

WHITE PAPER

Augmented City

For a more technological, resilient and sustainable city.





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We increase the city's ability to serve its citizens, protect the environment, boost the local economy. And put people first.





01 Synergy between Public and Private for easily accessible public services

Looking beyond the concept of the Smart City to increase the city's ability to serve its citizens, protect the environment, boost the local economy and put people first, making public services more efficient through the use of innovative technologies and **public-private partnerships**. Welcome to the **Augmented City: an increasingly technological, resilient, and sustainable city** that can respond to new needs, showing local administrators that digitalisation represents a unique opportunity for progress and good governance.

This vision also encompasses the concept of the "**15-Minute City**", in which public services are easily accessible, i.e. a maximum of 15 minutes from any resident's home, thereby

helping to reduce pollution, optimise travel times and accelerate urban transformation.

Today, medium/small towns are also perceived as increasingly liveable, raising new questions in terms of accessibility, infrastructure and services. **ITI, Integrated Territorial Investment**, is the most suitable tool to provide concrete answers, bringing together the main resources from one or more operational programmes to implement multidimensional and intersectoral interventions. It also provides for an integrated management and implementation regime, beyond the administrative boundaries of any individual town, acting as a driving force for innovative and sustainable development on a larger scale.



Each local public administration is therefore able to play an active role without the burden of going it alone. Maximum results can be achieved through targeted investments and risk-sharing with the private sector, with sustainable and long-term economic and financial models, taking advantage of the European funds that are available.

As an accelerator of change, Municipia – the Group's company dedicated to serving towns – is striving to build the cities of today and tomorrow on the five fundamental pillars of a single technological ecosystem: **Financial and Environmental Sustainability, Security, Mobility, Welfare and Interactivity.**



Engineering in the Augmented City



1. From finance to the environment, sustainability is key. **Revenue management**, the first area of intervention, is an essential foundation for all public services. With a structured methodological approach, we can oversee all processes, ensuring that the administrative body achieves three fundamental objectives: fairness in terms of taxation, a citizen-centric focus, and planning and control of the resources necessary for the proper functioning of the city. The second area of intervention is the protection of environmental resources, because sustainability requires more effective **management of the waste management cycle and energy and water management systems**.

2. By their very nature, cities bring people together: the second requirement

is therefore **security**, which translates first and foremost into risk prevention for citizens. This can be achieved through an active system of monitoring and identification.

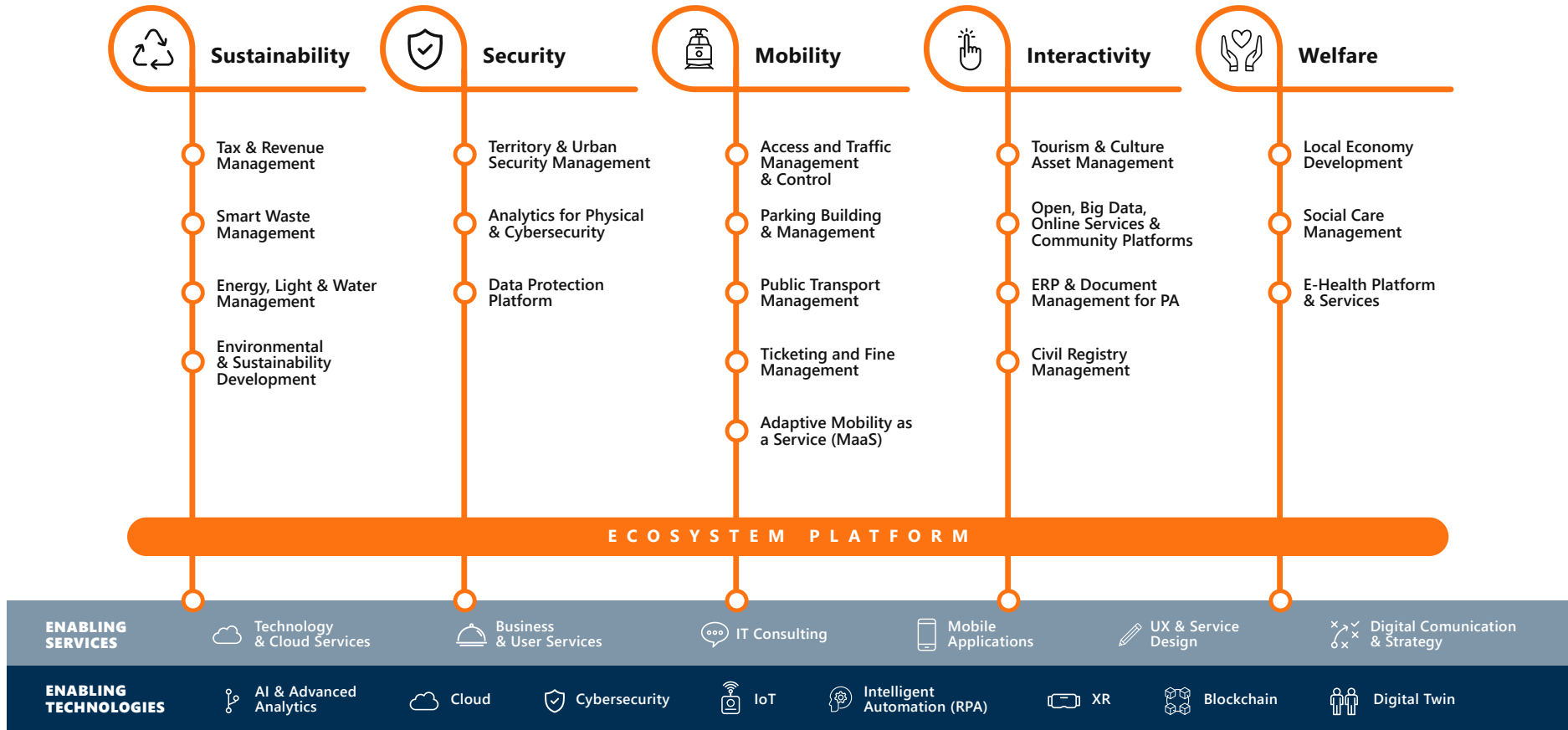
3. Thirdly, citizens must be able to move around their city. We develop hardware, software and IoT technologies to carry out **smart mobility, smart parking, city logistics, MaaS integrator and bike sharing projects**. These solutions optimise access to services, ensure road safety, and reduce the environmental impact through technological management and control infrastructures and services. We also design, build and manage integrated systems to create Limited Traffic Zones (LTZ) and low-emission zones using public-private partnerships and project

financing schemes. Additionally, we are promoting innovative strategies in the organisation and management of **local public transport** services, which will form the backbone of a new collective, shared and sustainable approach to mobility.

4. No city is a closed system: today, urban life relies on a high level of **interactivity**. Every process is focused on the citizens and city users, from administrative practices to registry and payment management. This reality requires open and transparent technologies and solutions that are absolutely secure and accessible at all times, thanks to Cloud tools. Making a city interactive is also a fundamental step for the local economy. For example, this interactivity can increase the use of **cultural and tourist assets**, enhancing

them and making them open and accessible to everyone, even remotely.

5. Last but not least, **welfare** is transformed into an integrated system of digital services for proactive and data-driven public policies, prioritising knowledge, proximity, community welfare and security in the name of social inclusion. Today, technology is more than just a tool: it is a fundamental driver of sustainability with a profound impact on society as a whole. Local public administrations must focus on knowledge and their ability to predict phenomena and respond with appropriate services and measures, avoiding disjointed and ineffective interventions thanks to shared public databases, which are accessible to all the entities providing services in the sector.



Engineering in the Augmented City



03 Financial and environmental sustainability at the core of community development

Knowing the territory for a true data-driven governance

Revenue management is the first tool for identifying the necessary resources to ensure that public services are as efficient as possible. With Municipia, we are able to support local authorities in terms of sustainability, ensuring that the budget remains balanced. Our activities are focused on three main areas. The first undertaking is endogenous, focussed on the technology within the authority itself. The objective is to construct a **Knowledge System** that goes beyond mere databases: it must be able to give meaning to information, interpreting and putting it in context in order to understand what data represents in terms of taxable

entities in the area. This knowledge is a valuable resource for the authority to use when drafting the annual financial statements and monitoring activities for the collection of tax and non-tax revenue.

The second undertaking is exogenous, enabling taxpayers to access and check their tax position, submit applications to the authority, and make payments in a simple and secure way via a **range of services on IT platforms**, which can be accessed online from various devices. For example:

- **The taxpayer portal**, developed using Human-Centred Design (HCD) methodologies and techniques in compliance with the AGID guidelines.
- **MuniPay**, a modular solution



that supports the authority in its interactions with the PagoPA world, especially in terms of displaying citizen debts, an online payment portal, and in accounting and financial reconciliation activities.

- **The taxpayer's digital file**, a virtual archive in which all the documents are stored for both the authority and the taxpayer.
- Proactive and pre-filled **online applications** to help citizens to access services.
- Provision of **pre-filled but editable declarations**.

The third undertaking is both endogenous and exogenous: effective **recovery**

actions to handle evasion and enforced collection, which can be implemented via our management systems. The latter make use of the information recovered via the Knowledge System in order to harmonise the management of services for citizens, backed by greater availability of municipal revenue.

In this context, Municipia allows us to provide services that optimise results by significantly reducing the execution time with regard to the mandatory deadlines. All this is possible thanks to a proprietary and independent software architecture and centralised management processes, specifically designed for each Italian tax category: IMU/TASI, TARI, CUP and other minor taxes.





Waste management: from problem to opportunity

New technology can transform the “waste problem” into an opportunity for local public administrations, multi-utility service providers, and companies operating in the sector. The solution lies in an articulated supply chain that requires tools, such as ERP (Enterprise Resource Planning), and smart technologies to ensure complete integration between the administrative, financial and control functions and operational and planning activities.

We are thus able to support customers as they work to manage and optimise the entire waste management process: from collection services (vehicle management) to disposal, sorting and recovery (delivery to waste disposal plants), and from

pricing (determination and collection of the amount due) to identifying evasion. A comprehensive and modular solution, from bins to payment collection, which demonstrates how technology can be applied to processes to promote efficiency, increase the economic resources to be reinvested in the area, and generate concrete results that are actually visible to the public. This complex and ever-evolving field requires:

- **detailed planning and management** of waste collection with innovative systems, making use of the data provided by smart containers equipped with IoT technology
- **construction** of data-driven models to support decision-making in all phases of the waste management cycle
- **control and reduction** of collection

costs, including through the optimisation of vehicle routes

- **improvement** of environmental standards – in compliance with the obligations imposed by the Italian Regulatory Authority for Energy, Networks and Environment (ARERA) in the TQRIF act – in terms of the contractual and technical aspects of the services in the contracts and/or quality charters in force
- **reduction** of outstanding payments through evasion identification techniques and optimisation of collection processes
- **increased** citizen safety, combatting illegal dumping by means of local monitoring tools

Reducing energy consumption and achieving greater savings

We are developing technological efficiency projects, ranging from public lighting to building automation, in order to reduce energy consumption, lower pollution and free up economic resources that can then be used in new services.

Public lighting efficiency (smart lighting)

Implementation of innovative projects to upgrade existing structures with high-efficiency, remote-controlled and integrated systems within the context of a smart city ecosystem (electric mobility recharging, energy community management), allowing for:



- **reduced energy consumption** thanks to technological innovations (LED) and remote-controlled lighting (adaptive lighting)
- **lower CO₂ emissions** due to reduced consumption (with the same level of wellbeing, technological innovation and adaptive lighting) and an improved energy supply (renewable sources)
- **increased safety for citizens** thanks to comprehensive system upgrades (supports, cables, boards, and lights)
- **transfers of digital knowledge** to the local authority and citizens through web-based platforms for consumption control and report management.

The following actions can be

implemented in real estate (schools, sports facilities, public housing):

- activation of remote management systems and presence detection sensors in the rooms and on the windows to
- actively and automatically regulate the lights and air conditioning, and to monitor consumption and air quality
- monitoring risk areas, evidence of unsafe conditions and potential unlawful behaviour
- accurate and numerical verification of the people present in individual areas and in the building as a whole to counteract unauthorised entry/exit, attendance and security checks for emergency management, and detection of noxious gases.

These actions lead to:

- **lower energy consumption** through technological innovations (windows, LEDs, thermal insulation) and remote control
- **reduced CO₂ emissions** thanks to both lower consumption (with the same level of wellbeing) and an improved
- **energy supply** (renewable sources, including self-consumption)
- **improved indoor wellbeing** for users
- **transfers of digital knowledge** to the local authority and to citizens through web platforms to monitor consumption, improve behaviour

(raising awareness, including through gamification processes) and manage reports (faults)

- **reduced “energy poverty”** among vulnerable groups by activating and supporting the management of energy communities.





Engineering approaches the Augmented City as a “system of systems”, in which the smart grid works in synergy with mobility, addressing the problems of various stakeholders such as energy distributors, prosumers, energy retailers, operators of electric car charging station networks, and electric car owners. The foundation is a blockchain-based flexibility marketplace, which is both innovative and transparent. It can also eliminate preliminary processes by combining supply and demand, interacting directly with IoT devices: manufacturers’ energy meters; electric car infrastructures (to determine vehicles’ positions and typical routes, charge status, and remaining battery life in real time); and electric vehicle recharging stations.

For example, Engineering is working alongside Areti of the Acea Group to develop a local flexibility market in the city of Rome as part of RomeFlex (Reshaping Operational MEthods to run grid FLEXibility). This project is perfectly aligned with Resolution 352/21 of the Italian Regulatory Authority for Energy, Networks and Environment (ARERA) regarding the implementation of pilot projects that allow distributors to experiment with the supply of local flexible services.



04

Integrated mobility is crucial for more livable and attractive cities

Integrated mobility is crucial for more livable and attractive cities



Public decision-makers must manage and plan mobility infrastructures; draw up regulations for access, transit, and parking for all means of transport – including commercial vehicles – and all categories of users; and provide and manage an efficient, sustainable and dynamic **public transport service** that supplements/complements the private services available, responding to continuous and rapid changes in terms of demand, services, constraints and objectives. To meet these objectives, they must **make the most of the latest technological innovations**, namely new platforms, artificial intelligence, the Internet of Things, big data and **MaaS** projects. Within Engineering, Municipia opens up opportunities to use our IoT

technologies, which fall into the broader category of ITS (Intelligent Transportation Systems), in order to implement innovative services for citizens, companies, public administrators and their subsidiaries in an organic manner and on a large scale, aiming to achieve economic, environmental, and social sustainability. The overarching goal is to create cities with a low environmental impact, low energy consumption, low accident rates, and higher productivity levels.

We offer services and solutions to better utilise data and services by way of technology that allows for real-time integration and processing, in addition to redesigning mobility

systems. Furthermore, with the support of dedicated partners, we manage and design parking areas and Limited Traffic Zones.

In terms of road safety and education, we offer software solutions and services to support the chain of traffic offence management and all administrative sanctions in general, as well as compliance in the event of road accidents, lost property, and road signs. These services **facilitate the management of disputes resulting from fines and offer solutions for road safety education**. In the name of sustainable and efficient urban mobility, we support cities and utility providers as they implement smart mobility, smart parking

and city logistics projects. **Municipia also offers a single dedicated platform, INES Cloud, which can integrate existing systems and infrastructures by positioning them in an open and interoperable environment.** Integration with third-party systems enables public administrators, municipalities, and private operators to achieve unprecedented levels of efficiency and insight into mobility management. Parking is a particularly practical example: parking info tools, which are integrated and easily available on drivers' smartphones, reduce the time spent searching for parking spaces and urban traffic, with positive social and environmental impacts and economic advantages for businesses.



05

Interactivity: applications and services from anywhere and at any time



Digital experience at the core of a new circular digital public service

Today, public services must be natively digital, shaped by the citizen experience rather than the automation of administrative processes. The priorities are cybersecurity and secure data processing (GDPR). For the Engineering Group, and for Municipia in particular, the digitalisation of public administration is a chance to overhaul and strengthen the systems, recognising the central role of authorities in the development of the entire country's system, equipping them with an **integrated digital model. Based on reliable and secure software and systems, it will offer access to applications and services from anywhere and at any time**, guaranteeing operational continuity for the back-office

activities of municipal operators and for the use of mobile services by citizens and businesses.

A concrete example is **jEnte**, a simple, protected and **customisable Cloud platform** for rationalising the management of local government and the associated companies.

By offering a circular digital public service model, this **“end-to-end” digital transformation** process provides financial savings and increased administrative efficiency for the public administration, thereby generating value for the community.

The management and **exploitation of data** also deserve particular attention.

The Engineering Group has been committed to promoting **open-source technology** for many years. Backed by our knowledge and digital platforms, we are able to help cities better manage the data they possess, transforming it into a strategic tool to provide new services to citizens and businesses.

We have accrued in-depth experience and technical skills with regard to data ecosystems, working on various research and innovation projects that applied our solutions to issues related to data interoperability in urban areas (e.g. the SynchroniCity Large-Scale Pilot; CEDUS, Sustainability Enabler and Easy2Go within EIT Digital; the SELECT for Cities and AI4Cities pre-commercial tenders; and ToNite, funded within the European Urban Innovative Actions programme on the theme of Urban Security), as well as to production projects in the IoT field.





The use of application programming interfaces (APIs), data models, and open standards shared by relevant European communities (namely FIWARE and Open and Agile Smart Cities) is a defining feature of our solutions. A key example is **Digital Enabler**, a digital platform ecosystem powered by FIWARE. We are therefore proud **facilitators of open innovation in the context of cities, which can be understood as complex ecosystems that are characterised by a high level of interactivity** and must be supported through the adoption of a collaborative model of government (Open Government), based on transparency, participation, and data sharing. In this area, we have gained extensive experience in:

- **participatory innovation**, with the creation of platforms that support public participation processes, allowing stakeholders to express ideas, interact and collaborate to “cocreate” urban development

strategies. The platform has been used in cities such as Genoa, Turin, Eindhoven, Tampere and Helsinki.

- **open data**, by way of the Idra open-source platform, which creates a single point of access to all open data made available by public administrations and private entities, facilitating its use and enabling the creation of new value-added digital services and applications. One of the projects currently using Idra is SPOTTED, co-funded by the European Union, which integrates and processes open data, including Earth Observation satellite data, to support the management of green areas.



Digital Experience to promote new forms of tourism and enhance cultural sites

The evolution of accessibility and tourists' desires has put tourists in charge of their own experiences and the organisation of their holidays, and they therefore require increasingly punctual and timely responses.

In this context, the Engineering Group, and Municipia in particular, offers a comprehensive solution tailored to each customer's specific needs, providing integrated services ranging from

destination management to digitisation, and from control and management of flows for security purposes to the creation of immersive and personalised itineraries. The aim is to use digital technology to help tourists "live" the experience remotely before they set off, helping them to choose between the activities that the destination offers to **create a tailored holiday**, supported by technology such as augmented reality and the Metaverse. Activities for incoming tourists are also enabled and supported by the analysis of data generated by technological systems for the management of cultural and tourist assets, enabling particular actions for specific target markets.



Today, digital technology is also one of the most valuable tools for protecting the environment, because it can effectively support compensatory actions that benefit the planet, thereby integrating innovation and sustainability. For example, the EcoMoB app, which came into being as part of one of over one hundred international projects that we are carrying out with our Research & Innovation Department, is used to protect and nurture unique landscapes with a high level of biodiversity – in this case, the **Espace Mont-Blanc** – in order to enable and promote conscientious and sustainable tourism that respects Italy's natural heritage. We have further experience innovating in this field, including:

- **HyperCute**, a system designed to manage and promote sites and objects of artistic and cultural value, using XR and AI technology to highlight places of tourist/cultural interest with sophisticated digital content. Thanks to HyperCute, it is possible to create immersive and interactive experiences using photos or 360° videos, allowing visitors to make the most of local attractions and services on various devices, including mobile phones. It is also a useful tool to create a profile for the area, perhaps by starting with the main attractions and gradually adding other locations, or by exploring specific places and delving deeper over time.
- An **exhibition** created entirely in virtual reality for the MAXXI (National Museum of 21st Century Arts) in Rome, digitising plans from the greatest contemporary architects – from Campo Baeza to De Feo, and from Rossi to Sacripanti – to create 3D models for users to explore in detail via an immersive app, compatible with virtual reality viewers.



Interactivity: applications and services from anywhere and at any time



06

Urban security: monitoring what happens to protect citizens

Building a secure city means analysing the context to **design and enable an integrated system capable of protecting the health and safety of the citizens and the city's heritage**. It therefore requires a technological infrastructure that can effectively assess local phenomena, in addition to supporting decision-making processes in the field of road safety, safeguarding vulnerable users (pedestrians and cyclists).

To create an advanced, modern and effective infrastructure to support the work of the police, cities can implement systems based on AI with self-learning algorithms (machine learning and deep learning) to monitor illegal behaviour; deploy approved systems for detecting infringements of the Highway Code to reduce accidents; create smart pedestrian crossings to protect pedestrians; and establish an interface control room. The advantages include:

- **Reduced** insecurity among citizens and increased levels of trust in the police and local authorities
- **Timely and effective** law enforcement and local government interventions on the ground
- An overall **reduction** in crime and illegal behaviour
- A progressive **reduction** in urban decay
- **Higher levels** of social cohesion and civic cohabitation
- **Increased** compliance with the Highway Code and decreased accidents leading to deaths and injuries

The urban and road protection projects play an important role in the promotion

and implementation of a unified and integrated security system. Its core purpose is to ensure the wellbeing of the local communities, which is also pursued through urban, heritage, social and cultural redevelopment activities and the enhancement of degraded areas.

This principle forms the basis of **security in the Augmented City, which must be able to constantly understand and monitor what is happening and react quickly to protect its citizens.** The technological solutions we have developed in the name of Urban Security fit perfectly into this context. We are part of the **Smart SENSE 4.0, SURVANT, APPRAISE** and **COMPACT** research projects, which allow for the automatic detection and timely communication of abnormal behaviour and public safety issues, with full respect for citizens' privacy.

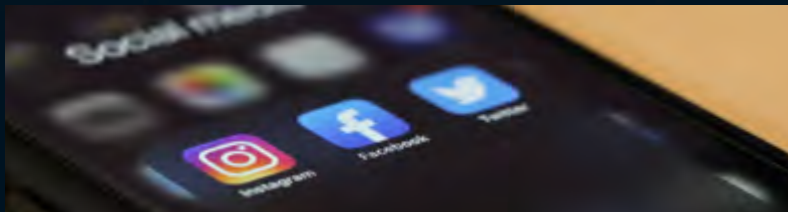




Research

SMART SENSE 4.0

This project allows for smart use of all the relevant information that can be extrapolated from the internet and in particular from social media, while respecting citizens' privacy, to detect risks and potential threats to public safety and promptly identify and monitor cyber-physical events and dangers. SmartSense supports the creation of data ecosystems for smart cities, promoting a proactive and participatory approach to urban security, focused on prevention by countering emerging and difficult-to-identify threats without proactive citizen involvement. The in-depth analysis of the data, based on innovative artificial intelligence techniques, creates a higher level of awareness among citizens and enables participatory security policies and mechanisms.



SURVANT

Survant works to identify events that may affect public security by automatically analysing heterogeneous video archives, which are distributed, acquired and processed in near-real time, to recognise behavioural patterns that are deemed dangerous to public safety.

The system can be configured and trained to detect and monitor various types of events and crimes that take place in the street (vandalism, thefts, muggings, assaults), large public events (violent demonstrations, uncontrolled crowd movements during sports or music events, etc.), as well as crimes against minors and the elderly.





Projects

APPRAISE

Appraise offers an integrated threat intelligence solution for augmented cities, enabling the continuous and effective monitoring of internet sources (including social media and darknets) to detect potential threats and improve strategies for the protection of soft targets, promoting collaboration and the proper exchange of information between local authorities, law enforcement agencies, and security professionals from both the public and private sectors, who work together to manage citizen security. By adopting a proactive resilience-driven approach based on risk assessment, APPRAISE helps to prevent criminal and terrorist acts, significantly reducing the vulnerability of cities, urban spaces, and their citizens, who are constantly exposed to physical threats and cybercrimes.



COMPACT

This project was launched to strengthen the IT resilience of local public administrations. In 2021, the global number of ransomware attacks grew by 151%, and the FBI has warned us that there are currently one hundred different strains of ransomware circulating around the world. In order to achieve its objective, COMPACT provided the five municipalities participating in the project (Bologna, Afragola, Amadora, Donostia-San Sebastián, and Bremerhaven) with the necessary tools to carry out quick and effective risk assessments, benefit from training services, carry out efficient monitoring activities, and share information and knowledge with other local public administrations. The creation of an adequate infrastructure to support the safety of citizens through the installation of sensor and camera networks, smart street furniture, variable message signs and cutting-edge sensors makes the analysis of local phenomena more effective, supporting the decision-making process.



Urban security: monitoring what happens to protect citizens



The **GDPR** has strengthened the protection afforded to citizens' personal data. This regulation has profoundly changed the ways in which the collection, storage and sharing of personal and sensitive information regarding citizens is managed. There is therefore a need for reliable tools to comply with the requirements. At Engineering, we are responding to this need with cutting-edge solutions. For example, CaPe (Consent-Based Personal Data Suite) is a “user-centric” platform aimed at public authorities, allowing citizens and companies to manage and track personal data in compliance with the GDPR. The CaPe framework provides tools both for data owners, who can easily manage and track their data, checking the consent granted, and for data processors, who can ensure that their data sharing is secure and in compliance with the data minimisation requirements and rights to be forgotten and data portability laid out in the GDPR. Finally, the integration of blockchain technology allows for automated consent “notarisation” and makes data management more transparent.



07

Welfare: proactive social policies to leave no one behind





We promote the development of local communities by enabling:

- **businesses** to operate within the Industry 4.0 framework, through the application of ICT in areas ranging from goods logistics to the development of innovative methods for trade, local promotion and increased services
- **citizens** to take advantage of knowledge by applying it to education – utilising big data and supporting teachers in terms of learning processes and activity design – in order to make the school system more modern and accessible, including in terms of building and teaching quality.

Furthermore, Engineering’s Augmented City also has a positive effect on citizens’

health. Prevention, treatment and care processes are now moving towards networked and multidisciplinary models, capable of creating integrated pathways based on specific factors. Information infrastructures, and their integration across clinical and organisational domains, play a crucial role in the implementation of these models. The opportunities opened up by “data management” and its potential for value creation are enormous for both citizens and providers:

- a **reduction** in (or complete elimination of) waiting times for scheduled appointments, as well as intervention times for health emergencies
- continuous **monitoring and remote assistance** for patients who do not require hospitalisation

- the immediate **availability and delivery** of specialist drugs to the many health facilities located in the cities, as well as the continuous and widespread **monitoring** of air quality, water quality, workplace quality, and much more.

With life expectancies increasing, local authorities must provide new and rapid responses to guarantee adequate services while simultaneously promoting social inclusion and maintaining the same quality and level of care. This issue has become particularly pressing in light of recent health emergencies. Understanding the social context and the number of beneficiaries makes it possible to adopt an unambiguous and unified vision, resulting in more informed management and efficient and targeted expenditure, leading to social equity, an increase in services, retraining, and

a broader group of service recipients. The management of data on the resident population (not just patients) makes it possible to respond rapidly to changing local needs, acting on specific, surveyed, and georeferenced clusters to act in a preventive and proactive manner (moving from social services to social policies).

In this context, we at Engineering, and Municipia in particular, offer local authorities a range of solutions – including by way of outsourcing – to guarantee greater efficiency, activation of resources, simplification of procedures, increases in essential service levels, expansion of the area of intervention, and new services to create real **community welfare**.

08

**Digital Enabler: our
platform ecosystem**



In cities, data and information must be easy to access and utilise: by city administrators, by service providers, and by all those who live in cities every day of their lives. This is the only way to effectively address the priorities and needs of cities, creating sustainable value for the entire urban ecosystem and exercising data-driven governance. To this end, Engineering has developed a digital platform ecosystem, Digital Enabler, with a specific vertical service dedicated to the Smart City, which supports cities in their decision-making processes, facilitates new business models based on the data economy, increases business opportunities for the various players in the urban ecosystem, and allows citizens to benefit from better services.

This suite of accelerators allows for the rapid development of data management applications, providing a single point of access to an integrated urban knowledge base.

Thanks to its key features, it is able to:

- enable rapid development of new vertical applications
- make heterogeneous software systems interoperable
- provide a suite of independent and interoperable tools
- allow for automatic identification of open data sources (data discovery)

- manage different IoT devices that can interact through standard protocols such as HTTP, MQTT, OPC-UA, ModBus at different levels (Edge, Near Edge and Cloud)
- offer tools to view and interact with data in different ways, from standard dashboards to digital twins, through to augmented and virtual reality applications
- encompass tools that guarantee scalability in the management of big data and data streams
- offer developers a code deployment environment in serverless mode
- provide graphical approaches for design and monitoring processes and for the integration of data without requiring specific programming skills (low code)
- provide a layer of standard API to ensure maximum interoperability with customers' existing third-party systems/solutions
- deduce new information from data and analyse trends using AI tools and a catalogue of ready-to-use algorithms
- guarantee that the processing of personal data conforms with the European GDPR.



FEATURES

Cloud-native and scalable solution for managing data from heterogeneous sources (including IoT and satellite data)

Composed of **independent and interoperable modules**, it provides developers with **serverless environments** to execute code and **develop AI models**

Based on **open-source software**, it complies with standard specifications for interoperability and GDPR

BENEFITS

Domain and technology-agnostic, it accelerates the development of domain-specific applications that can be **deployed anywhere** (on-premises, public/private cloud, hybrid cloud environments)

Drastically reduces time-to-market for new applications, meeting the rapidly changing market demands

Enables interoperability without being intrusive in third-party system integrations

Accelerators

- Data Discovery
- Data Acquisition
- Rule Engine, Adv. analytics, Serverless
- Data Integration and Harmonization (Low/No code)
- IoT and Edge Management
- Data Vis. (Digital Twin, dashboards, AR/VR app.)

INCREASED INTERCONNECTION

DE is a platform that is natively IoT-enabled and based on Open Standards and Open APIs



SIGNIFICANT CHALLENGES REQUIRE COLLABORATIVE RESPONSE

To easily enrich and coordinate data, integrate third-party capabilities and services, and derive new insights using AI techniques.

EXPANSION OF PLATFORM-BASED BUSINESS MODELS

DE is a multi-purpose data-driven platform enabled for the Cloud, serving organizations, communities, and end-users in the market.

INFORMATION BECOMES THE MOST VALUABLE ASSET

Advanced analytics, data exposure, and data monetization are well-defined processes.

Digital Enabler, which is based on open-source software, complies with the standardisation specifications promoted by major international communities such as **FIWARE¹, GAIA-X², International Data Spaces Association³ and Open & Agile Smart Cities⁴**. In a market replete with proprietary digital solutions and platforms for Smart Cities, these distinctive elements make Digital Enabler an attractive choice, even for cities with increasingly limited resources.

Digital Enabler also aims to radically transform the way urban services are designed and delivered, directly involving citizens and other stakeholders in their co-design and co-creation through a shared open innovation space, promoting the development of user-centric applications and services. Since 2017, it has been successfully applied in both pilot projects in various fields (for example, parking management, bike sharing, mobility, environment, resilience to natural disasters, tourism, health, utilities, agriculture) in Europe and South America, and in production contexts (e.g. a biosurveillance solution for tracking the SARS-CoV-2 pandemic and a remote control system for public lighting). The platform's journey has been shaped by a commitment to forming additional partnerships, both nationally and internationally, to contribute to the digital transformation of urban services in European cities and around the world, with the aim of **improving the quality of life and wellbeing of citizens**.

1. <https://www.fiware.org>

2. <https://www.data-infrastructure.eu/GAIA/Navigation/EN/Home/home.html>

3. <https://internationaldataspaces.org>

4. <https://oascities.org>



Digital Enabler for Smart Cities

Smart Land in Valmalenco

Italy's first "Valley 4.0". Valmalenco, in the Alps, is working to drive local development in terms of infrastructure; economic, cultural, social and environmental attractiveness; cohesion; and a shared identity. Under the project financing scheme, a technology and data collection infrastructure is implemented and managed for each project.

The main platform is Digital Enabler, in addition to a series of digitisation solutions and services for citizens and municipal employees (ARGO).

Eng-DE4BIOS: the power of the data in the fight against Covid19

Our data-driven and cloud-native biosurveillance system is able to collect, integrate and harmonise data from different sources in order to provide updated status information on the evolving pandemic in real time while respecting personal privacy. Based on our Digital Enabler platform ecosystem, the solution can map and geolocate infected subjects and identify clusters that require urgent attention using algorithms based on artificial intelligence. Digital Enabler has made it possible to integrate data from heterogeneous sources (healthcare staff registries, residential facilities for the elderly, electronic health records, microbiology laboratories, hospital records, employee records, regional records, tax records).

Smart Lighting in Sicily for energy optimisation and reduction of CO₂ emissions

By applying an innovative approach to cities, we are able to lower their energy consumption, reduce pollution and free up economic resources, as well as providing the public and businesses with information and innovative services via mobile devices. In this context, a group of Sicilian towns came together, backed by Digital Enabler, to use lighting only where and when necessary, reducing CO₂ emissions and electricity costs. The system is connected and integrated with sensors and video cameras, which remotely detect, monitor and manage information received from the urban ecosystem, with a view to improving local surveillance for the benefit of public safety.



Digital Twin for Smart Building

XDT (eXtended Digital Twin) is a powerful tool to improve energy efficiency and establish a holistic overview of a given building: sustainable logistics, energy consumption, communications, planning, security, internal mobility and comfort. Our XDT solution is based on Digital Enabler. Thanks to its sensors and IoT technology, it allows for bidirectional information transfers in order to update the virtual model based on real-time updates from its physical counterpart. This technology accelerates the configuration of new smart solutions through the collection, processing, harmonisation and visualisation of data, allowing users to take actions and collect feedback in the field. XDT has been implemented as a pilot in the headquarters of the Focchi Group, a manufacturer of latest-generation smart facades.

Digital Enabler: our platform ecosystem

09

What is the future of the Augmented City?





Where will the next generations choose to live? Where will investors choose to establish their economic activities?

Number 11 of the 17 Sustainable Development Goals set out in the United Nations 2030 Agenda is “To make cities and human settlements inclusive, safe, resilient and sustainable.” This means, among other things, limiting the waste of energy and water, reducing greenhouse gas emissions, and managing waste and mobility more efficiently.

It goes without saying that a new balance needs to be struck between the various social, environmental and economic aspects. **To bring Smart Lands to life, it will take courage, integrated solutions and the ability to “network”**, bringing together diverse needs and including smaller organisations. Digital technology is therefore a powerful enabler, bringing positive changes to our everyday lives, the economy and the local area. The new **digital ecosystems** can be used to create solutions from new and existing assets and technology,

based on the main needs of people, neighbourhoods and cities.

We can work together for a common good, with increasingly active roles for all and an open dialogue between citizens and local and central government.

Augmented Cities are opening the doors to this future, and market leaders such the Engineering Group are proud to play their part.

This is the direction taken by Augmented Cities, and it is on this that market leaders like the Engineering Group rely, embracing the great challenge of our times: not creating a “city of the future” from scratch, but evolving cities that have existed for centuries, leveraging their history and traditions while also looking ahead and investing in innovation.

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