

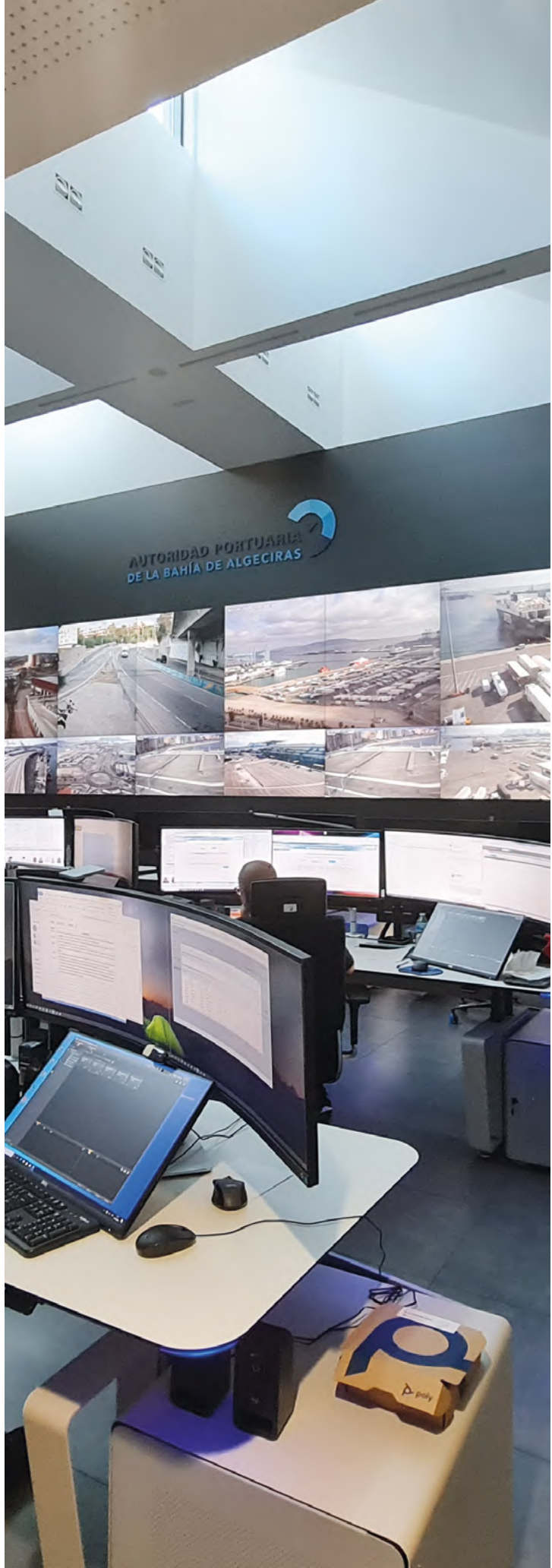
Innovation Report 2025



The reality
of a new port.



Travesía
de la
innovación



2025 Innovation Report ‘1

A summary of the **main actions and achievements** in innovation-related matters by Algeciras Bay Port Authority (APBA), including their Innovation Ecosystem throughout 2025.

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01

Foreword from our Chairman and Manager



Last year displayed an especially complex international panorama, dominated by high levels of volatility, systemic vulnerability and growing geopolitical and geoeconomic tension. **World chaos** became an unparalleled new order that holds powerful sway over cargo flows and hence the whole business that logistics and maritime hubs depend on. The lingering Red Sea crisis - a new armed confrontation on the Strait of Hormuz that only serves to pile more aggravation on top of on-going wars elsewhere; the proliferation of choke points; the disparities between European climate goals; the still-delayed IMO (International Maritime Organisation) *Net Zero Framework* calendar; evidence of a real growing bias that the EU's ETS (Emissions Trading System) regime has ushered into maritime traffic and to investment decision-making. All of the above are clear instances of the **challenging environment** prevalent in the today's industry.

With this in mind, port-logistics environments should emerge as **critical strategic infrastructure** that provides economic competitiveness: gates that are open to the arrival of foreign trade, energy transition enablers, and the cornerstones of secure, resilient supply chains – just as described under the recently-adopted European Port Strategy.

To tackle this panorama of frail uncertainty, the Port of Algeciras Bay has reinforced the competitiveness of its benchmark port and logistics service offer by generating added value at its Strait of Gibraltar megahub. To date, the Port of Algeciras Bay has reached incredible milestones: breaking the **100-million tonne mark for a tenth consecutive year**; renewing its World Bank-sponsored title of **Europe's most efficient container port** for the fifth year running; and strengthening its role as the port ecosystem's **digital operations orchestrator** – designated by the *Gemini Cooperation* as one of only seven port hubs in the world.

None of this would have been possible without the organisation's firm commitment towards channelling **innovation as a core business**

process, a conviction endorsed by the transition towards the new ISO 56001:2024 Standard, which was fully adopted in 2025. The certification gives us a better structure to manage the innovation framework that has already been integrated into the strategy, and stands shoulder-to-shoulder with the best practices worldwide that should drive us forward with a systematic and sustainable approach.

This commitment has also been written into the **new 2030 Strategic Plan with a view to 2040**, aimed at bolstering the systematic nature of innovation management, and the creation and reinforcement of an open innovation ecosystem for APBA's port-logistics habitat. The final objective is to convert innovation initiatives into a **competitive, sustainable engine-room** that can power the port and its sphere of influence.

Seen in this light, 2025 has provided us with significant progress thanks to the practical application of innovation and digital transformation; both fields backed up by projects that maximise the impact of the business, as well as by several initiatives geared towards open innovation, the management of digital talent, and partnerships with the Port of Algeciras Bay and Innovation Communities, as mentioned in the Report herein.

We stand out in the field of **logistics orchestration, traceability, and inter-operability**: initiatives based on state-of-the-art technology, digital connectivity and Artificial Intelligence models that drive nimble, coordinated port operations based on real-time forecasting to optimise efficiency. These are the projects that are having a relevant impact on Strait of Gibraltar traffic, bunker operations and handling ship arrivals.

At the same time, the active partnership of key initiatives such as the **PDCC (Central American Trade Digital Interoperability Hub) Project** and the **Port of Algeciras PCS (Port Community System)** – both of which began in 2025 – clearly shows their role as an international trade facilitator,



and allows us to face present and future green and digital corridor deployment initiatives with great hope.

Meanwhile, innovation projects have been encouraged to include a more proactive management of environmental **sustainability**, and to help decision-making in one of the most fundamental pillars of business. We have approached the development of smart tools on monitoring and controlling ship emissions that comply with legal standards, and the close observation and correlation of environmental and operational events that pre-empt early warnings and provide a contextualised administration of both.

In the field of open innovation, we have placed great emphasis on the launch of the **Port of Algeciras Digital Start-Up Centre in Port Logistics**, a component of the **Mission Andalusia** scheme sponsored by the Government of Andalusia. The centre has already made itself indispensable in sponsoring digital and technological entrepreneurship in such a strategical sector for the Andalusian economy as port-logistics, and has already born tangible results. Throughout 2025, the beating heart of the **Port of Algeciras Bay Innovation Committee** has carried out an intense schedule of activities directed towards the strengthening of the collaborative innovation ecosystem: bringing in new stakeholders, and building on the results of key initiatives that have been backed by public agencies and local partners.

On another note, we are immensely proud of the **3rd round of the scheme to partner Vocational Training Centres** in the framework of the **Algeciras Port Digital Academy** programme, focused on attracting, creating and holding on to local digital talent. Another year has witnessed the scheme sustain previous alliances, and even expand on the previous number of companies offering job experience schemes and employment vacancies;

all of which goes to show the Centre for Digital Venture's crucial role in terms of current and future competitiveness by encouraging local digital prospects.

We would like to round off this introduction by thanking all the Port Authority professionals and the companies who make up the port-logistics ecosystem – without forgetting our customers and partners – and for making this Journey of Innovation possible, thereby allowing us to tackle the forthcoming challenges that we may face with the confidence drawn from past successes and the collective efforts that characterise the setting we all work in together.

Ultimately, we are firmly committed to the strategy we drew up to position the Port of Algeciras Bay as a pioneering intercontinental logistics hub; to anchoring its leadership in innovation in order to fulfil the vision for it to become the **Next Generation Port of Algeciras**: smart (based on data and systemic innovation), synchro-modal (with operational excellence, just-in-time logistics and intermodal integration), and green (sustainable and carbon neutral); and to lifting it to new heights as the current international benchmark **Digital Innovation Hub** that the Port of Algeciras Bay is today: consolidating this flagship of digital talent and technology for the socio-economic revitalisation of Andalusia, and contributing to the future of the port-maritime industry at home and abroad.

02

Innovation at APBA



APBA Renews its Innovation Management System Certification and Makes the Leap towards the ISO 56001 Standard.

The Port of Algeciras Bay Authority (from hereon, APBA) has renewed its Innovation System Certification for another year, a certification we achieved for the first time in December 2019. On this occasion, the renewal has marked a significant milestone: the **transition and adaptation of the system to the ISO 56001 Standard** – the international standard that has taken over from the historical UNE 166002 – and dictates the requirements for innovation management.

ISO 56001:2024 is acknowledged worldwide and provides a framework that allows organisations to **integrate innovation into its strategy, processes and culture by ensuring a systematic, sustainable approach**. Moreover, the Standard follows a harmonic structure that is compatible with other management system standards, which has enabled the Port Authority **to align and integrate our innovation management system with the rest of the systems implemented in the organisation, harness synergies, and improve the**

general efficiency of management as a whole. By adapting, APBA has strengthened its innovation management leadership in the port environment, aligning itself with the best practices globally, and bolstering its capacity to generate value in an ever-more-competitive field.

Such progress has underlined APBA's commitment to evolve towards a more robust management paradigm that leads to excellence, and guarantees constant improvement and efficiency when devising, developing and executing innovation projects. The transition to ISO 56001 has also led to the **inclusion of new solutions and methodologies** that help strengthen key areas such as the management of knowledge, open innovation, and partnership with our port ecosystem.

The certification has gone towards reasserting APBA's outlook of a Next-Generation Port, consolidating a mature innovation system that is both competitive and sustainable, contributes towards the socio-economic development of its region, and tackles current and future port-logistics challenges head-on.

The Port of Algeciras Bay Innovation Committee Consolidates Activities and Moves towards Strengthening the Innovation Ecosystem.

In 2025, the **Port of Algeciras Bay Innovation Committee** has upheld its intense activities, focused on strengthening its innovation and digital venture ecosystem for the port-logistics industry. Throughout a **series of working meetings** held in July and October, the Committee made great strides in implementing various strategic lines, adding new players to its structure and consolidating the results achieved from key initiatives sponsored by public partners and local stakeholders.

Under the chairmanship of Jesus Medina – APBA’s Head of Technological Development – the Committee has seen significant growth in its associates, which now comes to **43 members**. During the sessions held in 2025, **new strategic endorsements** to help bolster the participation of differing ecosystem sectors were formalised. At the July meeting, **Logika Distribution** joined as a Board Member and **Satinel-System** joined as an Expert Consultant; and then, in October, **Continental Parking** joined as a Board Member.

At the same time, the Committee adopted a **headquarter-rotation system** for meetings, taking the October session to the **Campo de Gibraltar Chamber of Commerce** premises. The measure was taken expressly to strengthen the bond between itself and the region’s business ecosystem, and to provide the port and innovation community companies and local players with first-hand knowledge.

The Committee’s various lines of work generated specific results throughout 2025: the presentation of the **III Round of Pre-Commercial Project** funding developments under the **Port Funds 4.0** framework – sponsored by the Spanish State Ports Department – included the active involvement of several of our members. The goals reached during the above round, and the subsequent lessons learnt, have provided us with grounds to stir up involvement in the **Fund’s IV Round** by inviting participants to identify business challenges and partner outlining innovation proposals.

In addition, the **Innovation Challenge Identification Workshop** that was held during the first session of 2025 helped us to map out key challenges and explore innovation opportunities



in the port-logistics industry together, which gave us a frame of reference for future ventures and projects.

The **Mission Andalusia** initiative, promoted by the Andalusian Government and several local stakeholders, has enabled the Port of Algeciras to launch its Port of Algeciras Digital Start-Up Centre, a strategic site that encourages technological ventures in the relevant economic sectors. During the July meeting, the Committee-goers were given a **guided tour of the Centre** to get to know the premises, and the range of services that had been put in motion within the framework of this initiative.

At the end of the year, the Centre had already become home to three start-ups specialising in tech tools for the port-logistics field. At the October meeting, two of the three companies submitted their proposals to the Committee: **Panssari** – led by its co-founder and CTO, **Cesar de la Torre**, and **WDTech** – run by its founder and CEO, **Manuel Garcia**; both of whom contributed an innovative approach to the industry.

The **Innovations by Algeciras** section that was introduced to the October meeting has brought forward a new way of making innovation projects visible by means of partnerships among companies in the ecosystem. At the session, three initiatives were presented to the audience that exemplified the potential of teamwork: the partnership between **APBA and Navozyme**, the joint venture between **Bernardino Abad and WISEKey**, and the association of **Moeve and Gibraldrone**. All of these projects reflect the growing dynamism and development synergies implanted in the Port of Algeciras digital ecosystem.

The two meetings held in 2025 were rounded off by **networking areas** designed to facilitate the exchange of ideas and experiences among companies, start-ups, consultants and entrepreneurs from our port community. Such encounters have served to bolster a commitment towards collaborative innovation and strengthen ties among players inside the ecosystem itself.

Mission in Algeciras: Expand Scope without Losing Specialisation.

Since the very start, the Mission has had a very clear idea that each of its four strategic commitments would be oriented towards port logistics. With the passage of time, the project has left behind its seed phase to become an **active innovation hub to serve the port ecosystem**. Located at the Port of Algeciras, the centre has built on a model that transcends physical space and specific training courses. Its purpose is much more ambitious: to **link up emerging technology, start-ups and top maritime-logistics players together in a single space, and whose mission is to bring highly-sought tools – unfeasible without that layer of technology – to the marketplace**.

The centre makes up part of a regional network designed to accelerate high added-value digital ventures in strategic sectors. In the case of Algeciras, the focus is very clear, and is geared towards mobilising deep technologies in the port-logistics sphere of influence: AI, algorithmic optimisation, state-of-the-art sensor systems, process automation, energy sustainability, digital twins and other technologies focused on port security and resilience. These are the main pillars that participating companies are concentrating their efforts on.

The 2025 statistics reflect the assurance of the initiative. Throughout the year, **more than 60 training programmes** have been held – from workshops to master classes – with the active involvement of APBA's technical staff as lecturers. These sector-specific sessions helped entrepreneurs to contrast their progress with the people who run critical infrastructure and real-life operations.

The programme has partnered **nine start-ups in their acceleration phase**: *Ambervale Labs, Eonsear, Ocho, Panssari, SCAI Engineering, SoleaHeat, Synnect, Torbellino Tech*, and *WDTech Sensors & Systems*; and **three high-**



performance start-ups: *Deliverance Enterprises, Ion Technologies* and *Simulation Zero*. Moreover, one of the acceleration itinerary companies went on to qualify for the high-performance programme – a sure sign of technological maturity and market traction.

Partnership has been very intense: over **100 hours of specialist mentoring** – always personalised one-on-one sessions – which is one of the stand-out



features of the Mission. Sessions were focused on product validation, MVP (Minimum Viable Product) development, preparing meetings to explore pilot opportunities and – in certain cases – steering partners towards canvassing investment: the field of fund management is often one of the great unknowns to start-up companies in their teething stages. At the same time, entrepreneurs have had the chance to hold on-going conversations both directly with the Port Authority and as a candidate within the Ports 4.0 framework, and have been able to count on the support from the Centre's personnel. These are not closed announcements; they are open processes that are under way.

The bridge that connects the rest of the ecosystem's players is another of the Mission's distinguishing assets. In 2025, **specific meetings with the Port of Algeciras Bay Innovation Committee and networking sessions have been held**, where start-ups have been able to get to know the Campo de Gibraltar area's leading companies.

The initial approaches that arose from these meetings have continued to go on and may result in alliances and even groundbreaking tools for the marketplace. In this context, the Centre serves as facilitator to reduce the gap between emerging technology and the real-life needs of the port.



Another prominent factor is that the port environment provides a competitive edge that is difficult to mimic. By **operating next to one of Southern Europe's main logistics hubs** enables start-ups to validate tools on a stage that is conditioned by highly-complex operations. The fact that those entrepreneurs are able to contrast their proposals with technicians who actually manage real maritime traffic can obviously accelerate the work-flow considerably.

The outcome is a working ecosystem. From the infrastructure angle, Mission is not only a building fitted out with IoT, 5G hubs and test labs; it is a **platform that pivots around technical know-how, entrepreneurial networking and access to opportunities**. Innovation does not remain at the prototype phase – it presses on towards implementation in real-life scenarios.

The **priorities for the 2026 programme** include an energetic mobilisation of the Mission Network as a distinguishing feature of the initiative. The circulation of start-ups between ecosystems – as has already happened between *Smart Mobility* centres (in Alhaurin de la Torre) and port logistics – will open new synergies in the industry. New learning formats have been scheduled that are steered towards the development of new ventures in complex technological environments.



The strategy is clear: expand scope without losing specialisation. If 2025 was a year of consolidation, then **2026 should aspire to be a year for networked expansion, access to funding and access to the marketplace.** On a stage of ever-growing global competitiveness and accelerated tech transformation, the Centre in Algeciras has taken up a position as a **structural element for digital venture in Andalusia**: a link-pin between start-ups and corporates, and a space where innovation can find real pathways towards the very heart of the logistics system.



03

Voices of innovation



Connecting the Maritime World's Future from Outer Space: Safety & Sustainability by Digital Communication.



Alberto González Muíño,
CTO and Co-Founder
of *Alén Space*.

Alberto is CTO (Chief Technology Officer) of *Alén Space* and coordinates the technical teams and innovation programmes at the company. He is a Telecommunications Engineer graduate of the University of Vigo and has more than eighteen years' experience in designing and running missions that use small satellites that focus on setting up new communications systems.

To start off with, how would you describe *Alén Space* and what is its mission in the field of satellite communications?

At *Alén Space*, we design missions, satellites and other satellite-related components in what is called *NewSpace*, where dynamism and private sector partnership have given great support to new services from outer space. We have made up part of the *GMV Group* since 2023, and have taken part in international projects with *ESA* (the European Space Agency), *DLR*, *ETRI* and many other companies and institutions the world over.

Our focus is on communications tools and systems. We implement various applications on our SDR (Software-Defined) radios, such as ADS-B for 'plane tracking, IoT, and spectrum monitoring – or AIS/VDES – the payload we use on the *SATMAR* project.

Spain seems to be consolidating a more and more competitive satellite industry with businesses that are driving new models based on nano-satellites and in-orbit services, among others. How would you assess the current state of the Spanish space industry, and what role do you think that it can play in transforming the port-logistics sector specifically, and world trade in general?

It's evident that we live in a boom time for new businesses and services from outer space. The

NewSpace revolution – which has been in motion for a few years now – has made space a much more available industry, both for new companies and start-ups and for new services and customers who used to see space as unreachable, remote, expensive and reserved exclusively for huge corporations and government institutions.

However, it is private initiatives that are leading the implementation of new services geared towards society in today's world. And among those initiatives, the port-logistics sector has become one of the major beneficiaries: from the fields of communications and shipping, to how earth observation can improve existing processes and their efficiency, sustainability and safety.

***SATMAR* is a pioneering project that intends to validate the VDES standard as the natural evolution of the AIS system in orbit, in order to try and change the way maritime communications are handled and transmitted. From the tech point of view, how would you define *SATMAR*'s scope and significance for the industry, and what exactly makes it an especially relevant project for the port-maritime industry? What key advantages does VDES have?**

VDES is the new go-to standard that intends to supply a two-way digital comms channel between ships and stations on-shore. It works on the VHF band-width currently used in the maritime

sector for voice and DSC (Digital Selective Calling) communications, so that – in part at least – some existing ship and shore installations can be reused.

On the one hand, *SATMAR* seeks to demonstrate its technical performance in a real-life situation; and, on the other, to validate a series of use cases that we've identified as "appealing", together with APBA. As far as we ourselves are concerned, *SATMAR* helps us to understand what technical issues we need to solve in the face of future full-service deployments that can be implemented in future satellites and payloads.

There are very few initiatives in the world that are trialling the new VDES standard, and the lion's share is focused on the Arctic and other regions. We felt that it was important to start testing VDES in areas with Spain's characteristics and, specifically, in a port setting.

What were the main tech challenges that Alen Space tackled in designing, manufacturing and running the 6U nano-satellite?

Designing and commissioning a space mission always has its challenges, and in *SATMAR*'s case it wasn't an exception. Due to the type of satellite we build, where we try to minimise their size and weight, it's always a real challenge to try and fit all the technology that we want to test inside the tiny space that there is to fit it into. We also have to squeeze capacities to the max in terms of satellite power and communications to get the best performance out of the experiments and demos we do.

Another big challenge, of course, is implementing the VDES payload and the standard itself. Being a recent standard still under construction, we didn't have many references as to how to do it, but *Alen Space*'s technical team, together with our partners – *Egatel* and *Gradiant* – have really worked hard to put everything together and demonstrate it in a real-life environment.

From an engineering and software perspective, what innovations has the satellite adopted that

makes it unique as a test bed?

The main innovation is in the implementation of the AIS/VDES payload that enables us to set up two-way communications between ship and shore on the VHS band-width, and also receives AIS signals on four dedicated channels, both for local operations and for long-range ones targeted at satellite reception. The payload gives us the capacity to track any ship that carries a working AIS transmitter anywhere in the world, and we are even able to monitor its position and navigational status when it is out of range of on-shore stations.

As a secondary goal, *SATMAR* also allows what we know as *spectrum monitoring* or SigInt (Signals Intelligence) with VHF, short- and long-wave band-width coverage, which helps us identify interference, point out unwanted transmissions, and other transmissions that don't use AIS constructively: e.g., ships known as *dark vessels* that usually have suspicious or criminal intent, avoiding location by disconnecting or manipulating their AIS.

These innovations are the ones that can contribute to improving safety on the ocean waves and help the development of new services for the maritime industry.

During the pilot phase carried out with Oritia & Boreas, the aim was to transmit environmental data from remote areas. What opportunities does this capability open for fields like maritime forecasting or the future deployment of off-shore wind farms?

We have partnered *Oritia & Boreas* to integrate one of their weather stations at the Port of Algeciras that transmits real-time wind and ambient data up to the satellite. With this pilot scheme, we were looking to demonstrate a use case that we feel is very relevant: the monitoring of both environmental and weather conditions, as well as the remote surveillance of the state of infrastructure.

Moreover, by doing this via VDES, we can collect and transmit data efficiently and economically. This opens multiple possibilities – from off-shore



buoys set up to provide early warnings or for other scientific purposes, to monitoring maritime signalling and other infrastructure lying beyond the range of on-shore communications; or where traditional satellite cover would be more costly.

Let's talk a little bit about partnership, from your position as an innovative tech company: how would you assess the role of programmes like Port Funds 4.0 in driving disruptive programmes like SATMAR? What impact do you think that such public-private sector instruments have on the ability of companies to innovate, scale up tools and take them to real-life environments like the Port of Algeciras?

Port Funds 4.0 has been a great help for getting the *SATMAR* project under way and towards its success: not only as a financial instrument – which has obviously been very substantial – but also as a catalyst for helping the port-maritime community get in touch with companies like us that can offer these types of innovation projects and tools. The true success of *SATMAR* and *Port Funds 4.0* – in my opinion – is that we have found use case demonstrations that are very close to their real-life application: putting a VDES system into service in a port like Algeciras and linked-up to the rest of the Spanish ports.

What is Alen Space's appraisal of its partnership with APBA as project facilitator? How has the

port been key in validating use cases in real-life surroundings?

I think it's been very productive. All the people at APBA and its Innovation Bureau have welcomed the project with open arms, from its beginning as a proposal to the very end, and they have helped us understand the port environment and its needs better. The pilot schemes carried out at the Port and in the Bay of Algeciras couldn't have been possible without their collaboration or the means that APBA put at our disposal.

What lessons would you say are the most outstanding ones that have been taken on board from the interactions with APBA's technical team during the development stage of SATMAR?

I think that one thing that we've all learned from this project and partnership is that understanding the needs of port users and different players involved in the ecosystem from the get-go has helped us suggest use cases and tools that really get close to an eventual solution. There is a long way ahead, but establishing the use cases from the very beginning allows us to go on to the following stages on a safe footing.

Another lesson is that, when systems need to be integrated on a technical level in demos and pilots, it's really a good idea to have in-depth discussions between the tech teams prior to the event, so that everything is wrapped up before it's taken into the field. There's always going to be contingencies, but they can be minimised and made less relevant if you get to the demo with everything prepared and coordinated with everyone who's involved.

If we look towards the future, SATMAR may lay the foundations for constellations of VDES nano-satellites: how do you imagine the tech and commercial evolution of this line of work over the next few years?

Nano- and micro-satellite constellations are already here: it's the reality that has allowed new, low-cost services to expand easily all over the world today. We believe that this trend could also benefit

the port-maritime industry, and I'm sure that we'll see new services at sea and in port logistics sometime very soon.

What do you think the role of ports is in the mass adoption of cutting-edge maritime and satellite technologies?

Ports and the port-logistics community should define exactly what their needs and use cases are, so that tool and tech providers can focus on future developments and propose new service models. The legal aspect is equally important: e.g., to be able to adopt, implement and actually deploy VDES, the maritime community will have to back it, then take their support to the appropriate regulatory body to see if they will allow AIS equipment to be updated to VDES.

What do you consider to be the next steps along the road to taking validated technology towards large-scale operational deployment?

As I mentioned before, there should be a commitment from a legal point of view for VDES deployment to be effective. As in the case of AIS, its widespread successful implementation no doubt came from adopting a standard and a regulatory commitment to having it on board every ship. VDES should continue along a similar path if we want its deployment to be as successful.

On a working level, we need to develop constellations that will supply satellite-based services, and we feel this will come from either national or supranational government programmes. We can't discard the fact that some industries and private initiatives may promote constellations for certain specific services, as long as they have coordination with governmental bodies on an international level.

To round off our interview, what are the thoughts you can share with port authorities – and the maritime sector at large – about satellite technology's potential to improve the efficiency, safety and sustainability of maritime traffic?

Just as in other industries, services from outer space have come to revolutionise it and meet

the needs or use cases that haven't been able to be met before, without the satellite angle. As far as I can see, authorities should sponsor programmes like *Port Funds 4.0*, so that we in the industry can approach the real-life needs of the sector and suggest new ideas and services that deliver on its potential.

VDES is a clear example of a technology that can solve specific problems and deliver improvements in terms of efficiency, sustainability and safety too, but there are other fields of the space realm that could deliver new applications, such as earth observation and new generation PNT (Positioning, Navigation & Timing).

And, finally, what's the most important lesson you've learned in your career as an entrepreneur and businessman? What advice would you give to someone who's thinking about setting up their own business on a market like the port-logistics one?

Firstly, we have to get closer to the final user, and get to understand their problems and needs before beginning with implementation; secondly, that – beyond technology – the differential is the human factor of the team and its commitment, implication and ideas. Choosing the right colleague is really important, and looking after your team is key.

Thank you very much, Alberto.

My thanks to you, too, for the chance of being able to share the *SATMAR* project with you; and for all the support you have given us throughout all the phases of the programme..

From Estimation to Decision: How AI Redefines Port Call Management



Karno Tenovuo,
CEO and Co-Founder
of *Awake.AI*

First of all, we'd like you to tell us a little more about your start-up: how did *Awake.AI* come about?

Awake.AI was started in October 2018. The whole team came from *Rolls-Royce* Marine after it was sold to Kongsberg. *Rolls-Royce* and *Kongsberg* did not want to focus on ports and logistic chains outside ship systems. We did not see other companies solving this challenge according to our vision for the future, so we decided to solve it.

***Awake.AI* was born with the idea of transforming the maritime industry through data- and predictive model-based AI. What type of tools do you create with this technology at your company? What operational issues did you detect at the beginning, and how did you tackle them with your technology?**

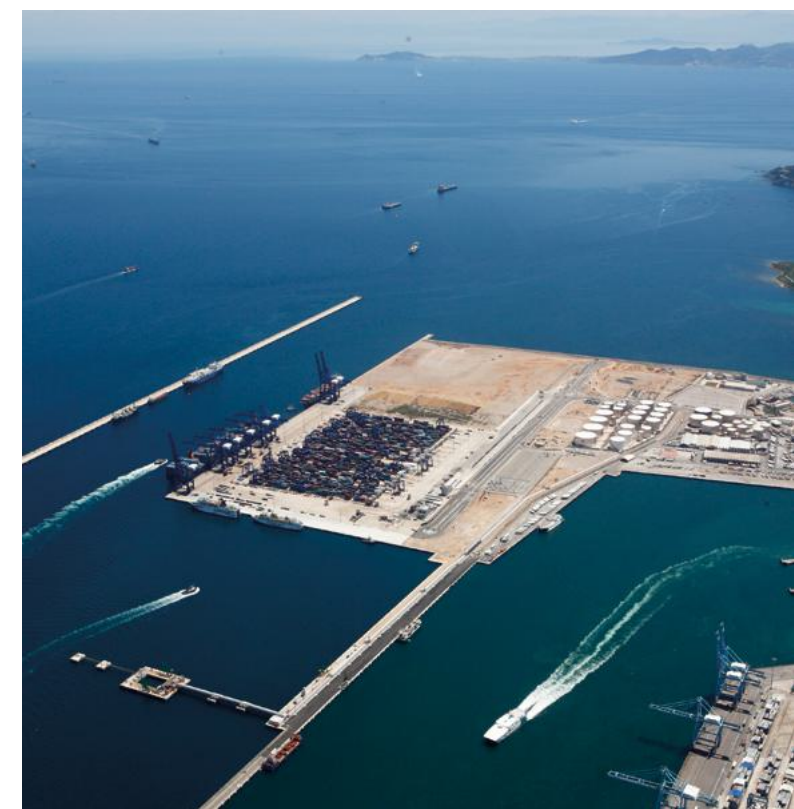
Awake.AI develops AI-driven solutions that help ports and maritime stakeholders make better, faster decisions by turning complex data into predictive insights. Our solutions span three main categories. **Situational awareness** focuses on real-time visibility and monitoring, including accurate ETA predictions and continuous event monitoring across port and vessel operations. **Situational understanding** builds on this by providing deeper insights, such as forecasting port congestion and enabling Just-in-Time (JIT) arrivals to reduce waiting times and emissions.

On top of this, our **optimisation solutions** support creating a customised AI models for smarter planning and execution, from optimizing cargo flows within ports to fleet-level optimisation across

Mr. **Karno Tenovuo** has been in the marine business since 2004 and launched several groundbreaking solutions to the market. Now he is the CEO *Awake.AI*. He received his M.Sc. (Tech) from Helsinki University of Technology and his M. Sc. (Econ) from Turku University.

First seven years of his career he worked at the Finnish shipyards leading R&D and business development. Then he started his own company and *Rolls-Royce* became one of his customers and was soon offered a global role heading business development & strategy based in Norway. Karno started the research on future ship operations and then grew that into *Ship Intelligence* business where was the SVP and P&L owner.

Some highlights include project with *Maersk & Svitzer* that demonstrated the world's first remotely controlled commercial vessel, *Stena* and *MOL* cooperation around intelligent awareness system, Safer Vessel with Autonomous Navigation (SVAN) project with *Finnferries* that was the first autonomous commercial ship demonstration in the world. Then he realized that ships cannot interact with the rest of the logistic chain unless the needed digital handshakes are being developed and linked to an open platform.





maritime networks. Initially, the key operational challenges were fragmented data, limited visibility only few days forward, and reactive decision-making. We addressed these by integrating diverse data sources into a unified platform and applying AI-based predictive models and event data, allowing the maritime sector to shift from siloed, reactive operations to coordinated, proactive, and optimized performance.

What aspects of the port ecosystem would you say make the adoption of solutions based on AI and advanced analytics more conducive? What kind of level do you think ports are at, to be able to adopt this type of technology? What barriers have you seen in the sector and how can they be overcome?

Ports are particularly well suited for AI and advanced analytics because they are data-rich, complex ecosystems where small improvements in timing and coordination create outsized impact. Vessel traffic, cargo flows, capacity and multiple stakeholders all interact in real time, making ports a natural fit for predictive and optimization technologies that improve situational awareness, planning, and decision-making.

In terms of adoption, most ports today are in an early to intermediate phase. Few ports globally have invested in basic digitalization, and a growing number are piloting new use cases, but full ecosystem-wide adoption is still emerging. The adoption rate for

digitalisation will likely follow the regulations such as emission reductions and single window regulations set by IMO. The early adopters are moving from isolated pilots toward operational, daily use of predictive insights across multiple stakeholders.

Key barriers include fragmented data ownership, legacy systems, and the need for cross-organizational collaboration and trust. There is also a skills gap and, in some cases, uncertainty around the tangible business value of AI. These challenges can be overcome by focusing on clear, high-impact use cases, building interoperable platforms that integrate existing systems, ensuring transparency and explainability of AI models, and fostering collaboration across the port community. When AI is positioned as a decision-support tool that delivers measurable operational and sustainability benefits, adoption accelerates naturally.

Also cybersecurity will be a barrier to overcome. When ports move from Excels and pen & paper to connected digital systems, it increases the risk of disruption due to e.g. cyber-attacks. That is why all port systems need to adopt Security by Design principles.

Do you think that companies and organisations who don't commit to implementing disruptive types of technologies like AI might lose their competitive edge? What advice would you suggest from your experience with these technologies? What conditions should a port meet to be able to benefit fully from predictive hubs like yours?

Organizations that do not invest in disruptive technologies like AI risk losing competitiveness over time. In the maritime and port sector, margins are tight and operations are highly interconnected, so the ability to predict, coordinate, and optimize becomes a clear differentiator. Ports that rely solely on reactive, manual processes will find it harder to attract traffic, meet sustainability targets, and respond to increasing volatility in global supply chains. From our experience, the key advice is to start with a good and measurable vision, not technology.

Successful adoption begins by identifying concrete operational challenges—such as congestion, berth utilization, or arrival uncertainty—and then applying AI as a decision-support tool that delivers measurable value. It's also important to progress gradually, moving from pilots to everyday operational use, while ensuring that people trust and understand the new solutions and new processes.

To fully benefit from predictive platforms, a port needs a few core conditions in place: access to shareable data, a willingness to collaborate across the port ecosystem, and a leadership with a data-driven vision. Equally important is change management—engaging users early, over communicating, getting early wins, integrating e.g. new analytics solutions with existing systems, and aligning digital initiatives with operational and sustainability goals. When these elements come together, predictive platforms can unlock significant efficiency, resilience, and environmental benefits.

The tool implemented in Algeciras provides constant ETA updates that help anticipate ships' arrival times. How does that translate in practice to the possibility of operating a just-in-time model; and what changes would that introduce in terms of planning calls at a port like Algeciras?

Continuous, high-accuracy ETA updates are a key enabler of Just-in-Time operations. In practice, this means that all actors in the port of Algeciras—port authority, terminal operators, pilots, tugs, and shipping lines—work from a shared and continuously updated view of vessel arrivals, rather than fixed schedules or manual estimates.

This allows port calls to be planned dynamically. Resources such as berths, crews, and nautical services can be allocated based on predicted arrival windows instead of conservative buffers, reducing idle time and congestion. Vessels can adjust speed during the voyage to match their optimal arrival time, avoiding unnecessary waiting at anchorage and lowering fuel consumption and emissions. Compared to traditional planning, where plans are set early and frequently disrupted, a Just-in-Time model

introduces a more flexible, data-driven approach. Port calls in Algeciras move from static planning to continuous re-planning, where decisions are updated as conditions change. The result is a more synchronized port ecosystem, improved operational efficiency, and a more predictable and sustainable flow of traffic through a high-throughput hub port.

Your tool doesn't only forecast ETAs, it also includes emission estimates, periodical analytical reports, and a whole range of operational indicators that help identify opportunities for improvement. How do you combine all these capabilities to support decision-making for calls at a port; and what value do they add to the players who intervene in port operations on a day-to-day basis?

By combining ETA prediction with emissions estimation, operational indicators, and regular analytical reporting, the solution turns raw data into a comprehensive decision-support framework for planned port calls. We have modelled every vessels' main engine, auxiliary engine, boilers and pumps for getting an accurate emission profile of the vessel in different operational modes. Accurate and continuously updated ETAs provide the timing backbone, while emissions estimates and KPIs add context—showing not *only when* something will happen, but also *how efficiently and sustainably* operations are being carried out.

In day-to-day operations, this means different actors can make better, role-specific decisions from a shared picture. Port authorities gain visibility into overall performance, congestion, and emissions trends, supporting capacity planning and sustainability reporting. Terminals and nautical service providers can plan resources more precisely, reduce idle time, and anticipate peaks or disruptions. Shipping lines benefit from improved voyage planning, speed optimization, and more predictable port stays, translating into cost savings and lower environmental impact.

Together, these capabilities shift decision-making from reactive problem-solving to continuous

emission reductions. Planned port calls are no longer optimized only for punctuality, but also for efficiency, collaboration, and sustainability — delivering measurable operational value while supporting ports’ long-term strategic and environmental objectives.

From your international experience, what differential value do you find at port like Algeciras when it comes to developing advanced projects based on data and artificial intelligence?

From an international perspective, Algeciras stands out as an exceptional environment for developing advanced data- and AI-driven projects. Its strategic location at a major global maritime crossroads, combined with very high traffic volumes and operational complexity, creates exactly the kind of real-world conditions where predictive and optimization solutions deliver strong, measurable value.

What truly differentiates Algeciras, however, is the maturity of its port ecosystem. There is a clear willingness among the port authority and key stakeholders to collaborate, share data, and experiment with new operational models such as Just-in-Time arrivals. This openness, together with strong digital foundations and a focus on sustainability and efficiency, allows AI solutions to move beyond pilots and into daily operational use.

As a result, Algeciras is not only a demanding testbed for advanced analytics, but also a reference port where innovations can be validated at scale and then replicated internationally. That combination of complexity, collaboration, and ambition makes it a particularly strong platform for advancing data-driven transformation in the port sector.

Operations aside, another of the fields that’s applying AI most is in environmental sustainability: how do you focus tools and employ AI to make a positive contribution towards this?

We approach environmental sustainability as an integral part of operational decision-making,

not as a separate layer. Our use of AI focuses on making maritime and port operations more predictable, coordinated, and efficient—because efficiency and sustainability go hand in hand. Main focus last year and this year is using AI to model all scope 1-3 emission types and sources in ports for accurate and meaningful CSRD monitoring and reporting.

By providing accurate ETA predictions and enabling Just-in-Time arrivals, our solutions help vessels optimize speed and avoid unnecessary waiting at anchorage, directly reducing fuel consumption and emissions. We complement this with emissions monitoring, reporting and sustainability-related KPIs, giving ports and shipping lines visibility into the environmental impact of everyday operational decisions.

AI also enables continuous monitoring and analysis in real-time, allowing ports to identify structural

inefficiencies—such as recurring congestion or suboptimal resource use—that drive avoidable emissions. AI also supports in planning different emission scenarios and calculating the cost impact of those emission reduction strategies. By turning this insight into actionable guidance, we support ports in meeting regulatory requirements, advancing decarbonization goals, and embedding sustainability into daily planning rather than treating it as an after-the-fact report.

We’ve talked about the fact that one of the Algeciras project’s added values was in estimating navigation-linked emissions: How do you see the role of this type of metrics in the maritime industry’s energy transition?

Emissions metrics play a foundational role in the energy transition of the maritime sector because they make environmental impact measurable, comparable, and actionable. Without reliable data on emissions associated with

navigation and port calls, it is difficult for operators, ports, and regulators to move from ambition to concrete change.

By estimating emissions at a granular, operational level, these metrics allow stakeholders to understand how everyday decisions—such as arrival timing, speed adjustments, or waiting times—directly affect fuel consumption and emissions. This creates transparency and enables informed choices, for example by supporting Just-in-Time operations, optimizing port calls, or prioritizing measures that deliver the greatest emissions reductions.

More broadly, consistent emissions metrics provide a common language across the port ecosystem. They support compliance with evolving regulations, enable credible sustainability reporting, and help ports and shipping lines track progress over time. In this way, emissions estimation is not just a reporting



tool, but a practical enabler of behavioral change and continuous improvement—both of which are essential for a successful energy transition in the maritime sector.

Let's talk about collaboration: according to your experience, do you think that institutions back start-ups enough? What could the Public Administrations contribute more to support entrepreneurship?

Collaboration between institutions and start-ups has improved significantly in recent years, and in many cases public administrations play a crucial role as enablers of innovation. That said, from our experience, support is still uneven and often slower than the pace at which start-ups operate. Many ports are looking for an AI partner like *Awake.AI*

Public institutions add the most value when they go beyond funding and actively act as partners. This includes opening access to data, facilitating collaboration between ecosystem actors, and creating safe environments for piloting and scaling new solutions in real operational settings. Clear procurement pathways and innovation-friendly tendering processes are especially important, as they allow start-ups to move from proof of concept to long-term impact.

Public administrations can further support entrepreneurship by reducing administrative complexity, aligning innovation programs with real operational challenges, and committing to long-term digital and sustainability strategies. When institutions provide continuity, openness, and a clear demand for innovation, start-ups are better positioned to scale their solutions and deliver value to both the public sector and the broader economy.

How do you assess the support received from the APBA in your case? What would you highlight about the way APBA works during the development of this proof of concept?

Our experience with the Port of Algeciras has been very positive. From the outset, we received

strong support and clear engagement from the port authority, which was essential for making a solution that can have an impact and is taken into real production use.

What stands out most is their collaborative way of working. The Port of Algeciras actively facilitated access to data, involved the right operational stakeholders, and maintained an open, solution-oriented dialogue throughout the project. This allowed us to continuously improve the solution, validate it against real operational needs, and iterate quickly based on feedback from day-to-day users.

We would also highlight their pragmatic approach to innovation. Rather than treating the proof of concept as a theoretical exercise, the port focused on practical value, operational impact, and scalability. This mindset, combined with technical openness and strong coordination, created the conditions for a successful project and positioned Algeciras as a reference port for data- and AI-driven innovation.

To start rounding off our interview, and – looking beyond this pilot – what kind of progress do you think we'll see in maritime forecasting models and decision-making tech tools over the next few years? What evolutionary potential can you see for the ETA Prediction & Emissions API inside a bigger port orchestration model?

In the coming years, maritime forecasting and decision-support tools will evolve toward greater accuracy, automation, and ecosystem-wide scope. We have already started this journey and created a world's first and currently port congestion analytics service that enables port authorities, terminal operators and shipping companies to know which vessels are competing on the same berth, what are the competing vessels ETAs and turnaround times and what is going to be every vessel's accurate waiting time.

This type of visibility has not been possible before, but now when the AI is modeling berth occupancy & availability combined with modelling every vessel's

ETAs, the result is groundbreaking service to support Just-in-Time arrivals. As orchestration matures, this Port Congestion and JIT solution can support multi-objective optimization—balancing efficiency, capacity, cost, and emissions at ecosystem level—while enabling more advanced Just-in-Time arrivals, collaborative planning, and sustainability-driven operations. Ultimately, it becomes part of a real-time “operating system” for the port, helping ports move from coordinated activities to truly optimized, resilient, and low-emission port ecosystems.

Finally, what is the most important lesson you have learned in your career as an entrepreneur? What advice would you give to someone who is considering launching their own business in a market like the port-logistics one?

For anyone considering launching a business in port logistics, my advice is to be patient, curious, and collaborative. 90% of the people you meet will tell you that is not going to work or it has been done already.

This is a conservative but highly interconnected market, so success depends on credibility, partnerships, and delivering clear, practical value. Start with a specific, high-impact problem, prove it in real operations, and make sure you find customers you are willing to pay for the service when it solves their problem.

Finding a product-market fit is hard and it takes time. When nine doors close in front of you, find the one door that takes you one step forward.





From Classroom to Company: Digital Education, Talent & Educational-Business Partnerships in the Port Sector

Jemuel Mark Gedalanga Agsaway, software developer at *Sopra Steria* and a former student of *Kursaal High School*.



We begin this dual interview session with Jemuel, a former student at Kursaal High School and who now makes up part of the tech ecosystem linked to the Port of Algeciras.

To begin with, tell us about the training course you were on when you got to know about the opportunity on offer at the Port Authority through the Algeciras Port Digital Academy programme. What attracted you about the initiative

At the time, I was doing the Higher Diploma in Development of Web Applications Course at *Kursaal High School* in Algeciras. I'd always had the Port of Algeciras at the back of my mind, having lived all my life in the area, but it wasn't until I got to know about the Algeciras Port Digital Academy that I became aware of the magnitude and complexity of operations that went on in the port environment every day. What most attracted me was the chance of learning in real surroundings, having an internship at a company in the sector and being able to apply the knowledge I'd acquired during my training in a high-impact professional setting.

Had you had any previous contact with the port industry, or was it a surprise for you to get to know that technology was present and driving the maritime-logistics business?



Jemuel Mark Gedalanga Agsaway is a software developer at *Sopra Steria*, where he is currently working on creating applications for the **Port of Algeciras Bay Authority**. A former student at *Kursaal High School*, he began his career through the **Algeciras Port Digital Academy**, an experience that marked a turning point in his professional trajectory and allowed him to step up from an educational to a professional environment. His career to date is clearly representative of the **Algeciras Port Digital Academy** programme: to sponsor the employability of local digital talent in the technological and port ecosystems.

Cristina Muñoz Salas is a Secondary School and Vocational Training teacher, as well as being **Head of the IT Department** at *Saladillo High School* in Algeciras, one of the educational centres that actively partners our Algeciras Port Digital Academy. From her position as teacher and coordinator, she has mentored students along the path of linking up software development training to the real needs of our port's business fabric by providing a key outlook on the role of schools in creating and holding on to local digital talent.

I did know about the port's relevance to its region and its clout in the local economy, but I didn't know the level of digitalisation or the depth of technology that port operations bear. Discovering how technology drives and optimises key processes in the maritime-logistics industry was, without doubt, a revelation.

During the companies' presentations at the beginning of the programme, what was your first impression? Did you think there was a real fit between the training you received and market needs?

To be honest, at the time I didn't have a clear idea about how my education was going to match up with the market's real needs. Nevertheless, in my internship period, I was able to see the huge amounts of data migration and digitalisation projects that were going on at companies in the port environment. It was then that I understood that the training we'd received was perfectly in synch with the real needs of the tech industry, especially in the fields of application development, system integration and digital infrastructure modernisation.

In your case, you interned at one of the partner companies. What was the initial experience like? What did you learn on a technical and professional level?

I did my internship at TTI-A (*Total Terminal International Algeciras*) and I think it was a really fulfilling experience. TTI-A is not a software-developer – lots of its systems are developed by third parties – and this made the experience different from that of my classmates.

The IT team introduced us to projects that had been designed specifically with our training in mind; in my case, I developed an application to migrate the data transfer system from an FTP-based model to APBA's new PCIS (Corporate Hub for System Integration). The project allowed me to work on integrating systems and my understanding of the importance of tech inter-operability in ports. Apart from my main project, we took part in daily

tasks with the IT team, such as reviewing reefer sensors, maintaining servers and adjusting the terminal access gates. These experiences helped me understand not only the computer systems that bear the terminal's operational load, but also the whole process a container goes through from its arrival on board a ship to its departure by road, and vice-versa. Although some of this knowledge may not be directly implicit in the development of applications, it gave me a comprehensive outlook on the business that is currently key to improving the tools I develop in my job today.

Once you had finished the internship phase, another of the programme's partner companies decided to hire you and take you onto their staff. How did you find that process, and what has that meant to you in terms of becoming one of the programme's success stories? What were the defining factors that made you become an employee at a company in the sector?

That process was a turning point both in my professional and personal life. Having finished my internship, I went through a time where it seemed impossible for me to find a vacancy in the tech industry. I began to feel discouraged and in a rut. But then I was invited to participate in the opening event of the programme's third edition, where I was awarded the prize for the best Undergraduate Final Project, a project I'd finished during my internship in the programme's first edition.

It was from that moment that I began to get support to improve my CV and submit my candidacy to companies in the sector. It was only a little later that *Sopra Steria* got in touch and I began my career as a junior programmer. Becoming a programme success story was a reason to feel grateful and be proud of myself. I feel that I owe a debt of gratitude to the people and companies who've trusted me, and I try to share my experiences with other students, particularly with those who go through moments of self-doubt. My main motivation was to be able to dedicate myself professionally to what I am passionate about, without having to abandon my family and friends.



Looking back, what aspects of the programme and the internship do you think were determining factors for you to become hired in the end?

The fact that I've worked in a real port industry setting was key. The experience I gained from TTI-A helped me understand both how to employ tech like API REST, and hubs like APBA's PCIS, as well as operational processes at the port. To have been able to rely on that inter-disciplinary working knowledge strengthened my professional profile, and gave me a cutting-edge value as a candidate.

Part of the initiative includes APBA trying to acknowledge and reward participating students' efforts with the Algeciras Tech Talent Awards for best Undergraduate Final Projects. From your point of view, as a participant and winner of the competition's second edition, what role do these awards play towards motivating students?

The Awards do have a positive impact on students' motivation. Beyond the natural competitive feature of any academic environment, official recognition validates the effort and dedication invested in your project. In my case, knowing that the winning project was going to be used for port business makes me even more satisfied. It was an experience that proves how the

work you do in your formative years can have a real impact on the professional world.

To round off the interview – and from your experience – what would you say to other students who are wondering if they should take part or not in future editions of the Algeciras Port Digital Academy programme and intern at one of the Port Community's companies?

I would say that, if they feel a real vocation for computing or for the tech industry, they shouldn't hesitate to take part. It's a unique chance to gain real-world experience and get to understand how technology can be applied in a strategic environment like ports. As far as my – and my classmates' – experience goes, we've all learned valuable knowledge that we can continue to use in our careers, whether inside or outside the region.

Finally, how has your opinion of the port industry changed after working in the sector, and what professional goals have you set now that you make up a part of it?

Working in the industry has helped me understand the size of its real impact on the lives of thousands of people. Recently, during the storm season, I took part – together with my team – in upgrading an application that controlled access gates and helped streamline transit times at the port. It was at that moment that I realised how even the smallest of adjustments to an application can have a significant effect on operations and the day-to-day life of the community. This experience strengthened my commitment to developing tech tools that are both efficient and responsible. As far as the future goes, my goal is to keep growing professionally, and gain an in-depth knowledge both in my technical understanding and my understanding of the business, so that I can provide more and more value to the port industry.



Cristina Muñoz Salas,
Teacher, specialising in
Computer Science and
Technology, at Saladillo High
School.

Next – to get to know more about the classroom side of the initiative, we are going to talk to Cristina Muñoz – a teacher at Saladillo High School – a centre that has been a partner for several editions of our programme.

Your school has partnered the Algeciras Port Digital Academy for several editions now: how did the initial partnership with the Port Authority arise, and what made you decide that you should include yourselves in the programme?

The partnership with APBA came out of the Port Authority's 2021-2025 Innovation Strategy, which defined talent management as one of its cornerstones towards transforming its business model. During the 2022-2023 school year, *Saladillo High School* joined the initiative by partnering a pilot scheme that gave us the chance of linking up education directly to the powerful business fabric of the port; in turn, this gave our students the chance to train themselves for the real challenges of port automation and digitalisation.

What did it mean for the school to partner the Algeciras Port Digital Academy, and how does the initiative fit into the educational strategy of higher vocational software development training?

For *Saladillo High School*, becoming a part of the Algeciras Port Digital Academy positioned us at the forefront of dual, collaborative training. The scheme helped us contextualise classroom learning in a tech environment of the highest level in the world, offering us partnerships with companies that we would never have had easy access to. This allows us to achieve a primary objective: meeting the goal of creating and holding on to local digital talent, and enabling our students to perceive a professional future in the Campo de Gibraltar region.

The programme seeks to bring port business and logistics closer to students in the digital field. From your experience as a teacher, what benefits do you see in exposing students to real-life environments such as the Port of Algeciras ecosystem?

Exposing the students to real-life environments is transformative in itself. By visiting APBA headquarters, terminals like *TTI Algeciras* and *APM Terminals* – and even by short sea cruises around the port – students begin to understand the complexities of logistics and gain first-hand contact with professionals who can give them a practical outlook, an updated view of tech tools and operational processes, all of which goes to awaken a sense of vocation, and helps them along the path to employment.

Every year, more and more tech companies are getting involved – from huge multinationals to local specialist companies. How would you assess the implication of the business fabric and its readiness to open its doors to students?

It's both positive and fundamental. We've seen how the vacancies at partner companies increase every year. The business fabric's willingness shows just how much the industry acknowledges the value of APDA's bond with the

region's schools as a nexus between talent and business. The implication of these companies is an investment in the future competitiveness of the port.

Representatives from the Port Authority and companies from the port ecosystem have stressed that "...it is very difficult to find qualified personnel". How are schools responding to the challenge of training up talent that can cover this growing demand for tech profiles?

Programmes like the one APBA sponsors allows us to understand the needs of the sector, and how we can adapt the technologies we teach by educational empowerment: and this helps us adjust to the features of our productive environment.

The Port Authority has held several editions of the Algeciras Tech Talent Awards, rewarding the best Undergraduate Final Projects. What is the importance for students to have their projects acknowledged and be able to show off their work to the public at large?

It's an enormous incentive that symbolises the commitment to their academic excellence. For students of our school – like Lucia Martinez, who was awarded a prize this year; and Angel Gomez, who was awarded an honorary mention – receiving

this type of acknowledgement gives professional validation to their efforts, and also increases their visibility to potential employers.

Have you noticed a change in attitudes, motivation or professional expectations in students, after taking part in the initiative, and listening to the real needs of companies like Maersk, TTI-A and Balearia from the horse's mouth?

Of course I have. Students go from seeing the port as something distant to suddenly recognising it as a fantastic option for going on to have successful careers there. Listening to professionals in top-level companies gives them a reality check that only heightens their motivation; and seeing classmates get taken on as staff in the sector really changes their expectations.

From your point of view, what skills – both technical and soft skills – do you think are essential for a student to be able to take the maximum advantage of an internship at a company linked to the port?

From a technical point of view, it's important to get to know about multi-hub programming, data analysis, management systems and cybersecurity, among many other matters. However, so-called soft skills are just as important: I could highlight the ability to adapt to different scenarios, teamwork, an open-minded attitude towards innovation, and continuous professional retraining.

To round off the interview, what are the main lessons you've learned, and what's the greatest satisfaction you've taken from your participation as a teacher in the programme?

I'm happy to see that the partnership between education and business works, and that we can actually gauge the results we get back: for example, in the number of participating students that go on to get hired from the initiative. Watching the personal and professional growth of our students – and their integration into the business world – is one of the most gratifying rewards I have.

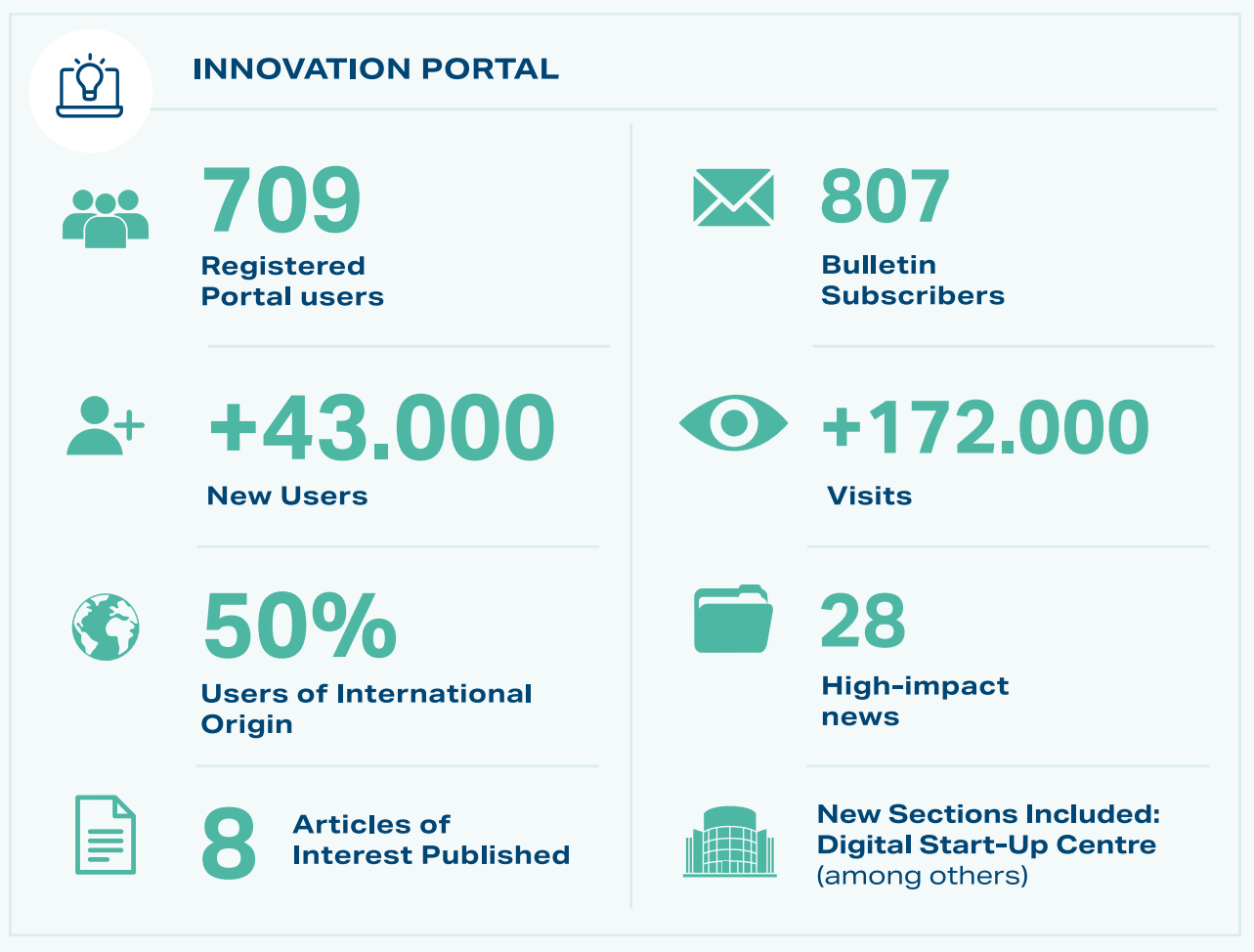
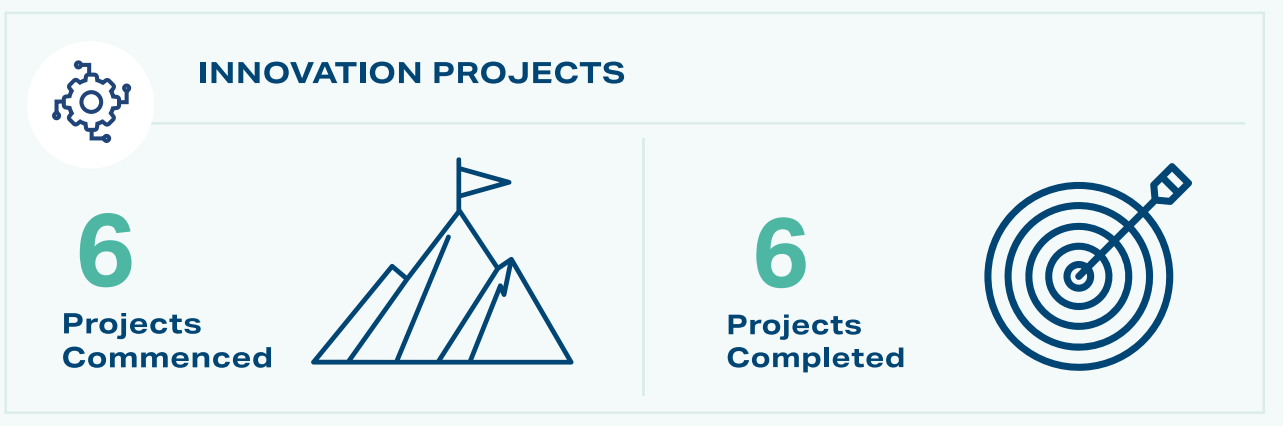
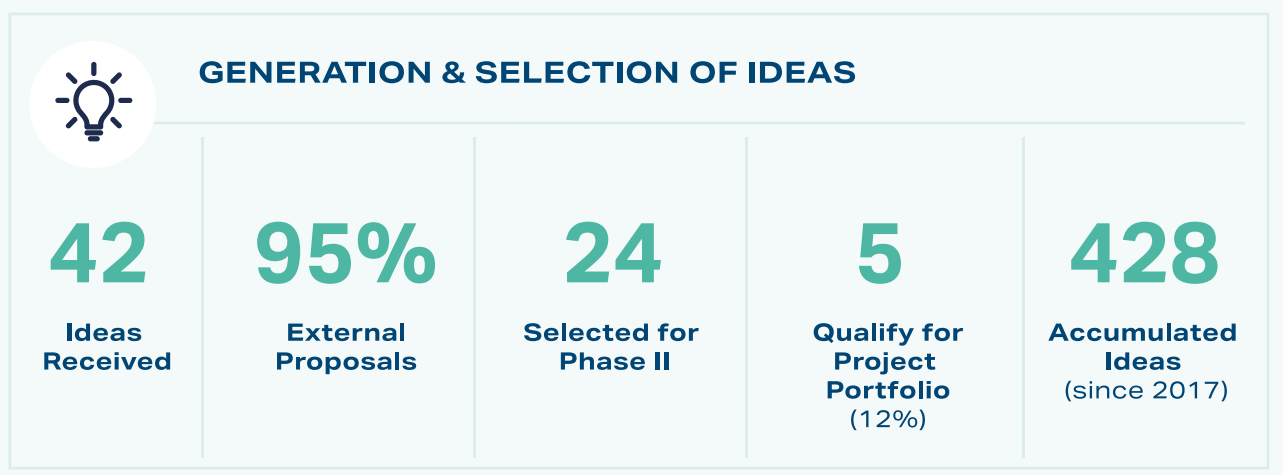




04

Figures & Milestones





05

Value-creating innovation



Sustainability & Innovation: A Strategic Duality for the Port of the Future.

■ Just to begin with, we'd like to know a bit more about the professional behind the job. Could you give us a quick summary of your career and how you became a benchmark figure in sustainable development at the Port Authority?

Throughout my career, I've had the chance of working in several areas of engineering and public-sector management, which has allowed me to gain a wide outlook on land and its infrastructure from an operational point of view. After beginning my career in Madrid in the Technical Management of a construction company, then later with a management position at Cadiz City Hall, I took a position in the General Infrastructure Sub-Directorate at the Port of Algeciras Bay Authority in 2004. Two years later, I was promoted as Head of the newly-created ASD (Area for Sustainable Development), where I manage the Urban-Planning, Sustainability and Conservation Departments from, as well as coordinating business at the Port of Tarifa since 2012. In 2004, sustainability was seen almost exclusively as an environmental matter and the burden of one department. From the very first day, I've worked towards changing that opinion: by integrating environmental, social and economic criteria into all of APBA's lines of work to encourage an inter-disciplinary approach in our organisation that combines technical rigour with a strategic outlook for the port's surroundings.

My trajectory has always featured a firm commitment towards energy transition and a more sustainable management model for our port – an ideal that came to fruition with the

Juan Antonio Patrón Sandoval is a Civil Engineer (Roads, Canals & Ports) from the Polytechnic University of Madrid.

Since 2007, he has been Head of Sustainable Development of the **Port of Algeciras Bay's (APBA)** Area for Sustainable Development, where he has headed up strategies such as Sustainability, Urban-Planning & Conservation; as well as being Co-Ordinator of the **Port of Tarifa** since 2012.

A Member of APBA's Management Committee, he has been the main sponsor of the port's Green Strategy (2021) and the port's Heritage Conservation & Enhancement Plan. His vision encapsulates a firm commitment to innovation, to position the **Port of Algeciras** as a port-logistics industry benchmark in energy transition and sustainable development.

creation of APBA's *Green Strategy* in 2021 – and which has since been acknowledged as a pioneering plan inside the Spanish Ports Network: a plan that was conceived as a global framework for decarbonisation, responsible governance, environmental protection and innovation. The Strategy has helped us consolidate and shed light on numerous initiatives that we have undertaken over the years, pivoting around an ambitious road map and aligned with sustainable development goals; and today, it's backed up by the support of dozens of our Port Community companies who've underwritten its twelve commitment goals. My becoming a reference-point for sustainability within the organisation has been – to a great extent – a natural outcome of the process: constant teamwork, geared towards creating value for our port, its surroundings and its people.

■ **In your experience, what role does innovation plan in meeting sustainable development goals in the port industry – in particular, regards the goals set down by APBA's Green strategy?**

Innovation plays such a decisive role, because it helps us change the way we understand, manage and preserve both the infrastructure and its surroundings. Thanks to new monitoring tools, digital hubs, forecasting systems, clean energy, and tools that reduce the environment's impact, ports can make more informed decisions, pre-empt risks, optimise resources and progress towards a more efficient business model that shows greater respect for the environment. Innovation really does act as an enabling agent to convert sustainability commitments into specific, quantitative actions that have a real impact on port ecosystems.

Innovation is the cornerstone towards achieving our **Green Strategy goals**: projects like our digital hub that monitors air quality, the smart tracking of energy consumption, or developing tools to electrify our quays all show that adopting new solutions is transforming the environmental management of our port. In the same vein, the implementation of tools that can aid grey infrastructure to become green infrastructure – together with projects



and applications to help protect sea life in our surroundings – only confirm that technology is playing a decisive role in transitioning towards a more sustainable, resilient, respectful business model.

All in all, progress shows that innovation not only contributes towards meeting our Green Strategy goals – it actually accelerates the process, and has become a key enabler for the end goal of achieving a more efficient, responsible management of our port.

■ **In your day-to-day life, what is APBA's Sustainable Development Department relationship with the entrepreneurial ecosystem and tech development? What cutting-edge value does innovation give your business?**

In its day-to-day life, the ASD has a very close relationship with the enterprise and tech development ecosystems via two complementary paths: on the one hand, directly with the TDA (Technological Development Area) in projects that are not ascribed to the Sustainable Development Department; and on the other, with the Green Strategy Promotions Bureau and ASD's Innovation Team in projects that are linked closely to that Strategy.

This dual connection guarantees fluid communications, a joint assessment of opportunities and constant teamwork for on-going projects. In this context, innovation provides a decisive edge, as it allows us to involve state-of-the-art tools, improve data-based management, pre-empt requirements and design more efficient, sustainable responses in order to strengthen ASD's capacity to drive forward real transformation in the port's environmental and heritage matters.

■ **One of the best examples of innovation driven by ADS is the non-intrusive monitoring project to determine the structural health of one of the port's most emblematic heritage monuments at the Port of Tarifa: the Sacred Heart of Jesus**

statue. Could you explain what the challenge is about?

The challenge consisted of protecting a heritage monument located at an especially exposed point at the Port of Tarifa, without us being able to undertake any physical intervention work on it. The monument in question is a granite statue of the **Sacred Heart of Jesus**, erected in 1944 on the breakwater head, placed atop an eleven-metre plinth. Since construction, the monument has been subject to the tremendous impact of wind, waves, coastal erosion and salinity – all factors that pose a hazard for its structural integrity, as well as posing grave concerns about its stability. Any eventual failure could make the sculpture tip or fall and – with it – the loss of a Port Authority heritage item.

Due to its vulnerability, we needed a system that could provide APBA with quality data to improve the monument's preventive maintenance. The system should be able to detect any shifts, subsidence, vibrations or deformations with extreme accuracy, but without resorting to drilling, tie work or any other type of invasive action on the structure.

■ **What does the implemented tool entail? How does it create value for the conservation and monitoring of the monument?**

When we set about what we really needed in the original **Innovation Challenge**, we implemented a non-intrusive digital monitoring system, developed by the **Deep Insight** spin-off, that combines IoT nano-sensors, high-frequency accelerometers, and GPS-PPK technology. The array records deformations, oscillations and vibrations in the plinth and sculpture assembly, without having to resort to install ties or do any drilling work to the structure. Being completely non-invasive, the solution respects the integrity of the monument: a crucial feature of heritage conservation.

The data recorded at the structure can then be integrated with real-time met-ocean data to undertake a cause-and-effect analysis of the monument's behaviour in the face of environmental conditions in its port setting. Apart from that, the

system includes a digital dashboard, an API to integrate data into other corporate systems we have, and an automatic alert service: all of which helps us track the structure continuously and give us an early warning of any anomaly as detected.

Continuous monitoring is fundamental for the conservation of the monument: it offers unbiased, high-precision data that allows us to identify any tentative shift or unusual behaviour before it becomes a structural problem; it also gives us time to plan any preventive or corrective maintenance that would avoid a sudden failure. The data, correlated with the physical environment, will also help us understand how the structure responds to phenomena like groundswell, wind and changes in the weather, all of which will go towards the decisions we take as to how and when we intervene. The digital hub and automatic alert systems will allow APBA to make the best use of its resources, prioritise action and improve planning in the mid- and long-term.

■ Why did you opt for a tech-based tool to overcome the challenge? In your point of view, what potential for scalability could this type of tool have; and what other applications could they have in the field of port conservation?

We chose a tech tool because it helps us with the continuous, accurate, non-intrusive monitoring of a heritage asset where physical intervention work is unacceptable. By employing a system with IoT nano-sensors, cutting-edge accelerometers and GPS-PPK technology, we can get a level of detail that would be impossible by traditional inspection: it records high-frequency deformations, vibrations and oscillations without altering the structure itself. Such an approach gives us the chance to analyse how the plinth and sculpture ensemble responds to met-ocean phenomena like groundswell, wave surge, turbulence and wind; this data will then be integrated into a digital hub that provides real-time visualisation and alerts.

In the same way, technology helps build a cause-and-effect model between environmental



conditions and the structural behaviour of the monument, it also offers up objective criteria for planning preventive maintenance and pre-empting risks – something very relevant for structures exposed to coastal erosion, salinity and changes in weather.

The characteristics of this tool make it highly scalable within a port setting: from heritage conservation, to the smart management of infrastructure, and even to the adaptation of port systems to weather conditions. This is how lots of ports safeguard their lighthouses, ancient breakwaters and other historic buildings that are similarly exposed to the onslaught of weather and sea. A non-invasive system based on IoT sensors and high-precision positioning may easily be reproduced in these types of structures without compromising their integrity. Docks, piles, piers and other superstructure submitted to the dynamic forces of currents, groundswell and the passing of ships could also benefit from this technology to detect subsidence, record unusual vibrations, anticipate structural fatigue, and cross-check data with oceanographic variables, so that the cause-and-effect model that has been employed at the monument in Tarifa would be equally useful for more complex systems.

Besides, the availability of a public API with real-time structural data opens the door to digital twinning, asset management systems and risk-forecasting hubs that are already being developed at a number of ports. This should progress towards

the automation of maintenance decisions, and AI-based simulation and forecasting models.

Finally, the capacity for correlating the structural response to extreme groundswell, erosion and changes in wind dynamics is especially valuable for ports that are looking for climate-change adaptation and resilience strategies. This tool could help identify deterioration trends that are linked to more intense storms or a higher frequency of extreme weather.

■ What were the steps taken on the path to identifying and defining the requirements? Did you assess other tech alternatives or proposals? Tell us what the process was like, from identifying the opportunity to implementing the tool.

The first step was for our **Sustainable Development** Area to identify the risk, and the requirements needed for a tool to monitor an APBA Heritage Conservation & Enhancement Plan monument.

The initial diagnosis gave us two main causes for worry: the physical integrity of the plinth that

supports it; and the lack of a reliable, non-invasive system that could anticipate risks before they became obvious.

This is where APBA's Technological Development Area and Innovation Team came into play – to define the requirements that such a tool would need, and thus give us a solution to the problem: so, the Innovation Challenge was launched. Several ideas and technological tools that provided unbiased, continuous, high-precision data were submitted, all of which had the potential to improve preventive maintenance without physically interfering with the monument.

Among the proposals, we discarded the ones based on satellite imagery, which – even if they offered a non-invasive, global vision – didn't allow us to capture a shift with an accuracy down to the millimetre. They also relied on atmospheric conditions, satellite orbit frequency, and couldn't record either structural vibrations or the structure's dynamic response to them. Neither did we choose an idea based on a port-located camera monitoring system – even though, as an alternative, it would have provided higher local resolution – however, it





Innovation Team, we’ve made great strides towards its systemisation and in the inter-disciplinary teamwork among different areas: two key factors if applied innovation is going to generate tangible results that align with the needs of our port.

In organisations where innovation is integrated – as in our case – projects aren’t driven just by technological teams, they’re driven by the person who is in touch with operational challenges, the layout of the environment, the management of heritage and all the associated risks. This ensures that tech tools respond to real problems, not just to trends or proposals that have nothing to do with our day-to-day work.

■ **What are main lessons that your organisation has learned from this project?**

Beyond the realms of learning about the scope and limitations of several non-invasive monitoring technologies, the main lessons we’ve learned are rooted in the importance of detecting the requirements needed by the actual field of operations, and in not rejecting an innovative approach off-hand, because of the added value it brings to inter-disciplinary collaboration between different teams. The combination of technical, operational and environmental knowledge from different areas has allowed us – in our case – to ascertain problems with greater accuracy and go on to choose the right solution. The path we’ve taken in the case of the Port of Tarifa monument proves that our organisation already has a structured methodology that can tackle complex technological challenges, which in turn reduces uncertainty, streamlines decisions and increases our efficiency to develop cutting-edge solutions.

■ **What message would you like to send to other port organisations or government bodies who may be considering innovation as a solution to solve complex challenges in their business models?**

My message is clear: innovation in the port industry isn’t just technology *per se* – it’s active listening, internal teamwork, long-term method and vision. Combining these elements can help any government body advance sustainably and face the most complex business challenges with flying colours. Challenges change, of course, settings evolve, and needs alter. When innovation makes up a part of an organised culture, it becomes a natural tool used to adapt and anticipate, not just react.

■ **How do you see the future of port infrastructure and heritage conservation in the next ten to fifteen years? What challenges do you think will be key, and how could innovation and technology help tackle them?**

In the coming decade, port infrastructure and heritage conservation should progress towards a much more predictive, automated, connected model where technology, artificial intelligence and evolutionary digital twins can predict problems long before they actually appear, and where sustainability is a central axis for decision-making.

Broadly speaking, I can foresee three main transformations: continuous smart monitoring; data-based decision-making; and more accurate, less invasive intervention mechanisms. Nevertheless, the more widespread that sensors, digital twins and data hubs become, the more critical protection against cyber-attacks will prove.

Among the key challenges over the horizon, maybe the most relevant of them is how we’ll be able to tackle the impact of climate change at our ports: more frequent, more intense groundswell, the rise in sea levels, coastal erosion and other extreme phenomena will demand more resilient infrastructure that has to be monitored with greater resolution. On the side of heritage, the monuments will continue to be exposed to storms, salinity, wind and rain. Technology may allow us to act just in time and reduce the number of aggressive restorations.

didn’t have enough geometrical accuracy or image-visualisation reliability; and, again, it didn’t allow for dynamic structural data to be captured (high frequency vibration, resonance, micro-oscillation) from the monument itself.

That’s why we selected *DeepInsight’s* proposal. We agreed on a pilot scheme, carried out sensor calibration testing, checked the viability of IoT communications in a hostile ocean environment, and validated the positioning system’s accuracy with the geometry of the monument. These trials proved that the tool would give a response to the accuracy and reliability prerequisites.

Finally, we installed the devices discretely, without affecting the monument itself; then, we deployed the digital hub with its key indicators, set up the automatic alert system, and activated the API’s

integration so that the collected data could be included on other corporate APBA systems for analysis. The project became fully operative in September last year, and provided real-time data that gave APBA a highly-innovative, preventive surveillance tool during the last few storms that hit the coast in the autumn and winter of 2025.

■ **Bearing in mind that the project has been carried out together with APBA’s Technological Development Department, how would you judge innovation’s systemisation and inter-departmental collaboration within the organisation to encourage applied innovation?**

Innovation at APBA is already in the make-up of our organisation’s culture. The experience of this project shows that, since the creation of the **Technological development Area and its**

06

Innovation projects



Effective Implementation of Artificial Vision Technology to Optimise Port Traffic.

At the moment, ports do business under the constant pressure of having to optimise operations due to **intensifying global trade** and the growing **demands on swifter services**. Port facilities face **complex operational challenges** in handling internal traffic flows, where the efficient management of vehicle, cargo and passenger movement is critical if ports want to continue to have a competitive edge and quality of service. Congestion and **bottle-necks** at port terminal gates and on their internal roads provoke cascading inefficiencies that crop up all along the supply chain. When transit times are drawn out unnecessarily, **operational costs** go up, port users suffer longer delays, and the port's overall capacity gets limited by management factors rather than by its physical limitations.

By acknowledging the **gap** between **facility capacity** and **operational performance**, APBA

has identified the **improvement of traffic management** as a **strategic innovation point**. The aim is to implement cutting-edge technologies that are able to gather real-time data about vehicle flow and – from that data – generate operational intelligence that helps to redesign and update the transit process constantly within our port premises.

To such ends, APBA has partnered **Isarsoft**, a German start-up specialising in **artificial vision tools** based on video recognition technology and AI models. The partnership came about under the European open innovation project **AspBAN (Atlantic Smart Ports Blue Acceleration Network)**, which enabled internationally-ranked innovative tools – even from outside the port-logistics world – to be found, identified and employed to bolster our industry's competitiveness.



The project was carried out until September 2025 and, in the main, intended to **trial the artificial vision tool at the Port of Algeciras facility** by developing several use cases for **solving operational needs in the realm of land traffic and multimodal transportation**.



Results to date have been very successful and have allowed us to understand **how this type of tool can be implemented and scaled up in the specific Port of Algeciras environment** to optimise road traffic. By giving our current video management system an added layer of business intelligence based on state-of-the-art analytics and operational knowledge generation, the update is especially poignant when considering complex scenarios such as **Operation Cross the Straits**.

The use and application of these new tools can help APBA: **(1)** to redesign waiting, embarkment and parking areas on the grounds of real-time flow and occupancy analysis; **(2)** to aid real-time decision-taking in redirecting vehicles, and opening up or closing off points of access or specific zones, depending on the congestion detected and thereby reducing bottle-necks; **(3)** to provide deeper knowledge of road traffic behaviour – including behaviour patterns – at the Port of Algeciras facility; and **(4)** to improve users’ perception of the service we offer by sharing real-time information (vehicle numbers at points of access, waiting times, occupancy), thus relieving the stress on our port users.

Digital Platform to Observe, Correlate and Pre-Warn of Environmental and Operational Events.

According to UNCTAD’s (*UN Trade & Development*) *2024 Report on Maritime Transport*, maritime transport makes up about **80% of all trade worldwide**. It also provokes an environmental impact on ports and their surroundings, especially **air quality, and noise and water pollution**. If we factor in the growing pressure from international regulations – which demand ports progress towards more sustainable and resilient business models – this is the stage that **ESPO (the European Sea Ports Organisation)** has decided to recommend the introduction of environmental tracking on: to trigger immediate warnings and alarms in the face of atmospheric and acoustic pollution.

To pre-empt this scenario, APBA already laid down an exclusive innovation focal point in our **2021-2025 Innovation Strategy: Climate Sustainability & Neutrality**, with the strategic aim of decarbonising our port activities, and thus mitigate pollutant gases such as GHGs and aerosols. This should: help reduce climate change and improve air quality; increase the quality of the settings where port activities are carried out along its urban borders; and preserve biodiversity and the marine ecosystem, thereby guaranteeing the compatibility of port business, among other improvements.

One of the first steps towards the transition to decarbonisation is in **identifying port-related emissions** from all their various sources and in **understanding the impact of the port-logistics business**. As ports chase the goal of climate neutrality, it is essential that GHG emissions – together with the repercussions of the industry’s carbon footprint – be measured accurately. This is the only way that we can glean an in-depth insight that lends itself to setting out base lines,



identifying emission reduction opportunities, and monitoring the progress and success of the policies and projects that are carried out. APBA considers that having **innovative tech tools** on hand is key: solutions that can help us capture **real-time data** about the environmental condition of our port, and **help decision-making** in both **operational and environmental management**. Such a pro-active outlook pursues the reduction in the impact of port activities on our surroundings and on people’s health – be they port workers or the people at large in towns of the port’s sphere of influence.

The **PANORAMA (Advanced Hub for the Observation, Correlation & Early Warning of Environmental & Operational Events in the Port Environment)** project came about from APBA’s backing of the above strategic framework; an innovation scheme co-funded by the 2021-2027 *Andalusian ERDF (European Regional Development Fund) Operational Programme* and the Andalusian Government’s University, Research & Innovation Department; and carried out in partnership with



UCA (the University of Cadiz), and particularly with the **UCASE Software Engineering Research Group**.

Its main objective was to propose the research and development of a **pioneering digital hub** able to **observe and correlate massive amounts of environmental and operational data** from various sources, but especially from operating systems and networks of sensors deployed in our port’s premises. The hub’s main purpose is to carry out a **real-time early warning of situations of interest** that are detected, and facilitate decision-making for the port and its surroundings in order to reduce its impact on the environment, on towns surrounding the seaport’s location and on its socio-economic context as much as possible.

The hub is rooted in an **EDA (Event-Driven Architecture)** system that integrates massive data coming from IoT (Internet of Things) sensors, operating systems and digital hubs, all processed in real time by means of **CEP (Complex Event Processing) technology**.

In our case, the **PANORAMA** hub will be made up of three working layers: **(1) a data intake layer** to integrate the data coming from sensors and other systems deployed at the port; **(2) a processing layer** that applies correlation algorithms to detect critical events; and finally **(3) a reporting layer** that will include a digital twin and a state-of-the-art

dashboard to keep the port environment's avatar updated in terms of physical data, and to aid decision-making by exploiting both real and simulated data.

We hope to achieve the following, among other results: **(1)** to gain an **active, digital monitoring tool** to correlate environmental and operational events at our port; **(2)** to **detect situations of interest automatically**, by means of environmental and operational data analysis; **(3)** to **aid decision-making** in the field of **environmental management**, with real-time contextualised data; **(4)** to **reduce the impact of port and maritime activities** on our immediate environment; and **(5)** to **employ reliable data** in order to prioritise decarbonation schemes and **assess the efficiency** of our environmental policies and sustainability projects.



Continuous Monitoring of the Structural Integrity of the Sacred Heart Monument at the Port of Tarifa.

The **safety of the structures** that make up a port's **heritage** is a huge challenge we face when we try to **safeguard their cultural and architectural wealth**, especially when grappling with the passage of time, the growing threat of adverse weather conditions, and the effects of climate change. Ports – apart from being critical hubs for economic business – are also the **custodians of historic buildings** that have stood the test of time and bore witness to all the interactions of man and the sea.

In this light, the wear and tear of natural phenomena such as tides, coastal erosion, floods, and changes in weather patterns intensifies the deterioration of infrastructure, which is often exacerbated by factors like salinity and environmental pollution.

Protecting their structural well-being does not only imply their physical preservation, but also their integration into a sustainable setting that allows **port business to continue to be compatible with the preservation of its legacy**. This is essential for guaranteeing the resilience of the structures against the onslaught of the climate and their



standing as **symbols of cultural identity and historical evolution**.

Within APBA's Heritage Preservation & Enhancement Plan, one of the specific challenges that the Port of Tarifa faces is to try and find a solution for the **non-intrusive monitoring of the structural health** of one of the **most symbolic features of the port's historic treasures**: the **Sacred Heart of Jesus Monument**, a work of art by Jose Capuz that was erected in 1944 and stands atop its breakwater head.

We need to perform the above work to **analyse disruptive and innovative tools** that can provide us with a comprehensive response, including: **(1)** tracking, monitoring and evolution of any shift or subsidence to the sculpture; **(2)** providing threshold data of risk and vulnerability levels; and **(3)** analysing the progression of shift and subsidence indicators to obtain an in-depth analysis of the stability and structural health of the ensemble that will allow APBA to detect any such displacement that would prompt swift action, should any risk of structural failure be found that might affect the monument.



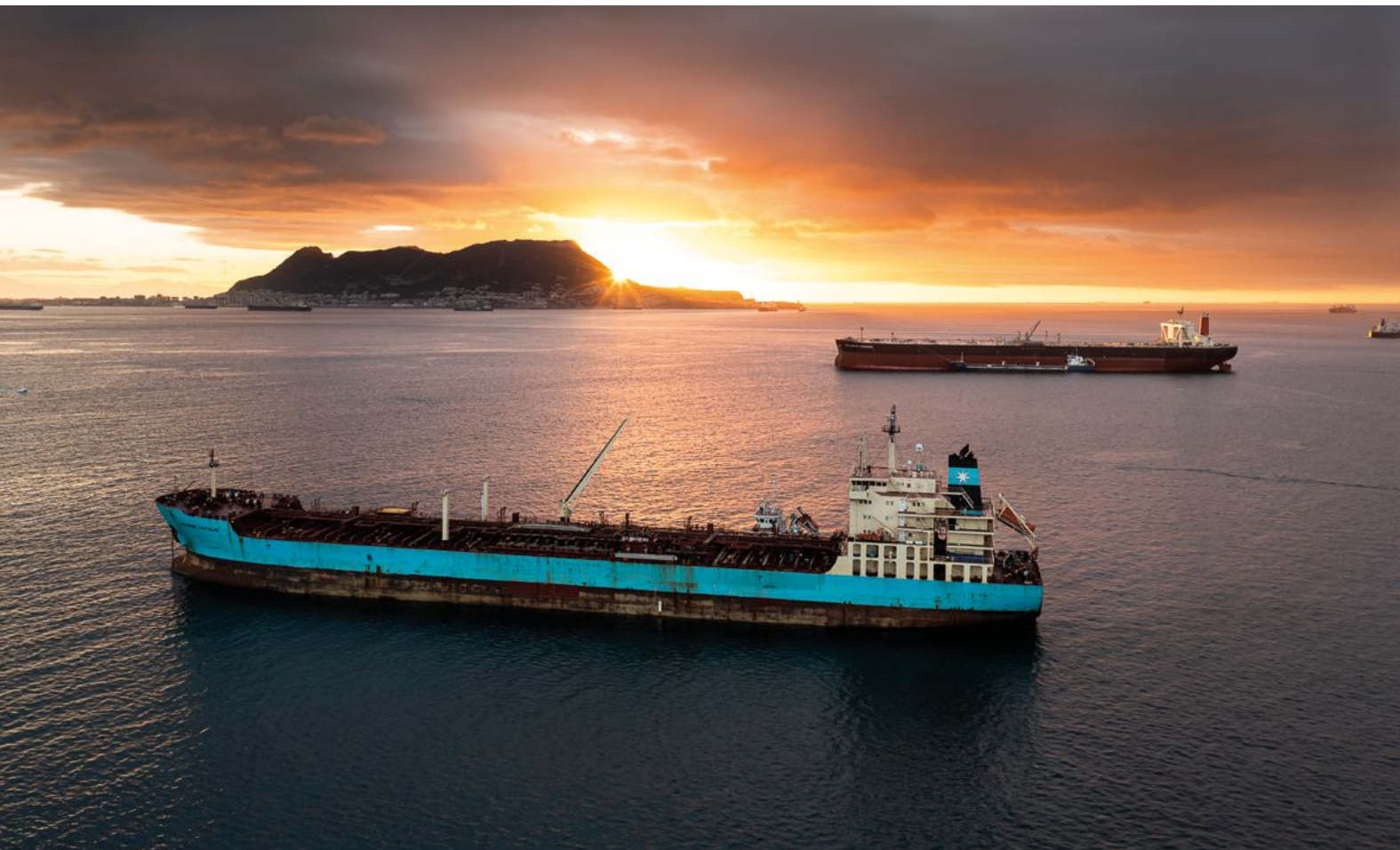
In this context, APBA has acquired an innovative tool designed by **Deep Insight**, a Polytechnic of Madrid Civil Engineering School spin-off, and

specialist in developing state-of-the-art monitoring systems in the port-maritime field offering integrated services to support risk management in multiple business sectors.

The scope of the project consists of deploying a **non-intrusive monitoring system** based on IoT (Internet of Things) nano-sensors that are able to **monitor any deformations, oscillations or vibrations** in the structure as produced by high frequency met-ocean variables, by employing cutting-edge and GPS-PPK (Global Positioning System - Post-Processed Kinematics) techniques, and accelerometers (for both static and dynamic environments).

The system is set to study the **relationship between the actions of the physical world and the behaviour of the structure**. All the results gleaned will be cross-referenced with met-ocean data as observed at the time (groundswell, wave surge, turbulence, wind, temperature), so that we can make a comprehensive analysis of cause and effect on the structure.





From Pilot Scheme to Production: AI-Based ETA Integration Forecasting in the Port's Digital Ecosystem.

Following the execution of a pilot scheme, the Port of Algeciras Bay Authority is currently working on the production deployment of the AI tool designed to provide cutting-edge forecasting for ship arrivals. The tool – designed by *Awake.AI* – has already demonstrated its potential to improve the forecast reliability of ETAs (Estimated Time of Arrivals), and has added significant value to our port's operational planning.

During the new phase, the focus has been on the stable integration of the ETA-forecasting API (Application Programming Interface) once positioned on the PCIS (Corporate Hub for System Integration), in order to include this data into APBA's digital ecosystem. Integrating the tool will allow us to exploit ship arrival predictions

systematically – including data about transit times, rates of speed and sailing conditions – and make them available for existing business operating systems, control panels and smart tools.

The availability of these forecasting tools in production should provide for a better synchronisation of both land and sea operations, a dynamic prioritisation of port calls, and much more efficient planning of our port's resources. Moreover, it will allow us to continue assessing the accuracy of **AI-based models by analysing the possible time-lapses between ETAs and ATAs** (Actual Time of Arrivals). This lays even stronger foundations for constant improvement and consolidates the use of predictive analysis as a keystone in APBA's Smart Port Model.



07

Initiatives



APBA Consolidates the "Algeciras Port Digital Academy" Programme in its Third Year of Partnership with Vocational Training Centres.

In January, APBA held an event to launch the third edition of its initiative geared towards schools that offer Vocational Training courses. This year's campaign is aimed at building on prior alliances and expanding the number companies offering students practical work experience to complement their theoretical training, and to showcase the success stories and attractions that such schemes can offer in the Campo de Gibraltar region.

The latest campaign began at the start of the 2024-2025 school year, previous campaigns having been promoted and coordinated by APBA's Technological Development Department since 2022, with the main objective of **bringing the port-logistics business closer to young digital talent and thus help their employability on the job market**, and also to aid the expansion of the technology and innovation productive fabric around the Port of Algeciras. It must be noted that this line of activity is part of an ambitious programme to attract, create and hold on to digital talent in the Campo de Gibraltar port-logistics ecosystem, known as the **Algeciras Port Digital Academy**.



The opening event was held at the Millan Picazo Auditorium and led by **Juan Antonio Herrera** – APBA's head of Innovation. It brought together





over one hundred students, teachers and partner company representatives. At the encounter, the education centres presented the training programme that they were offering in the fields of Innovation, Technology and Digital Transformation, whilst the participating partner companies detailed their projects and job opportunities on offer to students.

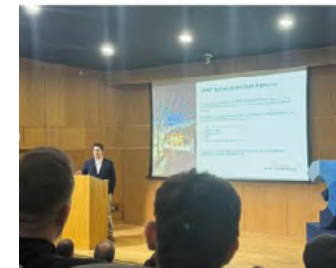
Mr. Gerardo Landaluze, – APBA Chairman – opened the event with a welcoming speech that celebrated the significance of this public-private partnership scheme, which – in his own words – **“...cements the fundamental foundations for the Port of Algeciras Bay’s present and future competitiveness.”** He went on to stress the importance of continuing to commit to a joint vision of teamwork that allows valuable young talent to be employed at our Port Community’s companies and organisations in such strategic fields as digitalisation and innovation.

Following our Chairman, **Jesus Medina** – APBA’s Head of Technological Development – praised the efforts made by each one of the organisations involved in the programme, and the tangible benefits of the scheme that have seen the number of participants rise once again, due to the **tremendous added value that linking up talent with the real needs of the port-logistics industry creates.** On a different matter, Medina

took advantage of the opportunity to go over the remaining initiatives that come under the Algeciras Port Digital Academy remit: many other training courses, like the *Expert in Digital Transformation Applied to Port Logistics Course*, undertaken in partnership with the University of Cadiz; the work done by the Port of Algeciras as a 5G Training Centre for the province of Cadiz, hand-in-hand with Vodafone and the Andalusian Government; the future digital ecosystem project – an educational programme that will eventually lead to the establishment of the Port of Algeciras Bay’s *Centre for Digital Innovation*.

*The audience then had a chance to hear about the outcome of the Programme’s second edition, presented by **Paco Saucedo** – APBA’s Head of Information Systems, and the Programme’s Coordinator – who encouraged the students to take on this unique opportunity to get to know the Port of Algeciras Bay’s port-logistics business leadership in greater detail.*

The second half of the event began with a presentation of the courses offered by participating schools in the Programme. **David Rodriguez** and **Daniel Suero** – both *El Saladillo High School* students – presented the higher diploma *Development of Multi-Hub Applications* training course taught at their school; **Victor Tello** – a teacher at *Kursaal High School* – for his part,



presented the curriculum of the *Development of Web Applications* course, and the *Cybersecurity in IT Environments* specialist course offered by his school.

On the business side of the Programme, representatives from all the companies involved in the Programme’s second edition were present at the event: specifically, **Roberto Andrades** – Senior TOS Support at *APM Terminals Algeciras*; **Alejandro Sanchez** – Software Engineer at *Maersk Technology*; **Carlos Navas** – Automation & Development Engineer at *TTI-A*; **Cristina Galan** – Project Manager at *NextPort.AI*; **Juan Antonio Pavon** – Full-Stack Developer at *Prodevelop*; and **Carlos Garcia** – Head of *Sopra Steria’s* Southern Agency. The third edition of the Programme saw *Balearia*, *Babel*, *Getronics* and *OnNet Center* be added to our list of partner companies. They were represented by: **Juan Javier Corrales** – *Balearia’s* Head of IT; **Fran Merchan** – Business Manager at *Babel*; **Alfonso Lopez** – PMO Practice Leader at *Getronics*; and **Francisco Clemente** – CEO of *OnNet Center*.

All of them described the innovative outlook of their companies’, their commitment to digital education, and were found to be excited and motivated about partnering the dynamisation of talent in the region’s port-logistics ecosystem.

Pioneering Product-Leader Skills Training Scheme Boosts Digital Development Dynamics.

In our commitment to modernising and making our organisation more efficient, APBA brought the first edition of a pioneering programme to train our employees as Agile Methodology Product Owners to a close. The scheme made up part of the **Algeciras Port Digital Academy** educational curriculum and focused on the new IT governance model currently being undertaken by APBA: a milestone in the digital transformation of our port, encouraging the creation of **multi-disciplinary – or “fusion” – teams** that combine business profiles, technology and operations to lead development projects with greater agility and with a more collaborative approach.

The training course was carried out over various classes and was geared towards employees from several areas and departments in our General Business Sub-Directorate, in order to train them up in key skills that will eventually enable them to assume the role as Product Owner. This role is essential in Agile Frameworks such as *Scrum*, due



to the fact that the figure acts as a nexus between the business needs and the development team: prioritising tasks, defining goals, and ensuring that the products generate real value for the business.

The course tackled fundamental aspects of the software development environment managed under Agile Methodologies such as work-flow, back-log management and sprint-planning; as well as dealing with the specific organisational tools that APBA has to develop them.

Jesus Medina – Head of the Port Authority's Technological Development Department – underlined the fact that:

"...This programme is a bold step along the path towards strengthening agile, self-dependent fusion teams within our organisation. It allows us to lend a swifter response to port-logistics challenges by encouraging a culture of continuous innovation and ensuring value creation."

From our Port Authority, we have to give a special thanks to both the participants' and their charges' implication in the programme, and to the efforts of the programme's organising team. This is another example of how the Port of Algeciras is strengthening its position as a benchmark for innovation, committing to agile, efficient management that is rooted in its people.

SaferSEA – a Tech Solution-Based Maritime Safety and Ecological Transition Project.

Maritime transportation is a cornerstone of the world's economy, but also poses significant challenges in terms of **safety, sustainability and environmental protection**, especially in a strategic area like the Atlantic Ocean. It is in this context that APBA gave an exclusive *Sustainability and Climate Neutrality* approach to its **2021-2025 Innovation Strategy**, an approach that aims to decarbonise our business and preserve our marine ecosystem. And this is what the European **SaferSEA** (Safer, Smarter & Eco-Friendlier Atlantic Area) Project was born into, an initiative that has a **€1.51-million budget** co-funded by the ERDF (European Regional Development Fund) through the **Interreg Atlantic Area Programme**.

SaferSEA is headed up by **Technopole Brest-Iroise** and is backed by a consortium made up of French, Spanish, Portuguese and Irish companies, such as the **Bay of Cadiz BIC** (European Business & Innovation Centre), **CEDRE** (Centre of Documentation, Research & Experimentation), **UPTEC** (the Polytechnic University of Porto), **Sines Tecnopolo** and **AxisBIC**. The project aspires to identify at least **twenty innovation solutions** and support the development of **four pilot schemes** at port facilities in the Atlantic area.



APBA therefore welcomed a **technical visit** aimed at the consortium partners in the context of this project last September. The conference began with an opening speech given by **Salvador Leon** – APBA's Head of Digital Transformation & Innovation Department – who highlighted the Port of Algeciras Bay's role as **South Europe's international maritime gateway** and put the project into the context of **APBA's Innovation Strategy**, especially regards its approach on **sustainability and climate neutrality**.

Following that, **Nacho Serra** – a member of APBA's Innovation Technical Bureau – gave a presentation on several innovation projects that our port has carried out in matters of **maritime safety and emissions monitoring**. After that, **Technopole Brest-Iroise** – a leading **SaferSEA** partner company – explained the current state of the project and its forthcoming milestones, in the person of its Project Manager, **Morgan Le Meur**.

One of the conference's key points was the expansion in innovation challenges that APBA raised, as designed by our Sustainable Development and Technological Development Departments to attract state-of-the-art tools, specifically: **(1) the decarbonisation of port business** and mitigation of gas emissions to combat climate change and improve air quality; **(2) the early detection of hydrocarbon and sewage spills**; and **(3) the development of an innovative spill clean-up system**.

The first of the three challenges aims to provide tools that can compile data about GHG (greenhouse gas) emissions: how they spread into the surrounding areas and how they interact with other by-products such as noise, odours and residue. Such a tool should be able to come up with the **detection of emission-source locations, identify potential hazards and offer up useful data for us to set down mitigation measures based on evidence**.

The second challenge approaches the need to implement an automatic spill detection system. The proposal should contemplate the **continuous monitoring of our port's water quality**, be able to provide an early warning of pollution occurrences, and thereby improve our operational response capabilities.

The third of the challenges tackles improvements in the procedures to remove and treat pollutants in cases of spills. It requires a tool that can intervene with greater efficiency to **reduce the amount of hazardous waste generated** and minimise its impact on the coast and ocean environments.

The conference included a guided tour of our facilities to get to know the multi-modal activities at the Port of Algeciras hub better, and concluded at our **Port of Algeciras Digital Start-Up Centr**, where APBA's **Green Strategy** was presented, together with the service offer included in the **Mission Andalusia** initiative.





The Port of Algeciras Reaffirms its Position as a 5G Technology Training Benchmark.

Under our **Innovation Strategy**, the **Port of Algeciras Bay Authority** strengthened its position in 2025 as one of the strategic headquarters for the **5G New Technology Training** programme, driven jointly by the Andalusian Government's Employment, Self-Employment & Business Department, together with *Vodafone and Integra Conocimiento & Innovacion*. The programme makes up an integral part of **Algeciras Port Digital Academy**, whose main objective is to nurture local digital talent and create a tech reserve team that is ready to face the challenges of port logistics.

Between 2024 and 2025, we have brought **five training course cycles** to a close at our centre in Algeciras. The schedule for this period included the conclusion of two training cycles of **AI & Big Data Programming Applied to 5G Environments**, two cycles of **Programming IoT & Smart City Tools Applied to 5G Environments** and one cycle of **Programming Virtual & Augmented Reality Tools Applied to 5G Environments**.

To date, this has awakened the interest of a huge number of people – almost a thousand – of whom **more than 150 have been able to enrol and complete one of the courses**. Satisfaction surveys

have shown that the **courses have been very well regarded by students**, with special emphasis on their bond with lecturers, timetable flexibility and the characteristics of the centre itself.

One of the stand-out features of the training courses was their **accessibility**. Course requirements are minimal – students need to have a **high school or a mid-level training course pass certificate**. No previous knowledge of AI, Big Data or VR is required, which in turn opens up access to people with very differing backgrounds who wish to reconvert professionally or seek a change in their career.

Although the courses are positively discriminated towards **the unemployed** –70% of course placements are reserved preferentially– **active workers** who are interested in updating their skill set and improve their employability are also able to enrol. The concept of flexibility acknowledges that continuous training is one of the keys to opening up a world of work in constant evolution.

Each course lasts **150 hours** distributed strategically to enable learning: **30 hours of face-to-face classes and 120 hours on-line**. This combination helps students acquire the theoretical fundamentals such as the practical skills needed to develop connected devices, and then apply them to smart city environments with 5G technology.

Face-to-face classes have been held in a classroom at the Port of Algeciras **during the afternoon**, with three different rotations available that adapt to the personal circumstances and work timetables of the participants. Flexible scheduling has enabled not only locals from Algeciras, but also people from all the Campo de Gibraltar region to attend classes.

The success of the programme has led to its continuation, with plans for **at least three new courses** to be taught in **Algeciras** during **2026 and 2027**.



08

Innovation awards





2ª edición
Premios de Innovación
Algeciras TechTalent

Dirigido a los mejores Trabajos de Fin de Grado (TFG) de los alumnos del:

Grado Superior en Desarrollo de Aplicaciones Multiplataforma (IES Saladillo)

Grado Superior en Desarrollo de Aplicaciones Web (IES Kursaal)

Plazo de participación Hasta junio de 2024

Bases de la convocatoria





« ¡Forma parte de la revolución digital de la logística portuaria! »



APBA Rewards the Best Undergraduate Final Projects at the II TechTalent Prize-Giving Ceremony.

APBA awarded the prizes at the **II Algeciras TechTalent Innovation Awards Ceremony**, an event held at the Millan Picazo Auditorium in January.

The scope of application was directed towards Higher Diploma students in the field of Digital Transformation at Vocational Training Centres in our region, with a view to **acknowledging the talent, dedication and innovation of their work**.

Within the framework of the **Algeciras Port Digital Academy's** framework, APBA formed a new alliance with students and teachers from two centres and courses: specifically, *El Saladillo High School* & Vocational Training Centre's Higher Diploma in Developing Multi-Hub Applications; and *Kursaal High School's* Higher Diploma in Developing Web Applications at the

second edition of the awards ceremony, which covered the 2023-2024 academic year. Several of the students from the above centres went on to gain **internships at top-level Port Community companies**, as well as receiving master classes from expert professionals and taking **organised field trips** to facilities in order to get to know working processes at first hand, and the job opportunities available in the industry.

So, the latest edition of the initiative organised by our Port Authority once again focused on rewarding the best projects created by students who had the chance of experiencing the internship scheme above.

The projects were assessed by a Jury made up of professionals from APBA's Technological Development Department, and teachers from both schools. The following specific **criteria** were analysed:

- Quality of work submitted (50% of the score) was assessed by: **(1)** Clarity, accuracy, structure and overall synthesis of the documents

presented; **(2)** Quality of the coding source of the application, as per the SonarQube static analysis tool, with defect quality profiles.

- Degree of direct or indirect applicability for any use case related to the port-logistics business (25% of the score).

- Degree of innovation of the proposal made by the student (25% of the score).

The Jury decided that the winners of the second edition would go to **Alejandro Aguilar** - from **Saladillo High School** - and **Jemuel Agsaway** - from **Kursaal High School**, for their projects **"Tasty Dash"** and **"Transit System Module"**, respectively. APBA's Chairman – Mr. **Gerardo Landaluce** – together with the Head of Technological Development – **Jesus Medina** – and the members of the innovation team who led the initiative – **Paco Saucedo** and **Juan Antonio Herrera** – were charged with announcing the winners and awarding the diplomas.





APBA Takes Part in the Impulso&Crece Conference at the NTC (Navantia Training Centre)

San Fernando's *Navantia Training Centre* (the NTC) housed the *Impulso&Crece* ("Drive & Grow", in English) under an initiative organised by *Innova IRV* (the **Ricardo Valle** Innovation Institute) Foundation and the Andalusian Government's Industry, Energy & Mining Department. The event brought together professionals and experts to tackle the challenges thrown up by digitalisation, artificial intelligence (AI) and cybersecurity in the naval and port-logistics sectors.

The inaugural act of the event witnessed the participation of **Inmaculada Olivero** – Government Delegate to Cadiz; **Alberto Cervantes** – Navantia's Corvette and Offshore Patrol Vessel Business Director, and **Javier Lopez** – Vice-Chairman of the Innova IRV Foundation's University Ecosystem.

On behalf of APBA, we were represented by Jesus Medina – Head of Technology Development Department – who took part in a series of presentations once the event was underway. Medina shared the successes in implementing AI at the Port of Algeciras: for instance, in the optimisation of ferry berth and waiting time management, which favours the orchestration of port processes at the maritime-land interface, the development a smart system for bunker operation decision-making that enable Just-in-Time port calls, or the swift detection of spills and slicks in the ocean environment.

He went on to highlight how the Port of Algeciras had implemented cutting-edge technology to reinforce cybersecurity and optimise cybersecurity operations. With smart tools such as *Darktrace* – an NDR (Network Detection & Response) hub based on AI – we can ensure an early warning of anomalies and give an automatic threat response. In addition, he raised the need for cybersecurity awareness, considering the palpable reality of cyber-attacks that the maritime-port industry also suffers.



The conference also included speeches by **Juan Jesus Carretero** – Navantia’s Naval Systems Centre for Excellence – who spoke about “AI and Cybersecurity in Navantia Products”; and **Manuel Martinez** – the Port of Huelva’s CTO – who discussed the challenges of digital transformation and the ways they are being tackled at his port.

The Port of Algeciras – a Great Example of Applying Innovation for Port Operation Optimisation at the MARLOG 14 Conference.

Our APBA Chairman, and also Deputy Chairman of the MEDPORTS Association – **Mr. Gerardo Landaluze** – took part in the international MARLOG 14 (Maritime Transport & Logistics) Conference held in the city of Alexandria (Egypt) under the slogan “Artificial Intelligence Implementations – Towards Shaping the Future of the Digital World”.

In his speech, Mr. Landaluze underlined the use of **innovation and digitalization** at the Port of Algeciras in order to optimize port operations. He went on to present real-life instances of how tech innovations and AI in particular – are transforming the Port of Algeciras in several areas: container traffic (by optimizing operations and stopover times with tools like *Port Collaborative Decision-Making* as applied to *Maersk’s Gemini Cooperation* project); the bunker-supplying sector; and HGV Ro-Ro traffic, all to improve efficiency and reduce waiting time – something that has been proven in our own *Strait Crossing Operation*.

Mr. Landaluze explained that the drive towards **innovation, digitalisation and AI itself is a lynchpin** in the Port of Algeciras and its Port Community’s strategy:

“At this time, artificial intelligence is revolutionising many sectors of today’s society and – unquestionably – maritime transport, logistics and ports. It allows us to analyse masses of data, forecast results and prescribe operations to gain in efficiency, security and sustainability. Good examples of that at the Port of Algeciras

can be seen in our practical application of a Digital Twin during Strait Crossing Operation; or, in container traffic, our collaborative decision-making platform, which has helped us qualify for the Gemini Cooperation. The new project undertaken by Maersk and Hapag-Lloyd.”

MARLOG 14 – an encounter organised by the Arab Academy for Science, Technology & Maritime Transport – brought together renowned international experts in Egypt to discuss how AI is stirring up the maritime transportation and logistics industry.



APBA Presents the Impact of AI Application within the Nexomar Project Framework at the Port of Algeciras.

APBA presented its progress in the fields of innovation and AI at the *Future of Logistics: AI, Automation & Sustainability* congress, organised by the Seville Chamber of Commerce under Nexomar’s POCTEP (Spain-Portugal Interreg) project. The project is co-financed by the EU and coordinated by the Council of Andalusian Chambers of Commerce, with the aim of driving the internationalisation and competitiveness of companies in the port business sector that are located in Alentejo, the Algarve and Andalusia.

The act, held in Seville’s *Exploraterra* location was focused especially on the use of AI tools as applied to the supply chain, as well as innovation and the automation of logistics businesses, to bolster sustainability through the implementation of cutting-edge technology.

Jesus Medina – Head of APBA's Technology Development Department – intervened in representation of our Port Authority to explain how exactly we have been applying AI to improve operational efficiency at the Port of Algeciras. He detailed the development of our Port's CDM (Collaborative Decision-Making) projects, which are able to exchange real-time data with our container terminals, shipping lines and nautical-technical services – among others – to optimise operations and thereby reduce waiting time. He also highlighted how AI is already providing the operational management of the Algeciras enclave with predictive information, to know in advance what is going to happen, and prescriptive information, to recommend actions, thus transforming port logistics as we know it.

Francisco Herrero – Chairman of the Seville Chamber of Commerce – also took part in the encounter, as did **Rafael Carmona** – Chairman of the Port of Seville. Among the others present included project partners from both Portugal and Andalusia – expert speakers – who shared their knowledge and points of view in several presentations and discussion panels, along with more than ninety companies who held B2B (business-to-business) meetings among each other.

It should be emphasized that the *Nexomar* project is aimed at driving the maritime logistics business by giving the Alentejo, Algarve and Andalusian logistics systems a boost in terms of their organisational and technological capabilities. Such a boost will bolster their internationalisation and increase the foreign presence of their businesses, be they from the logistics or manufacturing sectors.



The Port Authority of the Bay of Algeciras Takes Part in ALICE's 2025 Brokerage Event.

APBA featured at the III Brokerage Event that the *ALICE* (the Alliance for Logistics Innovation through Collaboration in Europe) Euro Tech Hub held in Brussels on the 2nd and 3rd of April last. The event brought together more than 120 delegates from the intermodal logistics and transportation sectors, setting a common goal to analyse and explore new European Commission innovation funding opportunities from *ALICE's* perspective.

On this occasion, the conference placed its focus on the forthcoming *2025 Horizon Europe Work Programme* – along with other mechanisms, such as those sponsored by *EIT Urban Mobility* or *ESA* (the European Space Agency) and its *BASS* (Business Applications & Space Solutions) programme to develop tech tools for logistics based on resources in outer space.

Conference-goers had the chance of presenting, sharing and discussing their innovation ideas, concepts and tools in workshops and one-to-one match-making sessions, where they were able

to work on project design and partnerships for future editions of *Horizon Europe*. The sessions made up a powerful launchpad for partnering and linking up innovators, organisations, clusters and tech hubs to initialise the co-creation of tools for smart, sustainable cargo transportation. Other points that were addressed included future initiatives to align the needs of the industry to European research, and the role of *ALICE* and its members in influencing the European Commission's recommendations for the forthcoming 2026 and 2027 *Work Programmes*.

Conference attendees included delegates from a wide range of sectors: the port-maritime sector, with Port Authorities like the Bay of Algeciras, Valencia, Barcelona, Trieste and Duisburg present; logistics businesses, such as *La Poste Groupe*, *dbh Logistics* and *GEODIS*; logistics clusters, like *ALIA*, *Logistop* and *LIMOWA*; tech suppliers, such as *Transporeon*, *Transmetrics*, *Marlo* and the *ICCS-iSENSE Group*; research centres and universities, like *TU Delft*, *CERTH/HIT*, *RISE*, *Deusto* and *CENIT*; and huge retail outlets and manufacturing businesses, such as *Renault*, *Volvo*, *Scania*, *P&G* and *L'Oréal*. It is worth mentioning that the *2025 Horizon Europe* call for finance programme consists of a total of nineteen



logistics-related topics that represent a sum of €383 million in funding, and the opportunity of undertaking forty-eight new projects.

The most outstanding of these include proposals like: "*Accelerating Freight Transport & Logistics Digital Innovation*"; "*Integrating Inland Waterway Transport in Smart-Shipping & Multimodal Logistics Chains*"; and "*Real-Time Monitoring of Regulated & Non-Regulated Emissions from all Types of Vessels & Other Port Activities in order to Enforce Emissions Limits in Waterfront Cities*".



The Port of Algeciras Features as a Successful Case Study at the SVQ Emprende-Backed Open Innovation Conference in Seville.

On the 22nd April, within the programme of the Pablo de Olavide University's *Employment & Enterprise Fair* in Seville, APBA featured in the “Open Innovation as a Partnership Axis between Institutions, Businesses and Start-Ups” session. This was an event promoted by the SVQ Emprende Ecosystem and attended by undergraduates, lecturers, public and private sector venture experts, and business professionals from various walks of life.

The session was moderated by **Juan Luis Pavon** and structured across three blocks, one of which focused on presenting several success stories in open innovation between institutions, businesses and start-ups. The discussion format witnessed the presentation of various companies' partnership experiences – from *Inerco* and *Secmotic*, *Endesa* and *Ingelectus*, and – to round off the session – and finally the Port Authority of the Bay of Algeciras and

DeepInsight. **Daniel Hernandez Aliana** – APBA's Innovation Office Manager, together with **David Rodriguez Lorenzo** – Co-Founder and CIO of *DeepInsight* (a UPM – Polytechnic of Madrid – spin-off) were asked to explain how APBA had set up its open innovation programme, and how projects that had come about were being undertaken by the Port Authority together with *DeepInsight*.



The opening presentation was made by **Antonio Carmona Lavado** – Resident Professor at the Pablo de Olavide University and *INN-LAB* innovation, enterprise and family business researcher – on the keys to disseminating the open innovation paradigm. Then, before the success story-themed discussion panel began, several open innovation programmes being carried out by institutions such as *Espacio RES*, *CTA*, *Cesur*, *PCT Cartuja* and *Estrella Galicia* were presented.

SVQ Emprende promotes itself as an organised venture partnership that includes all of Seville's enterprise ecosystem – a public-private alliance backed by the City Council that brings together more than sixty agencies from within Seville's socio-economic ecosystem, all committed to the creation of new businesses and/or the advancement of already existing businesses: business organisations, universities, technology parks, foundations, company incubators and accelerators, investment groups, professional guilds, business schools, social economy agencies, tech communities, or co-working alliances; all of them working together as a coordinated association to partner and drive entrepreneurial talent forwards and thus strengthen Seville's productive fabric.



The Port of Algeciras Features as a Successful Case Study of Decarbonisation at the 2025 GreenTech Event Organised by Port Technology International.

The Port of Algeciras attended the 2025 edition of *GreenTech*, organised by *Port Technology International* and held in the Swedish capital, Gothenburg, on the 29th and 30th April. On this occasion, the event brought together more than sixty conference-goers from the main European ports, port terminals and port-maritime tech companies. Across a schedule of discussion panels and round tables, several experts in port logistics, sustainability and decarbonisation analysed the main trends and challenges faced by the sector on its path towards climate neutrality – the conference's cornerstone.

The Port of Algeciras was proclaimed as a success story in industrial decarbonisation in an inspiring speech given by **Miguel Montesinos**, CEO of the *Prodevelop* tech company. Montesinos showed how the state-of-the-art digital platform called *Posidonia PortCDM* is prompting tangible profits at our port: profits that support the industry's decarbonisation through emissions reductions stemming from a change in mentality that has focused on partnership, real-time and predictive data exchange, and the encouragement of Just-in-Time port calls.

During his address, he underlined the results gleaned to date, which have produced more fluid, coordinated and efficient port manoeuvres to such an extent that they have had an effect on operations and emissions, by optimising waiting times, inactivity and previous anchorages during the vessel call process. All of this demonstrates that Port Community's use of digital and

collaborative tools is a powerful example of how technology and sustainability can move forward in sync.

It must be mentioned that APBA is a port-maritime sector pioneer in the promotion of a concept called *PortCDM* (Port Collaborative Decision-Making).

The challenges of collaborative decision making began to be addressed at the Port of Algeciras in 2017, under the innovation project we named “*Pit-Stop Port Operations Algeciras*”. This pilot scheme laid the solid foundations required for sponsoring the development and implementation of such a hub at our port. A good example of this is seen in the product developed by the *Prodevelop* tech company: *Posidonia PortCDM*. The project was backed by **Port Funds 4.0** financing, and managed by the

Spanish State Ports Department together with our own APBA in its role as Port Living Lab of international reference.

The event also included currently-trending topics relevant to the port sector: the proliferation of green and digital corridors, the adoption and maturity stage of future fuel types, the benefits of electrification, the challenges faced by OPS (On-shore Power Supply) management, and the use of digital twins to help achieve a sustainable port environment. Among the speakers in attendance, there were delegates from the ports of Gothenburg, Rotterdam, Hamburg, Barcelona and Bilbao; world-leading terminal operators such as *APM Terminals*, *Eurogate*, *Yilport* and *Contship*; and cutting-edge tech pioneers like *Kalmar*, *Awake.ai*, *Conroo*, *Kempower* and *Hexagon*.



Algeciras, Central America and the EU Reinforce Digital Connectivity towards Greater Competitive and Sustainable Trade.



In the Costa Rican capital of San Jose, APBA – together with the European Union and *SIECA* (the Central American Economic Integration Secretariat) – presented an ambitious project to promote a bi-regional trade exchange **between the Port of Algeciras and Central America**, thereby strengthening our port as the gateway to Southern Europe.

To be specific, this is the **Digital Interoperability Project** set up between the PDCC (Digital Platform for Central American Trade) and the Port of Algeciras PCS (Port Community System). The initiative will allow inspections to be brought forward, guarantee smart documentary flows that are swift and secure, and offer exporters and other operators physical traceability of cargoes from port to port all the way across the sea bridge between both regions.

These supply chains carry a trade volume of some €18 billion a year, the EU being the second most important trade partner the region has and the top destination for its agricultural produce such as bananas and pineapples.

This is a ground-breaking pilot scheme that will enable the digital exchange of sanitary certificates and customs documents between both regions, enabling early document evaluation for cargo inspections, reducing waiting times at port facilities, and increasing reliability and efficiency in the process of goods entering the European Union through the Port of Algeciras.





GREENTECH FOR PORTS AND TERMINALS

THE ROAD TO NET ZERO



29 - 30 APRIL 2025
Gothenburg, Sweden





During the presentation, Mr. **Gerardo Landaluce** – APBA's Chairman – highlighted the strategic role of our port as a gateway into the continent: *"The Port of Algeciras is a key logistics hub for fresh and other Central American produce. With digital interoperability, we can bring the inspection process forwards, reduce transit times and bolster our position as an international benchmark in digital innovation and port sustainability."*

Besides our Chairman's address, **Maria Roman** – APBA's Head of Port Community Operations & Services – went on to give a presentation about the latest generation of digital ecosystems implemented by the Port of Algeciras.

Innovation and digital transformation are the two cornerstones of the business strategy, focusing on the role of the PCS as an essential tool for smart, secure data exchanges among all the logistics chain players: optimising processes, enhancing efficiency and reliability, and – above all – improving the traceability and transparency of the supply chains on their way through the Port of Algeciras. To conclude, she portrayed how the system works by showing a practical case of an import from Central America, underlining the significance of digitalising the exchange of certificates of origin and phytosanitary certificates to streamline the pre-assessment of documentation prior to the vessel's arrival.

The Project itself comes under the EU's *Global Gateway* strategy, whose main aim is to promote sustainable, reliable digital infrastructure in Latin America and the Caribbean. Such interoperability will position Central America at the cutting-edge of digital trade facilitation – having already had an ongoing agreement in force with the EU for over a decade; whereas Europe, led by the Port of Algeciras, will be able to boost its role as a strategic partner in developing modern, resilient logistics networks. To round off the meeting, all the institutions present agreed that the PDCC-PCS initiative is a pilot scheme

that is easily copied in other bi-regional logistics corridors, by integrating shared digital standards and supporting more efficient, sustainable supply chains.



APBA – Key Feature at the 2025 UIMP Port Week Round of Encounters in Santander.

At the beginning of September, APBA took part in the *Giving a Voice to Data: Data-Driven Ports & Organisations* conference at the emblematic Magdalena Palace in Santander. Encompassed within the *2025 UIMP (International University of Menendez Pelayo) Port Seminars* cycle of encounters, the event was organised by the UIMP itself, the Port of Santander Authority (PSA), and the Spanish State Ports Department. On this occasion, the 2025 edition of the conference pivoted around four meetings that tackled some of the main challenges that currently face the industry: innovation in smart, synchro-modal transportation; port management data integration; circular economies; and talent management leadership.



On behalf of APBA, **Juan Gonzalez** – Head of our Tech Development's Data Analysis Information Systems – took part in the third of the Meetings, led by **Lara Lloret** – resident scientist at *IFCA-CSIC* (the Physics Institute of Cantabria), and **Armando Lopez** – Head of the Spanish State Port Department's Technical Assessment & Cultural Heritage Department. This meeting turned around two main blocks: Data as a Strategic Asset, and *Digital Transformation of Ports in Data-Driven Organisations*. The series of speeches took on matters such as: public data policies and strategies, organisational and cultural challenges in a data-driven business model, directives to tackle cyber resilience in supply chains with emerging technologies, and the new role of ports in the information era. Among others, the speakers included **Alvaro Rodriguez** – The Spanish State Ports Department's Under-Secretary for Business Strategy and Development; **Christian Manrique** – Head of the Port of Santander Authority's Infrastructure & Public Domain Department; and



Mariela Gutarra – the leading Peruvian State Port Authority's expert in Government & Digital Transformation.

Gonzalez specifically presented the work carried out by APBA during the last few years. The lion's share of his address was given over to data governance, which consists of the policies and procedures that are required to ensure that the data generates value for the differing departments in the organisation. To round off proceedings, there was an informal discussion about port-based data given by speakers involved in the second block.

Santander's Port Week, held between the 2nd and 5th September last year, was originally conceived and arranged by the PSA, UIMP and the Spanish State Ports Department as a summer school offering training programmes that adjust to the industry's priorities, and to promoting a culture of continuous learning that adapts to the demands of a globalised panorama.

Courses are directed towards managers, executives and professionals who work in the port-logistics sector, whether public or private; professionals and researchers who are interested in studying port infrastructure; undergraduates who would like to take up a career in the port industry; and entrepreneurs and start-ups.





Ideas Afloat, entrepreneurship and innovation in the Port of Algeciras.

Through its UCA *Emprende* initiative, the University of Cadiz, together with FCTA (the Tech Campus Foundation of Algeciras) and APBA, held the *Idea Afloat: Navigate as a Team, Innovate at the Port* event at FCTA's Innovation Building. This is an initiative that strives to encourage the birth of ideas and ventures for use in the port-logistics sector among undergraduates from the Bay of Algeciras University Campus.

APBA Features at the III Campo de Gibraltar Innovation & Digital Transformation Fair.

On the 1st October last, APBA featured at the **III Campo de Gibraltar Innovation & Digital Transformation Fair** organised by the Campo de Gibraltar Chamber of Commerce. It should be noted that the Fair was arranged under the 2025 *Digital Campo de Gibraltar* project, and held a series of events whose aim was to promote private innovation and digitalisation towards achieving competitiveness improvements in regional businesses.

The encounter brought together more than 200 participants at the Chamber of Commerce's own facility, and it was sponsored by the Cadiz Regional Government's Planning, Co-ordination & Strategic Development Department's *Dipu-Innova Plus Programme*. The conference lent itself to bringing the latest news in digital and AI tendencies to the attention of the business fabric with a top-level bill of speakers from companies such as *Google* and *Microsoft*. AI – and its application in day-to-day business – had a stand-out role in this, the third edition of the

conference and brought companies, start-ups and entrepreneurs together to share knowledge and updates about trends, and provided a networking forum where businesses could get to know some of the newest tech tools and ongoing strategic projects in our region.

APBA featured not only in the event's exhibition hall, but also on the conference schedule as a participant in the round table entitled "*Digital Transformation in the Campo de Gibraltar: Success Stories*", and specifically in the person of **Juan Antonio Herrera** – APBA's Head of Innovation. His speech underlined the importance of innovation within APBA's corporate strategy; at the same time, he also talked about several innovation projects that have been carried out at the Port of Algeciras, for example: improving vessel arrival forecasting to benefit developments in Just-in-Time operational models; pre-empting the detection of spills and slicks in the sea by means of a smart system; and improving marine biodiversity by deploying artificial bio-mimetic reefs that are monitored by AI and underwater drones.

He also focused on the need to strengthen the local digital and entrepreneurial fabric so it could continue providing a competitive edge to the Bay of Algeciras's port-logistics ecosystem,

an objective which is being pursued by the Port of Algeciras Digital Start-Up Centre, focused on port logistics and backed by the Andalusian Government and its *Mission Andalusia* initiative.

APBA was accompanied in both facets of the conference by organisations that have a major presence as Port Community and tech big-hitters – such as *Acerinox*, *Moeve*, and *Indorama Ventures* – as well as *EON-Sea* and *Torbellino Tech*, the latter two being start-ups that have joined the *Mission Programme*. The Fair also provided a forum for the official launch of our recently-published 2024 Innovation Report.

The activity perfectly aligns with the goals that **APBA's Algeciras Port Digital Academy** is pursuing: to sponsor a powerful local digital ecosystem, i.e., to develop and bring on a "*digital talent pool*" to be shared among all the members of our Port Community – including APBA – and stemming from various lines of work that have been geared towards the creation of local digital talent.

For about three hours, thirty-odd undergraduates studying various university degrees developed an express ideation and prototyping process to solve a key port-logistics and Port of Algeciras challenge: continuous cargo and vehicle tracking throughout the port facility.

In order to do so, they worked in multi-disciplinary teams, each counting on the help of designated mentors: **Juan Antonio Herrera** – APBA's Head of Innovation, **Nacho Serra** – Member of APBA's Technical Innovation Office, and **Maria Niebla** and **Raquel Carmona** – Manager and Co-ordinator, respectively, of the Port of Algeciras Digital Start-Up Centre.

Before finalising the event, the five teams made a pitch in front of a jury made up of all the organising participants in the scheme, who then decided on the award-winners of the Most Innovative Idea





and the Best-Presented Idea. These two best ideas were awarded a prize of €500 each.

It should be mentioned that the event was funded by the **Andalusian Government's University and Research & Innovation Department.**

EVENTO

Ideas a Flote:
navega en equipo,
innova en el
Puerto de
Algeciras

20 octubre
10:00H

Edificio I+D+i -
Campus Tecnológico
de Algeciras



10

Collaboration with start-ups



Tracking Port Infrastructure Vulnerability from Outer Space.



APBA has taken part as facilitator of the **VIBE** (Vulnerability of Port Infrastructure from Space), focused on **developing a tool to manage the risks and vulnerabilities of port infrastructure through the application of *DInSAR*** (Differential Interferometry Synthetic Aperture Radar) technology and AI algorithms.

The project had an execution deadline of 24 months and has been funded by a **Ports 4.0** grant, seed capital launched by the Spanish State Ports Department, under the Pre-Commercial Projects category. The



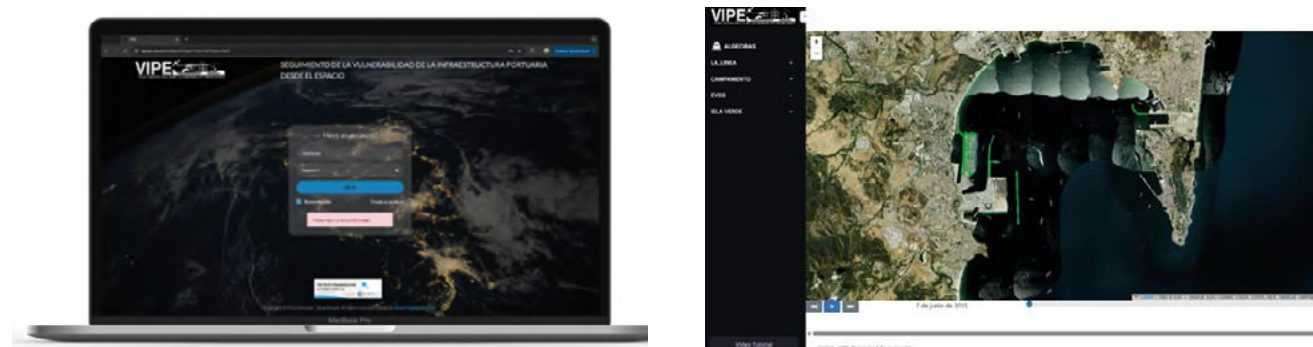
initiative has been undertaken by two start-ups: **Detektia**, a spin-off of ETSI's (Technical College of Engineering) Topography and Geomatics laboratory at UPM's (Polytechnic of Madrid) Civil Engineering School; and

Deep Insight, another spin-off – this time of **CEHINAV** (UPM's Naval Hydrodynamic Testing Canal). At the same time, the Ports of Huelva and Castellon Authorities have been involved as facilitating agents by providing an environment for carrying out use cases.



The **general concept** consisted of creating a multi-disciplinary web service to manage the vulnerability of port infrastructure on the grounds of its failure modes (slipping, buckling or subsidence) by monitoring the state of the infrastructure with satellite-treated imagery, thanks to **DInSAR** technology; this allows us to find deformities anywhere on the planet with millimetric precision, without the need for land-based instrumentation.

The **scope of the project** – funded by the Spanish State Ports Department – has included the digitalisation of 116 VAIs (Vulnerable Areas of Interest) at the Ports of Algeciras, Castellon and Huelva, as well as **InSAR** point cloud generation and the definition of key infrastructure buckling and shifting metrics (quality, state, rate and change).



On another front, APIs (Application Programming Interfaces) have been implemented to treat satellite data and integrate met-ocean variables and other events on a multi-user web hub with interactive dashboards, configurable thresholds and an advanced time series viewer. An event manager has also been developed to record incidences, maintenance activities and new works that enables traceability and decision-making. Finally, when the tool's front-end development was rounded off with the integration of metrics, feedback seminars and a final demo were held at APBA facilities to validate the tool together with its users.

All in all, the resulting project has evolved as a **software prototype** based on an SaaS (Software-as-a-Service) tool, allowing us to **process hyperspectral satellite images** that provide **thresholding data about the state of our infrastructure**, a record of **historical progression** and a **correlative analysis** with **met-ocean** variables in order to improve the **management of the port infrastructure's vulnerability**.

To conclude, it is important to mention that the **Demo Day** that rounded everything off was held on the 20th March, when the global results of the project, the use-cases carried out at the various ports, and the next steps towards improvement of the service and productization of the tool were all presented before State Port Department delegates at APBA's facilities.



Smart Mobility Analytics – an Intelligent System to Manage Port Mobility.

APBA has taken on the role as facilitator of the **SMA (Smart Mobility Analytics)** project



to develop an AI-based camera system by means of applying state-of-the-art detection algorithms, based on neuronal networks, that are able to analyse passenger and vehicle flow. The resulting product is an **integrated mobility management system** that facilitates data extraction, such as – for instance – passenger and vehicle **waiting times** and the **use being made of a port terminal's various premises**.

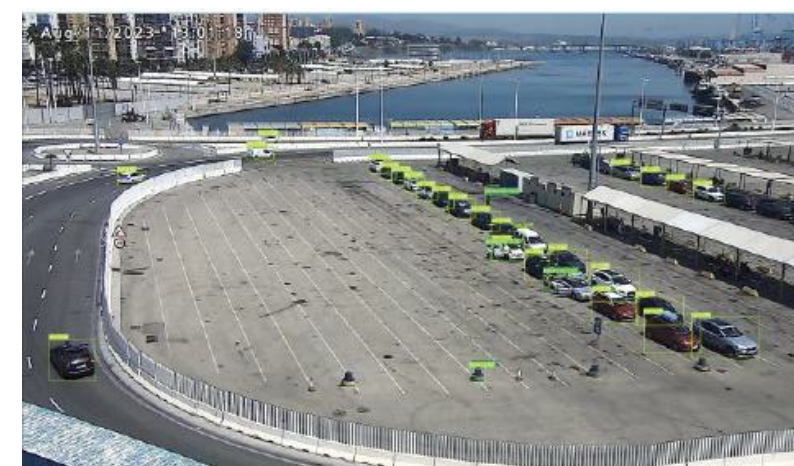
The aim of the pilot scheme was to **digitalise operational processes** at port terminals (passenger terminal, cruise station, etc.) by using **AV (Artificial Vision)** in order to provide a back-up tool for decision-making that would allow – on the one hand – the correct sizing of port premises to reduce congestion and, therefore, waiting times as passengers and vehicles flow through the port; and – on the other hand – give better attention to our passengers, vehicles, and public and private transport providers, even by sharing real time information with those port users.

The project, which was financed by **Port Funds 4.0** under the Commercial Project category, has been undertaken by **Delonia Software**, an engineering company that offers multi-disciplinary services in matters such as digital transformation and tool development, Big Data and AI-based systems and services – among others – for the banking, telecommunications, engineering and health industries.



The scope of the project – in the case of the Port of Algeciras – contemplated the functional **testing of passenger and vehicle traffic operations management in the areas around our Passenger Terminal**. It included the detection of the degree of occupation of parking areas, the monitoring of vehicle and coach arrival and departure flows in these areas and the tallying of all passengers who entered or left the Terminal.

Finally, it should be noted that the Port of Barcelona Authority has also been involved in the project as a main development scenario for the different use cases, and particularly analysing operations at the Port of Barcelona's Cruise Terminal.





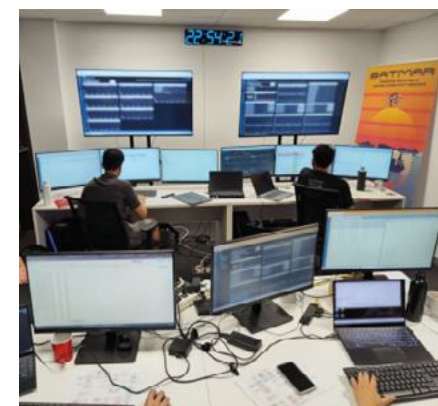
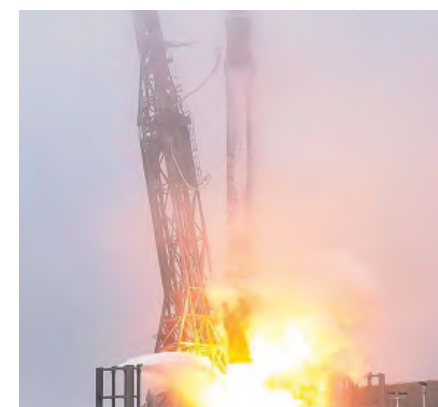
APBA and Alén Space Finalise the First SATMAR Satellite Pilot Scheme Campaign with Great Success.

APBA and the Alava-based company - **Alén Space** - finalised the first campaign of **VDES (VHF Data Exchange System)** technology pilot demos fitted on board the **SATMAR** satellite in December. This scheme, performed together with **Egatel** and other partners, places **Algeciras and Spain in a prominent position in the development of new satellite-based maritime communication tools.**

The project's aim was to demonstrate the viability of the VDES standard as a next step up from AIS (Automatic Identification System) and to explore prospective digital services for the port-logistics industry with a view to improving efficiency, safety and sustainability. The scope of the scheme includes the satellite's design, manufacture, placing in orbit and operation, as well as the development of ship- and land-based terminals to assess the feasibility of a complete maritime communications system driven by VDES.

This type of technology will allow for advanced services such as two-way communication, long-distance connectivity from the shore, optimized maritime alert management, accurate ETA prediction and data encryption, among others.

It is within this framework that **several use cases have been trialled in the port and maritime environment** during the test phase, in order to validate this new technology's behaviour and potential.



During the **first pilot**, messages were able to be exchanged between a ship and the port control centre, showing the capacity VDES has to enable secure, efficient two-way communications.

The **second pilot** involved sending environmental and oceanographic data from a boat adrift at sea, simulating applications that may be implemented at a future date with low-cost apparatus and communications channels adapted to the maritime environment. At the same time, the port carried out a demonstration of long-range AIS message reception from the SATMAR satellite, which proved that it was possible to amplify the ship-tracking signal beyond traditional on-shore stations.

The **last pilot** of the campaign, undertaken together with **Oritia & Boreas**, tested the secure transmission of environmental data from remote areas by employing a VDES terminal fitted to a weather station located in the Bay of Algeciras.

SATMAR, launched on SpaceX's *Falcon IX* rocket and placed in orbit on the 23rd June, 2025, passed the validation phase of its sub-systems and payloads with flying colours. It also carries on board a secondary payload to make it an orbiting SDR (Software-Defined Radio) tech laboratory. Among its various functions feature **RF (Radio Frequency) spectrum monitoring** on VHF, long- and short-waves, as well as a **new high-speed communication technology trial** in the short-wave band.

The **SATMAR** (Satellite-Based VDES Global Maritime Digital Communications Service) Project has been completely carried out by **Alén Space**, with the involvement of **Egatel** and the **Gradiant** tech centre. APBA has taken part as Facilitating Agent, with financial aid coming from the Spanish State Ports Department's **Port Funds 4.0**, lending support to the project's strategic nature and its alignment with the Spanish port network's innovation goals.



APBA Gives Backing to 17 Pre-Commercial Project Proposals at the Third Port Fund 4.0 Call.



The month of March saw the end of the **third Ports 4.0 round of innovation-funding** deadline to submit projects under the Pre-Commercial Category.

An initiative driven by Spanish ports' *TradeTech* ecosystem, it is designed to support both domestic and foreign entrepreneurs or businesses who have innovation ideas or projects that may **transform the port-logistics industry**.

This call for funding was oriented towards projects in the pre-commercial phase, i.e., those that have already passed TLR3 experimental proof-of-concept trials. Its aim is to facilitate the validation of real-environment proposals or reach the TLR7 technological maturity phase. During the submission phase of proposals, which began in December with the announcement of conditions in the Spanish State Bulletin, **APBA received and assessed a total of twenty-six such proposals**. This only goes to confirm the interest that the Port of Algeciras generates among national and international start-ups and businesses, once again reinforcing our reputation as a **Living Lab Port** on an international scale.

Following an exhaustive alignment analysis of submissions towards the strategic approaches and goals as defined by the Port of Algeciras, the port opted to give our **backing to seventeen initiatives, and APBA has committed to assuming an active role as pilot scheme facilitator** in fourteen of them, should these proposals eventually be awarded with funding.

The proposals are all based on emerging technology such as AI, computer vision, blockchain and drones, and are centred around optimising operations and driving environmental and energy sustainability.

The budget in this round of project funding comes to a total of €11,250,000. A maximum sixty percent financing is offered for costs in innovation-associated projects within the budget, with a top limit of €1,000,000 within the funding period's validity. The intended purpose of this aid is to help create a new product, service or process; or improve existing technology with a new innovative component and implement its development in the port-logistics sector.



The Port of Algeciras Develops a Start-Up Acceleration Programme under the Mission Andalusia Framework.

At a key moment for the digital transformation of Andalusia's productive fabric, the Port of Algeciras has made itself a cornerstone of **Mission Andalusia**, an ambitious programme driven by the Andalusian Government and several other local stakeholders to promote tech ventures in strategic sectors.

The mission offers programmes that adapt to the needs of **start-ups and digital-based venture projects**, so they can develop and validate tools applicable to real problems, all in an environment that is fitted out with resources and strategic equipment, key connections and investment opportunities. It is specifically structured on four innovation hubs distributed around Andalusia: one of them is located in the **Port of Algeciras** facility with a specific theme in mind – to **revolutionise port-maritime logistics**.

At the presentation meeting, **Antonio Sanz** – Andalusia's Regional Secretary for the Presidency, Interior, Social Dialogue and Administrative Streamlining – stated that the

Port of Algeciras Digital Venture Centre is designed to *"...drive any project that can contribute to modernising the supply chain – from energy efficiency and safety solutions to integrated logistics hub management and self-driven support vehicles for port operations..."* and guaranteed that the Centre *"...aspires to becoming the logistics innovation laboratory in South Europe."*

The acceleration programme has been designed to include a **100% specific focus on Port Logistics** – a strategic sector for the Andalusian economy, the Port of Algeciras Bay being one of the main maritime hubs in Europe.

The candidate projects for the acceleration scheme – open from May to September – may find themselves at any of maturity or development stage: it is not a prerequisite for projects to be established legally. All the participant projects have received an initial diagnosis and have been assigned a specialist tutor; and, throughout the programme, all the entrepreneurs have taken part in **practical workshops, on-line master classes, networking events and individual mentoring sessions** according to their needs.



Imagen & Video Processing



Maritime Instrumentation



3D Impression



IoT, 5G & NextGen Communications



Cybersecurity Enthec. biometrid

Advanced Analytics, IA & ML



Start-up Radar 2025

Logistics & Mobility



Future Transportation



Drones - AUV



VR & AR



Location Intelligence & Geo-Mapping



Blockchain



Energy Efficiency & Sustainability





On behalf of APBA, **Salvador Leon** – Head of our Innovation & Digital Transformation Department – took part in a discussion entitled ***“The Proactive Approach to Resiliency: How Ports Can Be Prepared for the Unprecedented”***. Moderated by **Marcel Lindemann** – co-founder of *Passify* – the panel brought together internationally-renowned experts such as **Nico de Cauwer** – the *International Port Community Systems Association’s* General Secretary – and **Kamran Ul Haq** – *Lloyd’s Register* Global Senior Vice President - Ports Advisory.



Salvador Leon’s contribution was **noted by the organisation as one of the most significant points of the whole encounter** in the official event summary, and placed value on **APBA’s operational resilience** in the face of unprecedented disruption: referring to the nationwide black-out that affected both Spain and Portugal in April 2025. During the incident, which lasted between four and twenty hours, depending on geographical location, APBA acted immediately. On realising the scope of the emergency, APBA activated a **Crisis Committee** to assess the situation and safeguard working continuity.

Port of Algeciras Operational Resilience Highlighted at Smart Digital Ports of the Future 2025.

APBA featured at the ninth edition of the **Smart Digital Ports of the Future** event, organised by **Port Technology International**, held in **Amsterdam’s Congress Centre** in November.

The event brought together representatives from all the **main ports and leading businesses of the world’s port-maritime industry**. Over two days, various **round tables** and **panel discussions** were set up, sharing success stories in **innovation and tech developments** at pioneering ports that could serve as inspiration for the whole port-maritime ecosystem in innovation and digital transformation matters.

Thanks to the port’s robust, resilient infrastructure, all the critical operational services were able to function during the incident, including our PMS (Port Management System), PCS (Port Community System), Video Surveillance, business at our Passenger Terminal, and Gate Access, among others. At the same time, the port identified and solved several operational challenges during the crisis, such as being able to supply fuel for generators through alternative sources, due to the fact that conventional petrol stations were unable to operate.

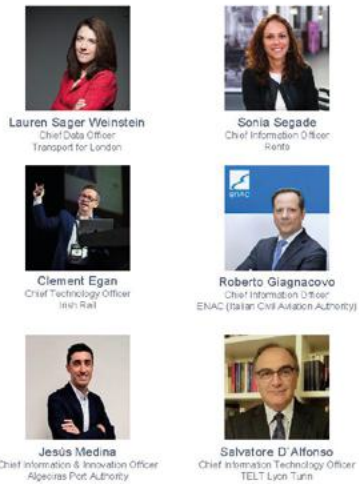


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Gartner.
IT
SYMPOSIUM Xpo.

**European Public Sector
Transportation Session: Success
Stories, Lessons Learnt & Discussion**



**APBA – an example of
leadership in transforming the
IT Operating Model at the
Gartner IT Symposium/Xpo
2025.**

The **Gartner IT Symposium/Xpo 2025** was held in Barcelona between the 10th and 13th November, an event of international prestige focused on exploring trends and strategic technology that can drive innovation and digital transformation towards shaping the future of organisations and businesses. Under the slogan *"Agents of Change: Leading Through Intelligence"*, the encounter bolstered its position as the most relevant summit meeting in the world for CIOs and IT executives.

Held at Barcelona's International Conference Centre, the event brought together **over 6,500 Information Technology leaders** from EMEA (Europe, the Middle East and Africa), with APBA being represented by our Head of Technological Development, Jesus Medina. The four-day schedule offered an immersive environment designed for strategic learning and digital transformation acceleration.

Attendees could participate in more than **140 theme-based sessions**, centred around Artificial Intelligence, cybersecurity, cloud sovereignty, cost optimisation and IT operating model innovation. In parallel to this, the *Signature Series*



introduced strategic trends for 2026, predictions about emerging technology and the executive agenda for CIOs, and the *IT Xpo* was the forum that congregated the main IT tool suppliers, with live demos.

Jesus Medina specifically took part in a discussion panel with the title *"European Public Sector Transportation Session: Success Stories, Lessons Learnt & Discussion"*, where he presented the transformational experience of the Port of Algeciras with his speech *"Evolution of IT Operating Model towards a Value-Optimised Approach"*. Medina shared the panel with **Lauren Sager Weinstein** - Chief Data Officer at *Transport for London*; **Irene Muñoz** - Chief Data Officer at *RENFE*; **Clement Egan** - Chief Technology Officer at *Irish Rail*; **Roberto Giagnacovo** - Chief Information Officer at *ENAC* (the Italian Civil Aviation Authority); and **Salvatore D'Alfonso** - Chief Information Technology Officer at *TELT* (Tunnel Euralpin Lyon-Turin).

His address began by highlighting the situation from the context of the **Port of Algeciras**, where APBA is tackling a highly-competitive scenario in the port-logistics industry in general - and in the Strait of Gibraltar particularly - due to the **variations in premium service quality** at competitive prices. The main strategic challenge consists of **exploiting innovation and digital transformation** to achieve operational efficiency

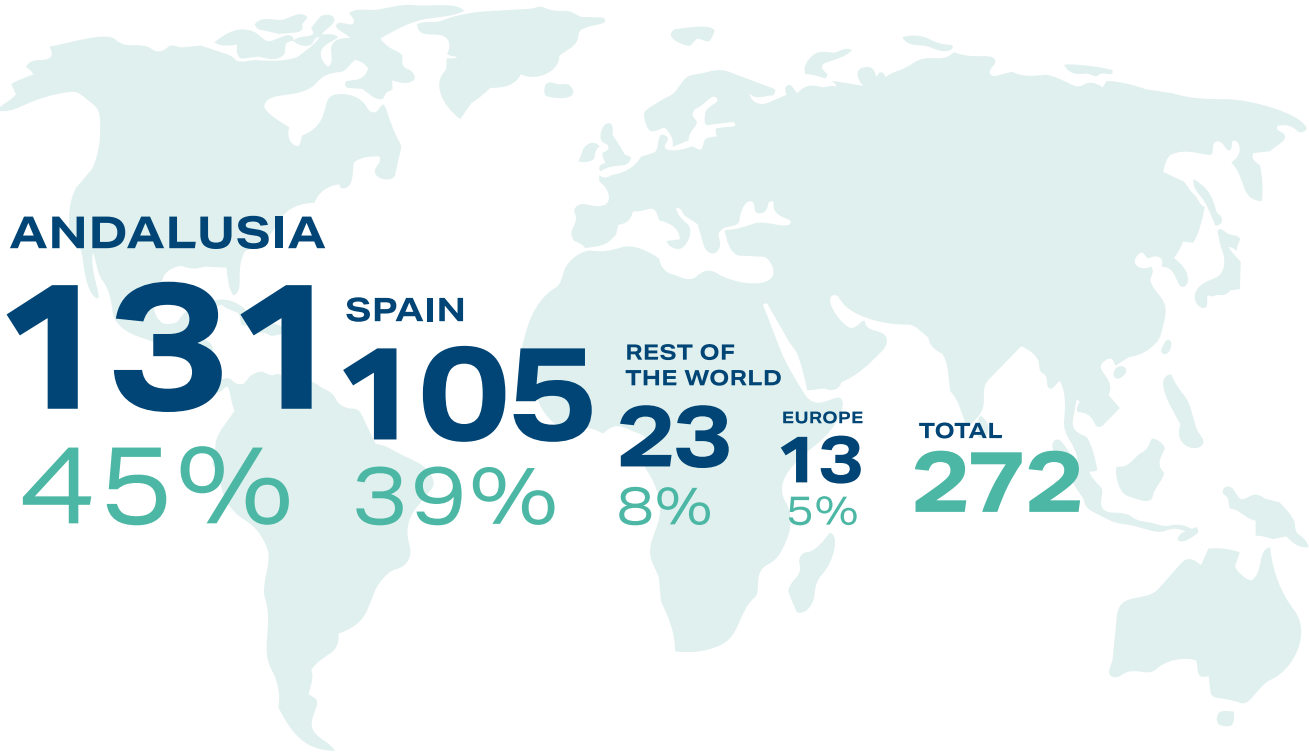
and reliability. In this light, **streamlining the implementation of new tech services** is a key opportunity for a traditional port-logistics industry which is complex and defined by the interaction of multiple stakeholders. In his own words, Medina stated that *"...digital transformation is not just a technical effort, but a **strategic necessity** that demands a **culture shift**, an **inter-functional partnership** and a **clear framework of governance**."*

He went on to detail the series of specific actions that the Port of Algeciras has undertaken in reply to these challenges, with a **complete transformation of its IT operating model**. Finally, he highlighted the results gleaned to date at Algeciras, by underlining the **higher level of agility** in adopting digital products and services that beget much **higher success rates** in projects and a **greater operational efficiency** of IT resources; and the adoption of a **transparent value-based prioritisation model** to ensure the efficient assignation of resources, focused on generating an impact on port-logistics business.



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SOURCE OF THE PUBLICATIONS



HIGHLIGHTS

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Press: Europa Sur

«The Port of Algeciras Bay's Innovation Committee maps out the route to 2025 with a new working session at the UCA-SEA Innovation Centre».

Press: Infopuertos

«The Port of Algeciras shows commitment to innovation at the International Marlog 14 Congress».

Press: Diario del Puerto

«Spain and Panama take the Green & Digital Corridor to Brussels with Algeciras at the forefronts».

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«The Port of Algeciras strengthens its strategic alliance with the Port of Ningbo at the Maritime Silk Road Port Cooperation Forum».

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«The Port of Algeciras, presented as a case for great decarbonisation success at GreenTech 2025, organised by Port Technology International».

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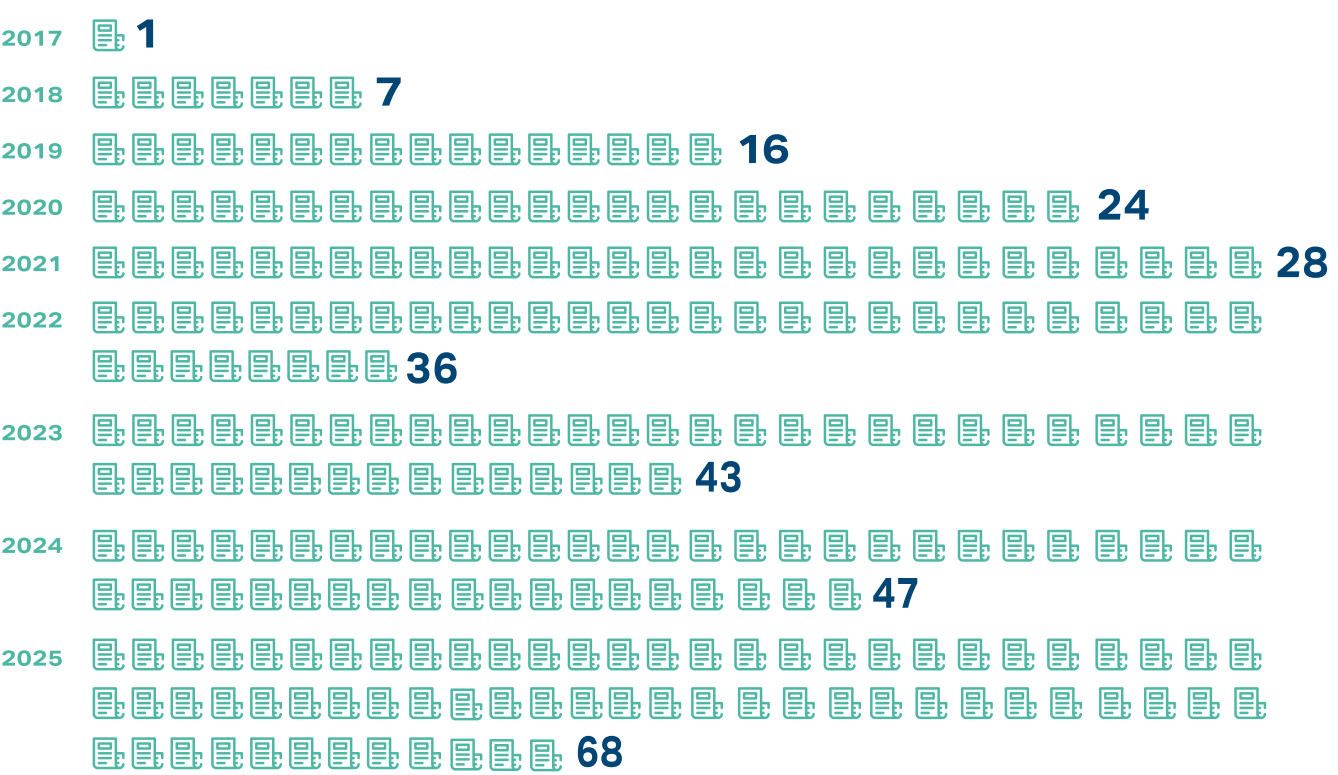
«SDP 2025: when the real port transformation engine is still human».

Press: Porttechnology

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Press: Diario del Puerto

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ACKNOWLEDGMENTS

Alberto González Muíño

Karno Tenovuo

Jemual Mark Gedelanga Agsaway

Cristina Muñoz Salas

Juan Antonio Patrón Sandoval

And to everyone who
makes innovation possible
at the Port of Algeciras:
thank you very much!

GLOSSARY

ADT - Technological Development Area

AIS - Automatic Identification System

APBA - Port Authority of the Bay of Algeciras

APDA - Algeciras Port Digital Acadeymy

API - Application Programming Interface

APS - Sustainable Development Area

BOE - Spanish Official State Gazette

CEO - Chief Executive Officer

CIO - Chieff Information Officer

CTO - Chief Technological Officer

DInSAR - Differential Interferometry Synthetic Aperture Radar

ESA - European Space Agency

ETA - Estimated Time of Arrival.

ETS - Emissions Trading System

FTP - File Transfer Protocol

GPS - Global Positioning System

AI - Artificial Intelligence

IES - Secondary Education Institute

IMO - International Maritime Organization

IoT - Internet of Things

ISO - International Organization for Standardization

JIT - Just in Time.

OPE - Strait Crossing Operation

PBA - Port of the Bay of Algeciras

PCIS - Corporate Systems Integration Platform

PCS - Port Community System

PMS - Port Management System

PortCDM - Port Collaborative Decision-Making

PPK - Post-Processing Kinematic

TOS - Terminal Operating System

TRL - Technology Readiness Level

TTIA - Total Terminal International Algeciras

VDES - VHF Data Exchange System

VHF - Very High FreQuency



