

The new role of robotics in industry: A step toward the future of automation and sustainability



INTERVIEW
Berta Aramburu
Head of the innovation laboratories at Moeve



INTERVIEW
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Chief Innovation and Technology Officer at Redeia and Director of Elewit

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GMV will take you there

Welcome to 2025!

2024 marked GMV's 40th anniversary—a milestone of four decades filled with achievements and continuous innovation. As we step into the new year, we are excited about the challenges and opportunities that lie ahead, enabling us to push the boundaries of what is possible.

If you want to be part of a dynamic team, visit our vacancies portal and find the perfect opportunity to start the new year:

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Letter from the president

In 2024, GMV has reinforced its commitment to sustainable growth and technological innovation. Our progress continues at a double-digit pace, both in revenue—approaching the 500 million euro mark, which we aim to surpass in 2025—and in our workforce, which now exceeds 3,500 employees. These accomplishments are a reflection of our vision: not only to meet current demands but also to anticipate the impact of emerging technologies in an ever-evolving market.

The Internet of Things (IoT), Artificial Intelligence (AI) and robotics are the cornerstones of digital transformation and the heart of many of our R&D initiatives. IoT connects devices, collects real-time data, and optimizes processes. AI analyzes this data, predicts trends, and automates decision-making, while robotics extends these capabilities into the physical world, automating

tasks and driving key industries such as manufacturing, healthcare, and logistics. The synergy between these technologies is creating a more connected, efficient, and competitive future. Our collaborations with industry leaders like Moeve and Repsol showcase the transformative impact of robotics and cobots in industrial settings. Projects such as ASUMO, which uses smart robots with IoT sensors for autonomous inspections in electrical substations, and Scoobic MED, focused on self-driving electric vehicles for sustainable urban distribution, highlight the vast potential of combining precise satellite localization with AI and cloud computing to manage robots and self-driving vehicles.

At GMV, we are confident in the power of technology to build a more efficient, secure, and sustainable future. This is the path we will continue to pursue alongside our clients and suppliers.

Mónica Martínez

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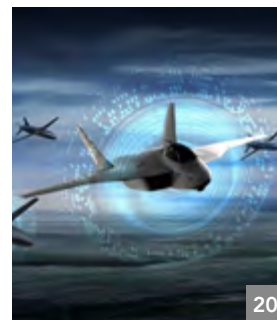
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The new role of robotics in industry: A step toward the future of automation and sustainability

Understanding the future path of industry requires first looking back and asking a fundamental question: What would the industrial landscape be like without the advent of robotics? The answer underscores the profound and transformative impact robotics has had since its commercial introduction in the latter half of the 20th century, coinciding with an era of unprecedented economic growth.

From its inception, robotics has been a driving force in productivity, resource optimization, and technological innovation—three pillars that have fueled all industrial revolutions. These factors have made robotics a direct multiplier of global GDP. Countries

such as the United States, Japan, and Germany, early adopters of robotics, witnessed substantial economic growth, with robotics contributing an estimated 10% to 15% of GDP growth by the end of the 20th century.

This history prompts a new question: What has transpired in the early years of the 21st century? While there is no clear-cut dividing line, we can see a natural evolution of the transformative role of robotics as it expands into new sectors and applications. Beyond manufacturing, robotics has found a place in industries like space exploration, agriculture, medicine, and logistics, creating unprecedented value. It has diversified into fields such as collaborative, service, humanoid,

medical, exploratory, defense, modular, nano, mobile robotics, and more.

A key turning point in this new era is the rise of Industry 4.0, a phenomenon that has accelerated both the development and integration of robotics with other advanced technologies. IoT (Internet of Things) sensors and communication systems now enable robots to collect and process vast amounts of real-time data. Additive manufacturing enables the creation of specific parts, which robots handle with millimeter precision. Robotics has also been integrated into advanced communication networks, leveraging cloud computing and 5G for concepts like cloud robotics, where computation takes place in the cloud, optimizing



resources and minimizing the need for physical infrastructure.

However, progress doesn't stop there. The interaction between robots and emerging technologies like augmented reality and virtual reality has introduced new forms of collaboration and efficiency in industrial processes. This convergence of innovations is paving

the way for a paradigm in which total autonomy in the production chain—once a distant dream—is now becoming a reality.

We stand on the cusp of a new era, where robotics will form a critical alliance with artificial intelligence (AI). This synergy promises to be one of the most significant technological leaps

in history. AI is empowering robots with the ability to adapt to dynamic environments and learn from them, enabling increasingly personalized and sophisticated interactions. As robotics continues to evolve, it will become more accessible and valuable, particularly in a world where sustainability and environmental consciousness are taking on greater importance.

Artificial intelligence as the catalyst for a robotic future

Artificial intelligence has become the driving force behind the rapid evolution of robotics. Today, robots are capable of operating in complex, unstructured environments and performing tasks that were once beyond imagination. Projects like ASUMO (Advanced SUBstation MONitoring), led by Elewit and Red Eléctrica, showcase how robotics, powered by AI and advanced solutions like **uPathWay**, can autonomously inspect electrical substations, handling tasks ranging from reading analog indicators to detecting oil leaks.

The impact of AI extends beyond enhancing the physical abilities of robots. It is also paving the way for breakthroughs in autonomous decision-making and problem-solving. In this new era, robots don't just execute tasks—they make decisions based on real-time data and analysis. The integration of technologies such as 5G, cloud computing, and data analytics allows the increasingly complex "brains" of these robots to reside in the cloud, reducing latency and maintenance while optimizing processing power and payload capacity.

In this context, solutions like **uPathWay** are becoming essential for industries that require precision and efficiency in managing robots and autonomous vehicles for tasks such as logistics, inspection, maintenance, transportation, and security. This

level of autonomy and intelligence is crucial in applications where human intervention is impractical or even impossible, yet it continues to add value in other areas. As a result, AI not only enhances robotic capabilities but also redefines the role and potential of robots within society and industry.

The impact of robotics on society

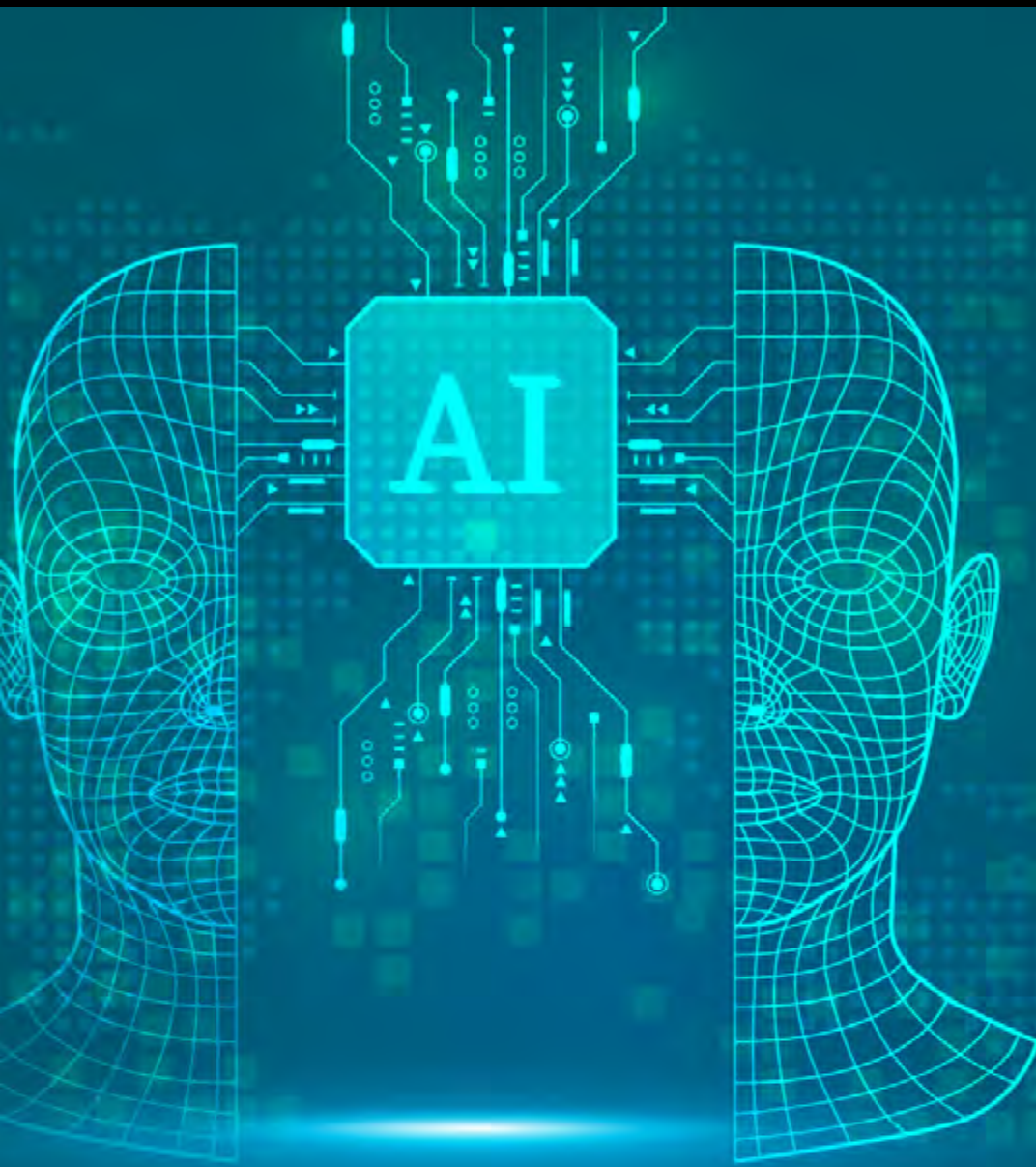
As robotics becomes more deeply integrated into society, it is inevitable that its presence will radically transform our world. The widespread use of intelligent robots in everyday life will significantly change how we interact with technology, blurring the boundaries between human and machine capabilities. This transformation will be seen across many aspects of life, from automated transportation and smart homes to healthcare and personalized education.

A tangible example of this shift is the Scoobic MED project: an Autonomous 5G Electric Logistics Vehicle with smart pay-per-use. In collaboration with Passion Motorbike Factory-Scoobic, GMV is developing a last-mile electric vehicle integrated with an autonomous vehicle control system. This innovative project enables logistics companies to move assets autonomously in urban areas, using a pay-per-use cost structure. Not only does this enhance efficiency and sustainability in urban logistics, but it also demonstrates how robotics is reshaping business models in the modern economy.

Economically and in terms of labor, robotics is driving a significant shift in how businesses operate and the types of jobs they require. The adoption of advanced robotics is not only automating tasks but also

revolutionizing business models and creating new economic opportunities. However, this shift presents challenges for the workforce, particularly with the displacement of low-skilled jobs or those that pose health risks. At the same time, new job opportunities will emerge in fields that demand advanced skills and the ability to quickly adapt to emerging technologies.

In this context, collaboration between educational institutions and businesses will be vital in shaping the labor market of the future. New roles will focus on the management, engineering, and innovation of robotic solutions, requiring not only technical expertise but also skills in problem-solving, critical thinking, and adaptability.



The robotic revolution in industry

The manufacturing industry has undergone a radical transformation, driven by the rise of smart factories and the implementation of the Smart Factory concept. This approach, closely tied to the concept of the software-defined factory (SDF), has been a key area of innovation for GMV since 2018. The company has developed solutions like **VirtualPAC** for the deployment, management, and secure operation of control systems in industrial plants, with the goal of improving processes

and addressing issues without the need for maintenance downtime.

These smart factories are not only more productive but are also better equipped to adapt to market changes and consumer demands. The integration of advanced robotics, AI, and IoT is enabling real-time monitoring and optimization of manufacturing processes, resulting in improved quality control, reduced waste, and faster production times, all contributing to more sustainable manufacturing practices.

Collaboration between humans and robots in these factories is another rapidly evolving key aspect. Collaborative robots, or *cobots*, enhance safety and ergonomics

in production environments while enabling more complex and creative processes. For example, Cepsa, with GMV as a technology partner, has implemented collaborative robots in its laboratories, equipped with specialized grippers. These robots have improved employee safety while driving significant gains in efficiency and productivity. *Cobots* not only automate sample analysis and packaging recycling but also promote circular economy-based production processes.

Furthermore, in partnership with GMV, Repsol has installed a robotic arm at its coke plant specifically designed for the safe opening and closing of reactors, a critical process in the energy sector. These interventions emphasize the importance of additive

manufacturing, which allows for the creation of specialized, custom parts and tools to address specific challenges in each industrial setting.

In addition to additive manufacturing and physical safety, cybersecurity plays a critical role in these projects. *Cobots* are integrated into industrial operational networks, becoming an essential part of the processes. At GMV, efforts focus on securing these systems by incorporating protective measures into the base software and securing the entire process, ensuring safe and efficient operations in highly demanding environments.

Agriculture as an emerging sector in automation

The agricultural sector, confronted with challenges such as climate

change, competitiveness, and the need to boost productivity, is increasingly benefiting from robotics. The agricultural robotics market is projected to grow at an annual rate of 17%, reaching \$218 billion by 2030 (according to GlobalData's "Robotics in Agriculture" report). From planting and harvesting to pest control and crop monitoring, robots are delivering unprecedented precision and efficiency, helping reduce labor costs and minimize environmental impact.

In this context, GMV is collaborating on the development of autonomous mobile robots aimed at transforming agriculture toward more sustainable practices. These innovations enable more efficient water use, precise pesticide application, and reduced soil compaction.

Additionally, GMV partners with companies in the sector to drive the digital transformation of their logistics processes into interoperable platforms. These initiatives not only enhance operational efficiency but also modernize the agricultural industry, aligning it with the growing demand for sustainability and advanced technology.

Leading robotics innovation for a sustainable future

Throughout this article, we have highlighted several robotics projects in industry that GMV is currently involved in or has participated in, illustrating the company's strategy, which focuses on three main pillars: collaborative robotics, industrial automation, and autonomous mobile robotics. In each of these areas, GMV delivers distinct value by developing innovative solutions and, in many cases, pioneering the design and implementation of market-first technologies.

- **Collaborative Robotics:** GMV focuses on projects where humans interact with robots or automated machines, especially in situations requiring high precision or complex industrial

GMV in space robotics

In the space sector, robotics plays a crucial role in various areas, including planetary exploration and orbital services. Robotics is essential to the emerging IOSAM (In-Orbit Servicing, Manufacturing, and Assembly) sector and

to achieving Europe's sustainability goals. In this field, GMV, in partnership with Spanish company AVS, developed the MICE device—an innovative mechanical interface for satellite capture and deorbiting at the end of their life cycle.

The MICE device is already in orbit aboard the LUR-1 satellite, and four new Copernicus Earth observation satellites are being equipped with the interface, which has been adopted by the European Space Agency (ESA) as the



autonomous asset inspections using quadruped robots to the autonomous management of material transport, alongside specialized services like sweepers, cleaners, and systems for road cone placement and removal.

In all these areas, GMV positions itself as a value-added integrator, forming partnerships with leading robot manufacturers, training and specializing its workforce, and delivering long-term, differentiated value to its clients.

In conclusion, robotics is poised to play an increasingly pivotal role in industry—not only in terms of efficiency and productivity but also in promoting sustainability. As robotic technologies continue to advance, it is essential to tackle emerging challenges and seize opportunities to build a prosperous and sustainable industrial future. Focusing on innovation, embracing robotics as a tool that integrates with multiple technologies, and positioning AI as a catalyst for groundbreaking solutions are critical to addressing future challenges. GMV will undoubtedly continue to contribute its expertise and leadership to these transformative projects.

processes. For these projects, GMV designs and develops custom 3D-printed parts using various materials, adapting them to each project's specific needs and creating tailored, unique solutions.

■ **Industrial Automation:** Specializing in projects where complexity and innovation are essential, GMV works in sectors where extreme conditions—such as high

temperatures or heavy asset handling—demand robust and reliable solutions.

■ **Autonomous Mobile Robotics:** GMV is advancing both end products and solutions that seamlessly integrate AI with mobile robotic systems. One notable example of GMV's capabilities in this area is the **uPathWay** solution. GMV develops technological solutions ranging from

standard for such missions. Additionally, GMV's robotic capture technology (CAT), designed for satellites equipped with MICE, is advancing rapidly, with a demonstration mission expected in the near future.

In other IOSAM applications, GMV leads Europe's latest developments in robotics for automatic assembly, such as the MIRROR robot, which can autonomously move, manipulate, and assemble various types of space structures in orbit. In-orbit

refueling will also be a key technology for the future of orbital transport and services. GMV is actively engaged in consolidating ASSIST, a docking and refueling interface, as the first European standard for this purpose.



Berta Aramburu

Head of the innovation laboratories at Moeve

Berta Aramburu, a graduate in Chemical Sciences with a specialization in Industrial Chemistry from the Complutense University of Madrid, brings over 25 years of experience to Moeve. Her work has been dedicated to research at the Energy Transition Center, in the area of refining conversion.

She currently oversees the company's four analytical innovation laboratories, located in San Roque, Cádiz; Palos de la Frontera, Huelva; Tenerife, Canary Islands; and Alcalá de Henares, Madrid. These laboratories play a vital role in providing analytical support to the company's various divisions and external clients. They also lead the development and implementation of new analytical techniques and methods to support new products arising from energy transition innovations. Berta's career at Moeve has been pivotal in advancing research and development in the energy sector, significantly contributing to the adoption of innovative and sustainable solutions.

The energy industry is transitioning toward cleaner, more sustainable energy sources. Could you share some of the innovative projects Moeve is pursuing to reduce its environmental footprint and contribute to this green transformation?

The world is changing and faces the most significant environmental challenge in its history. Global citizens are rallying against climate change, financial institutions are prioritizing ESG criteria, and governments are making ambitious commitments. We must all transform the way we consume, work, travel, and connect. Now is the time to act—swiftly, effectively, and collaboratively.

The energy sector is undergoing a transformation towards cleaner, more sustainable energy sources, and Moeve is at the forefront of this transition with a number of groundbreaking initiatives. "Positive Motion" is strategy for 2030, designed to drive the change towards a new organization that we hope will lead green molecule production in Spain and Portugal.

One of the flagship projects is the production of second-generation (2G) biofuels. Moeve is developing a plant to produce 2.5 million tons of sustainable fuels annually by 2030. These biofuels

are derived from waste and non-food raw materials, significantly cutting CO₂ emissions and advancing a circular economy.

Another significant initiative is the Andalusian Green Hydrogen Valley, set to become the largest green hydrogen project in southern Europe. This project will produce green hydrogen through renewable-energy-powered electrolysis, achieving a total capacity of 2 GW. Green hydrogen offers a clean energy alternative for use in a variety of sectors, including transportation and industry, helping to reduce reliance on traditional fossil fuels and lower greenhouse gas emissions. Green hydrogen is the energy vector under consideration for hard-to-electrify sectors.

Moeve is also committed to supplying sustainable aviation fuel (SAF), ensuring a continuous supply of SAF at Spain's major airports and contributing to a reduction of CO₂ emissions in the aviation sector. These projects underscore Moeve's commitment to sustainability and its active role in the transition to a greener economy.

Innovation is pivotal in moving toward a more sustainable economy. How has Moeve integrated research and

development to enhance energy efficiency and promote renewable energy use in its operations?

Innovation is a foundational pillar of Moeve's strategy, driving advancements in energy efficiency and the integration of renewable energy across all its operations. By embracing cutting-edge solutions, Moeve seeks to capitalize on opportunities for improvement and transition toward cleaner energy sources.

One notable example is the "Py-oil" project, a groundbreaking initiative in circular economy launched by Moeve in 2022. The project's pilot phase, successfully completed in July 2023, aimed to reduce dependence on fossil raw materials in production by recycling plastic waste. Through this initiative, Moeve tested the replacement of fossil feedstocks with pyrolysis oil—a product

“The energy industry is undergoing a transformation towards cleaner, more sustainable energy sources, with Moeve leading the way through a series of innovative projects”

obtained via chemical recycling of plastic waste—within its co-processing workflows. For the first time in Spain, Moeve achieved the production of circular phenol, a circular chemical component. Phenol is a versatile material essential to various industries. In renewable energy, it is used to manufacture wind turbine blades and solar panels. It is also used in the automotive and aerospace sectors to produce dashboards, vehicle interiors, and components for commercial aircraft. By utilizing single-use plastic waste that would otherwise end up in landfills, Moeve has set a benchmark for combining technological innovation, circular economy principles, and sustainability.

Moeve's Innovation Department is committed to creating innovative solutions that improve energy efficiency and reduce CO₂ emissions. These efforts are closely aligned with the company's "Positive Motion" strategy.

Collaboration is key to accelerating the energy transition. How is Moeve working with partners to speed up the adoption of sustainable technologies?

Moeve fosters collaboration to drive the energy transition through a range of initiatives and strategic partnerships. In today's environment, collaboration is essential, as it enables companies to share knowledge, resources, and innovative technologies to address global challenges more effectively.

“We plan to expand the use of collaborative robotics in production and logistics and explore new robotics applications in renewable energies”

A prime example is the launch of our startup accelerator, "Light Up", designed to support the development of emerging technologies that facilitate the energy transition. By partnering with startups, Moeve not only accelerates the adoption of emerging technologies but also creates an ecosystem of innovation that generates disruptive and sustainable solutions. Through this project, we aim to position ourselves at the forefront of the energy sector, addressing the challenges of our new business areas, such as sustainable energy production based on green molecules, sustainable mobility, innovative circular economy solutions, renewable energy storage, the chemical industry, and more.

Artificial intelligence and robotics could be key for maintaining competitiveness in an ever-evolving market. How is Moeve preparing to tackle future challenges and seize emerging opportunities in the context of the energy transition?

Moeve is leveraging artificial intelligence (AI) and robotics to optimize its operations. We are applying AI in predictive maintenance, process optimization, and energy management to improve performance and reduce costs. Robots are already handling tasks such as infrastructure inspection & maintenance and laboratory automation, boosting both personal safety and process efficiency.

The company is investing in AI and robotics training for its workforce, fostering a culture of innovation through hackathons and idea labs.

Moeve is also exploring new technologies like blockchain for supply chain transparency, IoT for real-time monitoring, and advanced carbon capture and storage (CCS) technologies. These efforts are focused on improving efficiency and reducing our carbon footprint. Looking to the future, Moeve plans

to further integrate collaborative robotics in production and logistics, deploy advanced AI systems for autonomous decision-making, and discover new applications of robotics in renewable energies. Through these initiatives, Moeve aims to lead the energy transition toward a more sustainable, efficient future.

A few years ago, Moeve implemented a robotic cell to automate the destruction of samples in its laboratories. Could you provide more details about this project and its impact on operational efficiency and employee safety? What are your future plans for expanding the use of collaborative robotics in your operations?

In 2022, we introduced a collaborative robotic cell, or cobot, at our La Rábida Energy Park laboratory in Huelva. This pioneering project, developed with GMV as our technology partner, automates the process of sample destruction and recovery, significantly enhancing both operational efficiency and safety for the people who work at Moeve.

The cobot is responsible for handling sample containers, opening them, and pouring out their contents. This automation enables us to process over 250 samples per day, improving productivity and efficiency. It also reduces human intervention in the handling of chemicals, which helps minimize health risks for our workers.

Additionally, we have installed a new cobot at our Innovation Center in Alcalá de Henares, Madrid, which will be fully operational by the end of this year. This robotic cell will prepare the aliquots need for the analysis of used lubricating oil samples, as part of the services Moeve offers to its clients.

Building on these successful implementations, we remain committed to expanding the use of collaborative robotics.



Regarding the promotion of automation and sustainability, how do you envision the role of robotics at Moeve in the next decade?

In the next decade, Moeve envisions robotics playing a pivotal role in our operations, driving both automation and sustainability. Below are some key projections and plans:

- **Advanced Automation:** Moeve plans to expand the use of collaborative robotics in all our facilities, not just in laboratories, but also in production and maintenance plants. This will allow for greater automation of repetitive and hazardous tasks, improving efficiency and reducing risks for employees. With the integration of artificial intelligence, robotic systems will optimize processes in real-time, adjusting operations to maximize energy efficiency and minimize environmental impact.
- **Robotics in Renewable Energy:** Robotics will be essential in the operation and maintenance of renewable energy facilities, such as solar and wind farms. Robots will efficiently and safely conduct inspections and repairs.
- **Circular Economy:** Robotics will also contribute to the circular economy by automating recycling and waste recovery processes, reducing waste and promoting material reuse.
- **Robotics at Our Service Stations:** Robotics will help us provide more efficient and safe services, optimizing wait times and ensuring a high standard of service quality.

These initiatives reflect Moeve's commitment to innovation and sustainability, preparing for a future where robotics and artificial intelligence are key to our success.



Silvia Bruno De la Cruz

Chief Innovation and Technology Officer at Redeia and Director of Elewit

Silvia Bruno holds a degree in Civil Engineering from the Polytechnic University of Madrid and in Materials Engineering from Rey Juan Carlos University. She also earned a Master's in Gas from the Higher Institute of Energy (REPSOL-YPF) and a PDM from IESE. She has pursued leadership and digitalization programs at prestigious institutions such as IMD Business School, MIT Sloan School, and the ASPEN Institute.

Since joining Redeia in 2011, Silvia has served as the Director of Innovation and Technology and is a member of the Executive Committee. In addition, she is the Director of Elewit, Redeia's technological platform and investment vehicle for projects focused on ecological transition, decarbonization, and communications. She is also a member of the Board of Directors of Hispasat.

With a career spanning the entire energy sector—from upstream to downstream in gas and electricity—Silvia has focused particularly on innovation and the development of disruptive, sustainable technologies that drive positive economic and social impact.

From your perspective as a leader in technology at an organization operating in the international electricity sector, what are the key areas where companies can focus to advance the ecological transition and universal connectivity?

While every organization plays a unique role in driving societal progress, I believe all companies have the potential and capacity to contribute in some way to the ecological transition and universal connectivity—two of the most significant transformations of our time and the central goals of Redeia.

At Elewit, as the innovation enabler for Redeia and its business units (Red Eléctrica, Redinter, Reintel, and Hispasat), we focus on several key areas, which align with our six core challenges as a company.

First, we work on electrical grid infrastructure and asset management, developing methodologies to optimize and automate critical processes in engineering, design, and infrastructure construction. In system operations and renewable integration, we focus on enhancing the flexibility of the electrical system and ensuring the

secure integration of renewable energy sources.

In the areas of connectivity, assets, and society, we promote universal and inclusive networks, optimize telecom services across our assets, and strengthen cybersecurity measures. Additionally, we are focused on creating new services and business models based on our assets and expertise.

In health and safety, we develop solutions to prevent accidents and enhance training and support for employees. Finally, under the banner of sustainable development, we aim to increase energy efficiency in our processes, reduce our carbon footprint, and promote the circular economy.

These are the areas we prioritize, and for us, they represent the primary roadmap for leading the ecological transition and universal connectivity. They are initiatives that many companies can embrace. However, beyond individual progress by each organization, it is crucial to foster intersectoral collaboration to achieve these global objectives.

Innovation and sustainability often go hand in hand. How is Redeia leveraging technology to create solutions and processes to address environmental challenges?

At Elewit, we were established with the primary goal of delivering technological solutions to the emerging challenges in the electricity and telecommunications sectors, where Redeia operates as a global leader. From the outset, five years ago, we have recognized that our efforts must be driven by continuous technological monitoring to achieve this objective.

In this process of technological innovation, we use a range of advanced tools, including energy storage, power electronics, gases and chemicals, nanotechnology, additive

“All companies have the potential and capability to contribute to the ecological transition and universal connectivity, two of the most significant transformations of our time”

manufacturing, virtual, augmented, and extended reality, and the metaverse. We experiment with cutting-edge technologies to develop impactful solutions for both the ecological transition and universal connectivity.

Additionally, we explore platforms and computing technologies such as Web3, edge computing, big data, blockchain, and quantum computing. We also use advanced data processing tools like analytics, synthetic data, computer vision and computer audition, deep reinforcement learning, and the Internet of Things (IoT) through sensors, wearables, and platforms.

In the communications space, we work with satellite, wired, and wireless networks, while our focus on IT and OT cybersecurity ensures the confidentiality, integrity, and availability of our systems.

This holistic approach is aimed at continuously enhancing the operational efficiency of both Redeia and its business units, while also contributing innovative processes that help build a sustainable future for society as a whole.

Collaboration between different sectors—business, public, and academic—is highly enriching in driving innovation. What effective strategies have you implemented to foster this collaboration and promote the adoption of technological solutions?

“ Since 2020, we have launched our “Venture Client” program annually, through which we have invested 1.7 million euros and supported 30 commercial pilots in partnership with 26 national and international startups ”

At Elewit, guided by an open innovation philosophy, we have built an ecosystem that fosters synergies among various public and private stakeholders, across different sizes and geographies, to drive transformative initiatives in the electricity and telecommunications sectors. Today, our ecosystem includes more than 100 partners and collaborators.

A key area of focus is our support for startups and entrepreneurs. Since 2020, we have launched our annual “Venture Client” program, through which we have invested 1.7 million euros and executed 30 commercial pilots with 26 national and international startups. Additionally, through our corporate venture capital vehicle, we have invested in three deep-tech-focused venture capital funds (Adara III, Cardumen Capital, and Adara Ventures Energy I), and made direct investments in startups such as Countercraft, Nearby Computing, HESstec, OktoGrid, Aerolaser, and Unusuals.

We also collaborate with prestigious universities and technology centers by signing framework and specific agreements aimed at fostering early-stage technological development and monitoring. Partnering with financial players is also crucial to provide the capital needed to bring innovative projects to life. For companies and institutions that create specific programs and policies to support the ecosystem, we provide advisory services, market insights, and facilitate connections with investors, among other forms of support.

As part of our ecosystem, we also tap into the expertise and talent of professionals from Redeia’s business units through our intrapreneurship program, “Despega”. To date, we’ve evaluated 30 promising ideas, supported nine, and developed four new products or services in collaboration with our professionals. Additionally, our active participation in innovation communities

and networks allows us to share experiences and continue expanding our collaborative reach.

The adoption of digital technologies such as artificial intelligence, robotics, and data analytics is already a reality. How can these technologies be leveraged more effectively in industry to accelerate the transition to a green economy and reduce our global environmental footprint?

At Elewit, we believe that innovation and technological disruption are central to the ecological transition. History has shown us that driving change requires redesigning processes and approaching tasks in new ways, with cutting-edge technology as the enabler.

These technologies enable us to optimize the use of power grids, making them more resilient, flexible, intelligent, and secure. Artificial intelligence (AI), advanced data analytics, and the internet of things (IoT) are already contributing significantly to this goal. For instance, AI can forecast and manage energy demand, reducing waste and improving efficiency. Data analytics helps identify consumption patterns and optimize resource use, while IoT enables the interconnection of devices for more efficient energy management.

These technologies can also drive automation in industrial processes, lowering material and energy consumption while reducing carbon emissions. By integrating these innovations, we not only improve operational efficiency but also promote a more environmentally sustainable economy.

Artificial intelligence has opened up a wide range of opportunities. How does this technology drive change and generate efficiencies in this sector?

Artificial intelligence has made a profound impact on society, creating numerous opportunities in various sectors and aspects of daily life, some of which are still emerging.



In the energy and electricity sector, AI has been a valuable ally for several years, and I'd like to highlight a few examples of its application.

- In infrastructure planning and network management, AI facilitates advanced simulations and multi-scenario analysis. This enhances our ability to conduct long-term strategic planning for electrical infrastructure while ensuring operational efficiency and smooth adaptation to changing market demands.
- In the maintenance of electrical grid infrastructure, artificial intelligence plays a key role by using machine learning algorithms to predict potential issues with substation and line equipment. This predictive capability improves system reliability and optimizes resource use.
- Additionally, AI helps identify patterns in production and demand by analyzing extensive historical data. This supports the expertise of our technicians in network operations,

aiding in the integration of renewable energy and efficient demand management.

- Lastly, I want to highlight the advantages of generative AI, which is particularly useful in processes that generate large volumes of documentation with quick turnaround times. Among other benefits, this type of AI enables us to extract information from documents with multiple sources and streamlines the information-gathering process.

Redeia has been at the forefront of implementing technological innovations for the management of critical infrastructure. A recent example is the ASUMO project. Could you share more details about this innovative project and how autonomous robotics could revolutionize management and maintenance in the electricity sector?

The ASUMO project, in collaboration with GMV, marks a significant advancement in managing substation assets through the application of innovative technologies. By integrating the internet of things, artificial

intelligence, and advanced data analytics, we are driving the digitalization and real-time management of electrical assets. The project focuses on capturing critical data from substation assets and real-time imagery, while generating digital twins of assets to improve operational availability and proactively address potential incidents.

Through the use of sensors, the integration of auxiliary services, the creation of a data lake for AI applications, and real-time visualization of substation assets using fixed and mobile cameras with AGVs (Automatic Guided Vehicles), ASUMO sets a new benchmark for the digitalization and intelligent management of electrical infrastructure.

ASUMO envisions a future where autonomous mobile robotics will transform operations and maintenance in the electricity sector, delivering significant benefits in terms of safety, reliability, and operational efficiency. This project is being developed in partnership with Red Eléctrica, the operator and system carrier of Spain's electrical grid.



Groundbreaking ERA2.1 project paves the way for autonomous UAS in security and defense

Focused on boosting range capabilities and creating a certification framework, the project aims to transform UAS operations in complex scenarios

The ERA2.1 project is a Research and Technology project supported by the European Defence Agency (EDA) and funded by contributing Member States (including Norway) through the CapTech Aerial Systems framework, one of the four Capability Technology Groups within the Intervention & Protection domain.

Led by a consortium of companies from Germany, Norway, Poland, Portugal, and Spain, this project represents a significant advancement in the automation of unmanned aerial systems (UAS). Focused on enabling autonomous capabilities and establishing a certification framework, ERA2.1 aims to transform UAS operations in complex scenarios,



enhancing their role in security and defense applications globally.

As a recognized leader in technology, GMV plays a key role in the project's development, particularly in designing an emergency landing system. This contribution builds on GMV's extensive expertise in advanced aerospace and defense programs such as ATLANTE, EUROMALE, and FCAS Remote Carriers.

At its core, ERA2.1 focuses on two critical areas of development: autonomous contingency management and autonomous UAS coordination and collaboration. For contingency and emergency management, the project will explore and implement advanced technologies

to autonomously address unforeseen operational challenges, ensuring the safety of the UAS, airspace users, and third parties. These innovations aim to establish new autonomous clearance protocols that will redefine safety and reliability in unmanned systems operations.

In the area of coordination and collaboration, the project emphasizes multi-agent systems, enabling UAVs to operate collectively and autonomously coordinate their actions. This capability will address challenges that individual UAVs cannot overcome on their own, optimize the use of multiple drones, and reduce the need for extensive human oversight. The project will also incorporate Manned-Unmanned Teaming (MuT), bridging the gap between

autonomous systems and human-operated platforms for more efficient joint operations.

ERA2.1 is set to revolutionize the UAS landscape, offering innovative solutions that promise to redefine autonomy, safety, and efficiency in defense and security sectors. By laying the groundwork for certification and compliance, the project represents a critical step toward the widespread adoption of autonomous capabilities in unmanned systems worldwide.

This milestone project highlights GMV's commitment to advancing the technological frontier of unmanned systems and ensuring their seamless integration into complex operational environments.

UAS Seeker demonstration flights for the Spanish Navy's Tercio de la Armada unit



■ As part of the CIMSEE-22 project, the UAS Seeker system conducted a series of demonstration flights with the Tercio de Armada (TEAR) from 15 to 17 October.

The UAS Seeker is a Class I MINI RPAS system developed by Aurea Avionics in collaboration with GMV and optimized for target intelligence, surveillance, and reconnaissance (ISR) missions.

The project implemented improvements identified by the units in the 2020 and 2021 flight series, such as the evolution of the payload, the development of an automatic tracking system, and the evolution of the ground station. However, the adaptation of the system to rainfall was the change with the greatest impact. The demanding weather conditions in which the operations were carried out demonstrated the high effectiveness and capabilities of the Seeker System, providing its operators with a strategic advantage compared to similar systems and proving to be a modern, Spanish technology-based, high-performance RPAS especially optimized for the execution of ISR missions.

The new features and capabilities integrated, significantly reduce the

operator's workload, allowing them to focus on key aspects of mission accomplishment and minimizing potential distractions.

The quality of the intelligence obtained in these tests showed the broad environment awareness that the system offers the operator, allowing them to obtain accurate data from targets located within its 15 km radius of action and with a range of 120 minutes.

The system has a high degree of reliability, with no incidents having occurred during the missions, some of which were carried out in heavy rain and at night.

In its report at the closing meeting for the series of tests, the TEAR deemed the Seeker system APT for the Unit.

GMV instrumental in the development of European GNSS services for drone operations

■ Currently, drone, or UAS (Unmanned Aircraft Systems), operations are in a phase of considerable growth. In line with current European regulations, the implementation of different types of UAS operations and U-space services is being carried out progressively, depending on the risk associated with such operations (the risk of the operation can be classified as low, medium, or high after methodologically analyzing the risks to people on the ground and to those manned aircraft in the vicinity of the operation).

In this context, DG DEFIS (The Directorate-General for Defence Industry and Space) of the European Commission (EC) and the European Union Space Programme Agency (EUSPA) have developed a roadmap for implementing

the different types of operations in three phases that contemplate different levels of risk. To develop this roadmap, in 2022 the EC awarded GMV the EUGENE project (European GNSS Service for UAS) to define a first European GNSS service concept geared to UAS for operations with a medium risk and SAIL (Specific Assurance and Integrity Level) II and III category.

During this first phase, the requirements, the provisioning scheme, and the implementation plan of the EGNSS service for UAS were defined taking into account the integration with the services provided by the Galileo and EGNOS programs, as well as the foreseen future developments of these services. The possible benefits from the economic point of view were also analyzed.

Drawing on GMV's leadership in GNSS and its experience in the UAS field and the results obtained in this project, the EC recently entrusted the second phase of the project, EUGENE2, to GMV. The objective of this phase of the project is to make progress in the implementation of the roadmap based on the results of the previous project and recent consultations with potential users of the service. EUGENE2 will also focus on medium risk and SAIL III-IV specific category operations.

The development of EUGENE will not only contribute to the objectives of the European Commission, but also aims to establish the basis for a service that, in the future, will be a critical element for the safe and efficient navigation of drones in European airspace.

CRUCIAL HINTS project enters new phase to strengthen cyber resilience of military aviation

■ The European Defence Agency's (EDA) CRUCIAL HINTS project, led by the Portuguese GMV team, has entered its second phase, marking a significant step forward in bolstering the cyber resilience of military aviation. Launched in 2023, the project focuses on addressing the complex cybersecurity challenges unique to the air domain, including threats to communications, navigation, surveillance, and the global supply chain.

Phase 1 of CRUCIAL HINTS laid the groundwork with a series of detailed studies. These included a cyber threat assessment of the communications, navigation, and surveillance (CNS) landscape, an analysis of emerging and disruptive technologies, and a comprehensive assessment of supply chain vulnerabilities. These studies, validated by a network of experts, highlighted the growing exposure of military aviation operations to cyber

threats and underscored the need for targeted resilience measures.

Building on this foundation, Phase 2 was launched in September with a renewed focus on some of the most pressing issues facing the sector. The collaboration includes the Royal Netherlands Aerospace Centre (NLR) and VEDETTE of Ireland, both of which bring critical expertise to the initiative. This phase will delve deeper into military aviation's reliance on the radio spectrum, examining the associated risks and evolving electromagnetic activities. It will also examine how these activities affect radio spectrum use in multi-domain operations, while developing effective prevention and mitigation measures.

A key highlight of Phase 2 is the development of a pilot aviation cyber course in partnership with the European Security and Defence College. This course aims to equip defense

professionals with the knowledge and skills to navigate cyber threats and electromagnetic risks in an increasingly contested operational environment.

CRUCIAL HINTS is not just an academic exercise, but a strategic initiative to address the real-world challenges facing military aviation. By the end of this phase, the project hopes to deliver actionable guidance and a blueprint for military aviation exercises designed for cyber and electromagnetic contested environments.

As the air domain becomes increasingly dependent on sophisticated technologies, the importance of initiatives such as CRUCIAL HINTS cannot be overstated. This project reflects Europe's commitment to enhancing cyber resilience and ensuring that its military aviation capabilities remain robust and secure in the face of evolving threats.



EUSPA awards GMV the contract to develop Galileo's Emergency aid Satellite Services

They will complement existing warning systems and will aim to increase the resilience and safety of European citizens in the event of all types of natural and man-made disasters

The European Union Agency for the Space Programme (EUSPA) has awarded GMV a FWC contract to deliver new Galileo functionalities under EmeRgency Alerting System (ERAS), allowing EUSPA to provide new Emergency related services, namely the Emergency Warning Satellite System (EWSS), SAR/Remote Beacon Activation and SAR/Two-Way Communications Emergency. The four-year contract, worth around 6 million euros, will enable significant

progress in Europe's response capabilities to natural and man-made disasters. The GMV led industrial organization includes Ineco, ALTEN Spain, and Kineton as subcontractors.

The new ERAS system will in the first place, allow Member States National Civil Protection Authorities for on demand broadcast of Emergency Warning messages to be sent directly to the population in areas at risk or already affected by a natural or provoked disaster, which will be

transmitted directly by the Galileo satellites to smartphones or any other device capable of receiving signals from these satellites. The alert messages will include information related to the type of risk, its severity, the area affected, as well as the expected time of onset its duration and guidance to react. The system will allow national civil protection authorities to generate and validate the content of the Alert through dedicated web-interface.





EWSS and ERAS will be yet another Galileo a major differentiator offering resilience, complementary to other existing public warning Systems, independence of terrestrial and mobile networks, able to reach the population fast and with a global reach. ERAS will be particularly beneficial and useful for inhabitants of remote regions of Europe with little or no mobile coverage.

As a complement to existing warning systems, ERAS will increase the

resilience and safety of European citizens in the face of all types of disasters. The joint use of ERAS and the Emergency Management Service provided by Copernicus will strengthen the disaster management policies of the European Union and its Member States. In addition, both systems will enable the population to be alerted to the risk of disasters such as the recent one in Valencian (Spain).

The system is expected to be fully operational in the first half of 2026,

which is a challenge in terms of deadlines and technical complexity. GMV's vast experience in carrying out similar projects is a guarantee of success.



This contract is carried out within the framework of a programme funded by the European Union. The views expressed in this article are the sole responsibility of the author and do not necessarily reflect those of the European Commission or European Union Agency for the Space Programme (EUSPA).

GMV attends Space Tech Expo Europe

From November 19 to 21, GMV participated in Space Tech Expo Europe, held in Bremen. This is a major European event for the space industry, where key players can get together and showcase their latest developments, while discussing important issues including, among others, space exploration, sustainability, NewSpace, cybersecurity, connectivity, 5G capabilities for the satellite industry, and the state of the space industry in general.

On its stand, GMV presented some of its latest developments both in the ground segment and in the flight and robotics segment, including, among others, **Sextans GMV**[®], a software-defined GNSS receiver for precise navigation, and G THEIA1+, an intelligent onboard camera that's transforming space imaging.

Once again this year, Alén Space had its own stand at this not-to-be-missed gathering for Europe's space industry, along with significant participation by the sales and business development team. At the event, they presented the company's full range of solutions and products for small satellites, including the newly launched DARA OBC.

Paweł Wojtkiewicz, head of GMV's Space sector in Poland, was also present at the Polish Space Agency's stand as a representative of the Association of Polish Space Companies.

Space Tech Expo has become one of Europe's leading space technology events and a key forum for space industry stakeholders to share expertise.

GMV leads the development of the data-generation infrastructure for Galileo's high-accuracy service

■ The European Space Programme Agency (EUSPA) has selected GMV's-led consortium for the second phase of development of the HADG (High Accuracy Data Generator) infrastructure for the Galileo's High Accuracy Service (HAS Phase 2).

The current HADG version (v1), also developed by GMV, is currently used to calculate the real-time precise corrections that are transmitted to the users of the initial service of Galileo HAS.

The second version (v2), which will be developed and deployed under this contract, will make it possible to provide the Galileo High Accuracy Full Service (HAS Full Service). Specifically, the new version will improve the accuracy and availability performance of what is known as Service Level 1 (SL1), with global coverage. This will be possible

thanks to the integration of updated **GMV's magicPPP**[®] algorithms into the infrastructure, and an increase of the number of ground stations providing data for the corrections calculation process.

The new HADG version will also make it possible to provide a new service (Service Level 2 or SL2) with coverage over the European Union territories by providing atmospheric corrections for faster initialization at user level, improving what is known as "convergence time." It will also allow for the authentication of service data transmitted through the Galileo constellation.

The GMV-led industrial consortium includes experts in atmosphere modeling from the Polytechnic University of Catalonia (UPC), cybersecurity specialists from Sidertia.



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The LEO-PNT program makes progress under GMV's leadership



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■ This April saw the kickoff of the LEO-PNT In-Orbit Demonstrator, a GMV-led European Space Agency project aimed at demonstrating services and developing key low earth orbit (LEO) satellite technologies for positioning, navigation, and timing (PNT) by launching a constellation of five satellites.

A month after the kickoff the System Requirements Review (SRR) took place, consolidating the system specifications and its component segments.

The System Preliminary Design Review (S-PDR) is taking place during November and December. During this phase, the preliminary design of the

system, its internal and external interfaces, as well as key aspects related to navigation performance, the use of the radio spectrum in accordance with regulations and the main technological and scheduling challenges, among many other issues, were presented to the European Space Agency (ESA). This was a key milestone in the development of the project that will enable GMV to consolidate its system vision before moving into the next phase.

The first of the five satellites, called Pathfinder-A, is based on a CubeSat architecture that follows a rapid development cycle that progresses in parallel with the above milestones.

The goal of this first satellite, scheduled for launch in late 2025, is to demonstrate the technology and help mitigate the overall program risks. It has its own specific milestones: a Design Key Point A (DKPa) that took place in May where the preliminary design of the satellite was presented, followed by a Design Check Points 1 and 2 in September and December, which will pave the way the Critical Design Keypoint scheduled for March 2025.

These milestones cement GMV's role at the helm of a comprehensive space mission, reinforcing its position as a leader in the European aerospace sector.

The GMV-led Galileo test bed will help improve the high precision service



■ The G2STB (Galileo Second Generation System Test Bed) is a key element for the European Space Agency (ESA) in the design and monitoring of the Galileo system. Led by GMV, G2STB is currently monitoring in real time the satellites and services provided by the first generation of the system (G1G) while, in parallel, prototypes, new concepts, and numerous experimentation activities are being developed in preparation for the second generation (G2G).

One of the cornerstones of the G2STB is the GESS (Galileo Experimental Sensor Stations) proprietary network of receiving stations, distributed worldwide, that allows for real-time collection of data disseminated by both Galileo and GPS. GMV, as

prime contractor, will be responsible for upgrading the capabilities of these stations in order to improve measurement quality and enable them to receive and distribute G2 signals and services. These GESS improvements will give the G2STB a key role during the in-orbit validation of the new G2 satellites.

GMV will also be expanding this network of stations in 2025, installing four new ones to improve global coverage, especially in the most critical areas such as Asia and the Pacific. This expanded network, consisting of 21 stations, will join the 17 currently used for the provision of the Galileo High Accuracy Service (HAS), resulting in a significant improvement in performance. Furthermore, to ensure

the uninterrupted provision of data to the operational system, redundant chains will be installed in several GESS stations considered critical due to their location and relevance.

To provide these and other data, enhancement activities are being carried out at the Galileo Processing Centre (GPC) installed at ESTEC. These improvements are focused on making the system more robust in order to guarantee the provision of real-time data at all times.

These new requests made and approved by ESA reinforce the role of the G2STB within the Galileo system and are the result of the trust placed by the client in GMV, thanks to the work carried out by the entire G2STB team.

GMV GSharp® Virtual Reference Station (VRS): one solution to rule them all

Can you imagine a positioning system so accurate that it could tell whether you're stepping on a paving tile or on grass? This has been achieved with the **GMV GSharp®** solution and its positioning using PPP (Precise Point Positioning) technology. But not willing to stop there, the family of services and products offered by **GMV GSharp®** has grown with the arrival of the Virtual Reference Station (VRS Service). This service also tells users whether they're stepping a paving tile or on grass using another precise positioning technique: Real-Time Kinematic (RTK).

Among **GMV GSharp®**'s innovative solutions, the VRS service stands out as one of the key options to be compatible with various platforms and user positioning algorithms, becoming the key service to rule them all. **GMV GSharp®** thus offers an even more complete package of products and services designed to achieve high-accuracy GNSS positioning through different positioning algorithms, making it perfect for applications requiring maximum accuracy, from precision agriculture to autonomous navigation.

HOW DOES A VRS WORK?

A VRS is like that friend who's always by your side, following your steps, and supporting you so you can reach your goal. It uses the GNSS corrections calculated by **GMV GSharp®** Correction

Service to generate virtual observations. The effect is the same as if there were a physical station at a given position, but it's actually virtual.

Through one of its modes of operation, when a receiver with an available RTK algorithm is connected, the **GMV GSharp®** VRS server customizes the position of that virtual station in real time, adapting it to your specific location. This not only increases accuracy, but also reduces the complexity and costs associated with high-quality positioning that requires a dense network of physical stations.

WHY CHOOSE GMV GSharp® AND ITS VRS?

- **High accuracy:** **GMV GSharp®** offers advanced corrections to reduce errors to centimeters.
- **Total flexibility:** The VRS server is just one of the many possibilities within the comprehensive **GMV GSharp®** package.
- **Resource optimization:** no need to invest in your own infrastructure; **GMV GSharp®** takes care of everything.
- **Universal compatibility:** designed to work with a wide range of GNSS receivers and positioning algorithms.

In conclusion, **GMV GSharp®** VRS not only redefines GNSS positioning



Laura Martínez
GMV's Navigation Systems High Accuracy
Services Manager

accuracy, but also makes it accessible, versatile, and scalable. The VRS server and other available options give you the power to navigate with confidence and pinpoint accuracy. Welcome to the next generation of positioning!



GMV GSharp® is at the leading edge worldwide for precise GNSS corrections



■ As a leading provider of services for global navigation satellite systems (GNSS), including real-time corrections for precise orbits and clocks, GMV is a regular contributor to the International GNSS Service (IGS). These corrections are generated by the company's solution known as **GMV GSharp®**.

The International GNSS Service (IGS) is an organization that provides high-precision data and products related to global navigation satellite systems (GNSS), such as GPS, GLONASS, Galileo, and BeiDou. Its mission is to support the geodetic reference frame, Earth observation and research, and positioning, navigation, and timing (PNT) applications, all as a way of providing benefits for the scientific community and society in general. It also fosters collaboration among the various types of institutions that work with GNSS, such as universities, space agencies, and private companies.

As part of its work, the IGS generates precise orbit and clock corrections in real time, as a service to the GNSS community. It does this by receiving worldwide contributions of precise orbits and clocks from other institutions, which are combined in order to create its own solution. In addition, it evaluates the accuracy of each contributor's orbits and clocks products, thus providing a reference frame for comparing their quality.

GMV has recently achieved a milestone that positions the company, and its **GMV GSharp®** solution, as having technology that can generate the world's best GNSS orbit and clock corrections for GPS and Galileo. According to the IGS, from the time when the latest update was made to **GMV GSharp®** at the end of August, GMV has consistently been generating the most precise real-time corrections for GPS and Galileo, compared to those of all other contributors. This is an achievement that positions the company among the world's elite with regard to this technology.

GMV GSharp® is an advanced GNSS positioning solution developed and operated entirely by GMV. It provides high-precision, real-time corrections for orbits, clocks, biases, and atmospheric effects. Designed for applications that require extreme precision, such as autonomous driving, precision agriculture, and maritime navigation, it works by integrating data from multiple GNSS constellations (GPS, Glonass, Galileo, and BeiDou), along with data from other sensors, to provide a secure and reliable position.

GMV ready to deploy a version of Galileo's control system

■ GMV has begun deployment of Version 3.1 of the Galileo Control System (GCS), marking a significant step forward in the program. This upgrade, led by GMV in collaboration with companies such as Indra, CGI, Telespazio, and Thales, builds on the previous version deployed in 2021.

Through this new upgrade, GMV will modernize the GCS backup center at Italy's Galileo Control Center (GCC), complementing the modernization previously carried out at Germany's GCC during the implementation of the previous version and thus achieving more robust and future-proof infrastructure.

In addition to the modernization of the control centers, the new version introduces major operational improvements, solutions to various anomalies, key improvements in the area of security, and significant evolutions within the Galileo program. This will be the last major release under the Galileo First Generation (GS1) contract, cementing the progress made so far and paving the way for future technological developments.

Work has begun with deployment in the validation chain, which will lead to operational validation for

subsequent deployment in the operational chain. All these activities are planned for 2025, and this version is expected to serve the Galileo program for the next few years.

Since 2018, GMV has been leading Galileo First Generation's GCS activities under contracts with the European Space Agency (ESA) and the European Union Space Programme Agency (EUSPA). This milestone reinforces GMV's 2018 commitment to driving progress in European navigation infrastructure.

GNSS systems performance monitoring for EUSPA: A continued partnership

■ Since 2016, GMV has been collaborating with the European Union Agency for the Space Programme (EUSPA) on the development and operation of the Galileo Reference Centre (GRC) located in Noordwijk, the Netherlands. The primary mission of the center is to independently monitor the Galileo services and data dissemination performance, and report findings to relevant stakeholders. It provides EUSPA, as the Galileo service provider, with an independent means of assessing the performance of the Galileo Service Operator (GSOp) and the quality of the signals in space. The GRC operates independently of both the system and the GSOp in terms of technical solutions (HW/SW, reference products, etc.) and operations.

The GRC system, developed by GMV, was initially designed to monitor Galileo Open Service (OS) and GPS civilian services. However, it has since evolved into a versatile platform capable of monitoring additional GNSS systems such as GLONASS and BeiDou, as well as new Galileo services. These

include the High Accuracy Service, which became operational in 2023, and the OS Navigation Message Authentication (OSNMA) service, which will be operational soon. These services are continuously monitored, with performance reports provided to GRC stakeholders to cross-check them against the committed performance levels and metrics. The system also monitors the Galileo Public Regulated Service, which is available to authorized users.

From a technical perspective, the platform's main goal is to independently and promptly generate GNSS reference products based on data from multiple stakeholders. It provides orbit determination, time synchronization, navigation message consistency analysis, and estimation of position, velocity and timing performance, all from the user's perspective. Our team has implemented state-of-the-art algorithms and scalable architectures to handle extensive datasets and accommodate future GNSS satellites, signals, and services.

The system is operated daily by the GMV team, in collaboration with EUSPA, delivering daily and monthly performance reports, calculating performance KPIs, and providing GNSS expertise to EUSPA.

Recently, EUSPA has extended the maintenance contract of the current GRC version by an additional 18 months, reaffirming their confidence in GMV expertise. This extension will enable GMV to continue refining the system to meet the evolving demands of the space sector.

Looking ahead, GMV is committed to further enhancing the platform's capabilities, reinforcing its position of excellence in satellite navigation systems technology. The ongoing collaboration with EUSPA in monitoring Galileo and other navigation satellite systems highlights GMV's dedication and commitment to innovation in order to deliver solutions that support critical missions.



GMV cements its position as a key player in the standardization of GNSS use



■ GMV's-led consortium has won a framework contract to support the standardization of GNSS in various sectors. The ENTICE (EUSPA Engineering Support to SBAS Standardisation Activities) project, funded by the European Union Space Programme Agency (EUSPA), will support the standardization of EGNSS for different sectors.

The four-year contract includes activities to further standardize Galileo and SBAS in civil aviation, introduce GNSS in railway standards, and continue the standardization efforts for the use of GNSS in sectors such as maritime and automotive, as well as in areas such as drones and time synchronization.

This achievement is based on GMV's extensive experience in the GNSS standardization area and on the company's work on previous projects for the EUSPA such as GESTA (GSA Engineering Support to SBAS DFMC Standardization Activities). GMV has also played a decisive role in drawing up the standards defining the Minimum Operational Performance Standards (MOPS) of EUROCAE (European Organization for Civil Aviation Equipment), as well as GNSS standards for the maritime and automotive sectors and time synchronization.

The consortium includes several prestigious organizations such as Honeywell, Airbus, the German Aerospace Center, and the French National School of Civil Aviation.

The groundwork is established for the European Space sectoral ISAC

■ The ISACS European Union 2024 Summit was held in Athens on 17 and 18 October. Organized by ENISA, the summit brought together key representatives from Information Sharing and Analysis Centres (ISACs) from all over Europe, with the aim of sharing cybersecurity expertise.

The summit was attended by key representatives from the main European sectoral ISACs (cities, automotive, aviation, energy, finance, healthcare, maritime, rail, retail and hospitality, telecommunications, and space), representing private companies involved in cybersecurity in Europe and some of the European agencies involved in the security of CIS systems.

GMV played a leading role as industry representative in the EU Space ISAC, the

European space sector center set up by the European Commission in 2022 as a platform for exchanging information, collaborating, awareness-raising, and highlighting best practices among private organizations to guarantee the security of our space systems, the networks on which they depend, and the standardization of production processes related to the European space industry.

To date and with the Board of Directors established, the EU Space ISAC has about 40 participants interested in the European Union's space sector. EU Space ISAC is structured around several working groups: one focused on security threats and cybersecurity, another

concerning the management of space operations, and a third devoted to standards and best practices for space security. These groups are developing pilot projects, needs surveys, and newsletters and compiling relevant standards and guidelines.

The summit met its goal and brought together key representatives of the EU's different ISACs to share expertise regarding their work, successes, and challenges. The attendees had the opportunity to meet with ENISA's staff and learn from their scope of work, which includes, among other fields, the implementation of the NIS2 directive, threat intelligence, information sharing, and training, as well as cybersecurity training, including cyber exercises.

GMV establishes the design and requirements of the latest version of Galileo's GCS

■ Following completion of the design phase of Galileo Second-Generation (G2G) satellites, GMV has now consolidated the requirements and design (baseline) of the infrastructure for the system's ground control segment (GCS) 4.0.

Since the project began and for the past 16 months, GMV has been participating in numerous system meetings, both at flight segment level and with other segments, to consolidate the baseline of the new version of this infrastructure, which represents a

significant technological evolution in relation to the original project. This work methodology is in line with the Scaled Agile Framework (SAFe), the foundation for the work dynamics during this phase of the program.

The baseline consolidation includes improvements and adaptations between the different segments, as well as a major modernization package for the ground segment. The main areas of modernization are the user interface, platform, and automation, bringing this

version of the second-generation ground segment to a technologically advanced state of the art.

GMV will deploy different versions of the ground segment incrementally throughout 2025 for the different system compatibility tests (SCTC). The year will culminate with the milestone of full qualification of version 4.0 for subsequent validation and deployment in the operational chain, thus laying the groundwork for control of the first launch of Galileo Second Generation.



GMV drives innovation within the framework of the EUSPA space program



■ GMV has taken on a significant role in a collaborative project led by EUSPA to enhance the European Space Programme's capabilities in the fields of Global Navigation Satellite System (GNSS), Earth Observation (EO), and Space Surveillance & Tracking (SST). This initiative is led by FDC, French company recognised for its expertise in the space domain and applications. Together with contributions of multiple partners (EY, EGIS, GEA), the project aims to support the uptake and evolution of SST

services within Europe, fostering technological advancements and expanding user engagement in space applications.

As part of this project, GMV has been responsible for three significant tasks. First, the company contributed to the collection and identification of SST user needs for the evolution of the existing services such as collision avoidance, re-entry analysis, and fragmentation analysis.

Another major contribution from GMV is a study to assess options for a potential marketplace for SST services at EU level. This prototype is based on the inputs provided by potential users and an analysis of the different options in the market. By creating a technical design and specifying interfaces for users, providers, and developers, GMV is helping to create an accessible platform for commercial SST services.

In addition, GMV contributed the Update of the EGNSS and EO Market Uptake in Space document, which sets the strategic direction for integrating GNSS, EO, and SST in space-related markets. This update emphasizes synergies across EU space components, ensuring that EUSPA's approach to market uptake remains adaptable to emerging technologies and industry needs.

Through this project, GMV and its partners are enabling EUSPA to advance Europe's presence in the space market, ensuring the region's competitive edge while delivering valuable insights into the future of SST and other space-based services.

GMV leads a workshop on space sustainability in SG (Spain) 2024

Reflecting its commitment to promoting the professional and academic growth of young people, GMV participated in SG[Spain] 2024, an event held in Tenerife on 8 and 9 November.

This international conference, organized by the Space Generation Advisory Council (SGAC), provides a unique platform for university

students and young professionals to connect with experts in the space sector and explore new opportunities in the fields of space exploration and astronomy.

Miguel Ángel Molina, GMV's deputy general manager of Space Systems EST, presented GMV's activities in the space sector and led a workshop

on sustainability, sparking valuable discussions and connections for a more innovative and sustainable space sector.

SG[Spain] 2024 brought together 140 participants of 15 European nationalities, making it the largest local SGAC space event held in Spain to date.

GMV drives innovation within the framework of the EUSPA space program

■ In 2024, GMV has successfully completed its participation in the European Defense Industrial Development Programme (EDIDP) projects for Space Domain Awareness (SDA). This work, which includes the INTEGRAL (SDA Command & Control), SAURON (SDA Sensors), and ODIN's EYE (Space-Based Missile Early Warning) projects, marks the beginning of a collaborative SDA system among the European Union states.

Leveraging its deep expertise in Defense and Space Surveillance and Tracking (SST), GMV has developed

new SDA capabilities to support the future European Space Command and Control (SC2) and Space Surveillance Network (SSN) systems. In particular, the INTEGRAL project aims to establish a proof of concept for the SC2 system, where GMV has led the Prototype development.

A major milestone of INTEGRAL takes place the week of November 25, when a coordinated Demonstration occurred at military sites in Italy and Spain (Torrejon Airbase). During this Demonstration, the Prototypes installed at both locations operated in

synchronization to validate the system concept.

These projects have been realized through a Consortium of prominent European space industry companies, with participation from all major players. The next phase launches in 2025 with the ODIN's EYE II (continuation of ODIN's EYE) and EMISSARY (continuation of SAURON and INTEGRAL) projects. These new multi-million Euro initiatives are funded by the European Defense Fund and co-funded by several European Ministries of Defence through the European Defense Agency (EDA).

GMV, actively contributing to a more responsible and sustainable future in space

■ As the space ecosystem grows and diversifies, it is crucial to address the sustainability of space in order to ensure responsible, long-term use. This means minimizing the generation of space debris, promoting eco-friendly satellite and spacecraft design, and developing technologies and policies that ensure the safety and sustainability of space operations.

As a leading company in the space sector, GMV is firmly committed to socially responsible, eco-friendly space activity. True to this commitment, GMV took part in several key space-sustainability events in October.

From October 8 to 11, it attended the Clean Space Industry Days at ESTEC, in the Netherlands. This event brought together space professionals and enthusiasts working on the sustainability of space missions. Over the course of four days, breakthroughs in eco-design, zero waste, and in-orbit services were discussed. Marian Ramos Prada, head of space traffic management (STM) policy and business development

at GMV, presented a paper on "Rules of the Road (in Space) applied to Collision Avoidance Autonomy," while Jorge Rubio Antón, a space surveillance and tracking (SST) and STM engineer at GMV, presented the paper "Attitude Estimation of Inactive Resident Space Objects from Photometric Measurements Using Particle Filtering." Manuel Prieto, project manager in GMV's Robotics and Onboard Autonomy Division, gave two presentations, entitled "CAT-IOD: CAT In-Orbit Demonstration Mission for a Prepared Active Debris Removal Scenario" and "Robotic Technologies for a Sustainable On-Orbit Servicing Ecosystem: ASSIST, MICE/CAT and MIRROR".

Space sustainability requires international cooperation and the establishment of standards and best practices that all space actors must follow to avoid congestion and pollution of the space environment. As such, during the "Clean Space Industry Days" on 11 October, Marian Ramos Prada participated in the final review of the "Zero Debris Technical Booklet," a document providing a list of

technical needs and essential solutions for achieving the goals of the "Zero Debris Charter," an initiative of which GMV is a member.

GMV also participated in the Forum of Innovation, Talent and Aerospace Education (FITEA), organized by the Ellas Vuelan Alto (Women Flying High) association from 29 to 31 October. This forum offers a valuable opportunity for collaboration in aerospace innovation and education, highlighting the visibility of women in science. Marian Ramos Prada participated in the "Sustainability of Space Operations" panel discussion, moderated by Irene Rivera from Ellas Vuelan Alto, with co-panelists Andrea Vena, chief climate and sustainability officer at the European Space Agency, Beatriz Gallardo, SST user engagement manager at the EUSPA, and Violeta Gandullo, an expert in space legislation.

By participating in these kinds of events, GMV is helping to ensure that space remains an accessible and useful resource for all, without compromising its long-term viability.

GMV welcomes members of DGAM, MESPA, and COVE



■ As part of the Space Situational Awareness and Control System (*Conocimiento y Control de la Situación Espacial: CCSE*) Program, military and civilian personnel of the Directorate General of Weapons and Material (*Dirección General de Armamento y Material: DGAM*) of the Ministry of Defense, the Space Command (*Mando del Espacio: MESPA*) and the Space Surveillance Operations Center (*Centro de Operaciones de Vigilancia Espacial: COVE*) of the Spanish Air and Space Army (*Ejército del Aire y del Espacio: EA*) visited GMV's Tres Cantos headquarters. The visit gave them a close-up look at the company's

technological capabilities and some of the cutting-edge projects it is working on.

The CCSE program, promoted by DGAM, aims to guarantee space situational awareness and surveillance to support Spanish Armed Forces operations. GMV is leading the development and deployment of the CCSE System for the COVE.

During the visit the delegation toured other key areas of GMV's facilities. The first stop was the EUTELSAT room, used for control center operations, where the functions and peculiarities of satellite telecommunications operations were

explained. The visitors then moved to the GCS (Galileo Ground Segment) room, a replica of the Galileo program operations, where they were shown how this fundamental system for European satellite navigation is managed.

The visit continued in the robotics laboratory and in **Platform-art**[®], where the latest advances in Guidance, Navigation and Control (GNC) systems were presented, placing GMV as a leader in this technology. Special attention was given to work related to space missions, with special mention being made of advanced autonomous navigation systems.

Finally, a presentation was made of one of the antennas of the passive radiofrequency satellite tracking system **Focusear**, used by GMV for its space surveillance activities.

Public-private collaboration, together with a commitment to technological innovation, is key to bolstering Spain's capabilities in areas like space surveillance and control, a domain in which GMV is a European leader, through programs like the CCSE. Furthermore, it demonstrates the importance of the private sector in the development of advanced solutions that contribute to the security and space operations of the Spanish Armed Forces.

GMV attends UN space traffic meeting

GMV took part in the UN Space Bridge Discussion on Space Traffic Coordination, an event organized by the UN Office for Outer Space Affairs (UNOOSA) at the UN's headquarters in New York City on 24 October.

The event brought together experts from governments and the commercial

sector to explore the potential of space technology in solving global challenges. Representing the company, Alberto Águeda, GMV's director of space traffic monitoring and management, worked with space agencies, satellite operators, legislators, and industry to develop solutions to the complex problems

involved in space traffic coordination (STC).

The conversations focused on the role of STC in improving the safety and efficiency of space activities through the sharing of SSA data, operational guidelines, and measures to prevent collisions and debris hazards.

Go, Hera go!

On October 7, the Hera planetary defense mission began its journey to the Didymos binary asteroid system

On October 7th, the Hera planetary defense mission began its journey according to plan. The spacecraft was launched from Cape Canaveral in the USA, on board a SpaceX Falcon 9 launch vehicle, and it is now heading towards its surprising destination: the binary asteroid system known as Didymos.

The launching of Hera represents significant progress in terms of humanity's ability to protect itself against potential impacts by asteroids. Hera is a space mission of the European Space Agency (ESA), and its main objective is to study the impact that NASA's Double Asteroid Redirection Test (DART) probe had on the Didymos binary asteroid system in 2022, and specifically on its moon known as Dimorphos. This is the ESA's first mission conceived for the purpose of planetary defense, and it is part of the international NASA-ESA collaboration known as Asteroid Impact & Deflection Assessment (AIDA), which has been designed as a way to study asteroid redirection as a means of protecting the Earth against potential impacts.

GMV is deeply involved in this unprecedented mission, with the company's contribution going back to 2018, when the focus was on an

earlier orbiter known as AIM. Since then, GMV has been leading an international industry consortium made up of participants from Spain, Portugal, Romania, France, Germany, the Netherlands, and Ireland. This group is now responsible for designing and developing the mission's guidance, navigation, and control (GNC) system, including the part involving the mission's proximity analysis. The GNC system is considered to be the heart of any space mission. In this case, GMV has developed a groundbreaking autonomous GNC for Hera, after taking into account factors such as the difficulties that the delay in deep-space communications can cause for the approach and navigation operations, the unusual characteristics of asteroids, and the uncertainty of the unexplored environment.

GMV's team in Romania has performed the mission analysis studies and developed the GNC system for Juventas, which is the CubeSat responsible for measuring the Dimorphos moon's gravity field and internal structure.

In addition, GMV is collaborating with France's *Centre National d'Études Spatiales* (CNES) in the city of Toulouse, to develop the CubeSat Flight Dynamics and Science Operations Centre, which will be responsible for control, planning, and execution of the Hera mission's CubeSats, including Juventas.

GMV has also been involved in the design and development of Hera's operational simulator, while also providing support by collaborating with the ESA at its operations center (ESOC) located in Darmstadt, Germany.

Finally, GMV has an integrated team that provides software support to the mission control system, as well as being part of the flight dynamics team, which supports the ongoing process of trajectory optimization and the calculation of the required orbit and attitude control commands.

Not only does the Hera mission represent a breakthrough in planetary defense technology, it will also be collecting invaluable scientific information about the formation and evolution of our solar system. With this launch, Europe is reaffirming its position at the forefront of space exploration and scientific technology.



GMV successfully completes the FASTNAV planetary exploration project



■ GMV has successfully completed the FASTNAV (Multi-range Navigation for Fast Moon Rovers) project. This initiative focused on developing, maturing, and demonstrating a navigation solution for rovers capable of achieving speeds of 1 m/s, a feat previously unattainable by an autonomous rover on the surface of a distant planet. Led by GMV, the project is funded by the European Space Agency

(ESA) under the General Support Technology Program (GSTP) and supported by the UK Space Agency (UKSA).

GMV has successfully increased the average travel speed of the rover in the FASTNAV project by introducing a new continuous driving paradigm that eliminates stops during journeys. This advancement improves speeds from the current 0.13 m/s to 1 m/s—an unprecedented achievement for an autonomous rover on the surface of a planetary body.

In addition to enhancing scientific performance and productivity in space exploration missions, this technology can also be adapted for use in complex terrestrial safety critical environments such as rescue operations, mining, nuclear and infrastructure monitoring. To accomplish this, GMV has implemented a guidance, navigation and control (GNC) system that incorporates an integrated visual navigation system within the rover. GMV's solution combines classic

computer vision with cutting-edge artificial intelligence, enabling the rover to navigate autonomously through a variety of different conditions.

The project has undergone an extensive testing campaign. The initial test took place in mid-June at Upwood Quarry near Farringdon (Oxfordshire), operated by the Hills group Ltd. The success of this initial campaign set the stage for subsequent tests in the first half of July at the Bardenas Reales Natural Park and Biosphere Reserve (Navarre, Spain), a lunar analogue environment. Following the results from both tests and upon returning to Oxfordshire, GMV implemented a series of machine learning-based enhancements to the GNC system of FASTNAV to improve its performance. These developments led to increased responsiveness and overall effectiveness of the innovative multimodal GNC system.

GMV presented preliminary project results at the International Conference on Space Robotics (iSpaRo) in Jun, in Luxembourg.

Seville hosts LangDev 2024, with aerospace and security taking center stage

This year, Seville hosted the LangDev 2024 conference, a can't-miss event for professionals and researchers in the fields of language engineering, Model Driven Engineering (MDE), and Domain Specific Languages (DSL). Known for its focus on hands-on demonstrations of software tools, LangDev is the ideal setting for showcasing advances in cutting-edge technology.

Seville, with its notable cluster of aerospace companies, was the perfect

host for the event, which in this edition placed special emphasis on the aerospace and security sectors. This edition highlighted the growing importance of model-driven engineering (MDE) in furthering technological innovation and, as recognized by the European Union, in advancing sectors such as aerospace. Cybersecurity was also a key issue, as the increased sophistication of cyberattacks calls for more advanced tools and processes.

Elena Alaña Salazar, head of GMV's Software Engineering Section, and Sergi Company Aguilar, a GMV space systems engineer, gave a talk on "Transitioning to MBSE in Space Projects: Insights, Challenges and Lessons Learned." Their talk focused on the impact of Model-Based Systems Engineering (MBSE) in the space industry, promoted by key organizations such as the European Space Agency (ESA).

GMV continue to drive innovation of space industry

■ GMV has achieved a significant participation in the recent calls of the ESA's Future Space Transportation Ecosystem Programme (formerly known as FLPP, the Future Launchers Preparatory Programme). FLPP ensures Europe's competitive advantage in the global space transportation market. It drives innovation in disruptive technology maturation, space transportation ecosystem studies, and flagship demonstrators.

Within the last competitive calls, GMV has secured five major contracts as leader, and two more as subcontractor, in the InSPOC-2 (In-Space Proof of Concept 2, InSPOC-3 (In-Space Proof of Concept 3) y FIRST (Future Innovation Research in Space Transportation) components.

The FLPP programme acts as a supportive partner, helping reduce risks and create consistent standards for the European SpaceTech ecosystem with the aim of shaping the future orbital market by helping create an ecosystem of key players who will offer separate, specialised in-orbit services, such as payload deliver, re-fuelling and servicing.

The announcement of the awarded contracts was made at the ESA FLPP Space Transportation Award ceremony, which took place in Paris, France, on October 9, and where the solidity of the GMV presence and expertise resulted evident to the audience.



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GMV showcases its solutions for achieving a standardized and sustainable in-orbit service

GMV was present at the 7th Annual Global Satellite Servicing Forum & Exhibition (GSSF&E), organized by the Consortium for the Execution of Rendezvous and Service Operations (CONFERS) and held in the US state of Virginia. It is considered one of the space industry's leading events on space infrastructure and operations.

This year's edition, which took place on 13-14 November, brought together leading commercial and government satellite operators, satellite manufacturers, satellite service providers, political leaders, financial and insurance experts, and media outlets from around the world, who highlighted key topics in rendezvous and proximity operations (RPO), on-orbit satellite servicing operations (OOS), and in-space assembly, servicing, and manufacturing (ISAM).

In addition to having a small space in the exhibition area, Joaquín Estremera, Head of the Robotics and Onboard Autonomy Section at GMV, participated in the "On the Job, On Their Own: An Update on Robotics and Autonomy for ISAM" panel discussion, presenting some of GMV's interface solutions geared towards more standardized in-orbit services, which, in addition to meeting new and demanding needs in terms of performance and cost, are capable of developing a safe, efficient, and sustainable space economy.

IAC 2024 and space sustainability

■ From 14 to 18 October, Milan was the chosen venue for the 75th edition of the International Astronautical Congress (IAC), an annual International Astronautical Federation (IAF) event.

The theme of this edition was “Responsible Space for Sustainability,” underlining the importance of preserving space as a safe and accessible environment for exploration, peaceful use, and international cooperation, thus ensuring the safety of the environment and space operations.

GMV had a significant presence at the event, with a stand displaying its

solutions in this field. Alén Space, part of the GMV group since mid-2023, also had a stand to showcase its products and services focused on small satellites.

Mariella Graziano, GMV’s director of strategy and business development for Space Systems Science, Exploration, and Transportation, participated in a panel discussion on the application of generative artificial intelligence in aerospace sustainability to improve strategic risk management. She also presented the GNC system developed for the Hera mission in a session on missions to asteroids, and outlined the solutions GMV is working on for developing the

Ramses mission’s GNC. Additionally, Graziano chaired the Solar System Exploration section.

Meanwhile, Fernando Gandía, head of the robotics and onboard autonomy division, presented two projects, one on robotics technology for a sustainable ecosystem and one on the design of flexible and modular robotic vehicles for efficient lunar exploration.

GMV also stood out thanks to its presentations and technical papers in the manned spaceflight sessions and in the astrodynamics and space-debris symposiums.



State of the Art – Space 2024

State of the Art – Space 2024 – Building Next Space, a key meeting on the present and future of the space sector, was held in Madrid on 28 November and was attended by leading space professionals.

The event is an initiative of Ellas Vuelan Alto (Women Flying High), an association that promotes equality in the aerospace

sector, acting in the political, academic, business, and social spheres on the basis of the United Nations Charter.

Mariella Graziano, GMV’s director of strategy and business development for Science, Exploration, and Transportation of Space Systems EST, addressed the New Space revolution in her talk on “Key Aspects for Building a Clean

and Sustainable International Space Ecosystem.”

The event featured participation by Cecilia Hernández and Isabel Perez-Grande of the Spanish Space Agency, as well as a closing address by Héctor Guerrero Padrón, Deputy Director-General of Aerospace Policy and Strategy at the Ministry of Science, Innovation and Universities.

Captive flight tests of GMV's avionics for the Aviolancio program

■ In the first week of November, GMV participated to the captive flight tests of the Aviolancio program conducted at Houston Air and Spaceport (Tx, USA). This program is led by the Italian National Research Council (*Consiglio Nazionale delle Ricerche*, Cnr) and aims to develop an air-launched micro-launcher to enhance access to space for small platforms. In this context GMV provides the complete avionics system for the small rocket, which includes hardware (HW) equipment, a telemetry system, onboard software (OBSW) and Guidance, Navigation and Control (GNC).

The campaign, aimed to characterize the flight envelope and conditions for the final flight. The test focused on verifying safety and ground operations, testing the communications with the ground, and collecting flight data to optimizing the system, software, and GNC development.

All activities were led by the Italian Cnr, which was also responsible for data transmission from the sensors and on-ground data acquisition and

monitoring. The tests were made possible thanks to the significant support of aircraft pilot Todd Ericson, from the USA company FTR Enterprises.

Aviolancio testing vehicle was manufactured by the Italian company Technology For Propulsion (T4i, Padua) and equipped with sensors. GMV integrated a preliminary version of the avionics, which included an OnBoard Computer (OBC), an Inertial Measurement Unit (IMU) and, the proprietary GNSS software receiver **Sextans GMV®**.

The captive flight tests were successfully executed, and flight data were collected throughout the complete mission.

GMV will analyze the data gathered during the avionics during these tests to conduct a post-flight analysis. This data will drive the optimization of the navigation algorithms, which will consider hybridization solutions (IMU plus GNSS) and enhance the robustness of the control laws developed for the Aviolancio program.

GMV shows its commitment to sustainability at the Munich New Space Summit

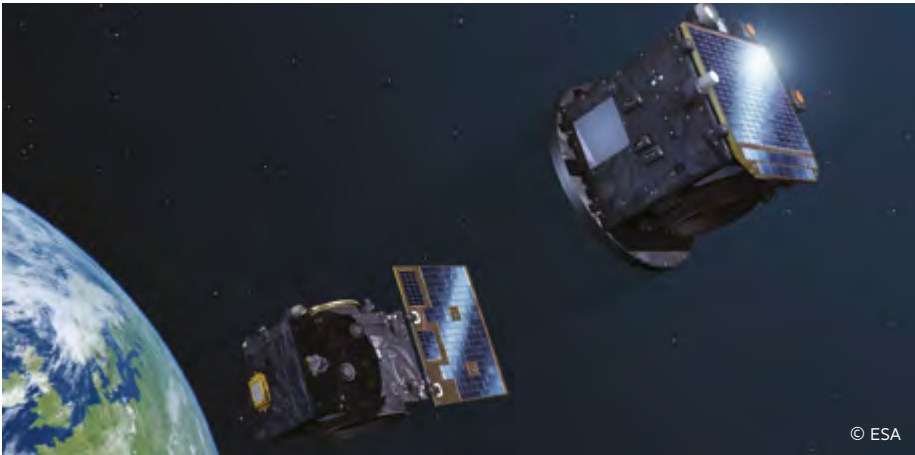
GMV participated in the Munich New Space Summit, held from 23 to 25 October at the Science Congress Center Munich in Garching, near Munich. The event seeks to foster collaboration and innovation in the New Space sector, focusing on technological breakthroughs, environmental sustainability, and regulatory frameworks.

This event brought together experts, researchers, industry professionals, and policymakers to discuss breakthroughs in commercial space exploration and address topics such as satellite development, artificial intelligence, reusable rocket technology, global telecommunications, and Earth observation.

GMV sponsored the meeting and had a stand to showcase its space-sector solutions, specifically those focusing on space sustainability. Enrique Fraga, GMV's general manager of Space Systems EST, also participated in the panel discussion on "Charting Europe's Path: Strengthening Leadership in the New Space Era," in which he and other European space industry leaders shared their ideas on how to foster a vibrant ecosystem that supports growth, drives technological breakthroughs, and ensures Europe's leadership on the global space stage.



With the Proba-3, GMV revolutionizes precision formation flying



■ On December 5 at 11:34 CET (16:04 local time), the European Space Agency (ESA) Proba-3 mission was successfully launched from the Indian Space Research Organisation's (ISRO) Satish Dhawan Space Centre in Sriharikota, India.

The mission consists of two satellites, the Coronagrapher and the Occulter, which will fly at a distance of 150 meters. The main aim is to demonstrate the feasibility of advanced formation flying technologies by creating a virtual solid structure in space to carry out detailed observations of the solar corona. One of the satellites will block the Sun's light, as in an eclipse, so that the other can study the solar corona more effectively.

Proba-3 is an ESA mission developed and built under the industrial leadership of Sener, in close collaboration with a consortium of 40 companies from 14

countries. GMV is playing a crucial role in this mission with a critical role in both the development of onboard systems and ground infrastructures.

GMV is responsible for the Formation Flying Subsystem (FFS), the most innovative and critical component of the mission. This subsystem includes the design, implementation, and validation of the onboard software in a simulation environment that replicates the onboard computer and electrical interfaces. The FFS maintains the necessary precision and stability between the two satellites, allowing them to function as a virtual rigid structure with millimeter precision in position and arc-second precision in orientation. In the FFS GMV en Spain is working together with Sener, which is responsible for the formation control function, and with NGC Aerospace in Canada, which is responsible for the

attitude and orbit control subsystem (AOCS).

In addition, GMV in Poland has designed and validated the onboard function for calculating relative positioning based on GPS measurements.

GMV has also developed the ground system responsible for flight dynamics verification (Flight Dynamics System or FDS). This system is responsible for orbit determination, event prediction and maneuver calculation, verifying that the satellites maintain formation throughout the mission, and it will provide support to operations during the initial, most critical phases.

With a lifetime of two years, Proba-3 will be a milestone in space exploration owing to its innovative approach to formation flying and because of the sensors it uses. Most operations on Proba-3 will be carried out in a fully autonomous manner, with the satellites coordinating their own operations based on a predefined timeline.

This unique and innovative technology will enable the mission to make unprecedented precision observations, thus opening new frontiers in astronomy, geodesy and earth observation, while allowing for the creation of virtual infrastructures and instruments in space, which would revolutionize access to and use of space.

International Symposium on Small Launchers and Spaceports

GMV participated in the first edition of the International Symposium on Small Launchers and Spaceports, an event held at the European Space Agency's (ESA) European Centre for Space Applications and Telecommunications (ECSAT) in Harwell, the United Kingdom, from 28 to 30 October.

Emanuele di Soto, product manager of GMV's Space Systems EST Flight Segment, gave a talk on "GMV Avionics Development, Products and Services for Small Launchers" in which he explained GMV's experience and developments in avionics, products, and services for small launchers.

The event was co-hosted by the UK Space Agency and the European Space Agency (ESA), and brought together professionals from industry, government, and academia, all working to advance the future of small launchers and spaceports.

GMV provides advanced flight dynamics to Sateliot's constellation of IoT satellites

The **FocusSuite**® technology provides comprehensive support for satellite control, including orbit determination, maneuver planning, and event calculation

GMV is leading the flight dynamics systems (FDS) operations provided as a service for four satellites belonging to operator Sateliot. These satellites, which are part of a constellation aimed at providing Internet of Things (IoT) services, are designed to improve global connectivity through such services.

Designed and manufactured by Alén Space, a member of the GMV group, the satellites were deployed on the SpaceX Transporter-11 mission, launched on 16 August aboard a Falcon 9 from Vandenberg Air Force Base in California, the United States.

GMV's **FocusSuite**® technology plays a key role in guaranteeing the

successful operation of these satellites, covering all mission phases, from launch and initial orbit insertion to operations in operational orbit and end-of-life procedures. **FocusSuite**® provides comprehensive support for satellite control, including orbit determination, maneuver planning, and event calculation. The advanced automation capabilities of this SDS suite enable efficient and reliable satellite management, ensuring optimal performance throughout the satellites' lifetime.

As well as managing flight dynamics, GMV is in charge of Space Situational Awareness (SSA) operations to minimize collision risks with other satellites and space debris. GMV uses its **Focusoc** service for conjunction analysis and

collision risk assessment. **Focusoc**'s automated conjunction assessment (CA) and collision avoidance (COLA) services predict potential risks and execute maneuvers to avoid them, thus ensuring safety and maximizing the useful life of the Sateliot constellation.

GMV is becoming increasingly active in New Space missions, promoting the use of Flight Dynamics as a Service (FDaaS) for these groundbreaking projects. This approach enables scalable and flexible satellite operations, adapting to the unique needs of space start-ups. GMV's dual focus on advanced flight dynamics and SSA operations underscores its commitment to innovation in safe and efficient satellite operations in an increasingly crowded space environment.



Studying machine learning algorithms for network management in optical satellite constellations



■ ML4MOCS, a study initiated in July 2024, is part of the ARTES 4.0 ScyLight Workplan, ESA's primary program for technology development in optical and quantum communications.

This study, led by GMV in Germany with the participation of Saarland University (DE), addresses the increasing number of Inter-Satellite Links (ISLs) in satellite

constellation networks. These links enable high-capacity, low-latency communication networks, but they also introduce significant network management complexity due to the large number of satellites and the anticipated optical data transmission rates.

As part of this study, software will be developed to manage communication

satellite constellations using Machine Learning techniques. The results will be compared with classic optimization techniques for these networks.

The objective of the study is to critically evaluate the potential of the developed elements and establish a roadmap for their commercialization."

IAASS holds its 13th Conference in Prague, focusing on space safety and sustainability

From 8 to 10 October 2024, Prague hosted the 13th Conference of the International Association for the Advancement of Space Safety (IAASS). The theme of this year's edition was "Building a Safe, Secure and Sustainable Space."

IAASS seeks to foster global cooperation and address the growing challenges

in space, highlighting the need for a unified regulatory framework to ensure safe and sustainable space operations for future generations.

In addition to plenary and parallel sessions, there were panel discussions on four crucial topics: International Space Governance, Aviation Safety During Launch and Re-entry Operations,

Space Traffic Management, and Long-Duration Space Exploration Mission Safety.

Marta Fernández Campo, from GMV's RAMS-QA Satellite Navigation Systems division, presented the paper "Assessment of Integrity of Localization Systems for Micro-Launchers with Analytic Techniques."

Europe launches new Sentinel mission with its upgraded Vega-C rocket

■ On 5 December at 22:20 CET (18:20 local time), the European Space Agency (ESA) Copernicus Sentinel-1C mission was successfully launched from Europe's Spaceport in Kourou, French Guiana.

Copernicus Sentinel-1 is an environmental monitoring and maritime security mission; Sentinel-1C satellite's goal is to expand and complement the Earth observation capabilities of its predecessors, Sentinel-1A and Sentinel-1B.

GMV plays a key role in Copernicus, the European Union's Earth observation program, participating actively in both the ground segment and the space component, as well as in the associated user services. Since the beginning of the program, the company has been involved in all phases of development and has covered the entire value chain, starting with the initial engineering studies and mission analyses needed to define its feasibility.

GMV also developed the control center, located in the ESA's Space Operations Centre (ESOC), from where the mission's evolution is monitored during the launch and early orbit phase (LEOP); the commissioning phase, to ensure that the mission meets the established requirements satisfactorily; and then to provide regular monitoring of the mission throughout the satellite's useful life. Its tasks also include developing the mission planning system, contributing to the development of the orbital control system, and providing the associated support during the satellite launch. GMV is additionally in charge of the development of the satellite's operational simulator used for validation of the mission's flight control procedures and operator training.

Furthermore, GMV is responsible for hosting (using proprietary infrastructure), monitoring, operating, and maintaining the mission planning component of the Sentinel 1 missions

on a 24/7 basis, including operations to address any type of emergency that may arise (e.g., natural disasters).

GMV is also in charge of the maintenance and evolution of all the simulators, control centers, and auxiliary software systems for the Copernicus satellites, including Sentinel-1C.

Finally, GMV regularly and continuously provides the precise orbit determination (POD) service, needed for processing and using the data generated by the instruments onboard Sentinel missions.

The Sentinel-1 mission is the result of a close partnership between ESA, the European Commission, industry, service providers, and data users.

The Vega-C rocket carried the third satellite of the Sentinel-1 mission, marking the return of the launcher and a key step in restoring independent and versatile access to space for Europe.



GMV highlights transformative role of EO data in healthcare at EUSPA UCP 2024

■ The European Union Agency for the Space Programme (EUSPA) organizes the User Consultation Platform (UCP) to gather insights, needs, and recommendations from a wide range of stakeholders who use or could benefit from EU Space data and services.

At the 2024 EUSPA UCP held in October, GMV participated in a key panel discussion titled “How to increase the use of EO data among commercial users”, within the Health and Wellbeing session. Alongside representatives from OHB, CloudFerro, and Water Insight, GMV shared valuable insights from its experience in prominent projects such as EO4Health (<https://eo4health.esa.int/>) and Global Development Assistance for Public Health (<https://gda.esa.int/thematic-area/health/>).

The panel discussed the transformative role of Earth Observation (EO) data in supporting public health and improving healthcare services. The EO4Health project is an exemplary case of how EO data can enhance healthcare accessibility and quality, particularly in underserved areas. GMV showcased specific instances where EO data have



been used effectively to track disease outbreaks, monitor environmental health risks, and support disaster response, demonstrating the tangible benefits of EO technologies in public health.

The discussion addressed the main challenges limiting commercial adoption of EO data, such as data complexity, scalability, and cost. GMV emphasized the importance of user-friendly, scalable solutions that make EO data accessible and actionable

for non-experts, particularly in the healthcare sector. GMV also highlighted the value of collaboration between technology providers and commercial users to develop tailored solutions that meet industry-specific needs, thus enhancing the commercial appeal of EO applications.

The session served as a platform for fostering innovation across industries, with the shared goal of improving community health outcomes and quality of life through EO technology.

GMV attends the latest edition of APSCC

GMV participated in the latest edition of the APSCC (Asia-Pacific Satellite Communications Council) Conference and Exhibition, this time held in Thailand's Chatrium Grand Bangkok from 5 to 7 November.

This event is the largest annual gathering of the Asia-Pacific satellite

and space community, providing a platform for market insights, partnerships, and business deals.

The conference features panel discussions, case studies, and presentations that seek to address disruptions and opportunities in the space industry.

GMV had a stand where it presented its space-sector products and services to the Asian market. Miguel Ángel Molina, GMV's deputy general manager of Space Systems EST, also participated in the session entitled “Digital Transformation-Where Are We?”, sharing GMV's outlook on the future of satellite technology.

GMV drives innovation in maritime emissions monitoring with EO4SEM project

This initiative is part of the future regulations for European waters, which will require the exhaustive monitoring of vessel emissions

The EO4SEM project aims to advance Earth Observation (EO)-driven monitoring of ship emissions, focusing on pollutants such as NO_x, CO₂, and CH₄. This initiative is in line with upcoming regulations in European waters that will require comprehensive monitoring of emissions from ships. In collaboration with the European Maritime Safety Agency (EMSA), the project will evaluate the potential of EO technology to improve regulatory compliance by accurately estimating emissions and identifying emission hotspots.

One of the main challenges is adapting EO data to maritime contexts. Traditional methods tend to achieve greater accuracy over land, as the reflective properties of electromagnetic

radiation differ significantly over water. Recent innovations and parallel studies (such as ESA's GMV-led World Emission) provide promising frameworks to address these limitations. By integrating ship-based AIS data and engine-driven emission models, EO4SEM will cross-check emission estimates from EO data against real-world operational models.

The project aims to create a prototype for high-accuracy EO-based emission estimation at local and regional scales. It will also provide guidance for the evaluation of technical specifications for future ESA satellites and sensors that could meet the requirements of regulatory enforcement and emissions verification. In this regard, key EO datasets, including data from the Sentinel-5, Prisma and GHGSAT

satellites, will be used together with ground-based AIS data to establish a comprehensive reference framework that will simulate the upcoming ESA missions. By deploying this setup on a Network of Resources (NoR) platform with interoperability practices, EO4SEM aims to deliver a seamless, scalable service to EMSA, ultimately supporting the agency's enforcement capabilities in European waters.

GMV's subsidiary in Portugal is leading a consortium comprising GMV in the UK, FMI, LSCE, Science Partners, and GHGSat. In addition to overall project coordination, the Portuguese team will be responsible for developing an end-to-end software application to be implemented using ESA's Network of Resources (NoR).



World Emission enters a new phase to improve global emissions monitoring



■ In October, the European Space Agency's (ESA) World Emission project began a new two-year phase. Building on the groundwork of the initial phase, this new phase seeks to improve the global emissions inventory service, which is based on Earth Observation (EO) satellite data.

World Emission, which began in 2022, is part of ESA's EO Science initiative, a program designed by the agency to maximize the benefits of applying

Earth Observation missions to science, society, and economic growth.

In this new phase, the consortium, led by GMV and with LCSE, KAYRROS, MPIC, ULB, BSC, and The Cyprus Institute as core members, has grown with the incorporation of two new members: Science Partners and Citepa. Together, they will work to continue and enhance World Emission's current service and products, which are based on Earth Observation satellite data.

One of the main goals of this phase is to demonstrate that EO-based top-down inventories of greenhouse gases (GHGs) and air pollutants can support countries' reporting. This involves showing that the data and knowledge provided by World Emission can be used by governments and policymakers to assess the effectiveness of emission reduction measures and to inform future strategies.

The project also aims to enhance stakeholder engagement, synergies, and service assessments. By working closely with end-user organizations, the consortium hopes to ensure that the services provided are aligned with the needs and expectations of those who rely on this information.

This phase also includes developments in two new areas: maritime emissions and methane R&D. These additions are expected to expand the range of gases emitted, emission sources, and geographic areas monitored, providing a more complete picture of global emissions.

Key Earth observation technologies for soil sustainability

From 8 to 11 October, Copenhagen hosted the EO for Monitoring, Reporting, and Verification of Carbon Removals event, a conference co-organized by the European Environment Agency (EEA) and the European Space Agency (ESA). The event brought together 180 experts from various disciplines and stakeholders to explore how Earth observation (EO) technologies can support the implementation of the Land Use, Land-Use Change and Forestry Regulations (LULUCF), the upcoming Carbon Removals and Carbon Farming (CRCF) Certification Regulations, and other related areas.

During the conference, participants attended discussions and presentations led by 40 distinguished speakers from various agencies and institutions (ESA, EEA, the Copernicus Earth Monitoring Service, and the Scientific Advisory Board of the European Commission, or DG CLIMA), and national greenhouse gas reporting experts, as well as representatives from the scientific community and the private sector.

Julia Yague, head of GMV's Remote Sensing Services and Spatial Data Use Platforms Division, presented

GMV's work in WorldSoils, highlighting the progress made in this ESA-funded project designed to develop a preoperational system for monitoring soil organic carbon (SOC) on a global scale, combining use of Earth Observation (EO) satellite data with large soil databases and modeling techniques. Marta Gómez, project manager in the same division, presented MRV4SOC, a European Commission project focused on the verification and reporting of carbon in agricultural soil, stressing the importance of these initiatives for environmental sustainability.

GMV enables better public health through AIR4Health project

■ GMV is participating in the AIR4Health project, which is being led by the +ATLANTIC CoLab, a Portuguese not-for-profit collaborative R&D laboratory. The aim of the project is to create an operational public health service, and GMV's contribution is based on its recognized expertise in systems integration and implementation of services. The new service will be hosted on the DestinE Core Service Platform (DESP) managed by the European Space Agency (ESA), as part of the system developed for the Destination Earth initiative. This represents a new milestone for GMV, as the company's first Earth observation digital twin project.

Extreme temperatures have increased significantly in frequency and severity

over the last decades in Portugal (and in Europe as a whole). This has translated into significant cases of excess mortality and morbidity, coupled with deterioration in air quality, with corresponding human and societal impacts. The AIR4Health project is focused on developing a prototype early-warning system, with the ability to predict the risk of increased mortality, and the number of disease cases, related to extreme weather events and air quality issues.

Within the consortium, a multidisciplinary group of expert scientists has demonstrated the suitability of developing new methods to dynamically measure health outcomes.

As compound climate and air quality extremes trigger significant health, social, and economic impacts, the AIR4Health project aims to pioneer the development of EO data-driven risk algorithms for predicting human mortality and morbidity.

As part of this project, two cases will be developed to analyze the health impacts of ozone during heat waves and nitrogen dioxide during cold waves. The project will use ESA-Sentinel-5p and NASA-AURA among other non-EO based sources.

GMV's role is to automate the acquisition of input sources, in order to create the processing chain, integrate the algorithmic modules using **GMV Prodigy**, and deploy that product on the DESP platform.



GMV unveils EOP-LABS, transforming Earth Observation with cloud-based innovation



■ September saw the launching of EOP-LABS, a groundbreaking project designed to revolutionize Earth observation (EO) data processing. In collaboration with Amazon Web Services (AWS), the project will deliver a cloud-based Ground Segment as a Service (GSaaS) solution for EO missions, as part of the InCubed initiative developed by the European Space Agency (ESA).

The purpose of the project is to deploy the **GMV Prodigy** product as a service on the AWS Marketplace. This will represent a very significant milestone for GMV, because it is the first time that a GSaaS data processing solution for Earth observation missions will be offered on a platform with a global impact, such as AWS. His solution eliminates the need for costly, hardware-intensive setups and allows customers to process EO

data directly in the cloud. Users benefit from a flexible, pay-as-you-go pricing model that reduces upfront costs and accelerates mission readiness.

As the satellite industry continues to evolve towards multi-satellite constellations, the complexity and volume of data are increasing. EOP-LABS actively addresses these challenges by providing seamless scalability and sustainable solutions, fully aligned with ESA's vision for a greener digital future.

The EO sector, valued at \$5 billion in 2022, is expected to triple by 2030. EOP-LABS aims to capture a share of this burgeoning market by streamlining satellite operators' data workflows and democratizing access to advanced processing tools.

As a pioneer in cloud-based EO solutions, GMV's collaboration with AWS positions Portugal as a hub for cutting-edge space technologies. The project also supports ESA and European Union initiatives for digital transformation and environmental sustainability.

As part of the project, the GMV team will create automated cloud service configuration and **GMV Prodigy** installation methods that comply with AWS requirements, which will then be available to customers on the AWS Marketplace.

The project is expected to be available on AWS Marketplace by mid-2025, offering its services to a global customer base and setting new standards for EO data management.

GMV delivers critical support for Emergency Management Service

■ The frequency and intensity of floods and wildfires are rising around the world, resulting in severe impacts on communities, including loss of life and significant damage to critical assets such as buildings, communication systems, agricultural land, and the natural environment. Last September, thousands of firefighters battled more than 100 wildfires along an 8-kilometer front in Portugal. Poland, the Czech Republic, Slovakia, and Romania faced mass evacuations due to flooding caused by rainfall five times the monthly average. More recently, Spain experienced flooding caused by a year's worth of rainfall in eight hours, with the worst possible consequences – the loss of hundreds of lives.

The Copernicus Emergency Management Service (CEMS) was activated to support emergency management activities in the immediate aftermath of the disasters. CEMS is the European Union's satellite-based emergency management service, providing essential geospatial information to support disaster response, preparedness, and recovery on a global scale. The GMV team played a critical role by working 24/7 to deliver high-precision maps and analyses, ensuring timely and actionable data to aid decision-making for effective disaster management and recovery efforts.

Disaster maps and analyses, detailing their impact on communities and their spread over time, are critical to understanding the extent of the damage and to facilitating effective response strategies. The ability to provide rapid information can have a significant impact on the outcomes for crisis managers, civil protection authorities, and humanitarian aid



organizations, enabling them to make informed decisions and take decisive action when it matters most.

In the post-disaster context, recovery analysis services are essential to guide effective reconstruction and resilience strategies. Recently, GMV also supported the recovery analysis of a wildfire that occurred on July 12 in Cordoba, Spain. This included wildfire

delineation and environmental, social, and economic impact assessments on land cover, population, and assets. The reports concluded with assessments of soil erosion risk and potential economic losses. This comprehensive approach focused on recovery efforts by providing a thorough assessment of the damage and supporting reconstruction planning and monitoring for the affected regions.

New Space Spain, opportunities and challenges in the aerospace industry

On 26 and 27 September, Vigo was at the heart of New Space in Spain, hosting a conference organized by Alén Space. With the theme “The road to global leadership”, New Space Spain brought together the main players in the New Space sector, including major companies in the Spanish aerospace sector, as well as organizations and institutions with a leading role in the industry.

The event was attended by over 270 professionals and 120 companies, highlighting the importance and potential of the space industry in Spain. Topics addressed included the challenges and new opportunities presented by new satellites, New Space, and the Spanish aerospace industry. Crucial aspects such as funding and support for the development of the sector were also discussed.

The conference included lectures and round-table discussions with over 40 experts from the sector, who shared their expertise promoting partnerships among companies, research centers, universities and public institutions; security from outer space; and the state of the space sector in Ibero-America. Also on show were groundbreaking projects, including the European Space Agency’s (ESA) LEO-PNT project, led by GMV and also involving Alén.

Alén Space launches DARA OBC, a high-performance onboard computer with low power consumption

■ Alén Space has presented DARA OBC, a new onboard computer designed for nanosatellite and microsatellite missions in low Earth orbit (LEO). Highlights include its energy efficiency and high performance in a compact PC104 format. This solution was developed with flight heritage (TRL9), which guarantees its reliability and adaptability for a wide variety of space missions.

DARA OBC includes a Software Development Kit (SDK) based on FreeRTOS, with drivers and support for the CubeSat Space Protocol (CSP). This makes it easier for engineering teams to customize the device, optimizing its functionality according to the specific requirements of each mission and accelerating application development.

DARA OBC’s technical features include its ARM Cortex M7 processor, with a frequency of up to 280 MHz and a typical power consumption of 280 mW, robust storage capacity

with flash memory, internal RAM, and microSD options up to 128 GB, and multiple connectivity interfaces (RS422, UART, CAN, I2C, GPIO). In addition, it has GNSS options, 3-axis IMU (magnetometer, gyroscope, and accelerometer) and cryptographic security capabilities (AES and HMAC), making it particularly suitable for operations in space environments with extreme temperatures, ensuring optimal performance and long-term durability.

DARA OBC’s versatility is complemented by temperature and current sensors, a real-time clock (RTC), and switched-mode power supply to optimize power consumption. All of the above makes the solution a robust, flexible, and reliable option within Alén Space’s portfolio, expanding the range of onboard computers together with TRISKEL, which integrates an OBC, a UHF TTC system, and software in a single module.

NEW PRODUCT

DARA OBC
On-Board Computer

- > Versatility
- > Seamless Connectivity
- > Robust Storage

Alén
A GMV COMPANY

Alén Space leads the space consortium selected by DLR for its CubelSL mission

■ The German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt, DLR) has selected the Spanish consortium made up of Alén Space and GMV to develop the two satellites of the CubelSL IOD mission. The launch is scheduled for 2026.

After the launch phase and initial operations, control of both satellites will be transferred to the German Space Operations Center (GSOC), which is the institution in charge of space operations in Germany.

The main goal of the mission is to demonstrate and validate the two-way optical laser communication between two CubeSats in orbit, through

the advanced features of the Laser Communication Terminal developed by the DLR Institute of Communications and Navigation, called CubelSL LCT. This mission explores the improvement of inter-satellite communication at a minimum distance of 500 kilometers and a maximum distance of 1500 kilometers in the same orbit, as well as direct transmission to Earth, allowing for reliable telecommand operations. CubelSL aims to achieve a significant technological breakthrough in CubeSats communication systems.

At its facilities in Nigrán, Pontevedra province, the Alén Space team will design and manufacture the platforms for the two 6U satellites, which will be built

under the CubeSat standard. GMV will contribute its AOCS (Attitude and Orbit Control System) expertise to this project.

The mission will be overseen by the DLR Responsive Space Cluster Competence Center (RSC3), with active participation of the DLR Institute of Communications and Navigation and the German Space Operations Center (GSOC).

At the RSC3, one of the most advanced centers in Europe, major Responsive Space research and technology demonstrations are carried out. This includes solutions related to next-generation, resilient, and secure communications for satellites using lasers.







CONVOY faces its first series of evaluations

The project, coordinated by GMV, is part of the first technological challenge launched by the European Commission in the field of improvised explosive device detection

In September, the first set of evaluations was carried out within the framework of CONVOY (CLOud iNtelligent explosiVe detectiOn sYstem), an initiative funded by the European Union that is part of the projects selected by the European Defence Fund (EDF) under the 2022 call for proposals.

CONVOY is part of the first technological challenge launched by the European Commission in the field of improvised explosive device detection. Coordinated by GMV and with the participation of leading companies and organizations from five European countries, CONVOY's main goal is to explore the potential of artificial intelligence for detecting, recognizing, and avoiding or neutralizing hidden threats. This technological challenge includes four sets of evaluation tests designed in an operational environment. These evaluations will allow for systems to be assessed and will drive the evolution of systems between each evaluation.

These first tests, which took place at FOI's facilities in Grindsjön, Sweden and lasted two weeks, were attended by the four consortia participating in this challenge, coordinated by the HiTDOC organizing team. The tests were intended for the consortia to

integrate the different components of the system, conduct field tests, and collect crucial data for future improvements.

During the first week, the testing was focused on the system's integration, and on ensuring smooth communication among all parties. During the second week, three specially designed tracks were used to perform a series of evaluations. This part had two main tests, avoidance and detection, which allowed the participants to evaluate the capabilities of the systems under different conditions, as each track had unique characteristics, ensuring a complete review of the system's performance.

The data collected from these tests are expected to drive future improvements, helping the consortia refine the systems and optimize their effectiveness.

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This project has received funding from the European Defense Fund under the EDF-2022-LS-RA-CHALLENGE-CONVOY:101121250 grant agreement. This article reflects the opinion of the author and not necessarily the opinion of the European Commission.

Final demonstration of AI4DEF, a project that explores the benefits of AI in defense



■ In December 2021, GMV signed a 36-month contract with the European Commission to demonstrate the benefits of the use of artificial intelligence (AI) in the defense field (AI4DEF).

Within this contract, involving a consortium of 20 companies, GMV

led a work package consisting of the adaptation of AI standards for the military sphere and the application of ethical and legal aspects of its use in the defense domain.

GMV has also been the leader of one of the use cases consisting of improving each phase of the TCPEP (Task, Collect, Process, Exploit, Disseminate) intelligence cycle through the use of AI techniques, resulting in faster, more reliable, and more appropriate situational awareness and decision-making.

To conclude the project, a final demonstration of the project was held in Copenhagen, Denmark, in October 2024, and was attended by representatives of various defense ministries and members of the consortium.

In this demonstration, GMV gave a live presentation on how the use

of artificial intelligence can help intelligence analysts detect artillery hits on the ground and use them to estimate the shooter's position. Additionally, AI was used to perform a dynamic recalculation of routes to reach a destination by ruling out damaged paths.

GMV's proven experience in JISR intelligence solutions cements its position as a key partner in technological innovation for defense. The AI4DEF project not only validates the successful integration of artificial intelligence modules in consolidated tools such as **CSD** and **Sierra Tools**, but also reaffirms GMV's capacity to lead the development of advanced capabilities that are transforming the sector. This breakthrough reinforces GMV's vision of a future in which AI redefines efficiency and precision in the military field, offering groundbreaking solutions in the service of global security.

The Region of Madrid and companies in the sector analyze the internationalization of the defense industry in the region

In October, a conference on "Madrid's Defense and Security Industry, Internationalization as a Strategy" was held in Madrid, hosted by IndustryTALKS at the headquarters of the Madrid College of Industrial Engineers (COIIM). The event, which was attended by various regional authorities, as well as representatives of leading companies in the defense sector, focused on several different success stories in terms of internationalization, as well as the strengths of the industry in the region.

GMV was represented by Begoña Rojo, a member of the business development and institutional relations team of GMV's Defense and Security area, who spoke about the importance of secure cross-domain information transfer in both the defense and critical infrastructure sectors and the expected trends of demand in this sector both domestically and internationally due to the need for information exchange between EU and NATO members.

Begoña Rojo also addressed the topic of defense SMEs and the value they bring to the supply chain from GMV's point of view, noting that SMEs are more vulnerable to changes in developments, strategies, financing agreements, etc., and therefore must be protected against these changes.

Lastly, Begoña Rojo discussed GMV's international experience, especially in the European market but without overlooking other markets in the rest of the world.

Operational assessment of the Dismounted Soldier System

■ In recent months, the Dismounted Soldier System (SISCAP) developed by GMV and Indra has undergone an operational evaluation, taking a decisive step forward in its development.

In this regard, tests were carried out in July at the Infantry Academy of Toledo. A platoon of legionnaires evaluated the system by simulating a reconnaissance mission and other day and night surveillance missions. Various day and night firing tests were also carried out during these exercises.

The second part of this evaluation, in which SISCAP underwent interoperability tests with the VCR 8x8 vehicle, took place from 14 to 18 October. In this way, the armored vehicle acted as a communications node between the unit and the tactical command and control center.

SISCAP is the result of an R&D program funded by the Spanish Ministry of Defense through the Subdirectorate General of Planning,



Technology, and Innovation (SG PLATIN). The progress of this new development is being supervised by Spain's Directorate-General of Weapons and Material (DGAM).

The goal of SISCAP is to equip combatants with advanced technology they can use to intervene in digitalized theaters of operations, where they will have to operate in a network with

systems adapted to the new combat cloud concept.

GMV has been involved in the SISCAP project since 2017, in a joint venture with Indra. Following the success of the operational demonstration, Phase 1-b of the SISCAP program has concluded, giving way to future phases with plans to expand the number of prototypes and include the rest of the subsystems.

GMV strengthens ties with DAMEN shipyard group in strategic visit

■ GMV participated in a strategic visit to the renowned international shipyard group DAMEN in Gorinchem, marking an important step in fostering collaboration between Portugal's industrial and scientific communities and DAMEN's extensive global supply chain. The visit, which focused on the opportunities arising from the acquisition of the D. JOÃO II vessel, highlighted the potential to enhance Portugal's naval industrial capabilities and bolster its defense economy.

The event provided a platform to explore long-term strategic partnerships, with José Neves, Director of Homeland Security and Defense

at GMV in Portugal, participating in discussions on how Portuguese companies can integrate into DAMEN's supply chain of over 1,000 global players. The focus is on building sustainable, innovative collaborations that can deliver a measurable impact within the next six months.

"This initiative underscores GMV's commitment to driving innovation and strengthening industrial ties within the naval sector," said José Neves. "Our involvement in these discussions reinforces our role as a catalyst for technological advancement and economic growth in Portugal's defense sector."

The visit included detailed project presentations and a productive meeting with key stakeholders, including the DAMEN project team, AED Cluster Portugal and idD Portugal Defence. These sessions provided critical insights into how Portuguese industry can align with DAMEN's vision and leverage the country's expertise to deliver cutting-edge solutions.

This initiative exemplifies GMV's commitment to advancing Portugal's naval industrial footprint, fostering international partnerships, and contributing to the development of innovative defense technology solutions.

GMV showcases its defense and security innovations at NATO Edge 24

From 3 to 5 December, the U.S. city of Tampa, Florida hosted the latest edition of NATO Edge, an event organized by the NATO Communications and Information Agency (NCI Agency).

In a rapidly evolving world marked by changing geopolitical landscapes, revolutionary technological progress, and new security threats, NATO's ability to remain strong and resilient depends heavily on its collaboration with industry leaders. This event is a unique forum for

During the three-day event, attendees had a chance to interact and participate in world-class workshops for discussing NATO's technology priorities, along with an opportunity to showcase their products and services to NATO leaders and experts, military decision-makers, and industry peers.

In addition to sponsoring the event, GMV had a stand to showcase its latest innovations in the field of defense and security. Specifically, GMV presented cross-domain solutions from its subsidiary AUTEK, as well as cutting-edge systems in Joint Intelligence, Surveillance, and Reconnaissance (JISR) and Command and Control (C2).

By participating in this forum, GMV highlighted the crucial role played by industry in reinforcing defense and security at the global level.

The ASPAARO consortium presents the Digital Fabric concept for AFSC to NATO

■ On 1 October, a demonstration of the Digital Fabric concept was presented to the AFSC (Allied Future Surveillance Capability) Support Partnership Committee at NATO headquarters in Brussels. This milestone marks significant progress in the project led by the ASPAARO (Atlantic Strategic Partnership for Advanced All-domain Resilient Operations) consortium, led by Airbus Defence and Space together with Northrop Grumman Corporation and including nine frontline companies from both sides of the Atlantic, including GMV.

Until May 2023, the consortium carried out the Feasibility and Risk Reduction Study of the NATO Allied Future Surveillance Capability (AFSC) Charlie Concept under contract with the NATO Support and Procurement Agency (NSPA), in order to define a new technical solution for NATO's future surveillance and command and control system.

In early 2024 the NSPA decided to contract an extension to further develop

the Digital Fabric concept defined in this study. Digital Fabric interconnects the various components of the AFSC, including air, naval, ground, satellite, and cyber assets, increasing the capabilities of these isolated elements. It provides resilient multi-domain monitoring and control services to meet AFSC capability requirements following a distributed command and control paradigm.

The outcome of this and other studies will provide support for future NATO decisions to equip the organization with new tactical surveillance and command and control capabilities that can meet future challenges and replace the current Airborne Early Warning and Control System fleet that will reach the end of its service life in 2035.

Thanks to its expertise in the field of joint intelligence, surveillance, and reconnaissance (JISR) information and communications systems (ICS), GMV is participating in this initiative, confirming the establishment of a long-term cooperation framework to cement its position as a trusted NATO supplier.



GMV develops a software tool to optimize the weaponeering process

■ GMV has developed a groundbreaking software tool designed to support Spain's Air and Space Force in the weaponeering process. "Weaponeering" is a term used in the military field to refer to the determination of the weapons needed to obtain desired effects on a specific target, considering factors such as target vulnerability, weapon effects, launch errors, damage criteria, damage probabilities, and weapon reliability.

The weaponeering process is essential in planning military operations, as it makes it possible to determine the optimal use of weaponry to achieve the established operational objectives. The new GMV-developed tool will make it possible to model and simulate the effectiveness of weaponry, thus facilitating decision making in the planning cycle.

Specifically, the tool will make it possible to model and simulate weapon effectiveness to achieve the necessary results in the planning cycle, as well



as to develop weapon effectiveness data and target vulnerability analysis to adapt to the evolution of targets, armament, and weapon systems available to the Air and Space Force.

For this development work, GMV has drawn on its experience in areas such as weapon modeling and simulation, flight mechanics, JISR and target

survey, GNC, and ballistic calculation, among others. The Spanish Air and Space Force will be able to use this tool to improve the precision and effectiveness of its operations, ensuring that the desired damage criteria are met with the optimal use of available weapons and ensuring the principle of proportionality in the use of force.

GMV showcases its capabilities at the 2E+I Forum

GMV once again participated in the annual meeting of Spain's Army-Industry Forum (Foro 2E+I), held this year in Toledo on 2 and 3 October. The Forum is organized by the Army Museum Foundation and led by the Army, under the direction of the Army Logistics Support Command (MALE).

This edition's theme was "Integrating new capabilities," and the program of round-table discussions was rounded out by an exhibition area. José Luis Delgado, head of GMV's Defense and Security SCIS section, participated in the first day in the round-table discussion on the dynamic demonstration to be

held later that day and, during the second day, in the "Experimentation Plan" round-table discussion, which covered the role of experimentation in the development of military systems as a meeting point between the conceptual design phase and the practical implementation phase. Some of the examples discussed were the TALOS Command and Control system and the SISCAP (Dismounted Soldier System) project.

The dynamic demonstration, led by GMV, showcased the capabilities of Argus, GMV's command and control system for managing manned and unmanned land,

air, and maritime units and platforms at small-unit level.

The ground-system solutions on display at GMV's stand sparked great interest among participants and visitors. Notable visitors to GMV's stand included Secretary of State María Amparo Valcarce García; Army General Amador Enseñat y Berea, chief of staff of the Army (JEME); Lieutenant General Fernando Miguel García y García de las Hijas, head of the Army Logistics Support Command (MALE); and Lieutenant General Miguel Ivorra Ruiz, director general of industry at the Ministry of Defense.

Representatives of the European Defence Agency visit GMV



■ On 9 and 10 October, GMV welcomed visitors from the European Defence Agency's (EDA) Captech Guidance, Navigation and Control (GNC) for one of its annual meetings. The goal of the EDA working groups (CapTechs) is to conduct research and technology (R&T) activities based on the defense capability needs of member countries.

The meeting held in GMV's head office in Tres Cantos, Madrid, is part of a series

of regular meetings whose main aim is to strengthen the capabilities of Europe's armed forces by promoting collaborative research and development (R&D) projects.

The meeting was attended by the EDA captech coordinator, representatives of the Spanish Ministry of Defense, and representatives of Spanish and foreign industry. Attendees visited various

spaces where GMV's teams develop their groundbreaking solutions. The tour included the replica of the Galileo program operations room, the robotics laboratories, and the Eutelsat room, used for control center operations, and also showcased GMV's defense solutions and equipment.

GMV is involved in several projects within the EDA's various CapTechs. Specifically, in the navigation CapTech, the company has participated in the GNCAir project, focused on the study of the application of new technologies such as artificial intelligence for the guidance, navigation, and control of manned and unmanned vehicles, and is currently participating in RIPTIDE, whose goal is to establish standards for the evaluation and verification of navigation systems against electronic warfare attacks.

GMV presents its technologies for Europe's Future Battle Tank

GMV participated in the Edefa group's event on Europe's Future Battle Tank program, held on 14 November at the Polytechnic University of Madrid. Ricardo Sáenz, GMV's director of defense and security programs, presented the capabilities and new technologies applied to this program.

The event was aimed at analyzing the role of tanks in current and future operational environments. This national forum on Spain's presence in the European Future Battle Tank project brought together the points of view of users, manufacturers, and stakeholders regarding the current challenges and opportunities.

Within this framework, GMV stood out for its participation in the FMBTech (Future Main Battle Tank Technologies) project, in which it will develop a groundbreaking vehicle navigation system. This is one of the eight projects from the European Defence Fund's 2023 call for proposals in which GMV will be participating (36 projects in total across the PADR, EDIDP, and EDF calls for proposals).

DESEi+d 2024

GMV participated in Spain's 11th National Defense and Security R&D Congress (DESEi+d 2024), a forum and meeting point for all defense and security R&D stakeholders that presents the latest research and work carried out in any of the thematic areas related to this field.

GMV had a space in the exhibition area to provide information on the IRIS system, a central platform for the management and

monitoring of unmanned vehicle (UxV) operations that was developed by GMV for Spain's Directorate-General of Weapons and Material (DGAM SDG PLATIN). It also provided information on the UAV Solo, the high-performance class-I Micro fixed-wing unmanned system developed by Aurea Avionics in collaboration with GMV.

Organized by the Directorate-General of Weapons and Material's (DGAM)

Sub-Directorate-General of Planning, Technology, and Innovation (SDG PLATIN) and the Directorate-General of Recruitment and Military Education's (DIGEREM) Sub-Directorate-General of Military Education, together with the University Centers of Defense and Isdefe (Systems Engineering for the Defense of Spain), the event took place from 12 to 14 November in Jaén.

The Spanish Army modernizes its communications systems with Autek technology

■ The Spanish Army and Marine Corps have launched Plan MC3, an ambitious program to modernize their command, control, and communications systems. This plan seeks to improve operational capability in variable environments, increase protection for the Corps, and ensure information dominance and interoperability both nationally and with allies, complying with NATO directives on Federated Mission Networks (FMN). All this will be achieved through secure networking.

To ensure the secure exchange of information between the different security domains of the Plan MC3 stations, which handle different levels of classification (unclassified, limited dissemination, confidential or national reserved), Autek's cross-domain



technology, specifically the PSTdiode hardware data diodes, will be tested.

PSTdiode is Common Criteria EAL4+-certified and is included in the Spanish National Cryptologic Center's (CCN) ICT Security Products Catalog (CPSTIC) as an approved product for handling classified information. It is also listed in the NATO Information

Assurance Product Catalogue, which reinforces its reliability and security for handling sensitive data.

Through these improvements, the Spanish Army and Marine Corps are seeking to strengthen their operational and protection capabilities, ensuring safe and efficient communication at all levels of information classification.

The 18th STIC CCN-CERT Conference and the 6th SPDEF-CERT Cybersecurity Conference see high attendance and strong collaboration

■ From 26 to 28 November 2024, the Kinépolis cinemas in Madrid's Ciudad de la Imagen hosted the 18th STIC CCN-CERT Conference and the 6th SPDEF CERT Cybersecurity Conference, with the theme of "Active cyberdefense for a digital world." This event, considered one of the leading cybersecurity conferences in Spain, is organized by the Spanish National Intelligence Center's (CNI) National Cryptologic Center (CCN) and the Joint Cyberspace Command (MCCE), in collaboration with RootedCON.

As part of its commitment to national security and technological sovereignty, Autek, a Spanish manufacturer of secure cross-domain information exchange solutions, has been a sponsor of the event every year since 2011. In this

edition, it participated in the Platinum category.

For Autek, the event, which brought together more than 7,000 cybersecurity professionals from various sectors, was a valuable opportunity to meet and talk with clients, partners, colleagues, and professionals both from Spain

and from other countries. This year was especially important due to the company's recent integration into GMV, enabling the company to share this new and exciting stage, as well as to connect with colleagues from various sectors and GMV's corporate departments, who also participated prominently in the event.



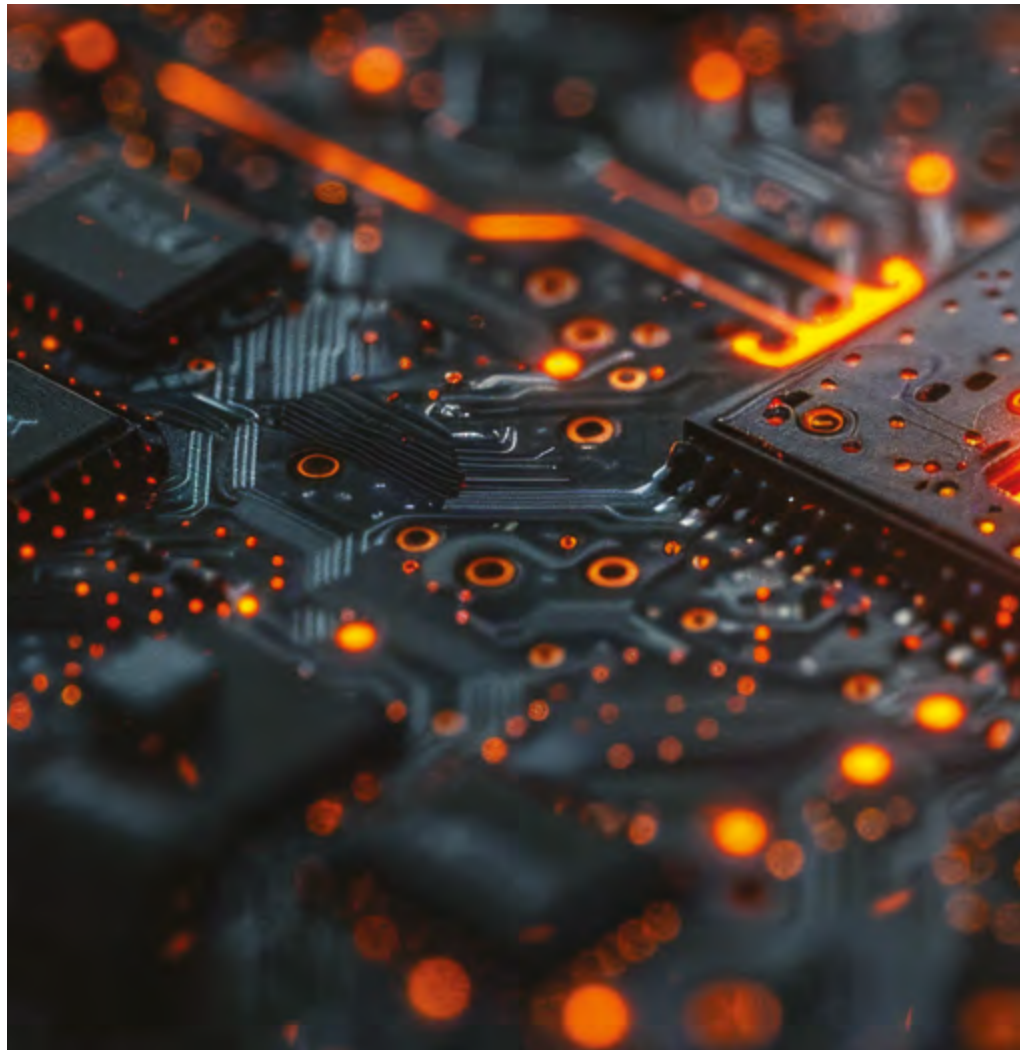
GMV participates in Cyberwings Colombia

From 18 to 22 November, Cyberwings 2024, the 4th International Cybersecurity and Cyberdefense Continuing Education Forum of the Air Forces of the Americas, was held in Bogotá, Colombia.

Organized by the Colombian Air Force, this fourth edition of the forum sought to position Colombia and the Colombian Air Force as leaders in the field of cybersecurity and cyberdefense.

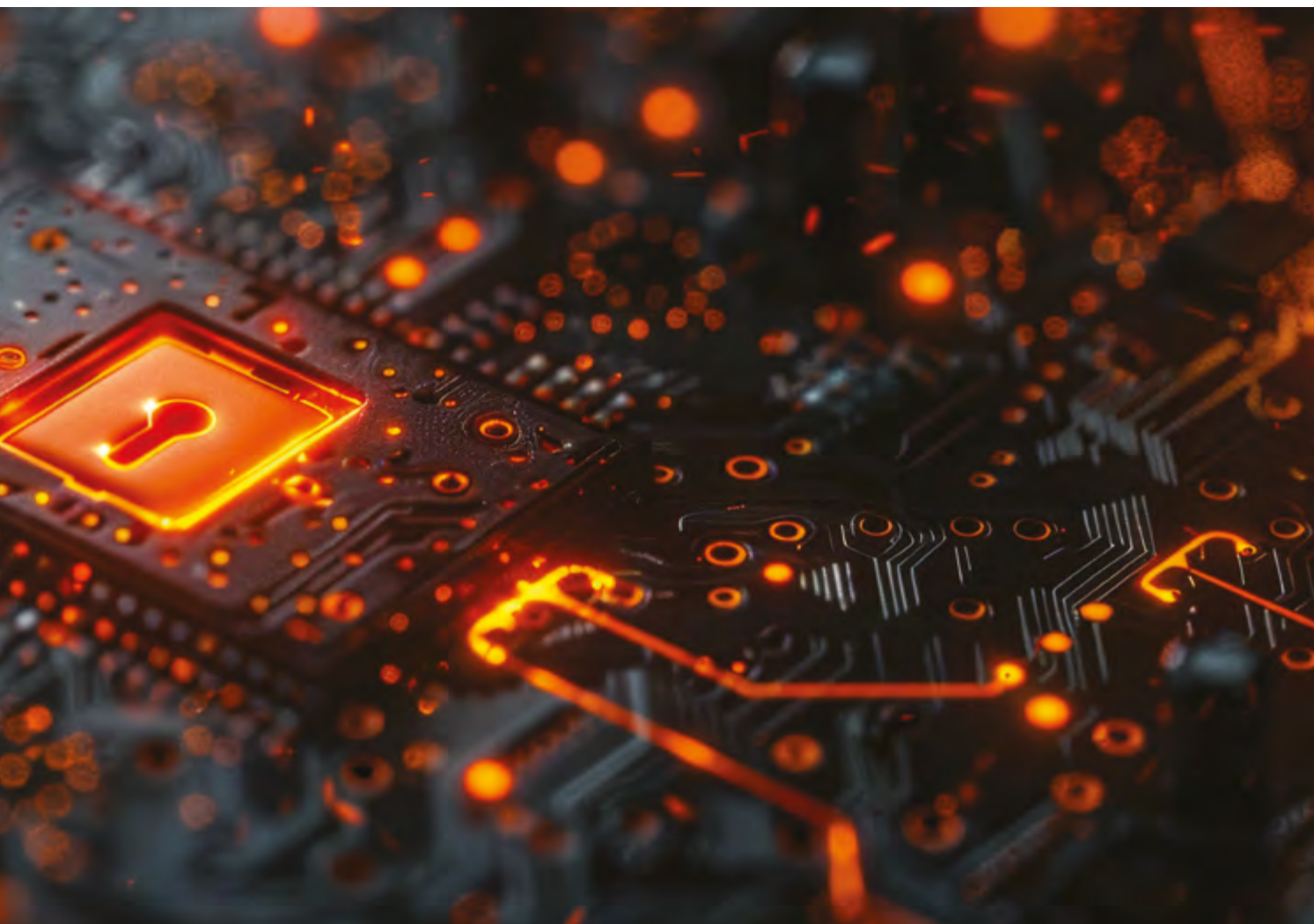
GMV, invited to the conference, was represented by José María Legido, manager of international markets for GMV's Secure e-Solutions, who gave a talk on "Cybersecurity in the European aerospace environment."

Legido highlighted the remarkable growth of the space sector, which currently has almost 6,000 active satellites in orbit, a number that is expected to increase over the next 10 years to more than 24,000. This anticipated increase would entail a significant increase in cybersecurity risks. Given that the space sector provides essential telecommunications and positioning services, any incident affecting these services could have a significant impact on society. In this context, Legido highlighted the need to effectively address the main risks the sector is facing, stressing the importance of integrating cybersecurity measures from the initial stages of any space project.



GMV Penbot, the AI-powered pentester that never sleeps

This solution has been designed to identify, analyze, and mitigate web vulnerabilities using advanced reinforcement learning techniques to effectively address the risks listed in the OWASP Top 10 (Open Web Application Security Project)



In a digital environment in which cybersecurity threats are growing exponentially, GMV has unveiled **GMV Penbot**, a revolutionary automatic pentesting solution based on artificial intelligence. This tool is designed to identify, analyze, and mitigate web vulnerabilities using advanced reinforcement learning techniques to effectively address the risks listed in the OWASP's (Open Web Application Security Project) Top 10. Its main purpose is to minimize the chances of cyberattacks that could compromise sensitive data, disrupt business operations, or jeopardize organizations' reputation.

GMV Penbot's distinguishing feature is its ability to replicate the behavior of a professional hacker, all in a fully automated manner without the need

for human intervention. Its intuitive graphical interface democratizes access to penetration testing (pentesting), allowing both specialized teams and non-technical personnel to detect and manage vulnerabilities efficiently and easily, opening the door to wider use of pentesting in organizations of all sizes.

Continuous learning is one of **GMV Penbot's** most innovative features. Through the use of simulated environments, the tool constantly improves its decisions and optimizes its performance against emerging threats. It can proactively identify attacks such as SQL injections, Cross-Site Scripting (XSS), and brute force attacks, some of the most common and damaging threats to web applications. This approach not only enhances security, but also reduces the operational costs associated with manual pentesting and

ensures regulatory compliance through continuous audits.

One of the key advantages of **GMV Penbot** is the integration of advanced pentesting tools, which generate accurate results in record time. This allows organizations to optimize resources and focus on strategic tasks. In addition, the tool automates the generation of detailed reports after each scan or test, providing security teams with a clear and consistent view of the protection status of the technology infrastructure.

GMV Penbot is a paradigm shift in the field of pentesting. This next-generation solution combines automation, artificial intelligence, and accessibility, providing organizations with a strategic ally to protect themselves against the threats of the modern digital world.

GMV participates in the 15th Cyber Commanders Forum summit

■ Málaga was the venue for the 15th edition of the Cyber Commanders Forum (CCF), coordinated by Vice Admiral Javier Roca Rivero. On the final day of this prestigious forum, the Andalusian Digital Agency hosted the “Cybersecurity Strategies from Southern Europe” event, with GMV playing a key role. During the session, leaders of security agencies from NATO, Japan, Brazil, and Australia, as well as their counterparts from Spain’s Joint Cyberspace Command (MCCE) had the opportunity to learn first-hand about the industry’s vision and the innovative proposals it offers.



José Carlos Barrios, project manager of the Big Data and Artificial Intelligence Division at GMV’s Secure e-Solutions, addressed the importance of Privacy-Enhancing Technologies (PET) in the context of the development of **uTile PET**, stressing its advantages over the traditional trend of centralizing all data and the risk of

sensitive information leaks. “Accessing data under an approved model is complex, as most of the time it is sensitive and subject to regulations and strict sharing rules; if little data is available, the accuracy of our Machine Learning (ML) or statistical analysis models is compromised,” he noted. However,

with **uTile PET** “it’s not necessary to access the data; thanks to the technology developed with open-source solutions, the data are kept in their centers of origin, preserving their privacy and making it possible to work with them in a decentralized manner.”

GMV becomes the first Spanish partner to achieve Imperva’s Premier level

■ GMV has reached Imperva’s Premier level after 14 years of collaboration between the two companies. This alliance reflects GMV’s commitment to helping its clients implement cybersecurity solutions that will protect their applications, data, and identities, while also ensuring compliance with the privacy and data protection requirements of Spanish and European Union legislation.

GMV is the only company in Spain that has achieved Imperva’s highest level of collaboration, Premier. This accomplishment reinforces the GMV’s leadership in cybersecurity, recognizes its investment in innovation, and enables it to offer its customers the most innovative

application and data protection solutions. “We have a long-standing partnership and mutual understanding with Imperva that has grown stronger year after year,” says Nathalie Dahan, head of partner strategy. “Today, GMV may be Imperva’s Spanish partner with the highest level of technical expertise in the solutions that Imperva offers. Our clients have also recognized this, during projects where we have integrated Imperva solutions.”

Meanwhile, Florian Malecki, VP, EMEA channel sales at Imperva’s CPL, explains how “Accelerate Partner,” the company’s partner program, “provides exclusive promotions that allow GMV to generate

recurring revenue while helping clients set up security programs that can scale and adapt to the changing attack vectors and compliance landscape. We are very pleased with and excited about this partnership, and we are now looking forward to further accelerating our market presence with GMV.”

Companies with a mature level of cybersecurity are embracing solutions that can guarantee protection and privacy for their personal data and sensitive information, while also ensuring regulatory compliance. That’s why they trust companies such as GMV, which has reached the highest level as an integrator of Imperva solutions.

Using artificial intelligence to quantify the risk of non-compliance with DORA and NIS2 and the cost of cyberattacks

The NIS and DORA regulations are a European Union milestone in terms of cybersecurity improvements and the resilience of companies in particularly critical sectors. One of the key common denominators is their focus on technological risk and the need to quantify it financially.

These regulations require knowledge of these losses as part of the risk management and mitigation process. Meanwhile, cyber insurance needs objective criteria to set the corresponding premiums and design appropriate protection models. In addition, non-compliance with regulations such as NIS2 and DORA may lead to considerable penalties that can affect the profit and loss account of the organizations concerned. For all these reasons, senior management needs predictive systems to quantify technological risk and the “translation” of potential losses into financial terms, allowing them to establish action criteria in line with their priorities.

In this context, the use of artificial intelligence (AI) can be extremely useful in combination with different techniques and methodologies such as:

- Integration with the organization’s critical asset inventory and dependency tree, including operations and clients, as well as the value assigned to the latter.
- Implementation of a common control base: CIS controls, for example, for measuring the security status of the organization’s most critical aspects.
- Integration with cyber intelligence data sources.
- Database with statistics of internationally standardized incidents and their impact for initial predictions and assessments.
- Analytical models such as Gordon-Loeb to determine the optimal level of information security investments against expected losses.
- Multimodal attack simulation techniques for calculating financial losses.
- Automated data related to vulnerability analysis and attack probabilities based on such vulnerabilities, inspired by MITRE ATT&CK.
- Integration of results related to pentesting activities.
- Statistical methods such as Monte Carlo simulations: multiple probability
- Potential use of the Open FAIR (Factor Analysis of Information Risk) standard to quantify and communicate IT risk using a common taxonomy and methodology.



Ángel García-Madrid
Business Continuity Manager/Head of
Resilience Services de Secure e-Solutions
de GMV

simulation, a mathematical technique used to estimate the possible outcomes of an uncertain event.

- Analysis algorithms provided by AI.

Banks, insurance companies, in critical sectors, organizations involved in the provision of healthcare services, strategic industry, and more, can benefit from tools and initiatives where the application of AI techniques provides extraordinary support for resilience and information security decisions and investments.



GMV takes center stage at #18ENISE, the international information security event organized by INCIBE

■ With the theme “Challenging the new digital era,” Spain’s National Institute of Cybersecurity (INCIBE), attached to the Ministry of Economic Affairs and Digital Transformation, organized the eighteenth edition of the International Meeting on Information Security (#18ENISE) at León’s Palacio de Exposiciones y Congresos convention center, from 21 to 23 October.

Reaffirming its commitment to innovation and cybersecurity, GMV played a leading role at the event, participating actively in various talks and round-table discussions. On the first day, Mariano Benito, GMV’s cybersecurity and privacy ambassador, presented the “Information Classification, DLP, and

IRM” report, drawn up by the AUTELSI’s Quality and Security Group.

At the El Palacín venue, where the Innovation Public Procurement projects backed by INCIBE were presented, GMV showed the progress made in the development of products and services for security operations centers (SOCs) specializing in the transportation and space sectors, as well as its groundbreaking self-sovereign digital identity solution. David Álvarez, project manager in cybersecurity software development, and Juan Miguel Auñón, head of privacy-preserving technologies (PPT) at GMV’s Secure e-Solutions, were tasked with sharing these achievements.

Patricia Tejado, director of digital public services at GMV’s Secure e-Solutions, also participated in the panel discussion on “Experiences and difficulties in attracting and retaining cybersecurity talent.” Javier Zubieta, marketing and communications manager of GMV’s Secure e-Solutions, also moderated the round-table discussion on “Analyzing technological risks in companies’ governing bodies,” as chairman of AMETIC’s Cybersecurity Commission.

The event also saw the launch of the ISAC-TIC (Information and Communications Technology Threat Information Center), with Luis Fernando Álvarez-Gascón, general manager of GMV’s Secure e-Solutions, playing an active role.

From car hacking to AI in pentesting, GMV breaks new ground at IT-SA

■ At the IT-SA Expo&Congress, GMV once again demonstrated its cybersecurity leadership with a series of groundbreaking talks addressing critical cybersecurity challenges.

The talk on “Car Hacking: Exploring Vulnerabilities in Modern Vehicles” was given by Carlos Sahuquillo, Cybersecurity Consultant at GMV Secure e-Solutions, who highlighted the increasing complexity of connected vehicles and the crucial role of cybersecurity. Sahuquillo used video demonstrations to show GMV’s advanced

capabilities in vulnerability assessment and vehicle penetration testing, stressing the importance of SOC’s and ethical hacking laboratories as key pieces in the protection of these systems.

Meanwhile, in his talk on “Network Hacking: Total Compromise Just One Click Away,” Marek Matuszak, International IT Security Services Leader at GMV Secure e-Solutions, warned of the fragility of cybersecurity defenses when faced with a single malicious click. Matuszak stressed the need to continually educate

users to prevent devastating attacks that can compromise entire networks, even highly sophisticated ones.

In addition, João Sequeira, Director of GMV Secure e-Solutions in Portugal, addressed the risks in the IoT field with his talk on “IoT Hacking: Attacks on Bluetooth devices,” showing the most common Bluetooth technology vulnerabilities. Through a live demonstration, he showed how a cyberattack on Bluetooth devices can highlight just how easily attackers can compromise personal devices.

Finally, Alicia Morales and José Luis Álvarez, Data Scientists at GMV Secure e-Solutions, introduced the future of cybersecurity with “AI Pentesting: Automated AI-driven pentesting application.” This presentation showcased **GMV Penbot**, a reinforcement learning (RL)-based solution that automates vulnerability detection in large-scale web environments.



GMV receives a prize from SIC magazine for its track record and contribution to the cybersecurity sector

■ As part of the SIC Awards gala organized by SIC magazine for its twentieth anniversary, GMV received a special award in recognition of its 40-year history and its contributions to the cybersecurity sector over three decades.

Luis Fernando Álvarez-Gascón, general manager of GMV's Secure e Solutions, received the prize from José de la Peña, editor of the magazine. In his speech, Álvarez-Gascón thanked everyone who has been part of GMV's journey: clients, partners, suppliers, former employees, competitors, and especially the company's current team.

He emphasized the pillars that have underpinned GMV's success over the last three decades: loyalty to its values, commitment to innovation, dedication to serving its clients, exceptional talent, and a clearly international profile. "Thirty years in



the cybersecurity field is no easy feat, and we at GMV have managed to stay true to our essence while adapting to a constantly changing environment," he said.

This award underlines GMV's commitment to excellence, cementing its leading position in a critical sector for digital transformation and global security.

GMV is back at Insurance Revolution

On 14 November, Madrid hosted the eleventh edition of Insurance Revolution, a key event for the insurance sector, this year with the theme of "Accelerating the integration of artificial intelligence in the insurance sector." During the event, GMV shared its experience working with major insurance companies, highlighting the technological solutions that are driving the digital transformation of this sector.

Artificial intelligence (AI) was one of the stars of this edition. GMV has been applying AI for years to combat insurance fraud, using advanced

technologies that analyze large volumes of data to detect suspicious patterns and atypical behavior, elements that might go unnoticed by humans. This AI capability is helping insurance companies transform their business, increasing efficiency, improving customer experience, and optimizing internal processes.

In addition to contributing to the use of AI, GMV is helping insurance companies meet the requirements of the DORA (Digital Operational Resilience Act), a European Union regulation that seeks to ensure that financial organizations, including insurers, can withstand,

recover from, and continue operating in the face of cybersecurity incidents and technological disruptions. This legislation has a significant impact on the industry, forcing insurance companies to strengthen their systems and ensure their ability to operate in the face of cyberattacks and other technological disruptions.

The event was an opportunity to delve into the technological breakthroughs that are transforming the insurance sector, positioning artificial intelligence as a key driver in its evolution towards a safer and more efficient and digitalized future.

R&D&I in ICT as a guarantee of strategic sovereignty



■ From 26 to 28 November, Spain's cybersecurity professionals converged on Madrid, which hosted the 18th STIC CCN-CERT Conference and the 6th ESPDEF-CERT Cyberdefense Conference, with the theme "Active cyberdefense for a digital world." This prestigious event, organized by the Spanish National Intelligence Center's National Cryptologic Center, Spain's Joint Cyberspace Command, and RootedCON, brought together leading domestic and international public- and private-sector organizations in the field of cybersecurity.

GMV, a leading organization in this field, actively participated in the event, with the presence of Luis Fernando Álvarez-Gascón, general manager of GMV's Secure e-Solutions, in two key round-table discussions. The first, entitled "R&D&I spending in ICT oriented to national (cyber)security, beyond European Union funding,"

addressed the imperative need to develop national industrial capabilities in cybersecurity, thus ensuring the desired levels of security and strategic autonomy, based on technological sovereignty. This approach must be elevated to political priority status and not limited solely to obtaining European Union funding, although these funds are also important and should be treated with greater ambition.

Álvarez-Gascón stressed that GMV's cybersecurity R&D strategy is not based on improving what others have already developed, but rather focuses on identifying and plugging existing gaps to create groundbreaking solutions. This effort has resulted in unique tools such as **Gestvul**[®], which manages the vulnerability lifecycle from identification to resolution, and **uTíle PET**, a solution that enables secure and private calculations to be

performed on distributed data without the need to expose or move them outside the organization.

The second panel discussion in which GMV participated, coordinated by Women4Cyber, reaffirmed the organization's commitment to working towards inclusive cybersecurity, stressing the importance of public-private partnerships for strengthening the current ecosystem and the need to maintain a clear focus on retaining talent. Luis Fernando Álvarez-Gascón stressed the need to take an equitable approach to recognizing, assessing, and compensating talent, a line of work that is fundamental in GMV.

To illustrate this commitment, he mentioned the PAIT[®] solution, a tool developed in partnership with Peplematters that helps organizations manage pay equity and promote pay transparency.

Improving the health of chronic patients: the aim of the partnership between GMV and INIZIO

GMV's **Antari Professional Care** digital platform becomes a valuable resource for the UK company's healthcare professionals

The collaboration between Inizio Engage's Patient Solutions Services division and GMV significantly boosts capabilities for the delivery of quality healthcare services. In this context, **GMV's Antari Professional Care** digital platform has become a valuable resource for the British company's healthcare professionals. This groundbreaking tool allows specialists to incorporate new features that optimize the care and monitoring of chronic patients, thus facilitating more comprehensive and personalized care. Thanks to GMV's technological solution, Inizio aims to improve patient

healthcare management, promoting a proactive approach to their treatment and wellbeing.

Thanks to the capabilities of **Antari Professional Care**, Inizio Engage's team of professionals can plan personalized patient care and the activities planned within their support programs. It also enables them to establish data collection during their visits, aligned with the needs of the program and their patients, and select the channels they can use for this purpose. According to Adrián Rodrigo, Smart Health Business Solutions of GMV's Secure e-Solutions, "the platform enables them

to offer much more comprehensive, personalized, and coordinated care, boosting the efficiency and quality of the service offered."

For Javier Salguero, Head of Patient Solutions Iberia of Inizio Engage, "for Inizio, the partnership with GMV represents the perfect combination of GMV's robust and proven technological capabilities with our company's human resources, multiplying the value of our joint proposals and improving the experience of those taking part in our projects, ultimately generating the most positive possible impact on both healthcare professionals and patients."



The race for equality: digital tools for an inclusive marketplace

In 1960, Rome was preparing for an event that has continued over the years and was a milestone for our society. From September 19 to 24, Rome hosted the first Paralympic Games, bringing together athletes from all over the world who, faced with the challenge of living with a disability, proved themselves in demanding disciplines such as athletics, swimming, basketball, and others. This historic event not only demonstrated the talent and determination of people who face their daily lives with an added difficulty. It also marked the beginning of a movement that has transformed the perception of disability and inspired people around the world. The first Paralympic Games laid the foundation for a future where sport would be a fundamental tool to promote inclusion and equality.

This event showed that, with the necessary adaptations, anyone can achieve excellence, realize their potential as a human being, bring out the best in themselves, and consequently enrich society. The Paralympic Games are an excellent example for the labor market moving forward. Although steps have been taken, changes are still needed to overcome the inflexibility hindering the full inclusion of this group,

as evidenced by the high rate of unemployment and underemployment they experience. Persistent preconceived ideas about people with disabilities that cause psychological barriers; the lack of accessibility, training, and awareness and insufficient or unenforced legislation are some of the reasons for all this.

DIGITAL TOOLS: CONTRIBUTING TO UNIVERSAL ACCESS

Even with the ongoing challenges, digital technologies have energized

the labor market for people with disabilities. Tools such as remote work, process automation, and online collaboration tools have transformed the work environment, making it more flexible and accessible. This not only benefits companies, but it also promotes a more equitable workspace for all.

Today, people with disabilities who previously faced physical or attitude barriers to employment now have more opportunities to develop their skills, live more independently, and



“With the necessary adaptations, anyone can achieve excellence, realize their potential as a human being, bring out the best in themselves, and consequently enrich society”

actively contribute to society. Thanks to advanced algorithms, jobs can be tailored to individual needs, while platforms that connect people with disabilities with companies looking for diverse profiles, along with e-learning programs that offer captioning and transcription or online mentoring programs, with which to acquire new skills and knowledge, are facilitating their professional development and inclusion in the labor market.

Everyone must have the same opportunities to access employment.



This is why it is important for public administrations to implement inclusive measures. Although regulations have already been created to ensure equal opportunities and facilitate the adaptation of workspaces, we still face challenges such as accessibility to technology, data protection and the elimination of biases in algorithms. So, if there are already tools that use artificial intelligence to analyze gender discrimination, it would be very useful to apply this approach also to identify biases in the recruitment process of people with disabilities.

STAGE BY STAGE

While the advances in digital technology are promising, much remains to be done to ensure that we can all benefit from them. It is crucial that technology companies and governments work together to design inclusive solutions from the ground up. The future of occupational and social inclusion hinges on greater investment in accessible technology, the training of specialized professionals, and the promotion of an inclusive culture.

Artificial intelligence, virtual reality, and robotics have the potential to transform the lives of millions of people with disabilities, enabling



*Maole Cerezo
Adviser for Marketing and Digital Health Outreach
for GMV's Secure e-Solutions*

them to participate fully in society. The labor market is like a huge competition where everyone should have the opportunity to play, leaving no one on the sidelines. Let's harness the power of innovation and collaboration by remembering the lessons of the Paralympic Games: with the right rules and a little adaptation, we can all play on the same team. Because people can be born with a disability or become disabled during the course of their lives. Let us not forget that, for those who are fortunate enough to live many years, it is likely that, over time, the conditions associated with old age will lead us to face some disability.

6th National Congress of the Spanish Rheumatology League: 50 years of progress

■ At the end of November, the 6th National Congress of the Spanish Rheumatology League (LIRE) was held, in which GMV took part. The event, whose president of the Honorary Committee was H.M. Queen Letizia, coincided with the celebration of the association's 50th anniversary. Twenty-four professionals participated as speakers in four panel discussions and three keynote lectures.

Maole Cerezo, Digital Health Marketing and Communication Advisor of GMV's Secure e-Solutions chaired the first panel discussion, entitled "Conditions and right to work of people with rheumatic and musculoskeletal diseases (ERyMEs)." The panel was composed of César López, director of the GoodJob Foundation and its

special employment center; Guillermo Rademakers, senior consultant at Peplematters; Elena Antelo, managing director of the Spanish Confederation of People with Physical and Organic Disabilities (COCEMFE); and Daniel Aníbal García, president of the Spanish Business Federation of Associations of Special Employment Centers (FEACEM).

As Cerezo pointed out when presenting the speakers, GMV has been collaborating for years with both the GoodJob Foundation and the consultancy firm Peplematters. GMV even collaborated with the former in the field of cybersecurity. A particular highlight was the definition of the content of a training course certifying professionalism in IT security. For their part, Peplematters and GMV

have worked together to draw up an equality plan, and GMV is currently working with the consultancy firm to develop the employee value proposition.

Among the conclusions reached at the panel discussion was the importance of facilitating the inclusion of disabled people in the ordinary labor market. The need to implement suitable measures to achieve this was stressed, preventing these people from taking on the responsibility of doing so as if they were "superheroes". In addition, consensus was reached on the need to professionalize patient associations, involving them when designing solutions to improve their quality of life.

GMV in the workshops held by Hospital Virtual Valdecilla during the 19th ANIS Congress

The National Association of Health Informers (ANIS) held its 19th Conference in Santander from October 25 to 27 under the slogan "Redesigning health journalism. Information challenges in the face of climate change, the media crisis, and misinformation"

Nearly 200 health communicators met to discuss the challenges posed by their profession, especially misinformation, climate change, and the increase in Sexually Transmitted Infections (STIs). During the meeting, the number of people who prefer to seek a diagnosis on the Internet rather than go to a doctor's office, which is on the rise, was highlighted. It also called for investment in research that addresses ethical dilemmas about the sanctity of life.

Carl-Henrik Heldin, former chairman of the Nobel Prize Committee, was among the most prominent speakers at the congress, emphasizing that disinformation and fake news have become a significant problem. Heldin emphasized the importance of reporting advances in medical research and disease treatment in a way that is accessible to non-specialist audiences without sacrificing accuracy, which represents a considerable challenge. The last panel of the event, chaired by Emilio de Benito, vice-president of ANIS and attended by various communication professionals and specialized journalists, stressed the essential importance of professionalizing reporters, an objective on which the Association has been working since its foundation through various training activities, such as seminars, meetings,

and workshops, to encourage ongoing training and safeguard professional ethics.

As part of the conference, GMV took part in the workshops promoted by ANIS's Cantabria office and held by the Virtual Hospital Valdecilla. Maole Cerezo, Digital Health Marketing and Communication Advisor of GMV's Secure e-Solutions, took part in these workshops, where she was able to see at first hand the importance of digital technologies in the training of healthcare professionals. This virtual hospital center is a pioneer in Europe in the use of clinical simulation as a training methodology and also in the promotion of teaching innovation, research, and the use of groundbreaking technologies as vital tools for improving patient safety and boosting professional skills.

GMV participates in INUBE's conference on personalized medicine and pharmacogenetics

■ The auditorium at the Medical Association of Badajoz was the venue for the 5th International Symposium on professional aspects dealing with the implementation of pharmacogenetics in Ibero-America, held on 5 November. This meeting was part of the CYTED 2024 Forum, held from November 4 to 7 in Madrid and Badajoz, with GMV's participation. The symposium discussed regulatory and clinical issues and the creation of tools and procedures for the clinical use of pharmacogenetics and personalized medicine. The event was attended by medical professionals from various regions, including Extremadura, Brazil, Colombia, Ecuador, Dominican Republic, Argentina, Portugal, Chile, Nicaragua, Mexico, and Cuba.

The day began with a talk by Dr. Adrian Llerena, director of the University Institute for Biosanitary Research of Extremadura (INUBE),

scientific director of the MedeA project and of the Pharmacogenetics Unit of the University Hospital of Badajoz. Llerena presented the model of the MedeA project in the Extremadura Health Service (Servicio Extremeño de Salud), which started up in 2013, and discussed Spain's regulations on the clinical implementation of pharmacogenetics.

For his part Carlos Royo, Head of GMV's Secure e-Solutions Health Strategy, presented the decision-support system called PoPS 1 (Personalized Oriented Drug Prescription System) in which GMV has collaborated with the Extremadura Health Service to develop a digital tool for personalized drug prescription as part of the MedeA project. Thanks to this tool and the patient's genetic information in their medical records, specialists can identify possible adverse effects or ineffective interactions between the

various drugs required by the patient, enabling them to prescribe the most appropriate treatment.

It is important to note that the Spanish Agency of Medicines and Health Products (AEMPS) has launched a new database of pharmacogenomic biomarkers. This tool aims to facilitate access to the information in the technical data sheets and to promote the integration of pharmacogenetics in clinical practice. This initiative is very valuable for advancing personalized precision medicine, especially after the recent update of the National Health System's genomic services portfolio, which was approved on June 23, 2023 by the Ministry of Health. In this way, healthcare professionals will be able to choose the most appropriate drugs according to the needs and genetic profile of each patient, resulting in greater treatment efficacy and a marked decrease in the risk of adverse effects.







GMV to supply Grupo Ruiz with the CAD/AVL System and Ticketing for the buses of Linares

This new project with Grupo Ruiz for the fleet of Linares (Jaen) will enable GMV to consolidate its position as a leading technology supplier to this operator

Grupe Ruiz has awarded GMV the contract to supply its CAD/AVL System, Onboard User Information System, Onboard Video Surveillance (CCTV) and Ticketing (including EMV and QR payment) for the fleet of eleven buses of the City Government of Linares.

This new project with Grupo Ruiz will enable GMV to consolidate its position as a leading technology supplier to this operator. The project will have a twelve-month execution period and includes the supply, installation, start-up, and two-year extended warranty of the new systems.

GMV will outfit Grupo Ruiz's buses with a ticketing desk to facilitate the use of the contactless transport card and single-ticket payment by

bank card through the EMV Transit system or by means of a QR code. Specifically, the ticketing system will include the following features: single ticket payment by bank card (EMV Transit system), payment by QR code, validation of Linares City Council transport cards, updating of blacklists and whitelists and updating of the on-line fare system.

The GMV-supplied equipment will also function as an onboard CAD/AVL unit, with location and communications functions, an onboard user information system by installing a TFT monitor on each bus and an onboard video-surveillance system (CCTV), equipping each bus with four cameras. At Control Center level, GMV will supply its ticketing backoffice, CAD/AVL, and CCTV systems.

GMV drives innovation in the public transport system of the Madrid Region



■ In December, the Minister of Housing, Transport, and Infrastructure of the Community of Madrid, Jorge Rodrigo, launched the contactless EMV bank card payment system for single tickets on city buses in El Escorial, Torrejón de Ardoz, and Pozuelo de Alarcón. This breakthrough is a milestone that opens up access to public transportation for residents and visitors to the region, consolidating the community's commitment to innovation and sustainability.

The inauguration ceremony was attended by prominent personalities, including Jorge Rodrigo, Regional

Minister of Housing, Transport, and Infrastructure of the Community of Madrid; Pablo Rodríguez Sardinero, Manager of the Madrid Regional Transport Consortium; Carlota López Esteban, Mayor of San Lorenzo de El Escorial, and Francisco Iglesias, CEO of ALSA, among others.

GMV was represented by Miguel Ángel Martínez Olagüe, GMV's General Manager of Intelligent Transportation Systems (ITS); María Jesús Calvo, ITS Customer Service and Maintenance Manager; Carlos González Bayod, ITS Business Development Manager; José Cuesta, ITS upsell development manager; and Antonio Blanco, ITS

Business Development Manager for Spain, Portugal, and Morocco.

During the event, attendees were given a first-hand experience of the system's operation as they boarded one of GMV's technology-equipped buses. This system allows users to pay for their ticket quickly and securely using physical or virtualized bank cards on devices such as cell phones or smart watches.

GMV has been responsible for developing and implementing both the onboard technology and the central systems that make this service possible. At the heart of this innovation is the **TV100** validator, a device designed, developed, and manufactured entirely by GMV, integrating the most advanced technological components to guarantee a secure and universal payment experience.

GMV, with a wealth of experience in the development of technological solutions for public transport, continues to back innovation to promote more efficient, accessible, and sustainable transport.

Rail industry news at AusRAIL 2024

GMV was present in November at "AusRAIL 2024," the national conference and exhibition of the Australasian Railway Association. The event, which was held in Broadbeach, Australia, has established itself as the largest rail meeting in the Asia-Pacific region, with more than 3,000 attendees from the Australian and New Zealand rail industry, as well as from other regions of the world.

AusRAIL attracts key industry leaders and decision makers from a variety of sectors, including passenger rail

operators, freight operators, rolling stock manufacturers, contractors, rail industry suppliers, consultants, and government representatives.

GMV used the event to showcase its latest innovations in the railway field, highlighting products such as **DV-REC**[®], an advanced video recording system for the railway environment, **PA Intercom**[®], a state-of-the-art intercommunication system, the passenger management solution **Info-Pass**[®], **GMV Planner**, for route optimization, and the CAD solution

AVL Tram, focused on real-time vehicle management.

During the exhibition, GMV had the chance to interact with some of the sector's main brands and clients, both local and international, such as Alstom, Hitachi, CRRC, Downer, John Holland, Gamuda, UGL, and East Japan Railway Company, making this event a vital opportunity for GMV both to demonstrate its leadership and innovation in the railway sector and to continue to expand its presence in the Asia-Pacific region.

GMV will provide ALSA with the SAE and ticketing system for the metropolitan area of Aragón

■ ALSA has trusted GMV to provide its CAD/AVL system and Ticketing System for the metropolitan and interurban concessions awarded to it as part of the concession renewal of the Zaragoza Area Transport Consortium (Consortio de Transportes del Área de Zaragoza: CTAZ) and the Regional Government of Aragón (Gobierno de Aragón).

The Government of Aragón and the CTAZ are engaged in a concession renewal process throughout the Community, with public tenders for the different regular public passenger transport concessions, both interurban and metropolitan, that operators are bidding for, giving them the possibility of operating new concessions for 10 years or renewing them, as the case may be.

ALSA has now awarded GMV the contract to supply its CAD/AVL System and its Ticketing System for Zaragoza's metropolitan transport and Aragón's interurban transport, involving the outfitting of 35 and 4 buses,

respectively. This project, together with the Aragon Government's Central System, which is also being developed by the company, will enable GMV to position itself as the leading technology supplier in this community.

GMV will equip ALSA's buses with a ticketing console to use regional contactless transport cards, also incorporating EMV payment technology and QR code reader. The GMV-supplied equipment will also function as an onboard CAD/AVL, with location, communications, onboard user information system, video-surveillance system and eco-driving functions. At the control center level, GMV will supply its ticketing backoffice and CAD/AVL systems, which in turn will report operating information to the central systems of the Gobierno de Aragón and CTAZ.

This new project with ALSA will enable GMV to position itself with one of the strategic clients of concession renewal in Aragón, helping to make it a leading technology supplier in this region.



GMV presents its most cutting-edge solutions at APTA TRANSform 2024

GMV was present at the APTA 2024 TRANSform conference, held in Anaheim, California, from 29 September to 2 October 2024. This key forum for industry professionals offered workshops, technical visits and educational sessions on topics such as transformative technology, equity, security, financing and workforce development. It also brought together a wide range of attendees, including transportation decision-makers, policymakers, manufacturers and consultants, encouraging the exchange of ideas and the establishment of new connections.

The company had its own booth where it presented some of its intelligent transportation systems (ITS) solutions, reaffirming its commitment to innovation and the transformation of public mobility. Among them the **GMV Hub EP200**, **ITS Suite**, **Sync**, and digital signage.

APTA TRANSform 2024 established itself as an outstanding platform for showcasing the latest innovations driving safer, more efficient and sustainable public transport, where GMV reaffirmed its leadership as a supplier of advanced technological solutions for the transport sector.

FIAA 2024, towards a future of intelligent and connected mobility

■ From 22 to 25 October GMV took part in the International Bus and Coach Fair (FIAA) 2024, held in the IFEMA fairgrounds in Madrid. This fair is the main meeting point of the bus industry and road passenger transport companies and a showcase for innovations in safe, ecological and connected collective mobility. With more than 10,000 visitors and 250 exhibitors, the company presented its most innovative solutions in intelligent transportation systems (ITS).

It highlighted its transport ticket validator, which allows access via cards, smartphones or bank cards, and is compatible with ABT (Account-Based Ticketing). In addition, it presented a modular architecture that allows customizing the configuration according to the customer's needs.



It also exhibited SAE and ticketing solutions for the driver, available in modular or all-in-one versions, and its EcoDriving tool, which optimizes driving to improve efficiency and sustainability. It also showed **GMV Planner**, a tool for integral management of transport service planning and operation. GMV, with over 30 years' experience in the transport

sector, continues to innovate to offer solutions that optimize the operations of transport companies and improve the user experience. Its participation in events like FIAA reinforces its commitment to the evolution of the sector and the creation of solutions tailored to the current needs of collective mobility.

21st Metropolitan Mobility Observatory Technical Conference

In October, GMV took part in the 21st technical conference of the Metropolitan Mobility Observatory, held in Tarragona's Convention Center under the slogan: The Challenge of Sustainability in Metropolitan Mobility.

The conference presented the main actions in mobility of the Camp de Tarragona and went into detail on issues such as sustainable mobility in metropolitan areas as well as interoperability and ticketing in public transport.

GMV was represented at the event by Antonio Blanco, Director of Business Development of Intelligent Transport Systems for Spain, Portugal, and Morocco, who took part in the panel discussion entitled Interoperability and Ticketing in Public Transport. During his talk, Antonio Blanco highlighted critical points such as the importance of transport authorities in

interoperability. In this regard, Blanco emphasized that the authorities' leadership in interoperability ensures a comprehensive vision of the transportation system while promoting fairness and neutrality and facilitating public-private collaboration. This in turn creates regulatory frameworks that allow operators and technology providers to work together.

Moreover, the ITS business development director for Spain, Portugal, and Morocco stressed that one of the greatest challenges to interoperability lies in the technological fragmentation generated by closed and proprietary systems, which hinders integration between different modes of transport. "Authorities should promote open standards and uniform APIs to ensure compatibility between technologies and facilitate centralized management of transport. GMV, with its adoption

of European protocols like SIRI and NETEX, is leading the way in the implementation of interoperable systems, enabling efficient integration of ITS solutions, as demonstrated by projects in Castilla-La Mancha and Galicia," he underlined.

As Blanco pointed out, there are many examples of authority-led interoperability, such as the Public Transport Card in Madrid and the pioneering system in Catalonia, which allow users to move seamlessly between operators. GMV has contributed significantly to these initiatives with open solutions in regions such as Castilla and Leon, where over 20 operators share a common system. Thanks to Next Generation funds, regions such as Aragon, Murcia, and Castilla-La Mancha are adopting interoperable and open models, consolidating sustainable and efficient mobility in Spain.

InnoTrans 2024: The leading trade fair for public transportation technology

■ The 14th edition of InnoTrans, the world's premier international trade fair for transportation technology, took place in late September in Berlin. Held biennially, the event brought together professionals and companies from across the globe to showcase the latest industry innovations.

InnoTrans is divided into five key sectors: Railway Technology, Railway Infrastructure, Public Transport, Interiors, and Tunnel Construction. The Berlin Exhibition Grounds hosted all 42 halls, with more than 2,771 exhibitors from 56 countries and 137,403 visitors from 137 nations participating in the previous 2022 edition.

GMV was present with its own stand, where it showcased its latest Intelligent Transportation Systems (ITS) solutions. This allowed attendees to explore cutting-edge technological proposals designed to shape the future of mobility.



GMV stands out in RailLive 2024 with a focus on innovation

■ November saw Rail Live 2024, one of the leading conferences and exhibitions for the rail industry, which this year took place at the convention center in Zaragoza.

Rail Live has established itself as a critical platform to discuss the latest trends and technologies in the rail industry, bringing together operators, infrastructure managers, manufacturers, suppliers, academics, and government officials. GMV

attended the event and presented a wide portfolio of groundbreaking solutions on its stand, including planning and optimization software, onboard systems such as CCTV, public address and communication systems (PA & Intercom) and passenger information and entertainment (PI & VI), as well as the **SAE-R**[®] operation support system and ticketing solutions.

Isidro Prieto, GMV's Intelligent Transportation Systems account

executive, took part in the Metro and Light Rail panel, sharing his experience on the latest technologies applied to these transport systems. Rail Live 2024 is an indispensable meeting point for industry professionals, highlighting the importance of innovation and technological development. GMV's presence at this event reaffirms the company's commitment to leadership and digital transformation in the rail industry.

The most innovative solutions for public transportation are showcased at TRANSEXPO 2024



■ GMV participated in the 17th International Fair of Public Transport TRANSEXPO, held from October 16-18 in the Polish city of Kielce. The event attracted over 3,000 visitors and placed a strong emphasis on ecological advancements in public transport. In an era of increasing environmental awareness, the fair served as a platform for presenting green technologies and solutions aimed at reducing CO2 emissions and promoting sustainable development.

At the fair, GMV's exhibition highlighted its new solutions for integrated fare collection and payment, utilizing QR codes, contactless cards, and EMV payment cards. These solutions

leverage advanced technology, enabling passengers to register their presence on board by simply tapping a payment card or an NFC-enabled mobile device, with secure tokenization mechanisms in place to protect card information.

Furthermore, GMV showcased its EcoDriving solution for real-time monitoring of driving quality, along with its **GMV ITS Suite** fleet management solution. The **GMV ITS Suite** has received the prestigious award in the "Passenger Service Systems" category, recognizing GMV's cutting-edge innovations in public transport management. This suite is transforming how public transport is managed through powerful tools for route planning, scheduling, and bus

stop management, all supported by real-time fleet monitoring. Its modular design offers a comprehensive solution that includes vehicle tracking, video surveillance, eco-driving, and passenger information systems, thereby assisting operators in enhancing efficiency and sustainability. GMV also presented its **GMV Planner** tool, designed for the integrated management of transportation service planning and operational tasks.

GMV's intelligent transportation systems are currently utilized by over 300 public transportation operators and managers across 35 countries. The company's control and ticketing systems handle approximately 4 million contactless card transactions globally each day. In Poland, GMV's innovative solutions are addressing the challenges faced by the sector in cities such as Warsaw, Szczecin, Tri-City, Bydgoszcz, Toruń, and Nowy Sącz.

In addition to the recognition received by the **GMV ITS Suite**, GMV is also proud to have been acknowledged for its booth design and to have received a special award commemorating GMV Group's 40th anniversary.

GMV takes part in the ITS Conference in Castilla y León

■ On 25 September 2024 Valladolid hosted the Conference on Intelligent Transport Systems (ITS), a key event in the field of mobility and new technologies, bringing together the main companies of the sector.

The day began with an institutional opening by the Minister of Mobility and Digital Transformation of Castilla y León. This was followed by a round-table discussion on mobility management for both urban and interurban traffic.

GMV was present at several of the presentations, sharing its expertise in the field of Intelligent Transport Systems, highlighting the technological innovations that the company is implementing to improve transport efficiency, sustainability and safety.

This event was organized by the Foro de Nuevas Tecnologías en el Transporte (ITS Spain), a non-profit association created in 2002 with the purpose of bringing together the

public, private and academic sectors related to Intelligent Transportation Systems. Its aim is to achieve safer, more efficient and sustainable mobility for people and goods, promoting the development and implementation of advanced technological solutions in transport.

GMV's participation in this conference reaffirms its commitment to innovation and sustainability in the transport sector.

GMV presents its smart mobility package at the C-STREETS project closing event

Created within the framework of the project, **GMV Smart Mobility Suite** incorporates C-ITS technologies while expanding its scope by integrating new data sources

On October 28 and 29, the C-STREETS project closing event brought the project partners together one last time to share the results of their efforts over the past five years. On the first day of the event, GMV presented its new **GMV Smart Mobility Suite** and demonstrated its application in a pilot project carried out in partnership with Lisbon City Council.

The C-STREETS project was a collaborative initiative involving 31 Portuguese partners and co-funded at 50% by the Connecting Europe Facility (CEF). Both public and private entities participated in this effort, which was led by IMT. The project's main objective was to build on its predecessor, the C-ROADS Portugal project, aimed at the large-scale deployment of cooperative intelligent

transportation systems (C-ITS) in Portugal.

C-STREETS advanced the development of urban pilot projects focusing on C-ITS services, while also addressing multimodality and interoperability. These efforts enabled data sharing and reuse through the National Access Point (NAP).

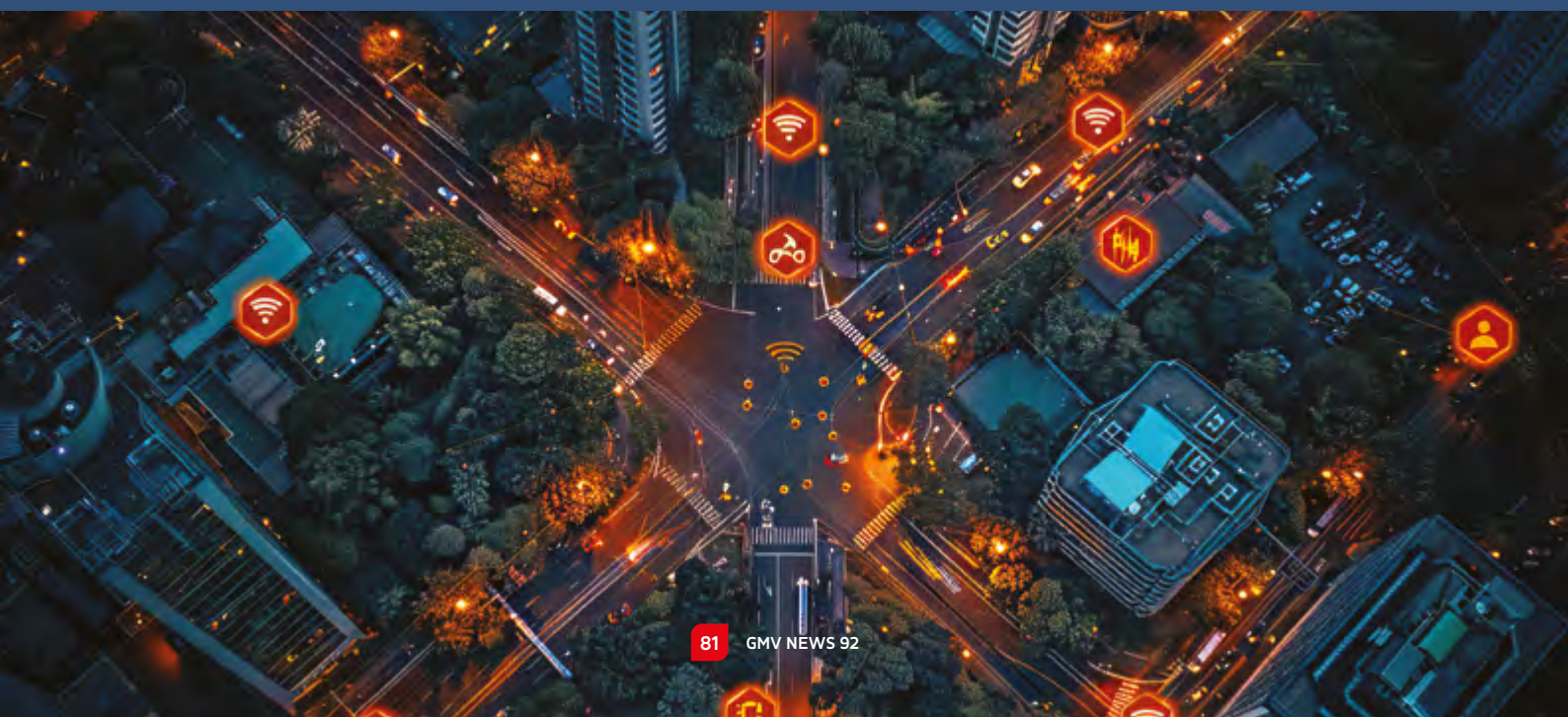
GMV initially proposed a pilot focused on logistics management. However, the company soon shifted its efforts to exploring solutions to improve public transportation reliability and emergency vehicle response times. This shift builds on the work that began with the C-ROADS Portugal project.

This endeavor led to the creation of the **GMV Smart Mobility Suite**, a concept that incorporates C-ITS technologies while expanding their scope by integrating

new data sources. The solution aims to improve road safety by providing drivers with real-time alerts about hazardous road conditions. It also addresses challenges such as optimizing public transportation operations and emergency vehicle mobility.

The **GMV Smart Mobility Suite** recognizes that not all drivers operate vehicles equipped with C-ITS technology. To bridge this gap, it includes mechanisms to communicate with non-equipped drivers through conventional means, such as variable message signs and mobile applications capable of receiving system-generated information.

Through the C-STREETS project, GMV has developed an innovative solution with significant potential to address current and future challenges in connected and autonomous mobility.



Recognition for innovation in smart mobility at the Castilla y León Automotive Awards



■ GMV won the Best Innovative Project Award in the Mobility category during the second edition of the Castilla y León Automotive and Mobility Awards, organized by the Automotive Cluster of Castilla y León (FaCyL). This award recognizes the excellence of the **GMV Smart Mobility Suite**, a cooperative smart mobility system based on C-ITS technologies.

The **GMV Smart Mobility Suite** uses V2X communications to facilitate real-time information exchange between the different players in the transportation ecosystem, such as infrastructure, vehicles, and data management centers. This advanced system makes it possible to monitor road conditions, detect accidents, manage special vehicles, and implement a traffic light priority system,

significantly improving travel safety, efficiency, and sustainability.

The award ceremony took place on 27 November at the Fórum Evolución in Burgos, bringing together more than 500 people and recognizing the innovative work of leading companies in the sector. Alongside GMV, other award winners were Grupo Antolin in the Sustainability category, HORSE in Digital Transformation, and Grupo Lince in Talent Recruitment and Loyalty.

This prestigious award reinforces GMV's commitment to the development of technologies that foster a more connected and sustainable approach to mobility, positioning the company as a leader in innovation within the automotive sector, both in Castilla y León and at the national and international levels.

GMV's key participation in Tech.AD US

From 8 to 10 December, The Henry in the Detroit suburb of Dearborn hosted the Tech.ad USA automotive technology fair. This leading event for the automotive sector showcased breakthroughs in connectivity, autonomous vehicles, Software-Defined Vehicles (SDV) and cybersecurity, areas in which GMV stands out thanks to its technological capacity and its constantly innovative approach.

GMV was involved in key moments of the event. One of the highlights was the presentation by Sara Gutiérrez Lanza, Director of the Automotive Business Unit at GMV, on "Solution Study: Driving innovation in automotive - Lessons from Space, avionics, robotics, and

cybersecurity," which addressed how knowledge developed in sectors such as avionics, robotics, and cybersecurity is applied to the automotive field. This approach provides advanced solutions in safety, reliability, and autonomy for new industry platforms, with special emphasis on concepts such as software-defined vehicles (SDVs), adopted by most manufacturers.

GMV also had a stand that became a strategic hub for meetings with key players in the ecosystem, including original equipment manufacturers (OEMs) and Tier 1 suppliers. This space made it possible to strengthen business relationships and explore new opportunities for collaboration.

The event culminated with the awards ceremony, where GMV was the winner in the Mapping & Localization category with its **GMV GSharp**® positioning solution, a highly accurate and secure positioning system that has proven its effectiveness in automotive applications and has already been adopted by major international manufacturers, including leading German manufacturers.

Tech.ad USA was a platform for GMV to boost its international visibility, showcase its technological breakthroughs, and continue to position itself as a leader in advanced systems innovation for the automotive industry.

GMV GSharp® wins the Impulso Award for the Best Urban Mobility Project

■ On 8 October, GMV won the Impulso Award for the Best Urban Mobility Project in the fourth edition of the Impulso Awards for Innovation in Sustainable Mobility, given during the Mobility and Automotive Gala held at the Mobility City space in Zaragoza.

This award recognizes the **GMV GSharp®** technology, a highly accurate and secure GNSS positioning solution designed for advanced driver assistance systems (ADAS) and autonomous driving.

The **GMV GSharp®** innovation combines information from multiple sensors to guarantee exceptional accuracy in vehicle location, minimizing risks through the concept of integrity. This technology is a key breakthrough in the development of automated driving functions that promote more efficient and sustainable transportation.

Every year, the Impulso Awards, organized by ANFAC, FACONAUTO,



SERNAUTO, and Fundación Ibercaja, celebrate projects that are leading the way in the transformation towards sustainable, connected, safe, and inclusive mobility in Spain. In addition to GMV, other groundbreaking initiatives from companies such as Birziplastik, Grupo Palausa, and Antolin, which have made a significant contribution to

progress in the field of mobility, also received awards at this edition.

This recognition reinforces GMV's commitment to technological innovation and to solutions that are building the mobility of the future, aligned with the values of sustainability and efficiency.

GMV participates in the latest edition of ASEPA and INSIA-UPM's vehicle automatization specialization course

■ Following the success of the six previous editions, this year the Spanish Association of Automotive Professionals (ASEPA) and the University Institute for Automotive Research (INSIA-UPM) held the seventh edition of the Vehicle Automatization Specialization Course. This updated and expanded course is designed to provide comprehensive training on automation technologies and the opportunities they bring to road transportation.

This edition's course consisted of three modules covering topics such as vehicle automatization technologies,

the impact of these technologies on road safety and the regulatory framework, as well as applications, experiences, and opportunities for companies in the sector. An online option was again provided to facilitate the participation of professionals from both Spain and Latin America, featuring presentations from more than 20 experts, including professors, researchers, and representatives of leading companies, involved in the course.

On this occasion, GMV focused its participation on solutions, products, and services that specifically

contribute to making progress towards driving automation. During its session, GMV presented **GMV GSharp®**, its accurate and safe positioning solution, as well as its C-ITS solutions and vehicle cybersecurity services, which are essential for the automation and secure connectivity of the vehicles of the future.

By participating in this edition, GMV once again reaffirmed its commitment to education and the progress of the automotive sector, contributing to the development of professionals who will be the mobility leaders of the future.

New equal pay regulations: a necessary change for pay transparency

Once Directive (EU) 2023/970 has been approved at the European Union level, strengthening the application of the principle of equal pay for equal work or work of equal value between men and women through pay transparency and enforcement mechanisms, companies will have to justify pay differences of 5% or more between men and women in equivalent positions. In addition, they must inform the workforce of their wage policy and report to management regarding the wage gap. This change, seeking to reduce gender disparities, poses challenges for the internal management of companies.

Salary transparency is not just mandatory, it's also a strategic opportunity. In a competitive work environment, known as the "war for talent," the highly valued aspect of pay equity is key to attracting and retaining the best professionals. Companies that are able to stay ahead of these regulations will have an advantage in the labor market.

Regulatory compliance will not only avoid penalties but will also improve

the reputation and competitiveness of companies, which is vital in an environment where information and opinions spread rapidly. Failure to comply could result in both financial penalties and reputational damage, making it imperative to adopt these measures proactively and as soon as possible.

JUSTIFYING THE PAY GAP: A CHALLENGE FOR COMPANIES

One of the most demanding aspects of the regulations is the obligation to justify any wage gap equal to or greater than 5%. Companies that cannot adequately justify these differences must implement



“PAIT® addresses key challenges such as pay equity and pay transparency, helping companies identify pay inequalities, preempt potential disparities, and implement strategies that promote equality, transparency, and compliance”

corrective measures or undergo a joint assessment with the employees' legal representatives (RLPT).

The regulations also oblige companies to inform their staff annually about their salary policy: the criteria used to determine salary and salary progression, and the average

salary by gender and job level. This requirement may entail a thorough review of salary policies and greater transparency in management criteria. Compliance boosts trust among employees and strengthens accountability within the organization.

TECHNOLOGY TO SUPPORT REGULATORY COMPLIANCE

Adapting to this new reality will not be easy, but companies can rely on advanced technological solutions. Tools such as PAIT® (Pay Analytics Intelligence Tool), developed by Peplematters and GMV, offer an exhaustive analysis of the pay gap using artificial intelligence algorithms.

Equal pay is no longer just an aspiration, but an obligation. Companies that take on this challenge with a proactive vision will not only comply with regulations, but will also position themselves as responsible organizations aligned with the values of equity demanded by society. The future of work will be fairer and more transparent, and companies that embrace it will thrive in an increasingly demanding labor market.



Eva Martínez, Manager of Services for GMV's Secure e-Solutions



Beatriz Ardid, Director of Peplematters



GreenBot, the autonomous farm vehicle that can find and get rid of weeds

■ On 10 October, the University of Seville's Technical School of Agricultural Engineering (ETSIA) hosted a meeting of the members of the GreenBot Operational Group. This project brings together public and private researchers and institutions to address the need to protect woody crops, using cutting-edge technologies such as robotics, artificial intelligence, cloud computing, and precision agriculture. Its ultimate goal is to create

an autonomous and modular robotic vehicle able to identify weeds through artificial vision and neutralize them by applying the exact volume of phytosanitary product, with great precision.

To carry out this work, the GreenBot project is made up of members of the University of Seville's research group, Cooperativas Agroalimentarias de

Andalucía, GMV, TEPRO, PIONER HiBred Spain SL, Agropecuaria de Herrera SCA, and the Asociación para el Desarrollo de La Campiña y Los Alcores Rural Development Group (GDR).

The meeting was an opportunity to address issues such as the selection of the algorithms to be used by the weed detection model, the start of work on the robot's artificial vision system, and the design of the actuation system, which Professor Manuel Pérez describes as "one of the most innovative elements of the GreenBot." The team members took the opportunity to analyze the economic and environmental benefits that small and large-scale farmers might see by implementing it, thanks to the reduction of inputs and labor it would entail.

The GreenBot Operational Group project is scheduled to last 21 months and will end in June 2025. It is funded by the 2022 round of grants for European Innovation Partnership (EIP) Operational Groups, within the framework of Rural Development Program of Andalusia 2014-2022.



GMV promotes quantum computing at Burgos Industry 4.0

During the Burgos Industry 4.0 Technology Meeting, held on 24 and 25 October, the Industrial Track 4.0 Technical Workshops established themselves as a key forum for exploring emerging technologies in the industrial digital transformation. During the event, Enrique Crespo, quantum technologies solutions leader at GMV's Secure e-Solutions, highlighted the company's commitment to quantum computing as a driver of innovation.

Crespo presented the CUCO project and explained how quantum computing can

solve complex problems that traditional computing cannot address efficiently, bringing about significant improvements in the simulation of materials, the optimization of industrial processes, and the creation of disruptive applications.

The importance of industrial use cases was another highlight. Applying these techniques to real processes could increase the efficiency and competitiveness of Spanish industry. However, Crespo emphasized the need to overcome adoption barriers and outline

the first steps towards a reasonable and adequate integration of these technologies into the industrial ecosystem.

The round-table discussion also addressed the evolution of other emerging technologies such as large language models (LLMs), 5G, and advanced cybersecurity. The experts agreed that these integrated solutions will allow for more resilient production, more secure communications, and smarter automation, leading the way to the industry of the future.

The ASUMO project is shortlisted for three prestigious technological innovation awards

This recognition highlights its pioneering nature in integrating advanced technologies such as autonomous robotics and artificial intelligence in the field of electrical infrastructure

The ASUMO (Advanced Substation Monitoring) project, led by Elewit and Red Eléctrica, Redeia Group companies, was shortlisted for three outstanding technological innovation awards: the 16th Comunicaciones Hoy Awards, the Advanced Manufacturing Awards, and the enerTIC Awards 2024. This recognition highlights its pioneering nature in integrating advanced technologies such as autonomous robotics and artificial intelligence in the field of electrical infrastructure.

ASUMO is addressing the challenges faced by electrical substations, where inspection and maintenance are essential to ensure the safety, efficiency, and continuity of energy supply. Elewit and Red Eléctrica, in their firm commitment to digitalization and innovation, chose GMV as the key technological partner for developing this disruptive, game-changing solution for the energy sector.

In collaboration with ANYbotics, GMV has implemented its **uPathWay** solution in a quadruped robot designed to perform critical tasks autonomously. This robot combines artificial intelligence and advanced sensors to perform analog gauge readings, thermography, partial discharge analysis, and oil leak detection. Its ability to operate in complex environments not only improves safety

by reducing human exposure in risk areas, but also optimizes processes by increasing inspection accuracy and efficiency.

ASUMO's success lies in the integration of multiple cutting-edge technologies, such as real-time data processing algorithms, computer vision systems, and machine learning tools that allow the robot to adapt to various operating conditions. This combination has driven a shift to a smarter, safer, and more sustainable asset management model.

Being shortlisted for the enerTIC Awards 2024, which focus on sustainability and energy efficiency, highlights ASUMO's relevance as a project that goes beyond technical aspects to become a leader for digital transformation in the energy sector. This achievement reinforces the commitment of Elewit, Red Eléctrica, and GMV to the modernization of critical infrastructure, showing how technological innovation can be the key to a more efficient and sustainable future.



GMV presents AgrarIA's results in Green AI

■ During the “GREEN AI: The Sustainable Future of Artificial Intelligence” workshop held on 12 October in Madrid by the Spanish Ministry for Digital Transformation and Public Service, Miguel Hormigo, manager of the Industry Sector for GMV's Secure e-Solutions, presented the AgrarIA project. This industrial research project, which concludes at the end of 2024 and is funded by the Ministry for Digital Transformation and Public Service, seeks to develop a sustainable global agricultural industry with a carbon-neutral footprint, using cutting-edge technologies such as artificial intelligence (AI), robotics, and bioengineering to identify new agricultural production methods.

The project includes the development of a data space that will be based on AI services and will bring together all the models of the agricultural value chain—production, processing, and distribution—in a single decoupled computing entity, allowing for the implementation of unique initiatives that will support a rapid,



efficient, productive, and sustainable transformation of the agrifood sector in the medium term. Hormigo emphasized how these technologies enable smarter resource management, in line with the goals of Spain's National Green Algorithms Program (PNAV). AgrarIA has specific development activities within its work packages for researching green algorithms applied to the data space and to different use cases developed by the project's partners. The project also emphasizes the pursuit of efficiency in the consumption of computational resources in order to be even more sustainable, all in line with

two of the sector's main challenges: competitiveness and productivity.

One of the other core research goals of the project involves modeling through different use cases of this data space, to demonstrate its validity as an interoperable, sustainable, and secure platform. Some examples of the use cases developed by the consortium partners are improved calculation of wine vintage capacity, energy efficiency in refrigeration plants, detection and rapid elimination of pests in tomato plantations in greenhouses, quantum computing applied to satellite images, and more.

GMV is leading the sustainable transformation of the agrifood sector with artificial intelligence

GMV is playing a key role in the transition towards a more sustainable and technologically advanced agrifood model by applying artificial intelligence and emerging technologies. While participating in leading forums, the company has demonstrated how these innovations are transforming the Spanish agricultural sector, from optimizing the use of resources to reducing the sector's environmental impact.

At the AI Under the Volcano event, Miguel Hormigo, manager of the Industry Sector for GMV's Secure e-Solutions, discussed AI's potential to transform

key sectors such as healthcare, education, and agriculture. With a focus on accessibility, social equity, and sustainability, Hormigo highlighted the challenges of the agricultural sector, such as its aging workforce and the urgent need for modernization. He addressed success stories such as the use of digital twins combined with AI in irrigation systems, achieving water savings of up to 40%, and upcoming goals in terms of improving mobile robotics and monitoring agricultural processes using AI.

Meanwhile, at an event organized by NatWest, Ángel C. Lázaro, head

of Robotics and Automation for GMV's Industry Sector, gave a presentation on how AgrarIA is applying groundbreaking technology to combat climate change. This project brings together AI, robotics, and bioengineering to improve sustainability and efficiency in the agrifood value chain. AgrarIA includes developments such as AI-based systems and satellite data to guide autonomous vehicles in agricultural activities and green algorithms that optimize technological sustainability by reducing the carbon footprint of AI models.

GMV and Peoplematters' PAIT[®] tool wins an award at the 16th Comunicaciones Hoy Awards

■ The PAIT[®] (Pay Analytics Intelligence Tool) solution, developed in partnership with Peoplematters, has been recognized in the Intelligence and Data Management category of the 16th Comunicaciones Hoy Awards. This prestigious award highlights the joint efforts of both companies to offer an innovative tool that helps organizations manage pay equity and promote pay transparency, key factors in today's business environment.

PAIT[®] is positioned as a strategic solution at a time when pay equity has become a priority both to comply with current regulations and to promote a fairer and more sustainable organizational culture. Thanks to its advanced data analysis capabilities, the tool makes it possible to identify possible wage disparities and, in addition, to make forecasts that help to prevent imbalances by helping companies to plan future actions.



This makes it an essential resource for making informed decisions and designing strategies to promote equality in the workplace.

This recognition underlines how GMV and Peoplematters are committed

to technological innovation at the service of people. PAIT[®] not only facilitates adaptation to regulatory requirements, but also boosts the trust of employees and other stakeholders in companies' transparency policies.

GMV joins Deploytour to work together in the common European tourism data space

■ Palma de Mallorca was the setting for the launch of the DEPLOYTOUR consortium, which, through the collaboration of 43 partners from 13 European countries, including GMV, will transform the tourism sector through the development of a common European tourism data space.

The goal of the project is to address the challenge of fragmented and inaccessible tourism data by creating a common platform where data from various stakeholders can be shared and used effectively to enable more

personalized, sustainable, and efficient tourism experiences.

Over three years, the project aims to develop a common, reliable, and secure European infrastructure for tourism data. DEPLOYTOUR will foster collaboration to help address recurring challenges in the tourism industry: aligning what the destination has to offer with what tourists expect, adapting services to new tourist groups, predicting high visitor arrivals, facilitating more efficient resource planning, and potentially creating new business opportunities.

DEPLOYTOUR is a €15.3 million project, co-funded by the European Union and coordinated by AnySolution, an expert in data collaboration and European tourism initiatives, and supported by DG GROW and DG CONNECT. It is based on the plan developed by two preparatory initiatives for the European Tourism Data Space (ETDS), DATES and DSFT, which defined the foundations of the common European data space for tourism. The European data strategy aims to establish common data spaces to support the efficient exchange of data between ecosystem players.

CUCO wraps up, positioning Spain as a leader in quantum computing



■ The CUCO project, initiated in 2021, concludes in 2024, establishing itself as a pioneering initiative in quantum computing at the national and corporate levels. With funding from Spain's Center for the Development of Industrial Technology (CDTI) and backing from the Ministry of Science and Innovation under the Recovery, Transformation, and Resilience Plan, CUCO has set a milestone in the development of quantum algorithms and their practical application in strategic sectors such as energy, finance, space, defense, and logistics.

Throughout its development, CUCO has explored several key fronts in the field of quantum computing. First, research into quantum algorithms has led to the development of hybrid solutions that

combine classical and quantum techniques, addressing complex problems related to simulation, optimization, and sustainability. In addition, the project has launched innovative proof-of-concepts in areas such as earth observation, signals intelligence, logistics optimization, sustainable energy, and finance, demonstrating the feasibility of these technologies in real-world applications. Another key aspect has been the definition of metrics and benchmarks, which establish standards for evaluating and comparing the performance of classical and quantum devices, providing a solid foundation for measuring the technological breakthroughs achieved.

The project's success is largely due to public-private partnerships involving companies (BBVA, DAS Photonics, GMV,

Multiverse Computing, Qilimanjaro Quantum Tech, and Repsol) and research centers (BSC, CSIC, DIPC, ICFO, and Tecnalia) and universities (Polytechnic University of Valencia), fostering an innovation ecosystem that has accelerated the adoption of quantum technologies. This initiative has not only driven technological breakthroughs but is also strengthening the commitment of institutions and government to the development of quantum computing and its impact on key strategic sectors.

With the completion of CUCO, Spain is positioning itself as a leader in quantum computing, laying the groundwork for future projects that will continue to explore these emerging technologies for the benefit of society and the economy.

GMV highlights breakthroughs in quantum computing applied to Earth observation

GMV took part in the tenth edition of the AI & Big Data Congress, an event organized by CIDAI and Eurecat in Barcelona on 22 and 23 October. Queralt Portell, a quantum data scientist at GMV's Secure e-Solutions, participated in the Quantum Computing & Artificial Intelligence session, where she presented the progress made within the CUCO project. This project, which marks a milestone in quantum computing in Spain, is funded by the CDTI and backed by Spain's Ministry of Science

and Innovation as part of the Recovery, Transformation, and Resilience Plan.

CUCO, the first major quantum computing project led by GMV, aims to promote the development of quantum algorithms and their application in various key sectors of the Spanish economy. During her talk, Portell gave details of the use cases GMV is working on, especially in the Earth observation sector. By integrating quantum machine learning and quantum optimization techniques,

GMV is researching the identification of photovoltaic plants from satellite images, optimization of satellite image acquisition, and short-term prediction of wind speed and direction in strategic areas.

These advances not only reflect the potential of quantum computing to transform Earth observation, but also show its applicability in improving industrial processes and making more efficient decisions in real time.

Tomorrow's tourism is created today

The Spanish tourism sector is heading towards a record-breaking 2024, with forecasts that exceed €200,000 million, equivalent to over 13.5% of the country's GDP.

For years, Spain has played a leading role in boosting its main industry. Initiatives such as the creation of the Smart Destination Platform (PID) and the Ecosystem Platform for Open Innovation (PIA), led by SEGITTUR, and the European project DEPLOYTOUR, which will give rise to the European Tourism Data Space, are clear examples. GMV, as a key player in DEPLOYTOUR, is playing a leading role in the definition and construction of these data spaces and also in the implementation of the use cases proposed by Spanish companies and agencies.

GMV is supporting all stakeholders in the tourism sector, both public (local authorities, regional governments, and the central government) and private (hotels, OTAs, restaurants, cruises, major events, among others), to speed up and boost their digital transformation process in three main areas: digital transformation, cybersecurity, and innovation.

In the digital transformation process, emerging technologies such as generative artificial intelligence and other tools that ensure private and sovereign data sharing are becoming increasingly prominent. GMV is bringing in its expertise in these areas, together with other emerging technologies such as 6G and quantum computing, which will facilitate the creation of new business models in data spaces.



Joan Antoni Malonda
Tourism Business Developer de Secure e-Solutions de GMV

“GMV supports all public and private stakeholders in the tourism sector to accelerate and boost their digital transformation process”

However, this revolution will not be possible without the second cornerstone: cybersecurity. GMV is addressing cybersecurity in a comprehensive way, both from a regulatory compliance standpoint (GDPR, NIS2, ENS, PSD2, and soon PSD3) and from a strategic and technological approach. A safety master plan is essential to define and prioritize the safety projects needed to reduce risks to acceptable levels. In addition, assessment of the current situation, intrusion analysis (pentesting), and the availability of SOC/CERT services for incident detection and response are essential.

The third cornerstone in this transformation is innovation, which has been part of GMV's DNA since its origins in over 40 years of history.



InnovaTech brings together the main Spanish leaders in innovation



■ On 3 December, InnovaTech 2024: Reimagining the Technological Future, an event organized by APD and INCOTEC, brought together leading professionals to explore the fascinating future of emerging technologies such as artificial intelligence (AI), quantum computing, hyper-automation, and robotics. These breakthroughs promise to significantly transform industries and markets, and therefore impact the economy as well.

Luis Fernando Álvarez-Gascón, general manager of GMV's Secure e-Solutions, offered key insights in the panel

discussion on “Emerging technologies and hyper-automation: connecting tomorrow,” sharing his vision based on the company's experiences. Álvarez-Gascón underscored the transformative potential of these exponential technologies in business and talent management, noting that “one of AI's strengths is its integration with robotics.” He also addressed some of the challenges being worked on, such as “providing robots with autonomy to perform tasks that are dangerous for humans, such as inspecting certain facilities.”

GMV, integrating groundbreaking solutions that not only optimize internal processes but also redefine the client experience, is at the cutting edge of this world in which hyper-automation is evolving non-stop. As Álvarez-Gascón explained, the combination of AI and robotics is enabling organizations to leverage their talent by relieving employees of low-value tasks, allowing them to focus on more innovative activities that increase productivity and safety.

Quantum computing is also opening up a range of opportunities to tackle complex problems that once seemed insurmountable. This breakthrough promises to optimize processes and redefine business models in key sectors. The GMV-led CUCO project is among the quantum technology projects leading the way in the field, both as an example of public-private partnership and thanks to its proven results in the promotion of quantum algorithms. Backed by the CDTI and the Ministry of Science and Innovation under the Recovery, Transformation, and Resilience Plan, it is the first major national and corporate quantum computing project.

GMV presents ASUMO at AMETIC's generative AI and machine vision conference

■ At the end of October, AMETIC organized a conference on “Generative AI and artificial vision within reach for your company: discovering practical applications,” aimed at companies, organizations, and institutions interested in exploring the potential of these disruptive technologies and their implementation in various sectors.

During the conference, Robert Farzan, a data scientist specializing in artificial vision at GMV's Secure e-Solutions, presented the ASUMO (Advanced

Substation MOnitoring) project, a pioneering initiative developed by Redeia group companies Elewit and Red Eléctrica for automated monitoring of electrical substations.

As part of ASUMO, GMV has designed an autonomous mobile robotics solution based on artificial vision for advanced asset inspection at electrical substations. The project relies on an autonomous quadruped robot, deployed in the facilities, which performs ongoing monitoring of the assets by processing

images captured by specialized cameras and analyzed by artificial intelligence.

This groundbreaking technology includes GMV's **uPathWay** platform, which manages and coordinates the tasks of the autonomous mobile robots, enabling operations such as reading analog indicators at height, carrying out thermographic reports of transformers, and early detection of anomalies. All this translates into a substantial improvement in the monitoring and maintenance of this critical infrastructure.

GMV hosts a session to analyze the differences between AI and generative AI

■ On 27 November, GMV headquarters in Tres Cantos, Madrid, hosted “Traditional AI vs. generative AI: advantages and limits for their implementation in companies,” an event focusing on the growing adoption and integration of artificial intelligence by companies.

Organized by the BIDA Observatory (Big Data, Artificial Intelligence and Data Analytics), AECA (Spanish Association of Accounting and Business Administration), and GMV, the session featured an interesting talk by Álvaro Barbero, chief data scientist at the Knowledge Engineering Institute,

who explained the use of AI in an organization through different use cases.

This was followed by a round table discussion moderated by Javier Zubieta, marketing and communication manager of GMV’s Secure e-Solutions, with the participation of subject matter experts such as José Carlos Baquero, head of AI and Big Data at GMV’s Secure e-Solutions; Mónica Molés, head of the user process support unit at the Bank of Spain; Richard Benjamins, CEO of OdiselA; and Enrique Bonsón, chairman of AECA’s New Technologies Committee.

The panel presented the “Guide to Managing Generative AI in Business,” developed by members of the BIDA Observatory, which seeks to explain generative artificial intelligence and its most impactful business applications, as well as its opportunities, challenges, and limits. It also analyzes management models for its integration in companies, lessons learned for future implementations, relevant use cases, and implications for data protection and citizen protection. The guide can be downloaded from the BIDA Observatory website.

AI and automation, the stars of Advanced Manufacturing Madrid

■ The Advanced Manufacturing Madrid event brought together experts to discuss how artificial intelligence (AI) and automation technologies are transforming large-part manufacturing, optimizing processes, and improving operational efficiency. Ángel C. Lázaro, head of robotics and automation for the Industry Sector at GMV’s Secure e-Solutions, participated in HispaRob’s round-table discussion on “AI and automation for the new era of industrial large-part production.”

During his speech, Lázaro highlighted the relevance of collaborative architectures that integrate technologies such as manipulator robots, mobile robots, and support systems, including overhead cranes. He stressed that frameworks such as ROS are essential for communication between these robotic teams, and emphasized the importance of technology transfer from sectors such as space, which is key to meeting complex challenges in industrial production.

Artificial intelligence is transforming robotics and industrial production. In process optimization, AI-based systems offer extraordinary adaptability and precision, enabling robots to perform complex tasks. In advanced planning, scenario simulation facilitates more efficient strategies for assembling large parts.

Reinforcement learning, another prominent innovation, enables robots

to acquire skills autonomously, adapting to changing environments. Machine vision, meanwhile, is crucial in defect detection and in solutions such as **uPathWay**, which uses semantic odometry for autonomous navigation. Finally, AI-driven predictive maintenance is making it possible to anticipate malfunctions, thus optimizing operating times and cutting costs, cementing AI as a cornerstone of modern industry.



Quantum computing and AI, poised to change the world as we know it



■ GMV took part in the 2nd Andalusia Artificial Intelligence Congress, held from 19–21 November in Granada. Ana María Sánchez, quantum computing leader for GMV's Secure e Solutions and an expert in quantum computing and artificial intelligence, spoke at the congress, discussing the potential synergy between AI and supercomputing.

Accelerating the training of artificial intelligence (AI) models requires high computational power, which is often provided by supercomputers. However, the high energy consumption of these systems poses a challenge. Quantum computing, with its potential

to solve complex problems more efficiently, is emerging as a promising alternative. In this context, Ana María stressed the importance of exploring hybrid solutions that combine the best of both technologies, taking advantage of the power of today's supercomputers while moving towards more mature quantum computing.

The synergy between AI and supercomputing is not new. AI is now ubiquitous, no doubt thanks to the generative AI of ChatGPT, Copilot, etc., but GMV has been integrating supercomputing and AI for years. A clear example is the CYBELE project, which kicked off in 2019 and in

which supercomputing was crucial for the efficient processing of large volumes of Earth observation data, running complex simulations of weather events, and accelerating the development and optimization of machine learning models.

CYBELE is a European Union initiative funded by the Horizon 2020 program that seeks to apply advanced technologies such as supercomputing, big data, cloud computing, and the internet of things, or IoT, in the agrifood sector. It uses innovative technologies to predict adverse weather events, improve crop management, and develop models that enable farmers to react in time to frost, hail, or other weather phenomena.

The combination of supercomputing, artificial intelligence, and quantum computing promises an even greater revolution than generative AI in sectors such as pharmaceuticals and logistics, as well as in areas such as finance and cybersecurity.

Robotics and automation: redefining the future of industry

On 10 October, during La Hora Premium, the Atlas Tecnológico platform's forum for discussing topical issues, Ángel C. Lázaro, head of robotics and automation for the Industry Sector at GMV's Secure e-Solutions, together with Pablo Oliete, CEO of Atlas Tecnológico, gave an in-depth analysis of how robotics is transforming various sectors and what the future could hold.

During the meeting, Lázaro explained how collaborative robotics is rapidly evolving, allowing robots to work together with humans in sophisticated applications that were once believed to be impossible. He also noted that mobile

manipulators are becoming a key tool for tasks requiring high precision in dynamic environments. Breakthroughs in artificial intelligence (AI) and machine learning are providing robots with greater autonomy and adaptability, while humanoid robots are facilitating their implementation in sectors that require minimal adaptations in operating environments.

However, significant challenges remain, especially in sectors such as transportation and logistics, where there is still a long way to go to achieve full automation. In agriculture, autonomous systems have considerable potential, and sectors such as the restaurant sector are

already incorporating robotics and seeing positive results.

Within this framework, GMV is driving the transformation of strategic sectors with solutions such as **uPathWay**, already applied in the energy, logistics, and agrifood industries. This innovative solution includes an opportunistic inspection module based on visual artificial intelligence, capable of detecting and recording anomalies in real time during robot movement. This breakthrough eliminates the need for detailed object models, significantly increasing operational efficiency and strengthening the responsiveness of industrial processes.

GMV awarded a prize by the British Embassy in Spain for its commitment to the space industry

This recognition highlights GMV's firm commitment to the development of the space sector in the UK and its contribution to economic progress

GMV was awarded a prize by the British Embassy in Spain in the fifth edition of the UK-Spain Business Awards 2024, an event that recognizes outstanding companies for their contribution to the strengthening of trade relations and economic growth between Spain and the United Kingdom. This year, GMV received the award in the "Commitment to the UK's space sector" category, a recognition that highlights its unwavering commitment to the development of the country's space sector and its contribution to economic progress. Mónica Martínez Walter, president of GMV, collected the award from Poppy Gustafsson, the UK's minister of state for investment.

GMV's commitment to the British space industry can be seen in the company's activities in the country, most notably those focused on the space segment (guidance, navigation, and control systems), the ground segment (development of control centers for telecommunication satellites, data processing systems for earth observation missions or applications using space data and technologies) and robotics. GMV also offers advanced solutions in areas like earth observation, surveillance, and tracking of space debris, mission planning, flight dynamics, navigation and autonomy, working with organizations such as the European Space Agency (ESA), the UK Space

Agency (UKSA) and the Defence Science and Technology Laboratory (DSTL). GMV's main clients in the UK also include companies such as Innovate UK, Satellite Applications Catapult, the Science Technology Facility Council (STFC), and key commercial clients.

For the sixth consecutive year, the United Kingdom remains one of the top destinations in Europe for international investment by Spanish companies and continues to be one of the main European investors in Spain. These figures reflect the solid collaboration and close economic ties between the two countries, with GMV playing a fundamental role in the space sector.



United by sports and team spirit

■ Commitment, enthusiasm, teamwork, and sportsmanship defined GMV's participation in the recent editions of the Corporate Races held in Valladolid and Madrid, in a year that is especially meaningful as the company celebrates its 40th anniversary.

This past November in Valladolid and December in Madrid, our colleagues proudly wore GMV's signature red under the motto "Together, we make it happen," demonstrating that together, we achieve the best results.

In both events, GMV's participation stood out not only for the values displayed with every kilometer but also for the team spirit that strengthens unity and corporate pride, drawing more and more GMV professionals to this unique experience.



Public-private partnerships: challenges and models of success on the 25th anniversary of the FMRE

■ The Leading Brands of Spain Forum (FMRE), of which GMV is a member, celebrated its 25th anniversary in 2024. To mark this occasion, the Forum organized two meetings in collaboration with Forbes with theme "The value that unites us," bringing together experts from various fields to discuss the challenges faced by companies in today's market.

The second meeting was held in October and featured GMV's president,

Mónica Martínez, along with Inma Riera, the general director of the Chamber of Commerce of Spain; Eva Piera, Mapfre's general director of external relations and communication, and Antonio Abril, the vice-president of FMRE and president of the Conference of Social Councils of Spanish Universities. Moderated by Pablo López, the general director of FMRE, the session focused on public-private partnerships, analyzing current models, successful case studies, and the experiences of the speakers in their respective areas of expertise.

GMV's president noted the importance/need for an optimum public-private partnership model to include well-aligned objectives, the equitable sharing of risks and benefits, and the capacity to build up the country's technological skills and business network. Firstly, as an example of collaboration, she

highlighted two cases from GMV's own beginnings in which, thanks to Spain's investment in the European Space Agency and the public-private partnership promoted by government and companies, GMV was able and has been able to take part in the Agency's projects. Secondly, she mentioned the European global satellite navigation system Galileo, a flagship European Union space program, which emerged from public-private partnerships and in which GMV has been involved from the outset.

The session continued with contributions from speakers on ways to improve synergy between the public and private sectors and concluded with a discussion on the most pressing challenges facing Spain that require collaborative mechanisms. Mónica Martínez specifically noted the need for a more efficient healthcare system, leveraging technologies such as artificial intelligence and Big Data.



GMV wins the Technology and Innovation Capital Award 2024

■ In November GMV won the Technology and Innovation 2024 prize in the 11th edition of the annual Capital Awards in Madrid, one of the leading events on the Spanish business scene. GMV's general manager, Jesús B. Serrano, collected the prize from the executive vice-president of Capital magazine, Antonio Hernández, at the gala held on 11 November in the Mandarin Oriental Ritz Hotel.

The annual Capital Awards highlight business excellence in different areas. The most prominent businesspeople, executives, and other relevant figures from the business world gathered at what's already become a can't-miss event in the economic and corporate circles.

A record-breaking total of 305 nominations were received in the 2024 edition, and GMV stood out in the Technology and Innovation category for its development of cutting-edge technology and groundbreaking projects, as well as for its ability to



constantly adapt to the needs of the markets where it's active.

With a track record of 40 years developing high-tech solutions, GMV continues to adapt to changing market demands thanks to innovation as

the driving force of development, transforming ideas into realities that bring value, efficiency, and sustainability to each project. This recognition is also a motivation for GMV in its endeavor to maintain its position as a leader in these fields both at home and abroad.

Spanish industry shines at the Southern Forum on Geopolitics and Defense

■ In November, GMV's general manager, Jesús B. Serrano, participated in the "Conversations for Security: Southern Forum on Geopolitics and Peace Defense" conversation, organized by El País newspaper, at the Museo Nacional Centro de Arte Reina Sofía in Madrid.

The event, which was attended by Spanish defense minister Margarita Robles, secretary of state for defense Amparo Valcarce, and the director-general of defense industry strategy

and innovation Miguel Ivorra, among other leading figures, analyzed the most pressing geopolitical challenges of our time.

Along with other top representatives of the Spanish space and defense industry, GMV's general manager participated in the round-table discussion on European strategic autonomy, sharing his vision on the need for competitive defense companies and on the importance of Spain taking its rightful place in the

field of European defense policies. He also highlighted the leadership of Spanish industry and stressed the importance of cooperating in the European framework as a way of pooling knowledge to address current challenges.

The event proved to be an opportunity for an essential conversation regarding the future of global security and Europe's role on the international scene.

GMV takes a leading role in discussions on the future of the defense sector



■ In December, GMV's general manager, Jesús Serrano, participated in the 11th edition of the "Megatrends: Industry and Competitiveness" forum, organized by El Economista newspaper. During the event, Serrano participated in the round table on "Strategic Autonomy: The Priority of Defense," which analyzed the geopolitical challenges that are conditioning the development of the defense industry in Europe and assessed the measures needed to strengthen the technological and budgetary sovereignty of the sector.

In the current context, marked by increasingly complex international politics, the importance of technological initiatives that boost the defense sector is also increasingly evident. In the case of Spain, the government has committed to increasing defense spending from the current 1.28% to 2% of GDP by the end of the decade. Jesús Serrano, GMV's general manager, argued that this increase is key to the development of in-house technologies to guarantee Europe's strategic autonomy, a goal that, however, he sees as still a long way off.

Despite the political commitment, Serrano emphasized the need to create a developed regulatory framework that will make the defense sector's goals a reality. "The first thing we need is a framework for action, something that isn't possible at the moment. There's no funding, no rules, no regulations... There's political momentum, but no regulatory momentum," he said.

Spain has historically been one of the NATO countries with the lowest defense investment in relation to GDP. Serrano stressed that the situation must change so that Spain can take its place in the sector: "In addition to the level of investment, we must work for Spain to be influential in Europe, in line with its role. GMV wants Spain to play its part both in economic terms and in terms of influence so that it can create joint demand within the European Union," he concluded.

Collaboration agreement between the Spanish Engineering Institute (IIE) and GMV

■ The Spanish Engineering Institute (IIE) and GMV have signed a agreement of collaboration to work together in various areas of common interest, focusing on critical engineering sectors such as industry, energy, innovation, communications, infrastructure, sustainability, and the environment. The IIE is a non-binding advisory body for public administration and is organized into 19 cross-disciplinary technical committees. GMV will be taking an active part in the Space Committee and the Defense Committee. This collaboration will enable GMV to take an active part in the IIE's Space and Defense committees, which are regularly consulted by the government on highly relevant issues. Furthermore, through this agreement

GMV will be considered as a sponsor of the prestigious Space Congress in the highest category available, as well as in all the events held by the Space Committee.

The Spanish Engineering Institute is a federation that brings together various associations of engineers from different fields such as aeronautics, telecommunications, roads, mines, industrial or agronomists, among others. Through these associations, the IIE represents more than 100,000 engineers throughout Spain, promoting the progress of engineering nationally and internationally, and contributing to the development of engineering as a service for the common good of society.

Internationally, the IIE represents Spanish engineers in important global bodies, such as the World Federation of Engineering Organizations (WFEO), the National Federation of Engineering Associations (ENGINEERS EUROPE), the Pan-American Union of Engineering Associations (UPADI), and the European Network for Accreditation of Engineering Education (ENAAE). Through its international committee, the IIE actively participates in the design of global engineering strategies.

This agreement strengthens the relationship between GMV and IIE, opening up new opportunities for collaboration and visibility in the field of engineering and technological innovation.

The Madrid regional government's minister for digitalization visits GMV to learn about its technological innovation breakthroughs

■ Miguel López-Valverde Argüeso, the Madrid regional government's minister for digitalization, visited GMV in November to learn about the company's key areas of operation and its latest developments in disruptive technologies, such as quantum computing. He raised highly relevant issues, reflecting his extensive experience.

The visit highlighted GMV's role at the forefront of innovation and public-private partnerships from the company's beginnings. López-Valverde Argüeso was welcomed by Luis Fernando Álvarez-Gascón, general manager of GMV's

Secure e-Solutions, and Pedro J. Schoch, director of Corporate Development, Marketing and Communication, who stressed the importance of public-private partnership throughout GMV's history and highlighted how the company, which is celebrating its 40th anniversary and active in sectors leading the way in innovation, has seen remarkable development thanks to this strategy.

López-Valverde had the chance to see GMV-developed robots in action, receiving detailed explanations of the latest missions the company is working

on. Similarly, Carlos Illana, Digital Health product manager, presented the innovative Alisse project, after giving an overview of the healthcare products developed in our unit.

In the second part of the visit, Inmaculada Pérez, director of Digital Health; Patricia Tejado, director of Digital Public Services, and Juan Jesús León, director of products and new developments, gave presentations on their respective specialties: digital health, public institutions, cybersecurity, and quantum technology.





GMV's solidarity in the face of flooding



On 29 October, a cut-off low storm system known in Spanish as a *dana* slammed the Valencia region, causing not only material damage but also uncertainty and worry. The company immediately activated a swift, coordinated response to support our colleagues at the Valencia branch, showing that in the hardest of times, we put people first.

GMV's team, led from Valencia by Digital Health Director Inmaculada Pérez Garro, worked in the first few hours to track down all the colleagues in the area. "We sent messages to locate all our colleagues. Although the first moments were difficult, little by little we found out that they were okay. All but one, who took longer

to locate and who finally texted his manager that he was safe. It became immediately apparent that there was a need for equipment: hydro hoses, masks, PPE, boots, shovel, and more," says Inmaculada Pérez Garro.

As phone lines were reestablished, those affected shared their accounts of what had happened.



Each story was a testament to resilience and humanity, and informed the team's aid coordination efforts. For example, GMV's Adrián Quilis shared the following: "Sedaví, what was once a quiet and relatively privileged town in Valencia, looked like a war zone; cars piled up in the streets, mud everywhere, homes and businesses destroyed, social instability... and even human remains, to put it delicately, in certain parts of the town. At this time, as resources were scarce and money was of no use, we could assess our actual needs, and far from the internet, fancy cafés, etc. we bartered with gasoline, food, water, tools, and skills, very similar to what you see in post-apocalyptic movies like Mad Max. GMV provided us with a hydro-cleaner and protection material. To an outside observer, this looks like a simple device for cleaning vehicles, walls, and not much else,

but it saved us, in our house and in our neighbors' houses and even the streets themselves, from another month of the 'brown hell' we were in, not only because of the mud itself but also because of all the diseases it could bring to those of us living among mud and stagnant water."

GMV's priority was clear: the wellbeing of our colleagues and their families. It wasn't just about listening, but also about taking action. Resources were mobilized in record time: boots, cleaning machines, hoses, and PPE. "Following the chaos we experienced and everything that still lies ahead before we can fully get back our lives, we're constantly reminded of how lucky we are. Losing our car, storage room, or garage, is nothing compared with what many Catarroja residents lost in the dana," says Carmen Igual. "In such a bleak

situation, the bright point was undoubtedly the kindness of human beings."

GMV has earmarked a budget of €30,000 to support recovery efforts by helping over ten local businesses that lost their premises, such as Malcom's study center in the town of Benetússer:

"The dana wrecked our entire center, and we've had to start from scratch. Thanks to GMV's swift reaction and all the IT equipment it has provided us with, many of our classrooms are now equipped for reopening in January and our students will gradually be able to come back. We'll never forget this!"

Life is gradually returning to a certain normality for our colleagues in the area. At a time like this, unity, closeness, and mutual support are crucial in order for all of us as a team to move forward together."

Advanced platform for managing and optimizing mobile robots and self-driving vehicles

uPathWay is a comprehensive solution designed to optimize the management of mobile robots and self-driving vehicles in industrial environments. It provides real-time data on your robots, analyzes performance, and ensures operational goals are met. This platform streamlines the deployment and integration of autonomous robots, unifying their management in a single system, regardless of manufacturer or model. With its intuitive interface, **uPathWay** enables efficient device control, mission assignment, and real-time monitoring of reports and status.

Key benefits

- Precise navigation
- Operational efficiency and cost savings
- Scalability

What is it used for?

- Facility inspections
- Continuous monitoring
- Operational optimization



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