libelium

The Green Book of Libelium 2025

Pioneering tomorrow's technology today

Year review

libelium.com

Contents

Alicia Asín
is CEO & co-founder
of Libelium

Instructions for a future that already exists

We close 2025 with the same feeling as a runner who runs out of breath a meter from the finish line. It has been a year of brilliant diagnoses and timid treatments. A year of PowerPoint techno-optimism, of summits where we applaud the urgency and of pilot projects that never scale up. We have talked more than ever about sustainability, smart cities, and the data revolution, but the reality is that we continue to apply 20th-century solutions to 21st-century problems. That is why 2026 cannot be a sequel. It must be a reboot. The year in which we leave behind digital adolescence, that phase of fascination with the new toy, and enter maturity: that of purposeful action.

The year of real datacracy, not just headlines. Stop using data as a rearview mirror to lament what was, and start using it as a map to decide, with rigor, where we are going.

And let no one say it's a utopia. At Libelium, we don't talk about possibilities, **we talk about realities that have been implemented.** We've seen it in Cartagena. There, our artificial intelligence solution for air quality did not result in more restrictions, but in more intelligence. The data made it possible to design a Low Emission Zone (LEZ) with surgical precision, minimizing restrictions on citizens and paving the way for green and transformative solutions such as the superblock in the historic center or the restoration of the Molinete Archaeological Park.

That is **datacracy:** not a Big Brother watching over us, but a tool that enables better-managed freedom.

We will also see this at the Alhambra. A monument that has survived centuries of history cannot be left at the mercy of the unpredictable. We have been entrusted with creating a **digital twin.** This is not a technological whim for virtual tours, but a shield against time. A solution that allows us to see and predict how humidity, temperature changes, or visitor flow can cause irreparable damage. It is using code to protect stone, artificial intelligence to safeguard memory.

Cartagena and the Alhambra are not anecdotes; **they are proof that the future is not a what, but a how.** They demonstrate that it is possible to govern with data without sacrificing rights, and to protect our legacy with a vision that anticipates, rather than reacts when it is too late.

We can continue to be an adolescent civilization, trapped in paralysis by analysis and polarization, or we can take the leap into maturity. A maturity where purposeful technology is not an option, but the only way forward. Where companies like Libelium not only have a market opportunity, but a historic responsibility.

Datacracy is not a prophecy; it is a decision.

The instruction manual for 2026 has already been written. So has the technology. The only question that remains is whether we, as a society, are finally up to the task. ■

European digital sovereignty in play

Antonio J. Jara
is CSO & board
member of Libelium

Let's be clear: talking about “data spaces” in Europe runs the risk of becoming the new Olympic sport in Brussels. Conferences are organized, lengthy papers are written, and PowerPoint presentations are designed that are true works of bureaucratic artistry. Meanwhile, on the other side of the Atlantic and the Pacific they are not debating the semantics of digital sovereignty; they are building it on a massive scale, with a market or state logic that should keep us awake at night.

Europe, with its fascination for regulating everything before creating it, sometimes seems more interested in designing the instruction manual for a car that does not yet have an engine.

The need for a federated, sovereign data infrastructure is obvious. The real question is whether we have the ambition and agility to build it before we become a digital province of other technological empires.
This is where companies like Libelium stop talking and start acting. We are part of the Gaia-X Board of Directors to build the foundations of this new economy. Our job is to connect the physical world, the one you can touch, measure, and feel, with that big digital strategy. When we install an air quality solution in a city, we're not just collecting particles per cubic meter; we are generating sovereign data for an environmental digital twin, enabling cities to make evidence-based decisions, not on the latest political whim. Once integrated into a European data space, this data becomes a strategic asset.

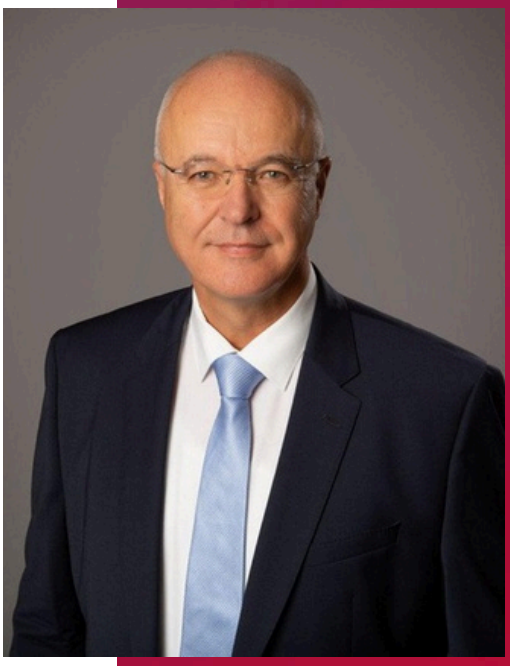
The same applies to water quality data, comfort KPIs in the hospitality industry, soil moisture in agriculture... The list is endless. If you can't imagine a business model now, you're completely out of the game. If your mind is already racing with ideas, count on Libelium on your path to success.

Europe needs less rhetoric and more heroes.

It needs to understand that sovereignty, not just digital sovereignty, is not declared; it is exercised. And it is exercised by building, integrating, and scaling up. Data spaces are not an end in themselves; they are the playing field.

And Libelium is not here to warm the bench.

Gaia-X and the importance of Europe's strategy, sovereignty, and governance



Ulrich Ahle, CEO of Gaia-X

At Gaia-X, we are driven by one clear goal: advancing Europe's digital transformation through trust, openness, and sovereignty.

Our mission is to create the de facto standard to enable federated and trusted data and infrastructure ecosystems, by developing a set of specifications, rules, policies, and a verification framework, allowing businesses, governments, and citizens to share and securely process data without handing over control or compromising on European values.

In today's economy, data is the central driver of competitiveness and innovation.

However, many European organisations, particularly small and medium-sized organisations, remain dependent on platforms that do not always align with Europe's principles of transparency, interoperability, and fairness. What is more, many organisations are captive to their data services or infrastructure providers due to a lock-in effect and the cost for a migration.

Gaia-X represents Europe's determination to define its own standards and build digital independence on its own terms. We are building an environment in which data can move more easily and responsibly across sectors and borders, complying with local regulations and enabling Europe's digital economy to flourish on its own terms.

At the heart of Gaia-X lies the concept of digital sovereignty. This means ensuring that every organisation retains control over where.

its data is stored, how it is accessed, and uThrough clear governance structures, compliance mechanisms, and technical standards, Gaia-X translates this principle into practice.

Our goal is a federated ecosystem in which no single actor dominates and where transparency, interoperability, and trust are guaranteed, enabling new participants to enter the ecosystem automatically if they comply with its rules.

Gaia-X represents Europe's determination to build digital independence

Companies like Libelium share this same mission. As experts in smart technologies and IoT solutions, Libelium represents the Gaia-X vision: enabling data to be used ethically, securely, and for the benefit of society.

Together, we are proving that innovation and sovereignty can go hand in hand, empowering organisations to utilise the value within their data while maintaining full control and responsibility.
Globally, approaches to digital sovereignty vary. In Europe, however, we are pursuing a distinct and balanced path, one that is open yet sovereign, innovative yet responsible.

What if AI planned the city for everyone?

Dr May East, international urbanist and author of "What if Women Designed the City?"

The future of humanity and the biosphere will be determined by how we choose to evolve our cities in the twenty-first century. Although urban areas cover just four percent of the Earth's surface, they consume 80 percent of global energy, generate 75 percent of carbon emissions, and draw more than three-quarters of the planet's natural resources. Cities are therefore the crucibles where planetary limits meet social aspirations – and increasingly, where artificial intelligence is influencing the conditions of everyday life.

AI now plays a significant role in how cities manage energy, mobility, health, and public services. Used wisely, its potential could be transformative. However, when AI systems are trained on biased or incomplete data, they risk reinforcing – and even amplifying – inequalities linked with gender, race, class, age and disability. Many city managers face a common challenge: the lack of intersectional, disaggregated datasets. Without such data, AI may reproduce historical inequities instead of supporting more just and co-evolving urban futures.

For AI to contribute meaningfully to equitable urbanisation, it must move beyond a narrow focus on optimisation. Rather than simply improving traffic flows or resource distribution, it should function as an instrument of bio-cultural-spatial justice – supporting ecological regeneration and gender-responsive design.

A new frontier is emerging in which cities deploy AI to strengthen people-centred planning, improve public space stewardship, and expand democratic participation. Vienna and Curitiba are among the cities demonstrating how digital technologies can deepen commitments to liveability and gender equity.

Vienna, a global reference for gender-sensitive planning, is now extending these principles into its digital transition. The city's long-standing practice of designing neighbourhoods around safety, walkability, care rhythms, and mixed-use proximity is being enhanced through AI tools that analyse mobility behaviours and assess green-infrastructure performance. In developments such as Aspern Seestadt, planners use data to understand how caregivers, children, and older adults navigate space and how these patterns intersect with energy use and climate resilience.

Curitiba offers another illustration of how AI can reinforce gender-sensitive planning. Through systems such as Zeladoria Digital, AI identifies broken sidewalks, poor lighting, and unsafe crossings – conditions that disproportionately affect women, who often walk more, trip-chain for care-giving, or travel with children.

When informed by gendered and intersectional realities, AI can illuminate caregiving-related mobility patterns, identify areas where women feel unsafe, and predict environmental impacts before harm occurs. In doing so, it becomes a catalyst for cities that are not only technologically advanced, but also socially just and ecologically regenerative. The question now is: what if AI planned the city for everyone?

Rights to the Future: Technological progress with values

Luisa Alli Turrillas is general director of Fundación Hermes

The technological acceleration of the past decade has outpaced all projections, propelling advancements that are redefining our societal capabilities. Artificial intelligence, automation, and digital platforms have unlocked frontiers of innovation that, merely a few years ago, bordered on science fiction. This dynamism presents a historic opportunity to construct a digital landscape that is safer, more inclusive, and steadfastly aligned with democratic values.

For while digitization has democratized access to tools that foster creativity, productivity, and civic engagement, it has simultaneously unveiled new risks: the misuse of personal data, opaque algorithms, or automated systems that threaten to entrench inequalities. Addressing these challenges does not imply stifling innovation, but rather steering it to fortify our rights framework.

It is in this spirit that Derechos al Futuro emerged—a citizen-led movement backed by over forty organizations, dedicated to ensuring that technological transformation progresses without compromising human dignity. Its mission is to bridge the gap between digital rights and diverse societal stakeholders, placing these issues at the forefront of public discourse

At this juncture, corporations play a pivotal role. Beyond mere regulatory compliance, they must lead responsibly by championing measures such as 'privacy by design,' ensuring algorithmic transparency, establishing strict boundaries on data usage, and bolstering cybersecurity. Likewise, ensuring equity within AI systems is paramount to preventing biases that disproportionately impact vulnerable

communities, thereby fostering a trustworthy digital ecosystem.

This commitment must be complemented by clear public policies and an informed, active citizenry capable of comprehending the technological impact on their rights and participating in their defense.

The digital landscape evolves with such velocity that it demands a process of constant reflection. Derechos al Futuro provides the necessary compass to guarantee that innovation proceeds in tandem with dignity, liberty, and equality. A robust, inclusive, and legitimate digital future is attainable only if we uphold these principles at every step of the journey. ■

Key results and growth in 2025

LIBELIUM'S TURNOVER 2025 **11,8M€**

+2M€
WON IN DATA SPACES

127
NEW PROJECTS

^40%
COMPARED TO 2024

Libelium is committed to quality...

ISO 9001

ISO 14001

ISO 45001

NEW

NEW

ISO 20000

ISO 33000

ISO 27001

ISO 178104

CERTIFICACIÓN DE CONFORMIDAD CON EL ens Esquema Nacional de Seguridad Categoría ALTA RD 311/2022

...environment....

Measuring our environmental impact.

We take care of our environment:
We are committed to reducing our environmental impact.

3.613

ENVIRONMENTAL SAVINGS (kpt/tn TREATED)

Theoretical score according to the European Commission's PEF 3.1 methodology. It is the result of weighting and aggregating 16 environmental indicators, among which are the carbon footprint, embodied energy, and water footprint.

.07

Tons of CO2 eq. not emitted

.19

MWh of energy consumption avoided

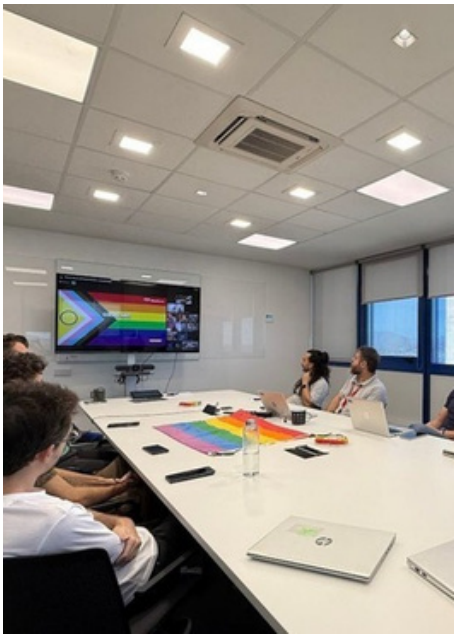
.82

m³ of water saved

...and to people.

LGBTQ+ Equality Plan

Weare proud tohavesignedour Equality and Non-Discrimination Plan, reaffirming our dedication to creating an environment where every individual feels respected indepently from their sexual orientation, and gender expression and identity.



Non-Discrimination Plan

Libeliummaintains a strictanti-sexual harassment protocol, ensuring a safe and respectful environment for all employees. This protocol fosters a workplace free from harassment and discrimination, where the well-being and dignity of every individual are paramount.

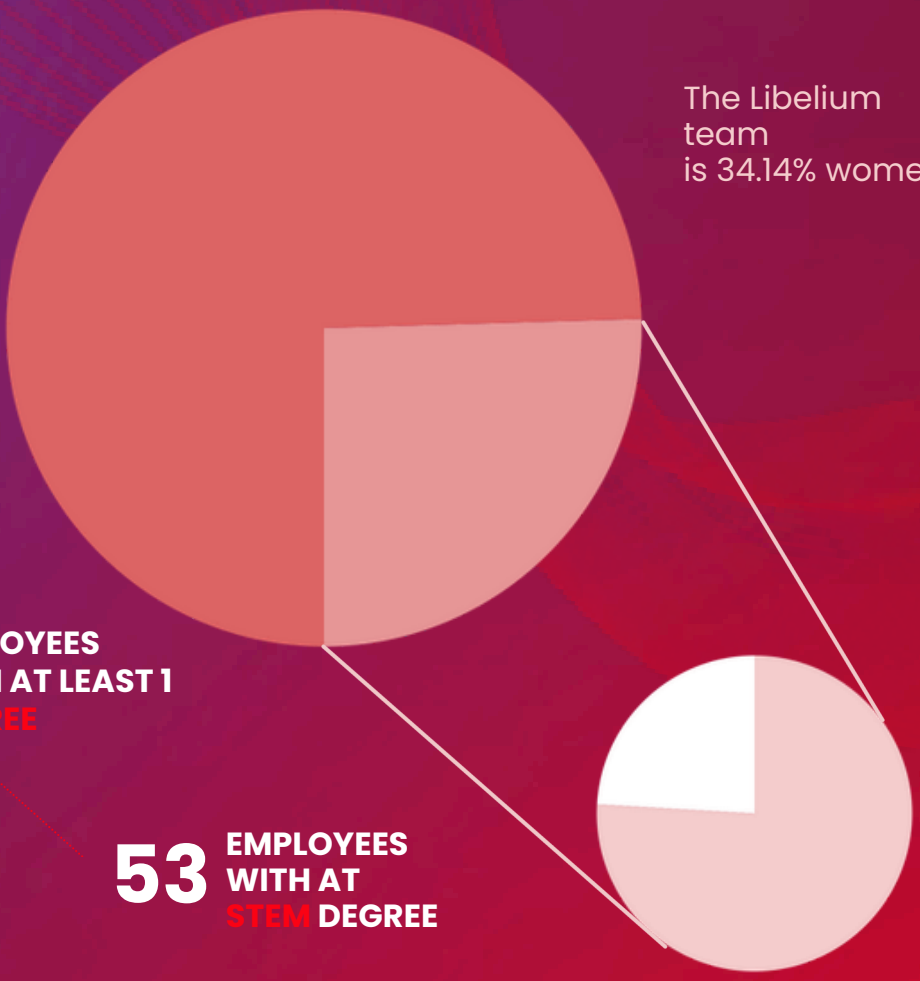
...and to people.

Family Responsible Company

Maintaining our commitment to work-life balance, Libelium renews once again the Empresa Familiarmente Responsable (EFR) certification reaffirming our dedication to build supportive and flexible work politics for our employees and their families.

Corporate Social Responsibility

Libeliumhasbeen awardedthe RSA+ (Corporate Social Responsibility) seal. Six years in a row! This certification highlights our dedication to transparency, social well-being, and environmental stewardship in all our operations.



The Libelium team is 34.14% women.

82 EMPLOYEES

74 EMPLOYEES WITH AT LEAST 1 DEGREE

53 EMPLOYEES WITH AT STEM DEGREE

35% of women in Libelium has at least one STEM degree.

Co-founded in 2006 by Alicia Asín (she/her), current CEO of the company, Libelium has 2 women on its management committee.
The global staff is made up of 28 women, 54 men.

Forging Europe's digital frontier

Pioneering the technology and leading the change in building the EU's sovereign data market.

+2 million euros for
Data Spaces projects

Libelium has won +2 millon euros to develop data spaces:

- **GeoSpaceData (SEDIA):** A project to create a geospatial data space that facilitates access to and sharing of geographic information for decision-making
- **AI4DS (SEDIA):** An initiative that uses artificial intelligence to improve and automate data management and analysis within data spaces.
- **Geo4Water (DS4SCC):** A data space focused on water management for Smart Cities & Communities, utilizing geospatial data.
- **BeatheHeat (DS4SSCC):** A collaborative project between the cities of Cartagena, Naples, and Taranto to use a data space to help mitigate the effects of urban heat.

DOME

Distributed Open Marketplace for Europe

The goal is to build a secure, unified digital data market, aligned with the European digital identity (e-wallet) and the European Blockchain Services Infrastructure (EBSI), promoting data sovereignty and privacy.

- **Objective:** To create a federated catalog of cloud-to-edge service offerings.
- Focus: Usability, inclusiveness, and equality.
- **Libelium's role:** Spanning the entire value chain, from data generation to use case implementation.
- **Key Partners:** Nunsys, Polytechnic University of Valencia, GFZ Potsdam, Barcelona Supercomputing Centre, and others.

SIMPL

Streamlining cloud-to-edge federations for major EU data spaces

SIMPL is essential for allowing data providers to maintain full control over who accesses their data, ensuring data sovereignty in a secure ecosystem.

- **Funding:** A €150 million project funded by the Digital Europe Programme.
- **Features:** Modular, open-source, scalable, and secure.
- **Objective:** To seamlessly interconnect datasets and their infrastructure.
- **Constructive Feedback:** Libelium has highlighted the need for dedicated semantic work within the SIMPL project to enhance interoperability.

LDT Toolbox

Powering Smarter, More Sustainable Cities

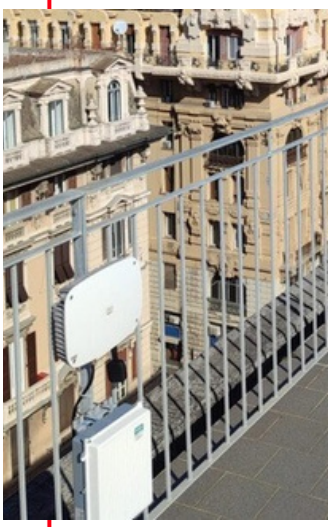
These virtual replicas, fed with real-time data from IoT sensors, allow for the simulation, visualization, and prediction of urban dynamics for more efficient management and planning.

- **Technologies:** IoT, Artificial Intelligence, and data analytics.
- **Applications:** Urban planning, resource optimization, and improving quality of life.
- **Practical Example:** In Genoa, digital twins are used to predict and prevent the deterioration of its architectural heritage.
- **Libelium's Platform:** iris360 is Libelium's digital twin ecosystem, featuring solutions like envair360 (air quality) and grid360 (energy sector).

European Data Spaces are already running

Do you already have your bib?

Key success stories



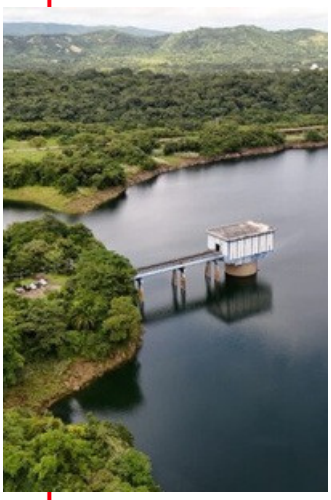
Digital Twins for Genoa's UNESCO Heritage

Faced with thethreat of pollution and mass tourism,

Genoa is protecting its historic Palazzi dei Rolli with Digital Twin technology. This virtual 3D replica, powered by IoT sensors, makes it possible to predict environmental damage before it occurs. It is the first model in Europe to transform heritage conservation, ensuring the future of millennial architectural gems.

Innovation halts deterioration to preserve world history

Read More



Digitisation of the Panama Canal's Critical Infrastructure

ThePanama Canal, avitalarteryofglobaltrade, has digitised its critical water infrastructure. With the Smart Water Xtreme (IoT) solution, Panama is implementing a 'virtual diver' that monitors water quality 24/7 in real time. This prevents contamination from maritime traffic and uses AI/FIWARE for predictive analysis.

Technology makes water management smart and sustainable

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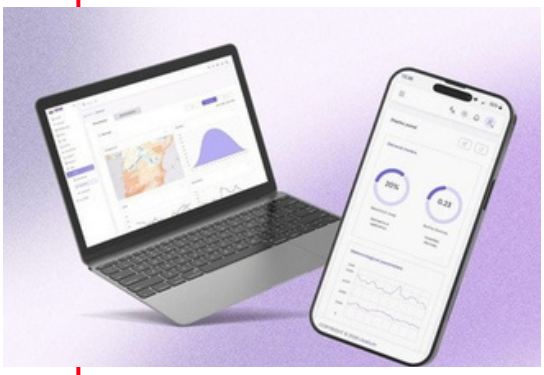
How Libelium's crowd monitoring helps save a Maltese paradise

GoldenBay, a natural gemprotected byUNESCO, was being destroyed by overtourism. Malta implemented Libelium's crowd monitoring (Smart Spot IoT) to obtain real-time footfall data. This allows them to predict peaks, set capacity limits and balance tourist demand.

Data management makes mass tourism sustainable

Read More

Key success stories



The iris360 digital twin platform continues to grow

Libelium is evolvingitsiris360 digitaltwin ecosystem by integrating the new grid360 solution, breaking down data barriers to maximise energy management efficiency and air quality without the need for large infrastructures.

Read More

Libelium enroll in the mission against “island cities”

Underscoring our commitmenttoopen technological ecosystems, Libelium joins the Open & Agile Smart Cities (OASC) network to help define MIM8 standards for digital twins, empowering cities to implement scalable and interoperable smart solutions free from vendor lock-in.

Read More

Libelium joins Gaia-X to promote data sovereignty in Europe

Reinforcingourpledgeto European digital sovereignty, Libelium joins the international Gaia-X AISBL association to actively drive the transition from vision to execution in building a federated, secure, and open data infrastructure.

Read More

Key success stories

Digital transformation in intelligent tourist destinations

Addressingthe critical challenges of the tourism sector, Libelium releases a comprehensive Whitepaper on Intelligent Tourist Destinations (DTIs), providing a strategic roadmap to leverage IoT and digital twins for sustainable, data-driven management.

Download

Maximize grid capacity with 62% less prediction error

Revolutionizinggrid management, Libelium enhances grid360 with advanced Machine Learning to reduce wind forecast errors by 62%, empowering operators to safely maximize transmission capacity and accelerate the renewable energy transition.

Download

How to apply UNE 178502 and 178503 in your smart destination

Simplifying the adoptionof tourismdata standards, Libelium publishes a practical whitepaper on UNE 178502 and 178503, detailing how iris360 empowers destinations to build interoperable, semantic ecosystems ready for European data spaces.

Download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Behind the change. Beyond the challenge