M
people have received services conducted by our solutions

+45
countries where services are operated through our solutions

12
industries where our solutions add value

We believe in the smart development of cities and territories with an integrated approach through state of the art solutions…

…with a focus on generating a tangible impact on the sustainability and societal factors within the territories and cities.

Change and transform

"From within", based on current assets, with a focus on the digitization of operational models and processes and safe interaction with citizens.

Revalue

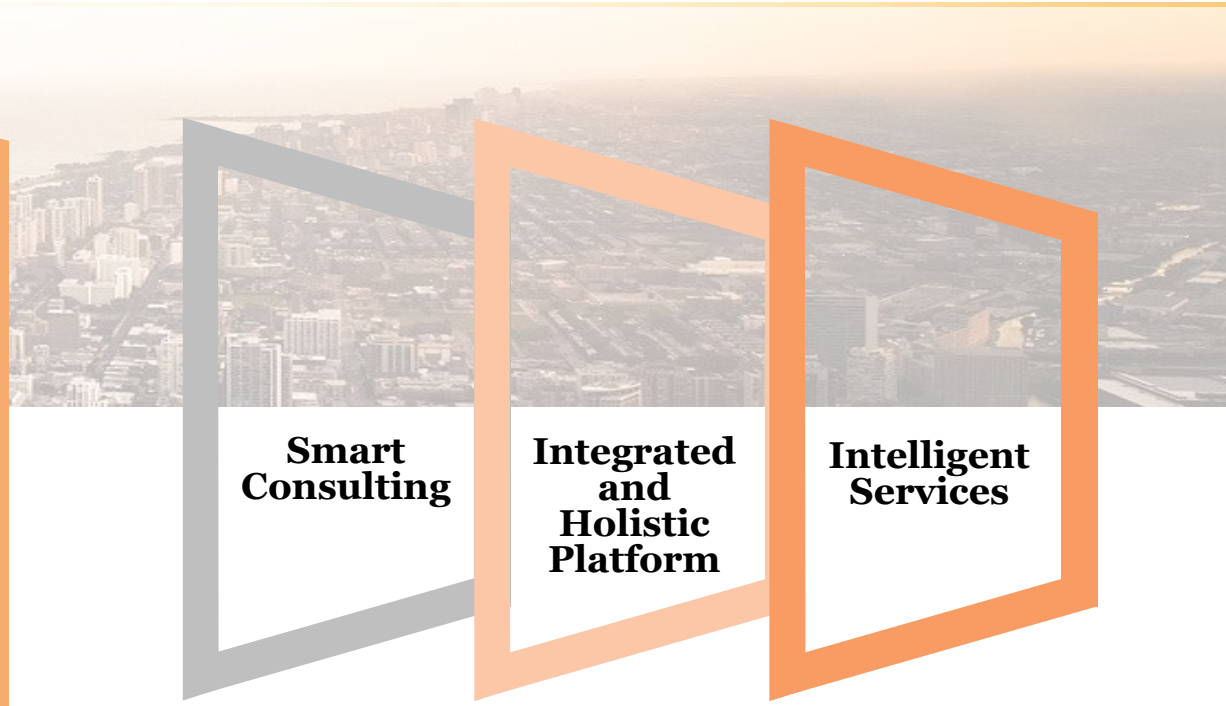
Future growth reinventing and dynamically adjusting the value proposition of the Territory, its services and their provision and the improvement of citizens' well being.

Create the future

Through anticipation and intelligent planning actions that allow adapting products, channels, resources, services and infrastructures, offering a territory with all kinds of guarantees against any future challenge.

We have developed an innovative global solution and services portfolio capable of responding to present and future needs in the management of cities and territories ...

Our approach is to cover the end to end life cycle of a smart city project trhough a comprehensive vision structured above consultancy services and technological solutions that converge to an holistic platform in order to make public services more efficient, generating a tangible impact on people's well-being granting a sustainable development within territories.



… that have led us a commitment to offer reference solutions based on high value products, with comprehensive vision and resolution, and focused on the intelligent transformation of cities and territories …

More efficient sustainable and safer cities

- Air Quality
- Smart Parking
- Parks and Gardens
- Smart Buildings
- Waste Management
- Smart Lighting
- Sustainable Urban Mobility
- Segurity & Emergencies

Increase competitiveity of tourist destinations

- Destination Promotion
- Tourism Heritage Management
- Dynamization of local commerce
- Tourist Intelligence

Develop more resilient and territories

- Natural Disasters Resilience
- Smart Coastline
- Fire Detection
- Climate Change, Natural conservation and Biodiversity

Foster digital transformation within the territory

- Telecare
- Agrifood
- Aging People & Silver Economy

… creating a strategic ecosystem of public and private partners to address any kind of project

Engineering Companies and Urban Planners	THE WORLD BANK · IDB · TTI · AECOM · ARUP
Transport Operators and Mobility Services	Metro · aena · renfe · Uber · SHARENOW
Urban Services Operators	FCC · urbaser · VALORIZA · acciona Servicios Urbanos
Financial Services and Insurance	BBVA · Santander · "la Caixa" · VISA · G Pay · MM · MAPFRE · AXA
TI Integrators	indra · ORACLE · IBM · Tech Mahindra · NTT DATA
Platform Providers	SAP · Telefónica · indra · IBM · Microsoft
Vertical Solution Providers	IOTSENS · WORLD SENSING · PHILIPS Lighting · Johnson Controls · Wondersara
Sensors Providers	urbiotica · e3t city · libelium · Telensa · SENSUS a xylem brand
Telecomm Operators and Data Providers	Claro · Telefónica · orange · vodafone · T··Mobile· · NOS
Cloud and Hardware Providers	DELL · Hewlett Pack Enterprise · Microsoft · IBM · HUAWEI · amazon · CISCO

Learning from past achievements and goals to help cities and territories to become smarter and more resilient to any crisis.

Las Palmas Climate Change

Cáceres Sustainable Tourism

Lugo Smart

Green Urban Logroño

DigiPal Green Infrastructures

Select4Cities

Casablanca Smart and Green City

Coruña Smart City

Tourist Destination Rias Baixas

Smart Camiño

Vatican Museums

Rome Citizen´s Digital House

Las Palmas Climate Change

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Ayuntamiento de Las Palmas de Gran Canaria

Summary

Provide an integrated and transversal vision of the city, concentrating a large amount of data generated from different sources to make Las Palmas de Gran Canaria a reference in tourism and the environment and improve the quality of life of citizens every day.

1. **Smart City Platform** as a technology base
2. **Citizen CRM** in order to meet you and have a 360º view of it
3. **Intelligent management of parking spaces** to improve urban mobility
4. **Smart Beach dashboard** to adapt the services of the Beach to the real needs
5. **Smart payment in public transport** to improve service quality
6. **Fleet management system** to optimize security and emergency services
7. **Park and garden management** for improved management and conservation of green areas
8. **Waste management** establishing dynamic collection routes based on container filling

Expected Impacts

30-35% Reduction in wáter consumption

Savings of up to 11% in waste collection management

10-20% higher income in regulated parking

Reduction of maintenance expenditure in green areas 15%

15% Emission reduction

Benefits

- More efficient and holistic management of all services
- Reduction of transport times in public and private media
- Reduction in fuel consumption
- Improvement of municipal training
- Optimization of the material and personal resources of the Administration
- Noise pollution reduction
- Efficient use of water consumption
- Greater digital literacy of society

Cáceres Sustainable Tourism

Summary

Conserve, value and publicize the heritage, acquire a greater knowledge of the behavior of visitors and citizens in their relationship with the city, activate strategies to build loyalty to the tourist, diversify the consumption of the service offer and build a system and management model that empowers the local business sector.

1. **Monitoring system** for preventive heritage conservation
2. **Tracking of the city and urban center** through mobile data and Webcams
3. **Mobile applications** to allow unified marketing and communication actions
4. **Professional portal** for business development and the use of tourist resources of the municipality
5. City platform that acts as an **Integrated Tourism Management System**.

Expected Impacts

Growth of 3,54% of employment in the tourism sector

Increase in the number of tourist establishments 15,7%

▲ 6% number of tourists

Increase in the average stay of the visit until 1,8 days

Benefits

- Creation of a digital tourism environment without borders, global, diverse, innovative and enriching
- Improvement of the effectiveness and efficiency of the City of Cáceres in providing services to tourists.
- Comprehensive management of city assets
- Increase in the number and duration of visits in Cáceres activating the service sector not only at the municipal level but also at the autonomous level.
- Promotion of the digitalization of the city's business ecosystem and its promotion
- Customization of the offer to the tourist

DigiPal Green Infrastructures

red.es

Ayuntamiento de Palencia

Summary

Promote the use of ICTs to promote the digital transformation of the city in order to improve the efficiency of public services and urban planning, position the city as a tourist destination and speed up citizens' access to information.

1. **Spatial data Infrastructure**, municipal GIS and Urban Planning System
2. **City platform** to centrally service the various verticals
3. **Smart tourism center** - promotional portal and mobile application with digital marketing tool
4. **Tourism management tool** to establish management metrics and indicators
5. **Irrigation management in** green areas for improved maintenance and conservation
6. **Energy efficiency** monitoring in municipal buildings.
7. **Sustainable mobility** (bikesharing, application transport to demand public buses)

Expected impacts

Reduction of energy consumption up to

30%

Increase in the average stay of the visitor in

8%

35%

Reduction in irrigation water consumption

Benefits

- Improving the competitiveness and efficiency of urban management procedures, through the provision of geographical component files
- Positioning of Palencia as an intelligent tourist destination with a homogeneous offer, complete and aligned with the strategic objectives that enable compliance (increased overnight stays, increased international tourism)
- Increased transparency and citizen participation through the use of ICT

Logroño Urban Green

Ayuntamiento de Logroño

Summary

Creation of an **"integrative brain"** to drive a change in the management culture through a holistic and coordinated management model, in which data control and monitoring of the different services allow the city to be more effective, both in economic terms as in the quality of public services. All this focused on increasing the welfare of the Achievements

1. **Smart Logroño Integral Control Center** as the backbone of city services
2. Municipal **Open Data Portal** to provide information on city indicators transparently
3. **Citizen Portal,** where you can check the information and data of the city in real time
4. Management of the **010 citizen service**
5. **Digital communications system,** which provides information and data instantly to emergency professionals
6. Integration and analysis of **meteorological station measurements**
7. **Irrigation management** to automatically program irrigation based on rain forecast

Expected Impacts

25%
Improvements in time responses of resolution of citizen requests, complaints and suggestions

35% reduction in water consumption

Reduction of maintenance costs and inefficiencies a
17%

+17.200
requests derived to the 010 digital citizen module

Benefits

- Generation of answers in real time and access to Big Data.
- Improvement of the management of services that have a positive impact on the quality of life of citizens.
- More agile attention through multiple channels (voice, e-mail and web chat) with geolocation services.
- Evolution of a classic model of independent management to another based on the management of the city as a whole.
- Value creation through citizen participation.

Lugo Smart

red.es

Concello de Lugo

Summary

Improve the quality of life of citizens and the efficiency of public services, as well as promote participation and transparency through new channels of information collection and dissemination.

1. **Open Government Portal** based on transparency, citizen participation and open data
2. **Electronic administration solution** for the complete management of any administrative file or procedure
3. Intelligent management **of surface parking spaces**
4. **GIS Municipality**
5. Improvement of the services of the **Citizen Card** (collection system, identification, ...)
6. **Smart Waste collection** system
7. Monitoring of **energy consumption** in public buildings
8. **Smart Street lightning**
9. **Smart Water Metering** (reading, supervision, management and maintenance)

Expected impacts

Savings up to **1 M€** annual thanks to the monitoring of waste containers

Water consumption reduction

25 L/pers.

Improvement in resolution times and interaction with the citizen in administrative tasks

45%

Benefits

- Improvement of efficiency and sustainability in the management and provision of public services, through changes in their management models supported by ICT.
- Greater coordination between the different municipal areas through the integration of intelligent services.
- More efficient management of supplies in public buildings.
- Greater agility in administrative procedures.

Select4Cities

Summary

Carry out the implementation of pilots in Antwerp and Helsinki, based on Onesait Platform, which solve environmental and sociodemographic challenges, using a large amount of data from different sources in the cities to improve the quality of life of citizens**.**

1. **System for measuring air quality** in the city of Helsinki
2. **Prediction tool** based on the measured environmental parameters
3. **Calculation of the comfort citizen index** of the city of Antwerp
4. **Measurement of sociodemographic variables** to perform a segmentation by similar neighborhoods
5. **Monitoring of environmental** parameters such as traffic, noise, weather, pollution, etc.
6. **Real-time feedback on the mood of citizens** in each neighborhood of the city

Expected Impacts

10-20% increase in income in small businesses

Pollution reduction by 24% thanks to environmental traffic control and regulation

3-5% reduction on health fatalities due to improvement of air quaility

Benefits

- More efficient management of existing pollution sensors in the city.
- Improving the quality of life of children and the elderly
- Optimization of costs related to the purchase of new sensors
- Involvement of citizens in the Smart development of the city.
- Optimization of the material and personal resources of the Administration
- Environmental and noise pollution monitoring
- Help in citizen decision making to select services in the city

Coruña Smart City

Summary

Implementation of the "Smart Coruña" platform that will serve as the basis for the management and integration of all intelligent services and solutions that make up the ecosystem of a city in areas such as environment, energy, urban mobility, health, safety, leisure and tourism and e-administration

1. **Smart City Platform** as a technology base
2. **Quality system of remote management of water and gas meters** to reduce maintenance activities
3. Early warning system on **water quality**
4. **Smart irrigation system**
5. Reduction of **energy consumption** in public buildings
6. **Street Smart lighting** system
7. **Smart parking system**
8. **Real-time traffic optimization**
9. **Air quality and noise control system**

Expected Impacts

Savings in maintenance and water management supervision activities

32%

Reduction of pollution levels

14%

Decrease in energy consumption in public buildings

21%

Street noise reduction of

17%

Benefits

- Improve the city's global competitiveness, management, sustainability, environment, mobility, etc.
- Integration of all services in a single information repository, open and scalable platform.
- Customization of the services provided to the citizen, dynamization of the economy (through the marketplace of data and applications), and improvement of transparency with open data and open government policies.
- Analysis and storage of real-time information of sensors, mobile devices to make predictions

Casablanca Smart and Green City

Summary

Implementation of a city platform conceived as an "integrating brain" that combines internet of things (IoT) technologies, big data and artificial intelligence to cross and analyze the information of the different services of the city.

1. **Smart City Platform** as a technology base
2. **Integration of cleaning service information** (waste collection intervals, location or volume of containers, ...)
3. **Slaughterhouse management system** ("end-to-end" production chain management)
4. **Fruit and vegetable wholesale market system** (volumes by type of product, prices or distributors).
5. Proof of concept to integrate **IoT devices** that collect information from areas such as the environment, transport, energy or lighting

Expected Impacts

Savings of up to 14% in waste collection management

Adjust agricultural production to demand to reduce losses

Improvement of the efficiency of municipal slaughterhouses, increasing quality and productivity

Benefits

- Simulate possible scenarios to define better public policies and generate public services increasingly adapted to the needs of the citizen proactively.
- Promote the emergence of local innovation ecosystems that increase cooperation, promotion and development of business opportunities for social and economic agents.
- Improve the efficiency of municipal slaughterhouses through management aimed at achieving greater productivity and quality
- Increase transparency through open data
- Adjust agricultural production to demand to reduce losses

European Smart Cities Platform

Antwerp

Four main urban projects

Urban Resilience

Social welfare

Air Quality

Urban Mobility

The challenge

Minsait was selected amongst 28 consortia from 13 European countries to design, develop and implement an open, standardized, data-driven, service-oriented and user-centric Smart City platform that enables large-scale co-creation, testing and validation of urban IoE applications and services for European cities to become models of digital and sustainable urban growth. The Smart platform has been deployed in Helsinki, Antwerp, Casablanca and other cities to manage several urban projects in security, mobility, air quality and citizen services.

The solution

Implementation of a city platform conceived as an "integrating brain" that combines internet of things (IoT) technologies, big data and artificial intelligence to process and analyze the information of different urban services in order to develop the following cross domain use cases in the case of Antwerp:

- **Urban Resilience:** geospatial analysis of the maritime transit of goods providing a real time alert system to officials. Availability for generating KPI's and reports.
- **Social Welfare:** citizen comfort index algorithm that compares citizen feedback with the impact of connectivity, mobility, weather, air quality, noise levels and security within districts.
- **Air Quality:** monitoring system based on real time data that serves citizens as a recommendation tool and officials to improve environmental policies through historical analysis of sources of pollution
- **Urban Mobility:** real time traffic monitoring that allows the identification of road incidents through an automatic alert system. KPI's and reports engine available for decision making.

Main benefits

Improving Emergency Operations

Anticipation of spills disaster
Reduction of emergency response time

Better Air Quality

Targeting sources of emissions.
Reducing negative health effects by informing citizens through applications to take protective measures.

Enhancing Social Welfare

Knowing which elements improve the well-being of citizens.
Improvement sense of belonging and Antwerp city brand.

More Efficient Commutes

Real monitoring of traffic incicents and causes.
Analysis of traffic jams and the delay magnitude.

Vatican Museums

Museos Vaticanos

+ 6,5 M tourists per year

MUSEI VATICANI

Challenge

Preserve, value and publicize the heritage, acquire greater knowledge of the behavior of visitors and citizens in their relationship with the city, activate strategies to retain tourists, diversify the consumption of the services offered and structure a system and management model that combines security and tourism.

Project Approach

- Comprehensive surveillance and security system for unified and coordinated management.
- Tracking and analysis of tourists through the access control and visitor management system
- Mobile applications to carry out unified marketing and communication actions.
- Recommendation engine to offer personalized services using contextual information.
- Management platform that allows combining tourism management and security

Contributed Value

- Centralize surveillance and control of all spaces, guaranteeing an immediate diagnosis of each incident based on the situation detected and the number of visitors affected.
- Efficient management of the tourist space and adequacy of resources based on the analysis of flows.
- Increase in the number and duration of visits to museums.
- Improvement of the tourist experience through personalized digital services that adapt the offer to the context of the tourist and the museum.

Mark Making the way forward

An Indra company