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MAY 2018, THE PRIVACY REVOLUTION

INTERVIEW

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Munich (Germany), 30-31 October

GMV will be present at the upcoming TU-Automotive, to be held on 30 and 31 October in Munich, Germany.

This event is the ideal venue for meeting up with fellow automotive professionals and technicians of connected cars, automotive technology, smart mobility, autonomous vehicles and electric vehicles.

GMV will be running a stand (P6) displaying its advanced inhouse solutions and systems for the automotive sector, including all the following: telematic control units, onboard unit systems for GNSS-based vehicles, smart connectivity modules and critical software, plus services and solutions for telematic functions and for intelligent transportation systems. GMV will also be giving a paper on automotive-sector security.

To find out more:
https://automotive.knect365.com/tu-auto-europe/

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LETTER FROM THE PRESIDENT

One businessman to another: "Do you know a good GDPR consultant?" "I do." "Great. Can you pass me the phone number?" "No."

This joke feeds on the doubts stoked up in many firms by the new European General Data Protection Regulation (GDPR), which came into force last May, accompanied by a veritable avalanche of emails and the need to click on innumerable consents to the use of our data when surfing the net. But these niggly teething problems in implementing the new regulation don't mean it's not necessary. Thanks to GDPR we Europeans are now entitled to decide who can use our data and for what purpose and also to have this data properly protected. We have been returned ownership of our data.

For over 20 years now GMV has been providing all-in Cybersecurity solutions, helping our clients in banking, public authorities, critical infrastructure or the legal sector to safeguard their data and infrastructure and abide by current law. This vast Cybersecurity experience was a determining factor also in GMV recently winning the biggest contract ever awarded to Spain's space sector, namely for maintenance and development of the Galileo satellites control system. The trustworthiness of the Galileo signals, and especially of the signal used by civil-protection services and armies, depends on the security and invulnerability of this system. Galileo's control system has thus to be properly protected and totally encrypted, calling on GMV's twin expertise in space and Cybersecurity.

Mónica Martínez

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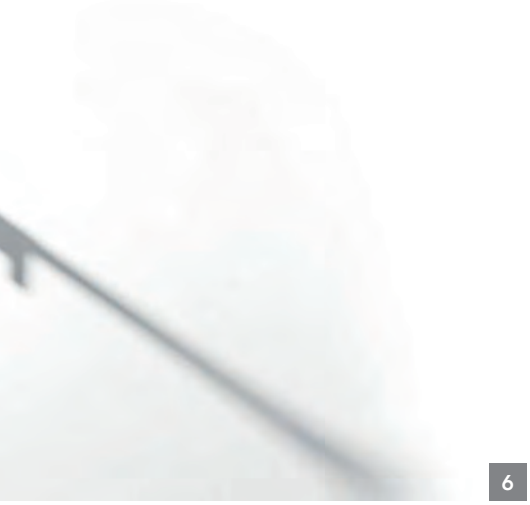
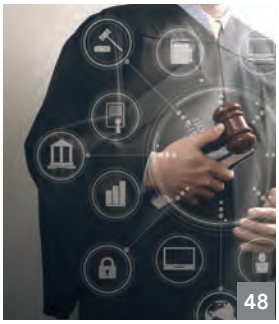
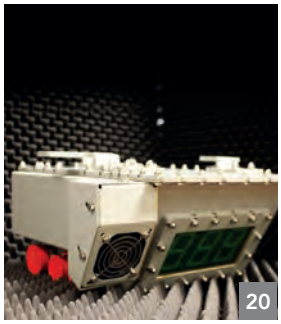






MAY 2018, the privacy revolution

ARTICLE 12 OF THE UN'S UNIVERSAL DECLARATION OF HUMAN RIGHTS RECOGNIZES THE RIGHT TO PRIVACY; LIKEWISE, ARTICLE 8 OF THE EU'S CHARTER OF FUNDAMENTAL RIGHTS. WITH THE ONGOING DEVELOPMENT OF THE INFORMATION SOCIETY MORE AND MORE INFORMATION OF MANY DIFFERENT TYPES IS BEING PROCESSED, BRINGING PERSONAL PRIVACY UP AGAINST BRAND NEW THREATS.

It is nowadays becoming difficult to imagine any current-day interaction in which personal data is not dealt with in electronic form. A banking transaction, an internet purchase, a medical appointment, a conversation on WhatsApp, Skype or Facebook, general elections… It can now be quite safely claimed that privacy affects all economic sectors and private lives.

True it is that not all personal data calls for the same zealousness in its custody and protection, since the privacy damage that might accrue in the case of theft or disclosure differs greatly in terms of the type of data involved. This is precisely why the abovementioned LOPD makes a distinction between three levels – high, medium and low – according to the "amount of privacy" they contain.

Healthcare data, for example, falls within the high-protection category. Data used in credit and financial-solvency services, by both public and private organizations, falls within the medium level. In the case of healthcare data the figures more than bear out this priority status: while credit card information might fetch between five and fifteen USD on the black market, a medical history goes for over fifty. Financial data has also now fallen within the sights of cybercriminals.

Other sectors, like defense and security, have to be especially meticulous about the protection of personal privacy. Anonymity looms large among the remit of state-level security watchdog bodies, as well as in international collaboration. Much the same goes for private security activities. "*As providers of services in this sector, as well as being totally rigorous in compliance with data protection law, we also have to abide by the strictest Cybersecurity and privacy standards*" argues Manuel Pérez, GMV's General Manager of Defense and Security.

As for the space sector, classified as critical under Spain's Critical Infrastructure Protection Law (*Ley de Protección de Infraestructuras Críticas*) and the aeronautics sector, whose component manufacturing processes incorporate security by default from the design stage onwards, neither of them a priori deals with citizens' information. In the case of "*civil satellite-navigation systems, measures to guarantee privacy of personal data are indeed called for*" points out Jorge Potti, GMV's General Manager of Space.

Intelligent Transportation Systems, on the contrary, and especially electronic fare-collection systems, deal with large amounts of personal data. Given that the useful life of any installed system is fairly long, says Miguel Ángel Martínez, GMV's Director General Manager of Intelligent Transportation Systems, "*it is*

essential to build privacy and Cybersecurity measures into the very product conception, otherwise it may well prove necessary to phase in later modifications that impair reliability and increase costs".

Healthcare use of personal data for research purposes is allowed under Spanish law, on condition of the patient's previous informed consent. "*This information has to be kept confidential at all times. As well as routine security controls like encryption and access management, an increasingly frequent measure is the separation of personal information and healthcare information in the processing, as well as data anonymization*", explains Luis Fernando Álvarez-Gascón, General Manager of GMV's Secure e-Solutions sector.

Just as data is broken down into different privacy categories, countries too are classified in terms of the data-protection and -security guarantees they offer in their transactions. For this reason Directive 95/46/EC on the protection of individuals with regard to the processing of personal data lays it down that personal data may be transferred only to such countries as ensure an adequate level of privacy protection.

A good example here is the USA, whose interpretation of data protection differs from Europe's. In the EU privacy or the right to the protection of personal data is recognized as a fundamental right in the constitutions of the member countries and also in the EU's Charter of Fundamental rights. In the USA, however, its federal constitution does not expressly acknowledge the right to the protection of personal data and privacy. This leads inevitably to the need of signing safe harbor agreements to neutralize any privacy-protection risk and to safeguard data subjects' fundamental freedoms and rights.

AS WELL AS LAWS

Just as technology and the internet has permeated deep into society's productive and business fabric, an equally deep-seated message about the shared responsibility for privacy protection is now needed. This calls for policies to raise awareness and foster education on the privacy of personal data as well as the development of skills and empowerment. Likewise, international cooperation and the encouragement of good practices and support of the privacy by design outlook would also help to improve the general picture.

The privacy by design concept to preserve privacy spills beyond mere law abidance. This ambitious idea rests on a series of basic principles such as: proactive rather than reactive; preventive rather than remedial; privacy as the default setting; privacy embedded in the design; full functionality; end-to-end security; usability without forfeiting security; visibility and transparency.

LEGISLATION

Although the use and control of personal data has been laid down in various rules, it is the responsibility of states and European and national organizations to protect and safeguard privacy. Spain's first moves in this direction came in 1992 with the passing of the Automated Processing of Personal Data Law (*Ley Orgánica de Regulación del Tratamiento Automatizado de Datos de Carácter Personal*: LORTAD), followed in 1998 with the General Telecommunications Law (Ley General de Telecomunicaciones), which laid down the obligations of public-network operators and telecommunications service providers.

The ISO 29100 standard is another international benchmark based on good practices and designed for integration with other corporate Cybersecurity management systems such as the ISMS ISO27000 certificate, as well as defining a series of privacy principles applicable to ICTs. These principles make up a compendium of good practices for ensuring data privacy, published by various international organizations like the OECD (Organization for Economic Cooperation and Development), among others.

One of the main principles laid down by the ISO 29100 standard refers to "data minimization". Under this principle the processing and handover of personal data must be kept down to a bare minimum on a need to know basis, i.e, information access only when sufficient and necessary for fulfilling a given function. Data minimization has been taken up as one of the GDPR's kernel concepts, around which many of its obligations then revolve.

Later on, in 1999, pursuant to article 18.4 of the Spanish Constitution and article 4 of the Strasbourg Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data, Spain passed its Personal Data Protection Law (*Ley Orgánica de Protección de Datos de Carácter Personal*: LOPD) to safeguard, among other rights, personal and family privacy, overriding LORTAD. One year later a watchdog organization was set up called the Spanish Data Protection Agency (*Agencia Española de Protección de Datos*).

On the other hand the European Union has taken several measures in this direction, including the NIS Directive and the General Data Protection Regulation (GDPR), both of which came into force in May this year. The former, with a draft implementation law being drawn up in Spain, aims to guarantee a high common level of security in EU's information systems and networks; the latter sets out to protect the privacy of European citizens' data. In this case the watchdog organization that looks out for European's right to privacy is the European Data Protection Supervisor.

The NIS Directive will help to formalize collaboration between public and private providers of essential digital services in the EU for the management of cyber-crises and recovery after cyber incidents. The GDPR, for its part, will directly benefit European individuals by guaranteeing their awareness of the Cybersecurity incidents that affect them. Indeed, data controllers (featuring prominently throughout the regulation) are obliged to notify the competent authority of any personal-data breaches that may occur within their particular organizations within a 72-hour deadline. This competent authority in Spain is the aforementioned watchdog body, the *Agencia Española de Protección de Datos* (AEPD). Other rights set out by the GDPR are identification of companies holding our data, the entitlement to know the use they are making of this data, as well as demand they be deleted, modified or even the right to data portability, whereby data subjects are entitled to obtain data that a data controller holds on them and to reuse it for their own purposes.

THE EXPERTS SPEAK

APPROACH TO THE NEW DATA-PROTECTION LEGISLATION FROM THE VIEWPOINT OF CRITICAL INFRASTRUCTURE PROTECTION

JOSÉ LUIS PÉREZ, Head of the Security and Plans Service of the National Critical Infrastructure Protection Center (*Centro Nacional de Protección de Infraestructuras Críticas*: CNPIC)

For several decades now personal-data protection has become one of the most controversial fundamental rights as far as its enforcement and concomitant measures are concerned.

The aim of data-protection security measures is to prevent the data of persons, clients and system users from being used in such a way as to impair their privacy and violate other fundamental rights and public liberties.

Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, repealed Directive 95/46/EC (General Data Protection Regulation).

This new personal data protection regulation came into force in Spain on 25 May 2018 with the aim of guaranteeing and protecting these public liberties and fundamental rights of natural persons during the processing of personal data, especially their honor and the privacy of the individuals themselves and their family.

The National Cybersecurity and Infrastructure Protection Center (*Centro Nacional de Protección de Infraestructuras y Ciberseguridad*) is the prime support body of the National Critical Infrastructure Protection System and of the Cybersecurity policies of the Ministry and the Secretary of State of Security. As such it has recently looked into this matter, especially from the viewpoint of critical infrastructure operators. The aim in so doing is to ensure that use of their systems does not flout any legal norm and may also be useful for the ultimate purpose of the National Critical Infrastructure Protection System, namely support of the essential services carried out in the nation's productive and strategic sectors.

Some of the most popular security measures in this context involve video surveillance. It would seem to stand to reason that it should in general be possible to set up video surveillance around strategic infrastructure or at least the infrastructure classed as critical, including the recording of images and sounds. Measures of this type (recording voices and images of potential terrorists) would seem to be fundamental in the fight against criminal activities and should also serve as evidence for the identification of people likely to threaten said infrastructure and their essential services. These recording possibilities should take in public spaces and thoroughfares; little would it serve, after all, for these components to have no "extramural" capacities. Cameras pointing only at the infrastructure walls would hardly be likely to offer proper protection.

It would likewise seem to be sensible for infrastructure operators to have access to images of suspects in order to prevent attacks, deny them access, detain them and pass this information on to the country's security corps and forces. In this context the question of data storage is as or even more important than the capture of images and sounds itself.

Another important factor here is that the obligation of keeping a record of processing activity might enable any potential terrorist to gen up on the information processing procedures of critical infrastructure operators. It would only seem to be logical for the processing arrangements for certain data not to be made public when

it may affect public security or the prevention, detection or investigation of possible illicit activity, even when these tasks are not technically being carried out by the state security corps and forces but other law enforcement agents. It should not be forgotten that, since the coming into force of the National Critical Infrastructure Protection System, critical infrastructure operators are responsible for protection of their infrastructure defined as such. And it only stands to reason for this requirement to be accompanied by certain "operational" capacities.

Lastly, mention must be made here of the factor of compatibility between initial data processing and subsequent processing for policing purposes. It would seem to be totally rational for data on critical infrastructure workers, culled and processed for hiring purposes, to be processed and used afterwards for the very protection of this infrastructure.

In any case we will see how GDPR enforcement pans out in the future, especially in terms of effective protection of Spain's national interests from a security point of view.

TURTLE PRIVACY

MARIANO BENITO, CISO of GMV's Secure e-Solutions sector and coordinator of the Operational Technical Committee of the Spanish chapter of Cloud Security Alliance

Who doesn't love turtles? Fetching animals that have been living on the earth since the Triassic **(1)**, 220 million years no less. Some of us would even have had one as a pet. Part of this species' survival success is based on a perfect awareness of its security needs: its shell is a fantastic physical security measure. Whenever the turtle senses danger, head and feet are withdrawn inside the shell, preventing any harm by its predators. Simple but effective.

But do turtles have privacy needs? Privacy is a human right, created by law by our species and applied solely to persons. In truth I very much doubt that turtles have the faintest idea what privacy is.

The best way of achieving privacy, however, is application and enforcement of measures that have been classified and developed historically in the field of information security. Small wonder: a predator cannot attack a turtle's head once it's been withdrawn in the shell; neither can the paparazzi get a snapshot of its face. A firewall or card-operated access door ensures that the communications entering a network or the people entering a room are duly authorized to do so, just as weasels and other animals do in their burrows, using similar access control mechanisms.

This dual validity of classic information security measures is also recognized in the most recent privacy-based legal text, Europe's General Data Protection Regulation (GDPR) **(2)**. Its article 32.1.b. calls for implementation of: "*appropriate technical and organizational measures to ensure a level of security [...] including inter alia as appropriate [...] the ability to ensure the ongoing confidentiality, integrity, availability and resilience of processing systems and services.*"

Some there are, therefore, who confuse the concepts of security and privacy. There are certainly similarities between them. As has already been said, both include among their objectives the guaranteeing of the three factors of confidentiality, integrity and availability of personal data. Security seeks to guarantee these same objectives for other information besides personal data. Even more importantly, the relative weight of the factors varies: Security strikes a balance between

them, whereas privacy prioritizes confidentiality over the other two. In the event of a security incident in any service handling personal data, therefore, a privacy-oriented approach would prefer the service to be shut down (during the shortest possible period), rather than the service remaining available with the corresponding risk of the theft or distribution of the personal data concerned. A security-oriented approach, on the contrary, would weigh up all needs and might well come to a quite different conclusion.

In any case technical and technological knowledge of security controls, of measures that might be brought in to improve our capacity of assuring our information, our systems, our persons, our organization would be a sine qua non of privacy success.

Historically privacy has always been linked to the legal field, a "lawyers' affair". And given that privacy is laid down in laws as a right of individuals, a legal knowledge of how this right is handled in each country is essential, from its bases to the detailed requirements to be met, whether declarations of the interested parties, forms to be filled in and the contents of same, guarantees furnished and exercising of rights by persons, internal and government procedures, the need of inspections or inspectors, the penalizing regime and, fundamentally, the relation between this right and remaining laws. In this sense the GDPR pools the current privacy requirements of the 31 countries of the European Economic Area, simplifying its compliance, especially for multinationals.

In short privacy has a lot in common with security. And also quite a lot with laws. But neither technologists nor lawyers can achieve it alone. A shrewd combination of both fields of knowledge is essential to ensure privacy success. GMV is only too well aware of this.

What would a turtle lawyer make of privacy? ¿Or a turtle security consultant? I certainly wouldn't mind hearing them. Just don't forget your shells my friends.

(1) https://es.wikipedia.org/wiki/Testudines

(2) https://en.wikipedia.org/wiki/General_Data_Protection_ Regulation

THE ROLE OF DATA IN MADRID'S HEALTH SERVICE. THE STRATEGY FOR GUARANTEEING PROTECTION AND PRIVACY

JOSÉ ANTONIO ALONSO, Director General of Healthcare Information Systems of Madrid's Regional Authority

■ Personal data protection is a fundamental right recognized in article 18.4 of Spain's Constitution and dealt with in the new General Data Protection Regulation (GDPR) and the development regulation of Spain's Data Protection Law (LOPD).

Royal Decree (*Real Decreto*) 1720 of 21 December 2007, approving the development regulation of Spain's Data Protection Law 15 of 13 December 1999 (*Ley Orgánica de protección de datos de carácter personal*: LOPD), lays down in its articles 80 and 81 the security measures required for files and processing, broken down into three levels: basic, medium and high.

Healthcare data in particular, deemed to be in need of special protection, calls for high-level processing security measures. It is therefore an overriding priority for Madrid's Regional Health Ministry (*Consejería de Sanidad de la Comunidad de Madrid*) to guarantee the security of our citizens' health information.

For its part the new General Data Protection Regulation (GDPR), lays down in its article 5 the principle of integrity and confidentiality, establishing in turn the need of ensuring the appropriate security of the personal data, including protection against unauthorized or unlawful processing and against accidental loss, destruction or damage. This obliges government authorities and companies to set up technical and organizational measures to ensure information security.

As custodians of the healthcare data of our patients, the real owners of their healthcare data, we are bound to guarantee its integrity and confidentiality. We are working away on this nonstop, doing so by setting up physical and logical security measures, training and raising the awareness of our information security professionals, implementing good practices in the use of information systems while also providing our citizens with secure channels (compliant with the National Security Scheme) for direct access to their healthcare information, such as the Healthcare Portal of Madrid region or initiatives such as My Healthcare Folder. All these tools are made available to our citizens for access to their healthcare information as well as a host of healthcare-related services.

INFORMATION SYSTEM SECURITY OFFICE

Our Information System Security Office (*Oficina de Seguridad de Sistemas de Información*), depending on the Directorate General of Healthcare Information Systems (*Dirección General de Sistemas de Información Sanitaria*) of Madrid's Regional Healthcare Ministry (*Consejería de Sanidad*), has been helping us to detect, prevent

and respond to threats and incidents for over 10 years now, working also as consulting body on Madrid region's healthcare security policies and measures.

From this office we provide both legal and technical support via a multidisciplinary group of specialists in IT law, IT auditing and standards and ICT project management and infrastructure-, network- and communication-security. This double-headed specialization, legal and information-security technology, enables us to offer complete responses to any demands that might crop up within our organization.

We work under an all-in security model, allowing us to cater for all information security consultancy needs, taking in legal and technical advice, certified training of our own professionals, guidance and awareness-raising in the setting up of good security practices, legal and technical consultancy in all fields and monitoring and control. This is carried out by means of assessment of security indicators, which are then phased into our center's program contract whereby we gauge our professionals' productivity and goal-achievement performance.

Our Information Security Management System has been certified under ISO 27001 since 2013. This cyclical system of analysis, revision and continuous improvement enables us to phase in nonstop upgrades, with the overall goal of achieving a suitable security maturity level of our center's information systems, ensuring service continuity and guaranteeing information confidentiality and integrity.

Since enforcement of the new GDPR on 25 May 2018 our security procedures have undergone significant changes. The traditional program of environmental and physical security audits (which we have been carrying for some years in our datacenters), health-record and critical-application audit trails, audits of wireless networks and our centers' security diagnoses has been fleshed out this year with datacenter risk analysis, phased into the program contract signed with our centers as additional indicators of obligatory compliance. This allows us to assess the impact on the organization and bring in security measures that help to mitigate any risks.

We have been working since 2016 to bring our security measures and policies into line with the new GDPR.

One of its most important new features is the Data Protection Officer (DPO), a figure of huge importance within the whole scheme. In the case of Madrid's regional healthcare ministry the official DPO is the Data Protection Committee (*Comité Delegado de Protección de Datos*), made up by a president, secretary and members representing the various Directorates General; its advisory body is the Information Systems Security Office (*Oficina de Seguridad de Sistemas de Información*).

Our Security Operations Center (*Centro de Operaciones de Seguridad*: SOC) provides a comprehensive prevention and protection service on a 24x7 basis, including all the following: active hardware and software monitoring with detection of any vulnerabilities; application of preventive and corrective patches; early warning systems to flag up any threats; security event log correlation and log management, by means of network-traffic monitoring probes in search of suspicious behavior, flagging up any attacks or intrusions; advanced malware analysis; forensic analysis tests and pentesting, conducted in secure and controlled environments for system-vulnerability analysis; management of security device configuration such as application of security policies; firewall and network-component filters, etc. plus Cybersecurity consultancy and advice, with analysis of external threats.

Without a shadow of a doubt healthcare data is one of our organization's most important assets. We are therefore duty bound to protect and govern it properly especially in light of the increasing takeup of new information technologies that now enable us to analyze, compare and study data in a way that would have been inconceivable only a few years ago.

ME

MAR ESPAÑA

DIRECTOR OF THE AGENCIA ESPAÑOLA DE PROTECCIÓN DE DATOS

LC

LEONARDO CERVERA NAVAS

DIRECTOR EUROPEAN DATA PROTECTION SUPERVISOR

The European Data Protection Supervisor and the Spanish Data Protection Agency (*Agencia Española de Protección de Datos*: AEPD) are the data-protection watchdog bodies in Europe and in Spain, respectively. The coming into force of Europe's General Data Protection Regulation has spurred creation of the European Data Protection Committee, an EU organization with its own legal personality, pooling the various data-protection bodies from each member country. The Secretariat is held by the European Data Protection Supervisor; this organization, run by Leonardo Cervera, collaborates closely with Spain's own watchdog body, the *Agencia Española de Protección de Datos*, led by Mar España. GMV News has had the honor of interviewing both of them to find out how they are leading this process of safeguarding their co-citizens' privacy.

WHAT WOULD YOU CONSIDER TO BE THE MAIN BENEFITS TO BE BROUGHT BY GDPR TO CITIZENS, COMPANIES AND THE GOVERNMENT?

ME One of the main aims of the General Data Protection Regulation (GDPR) is to strengthen individuals' control over their own personal data. To this end the GDPR subsumes already existing rights and grafts on new ones. For example, the right to data portability, whereby data subjects who have handed over their data to a controller for automatic processing, for example a social networking site, are expressly entitled to request recovery of this data and its unhindered transfer to another controller.

The GDPR also represents a substantial change in the compliance model for both data controllers and processors. This new model revolves around the concept of proactive behavior by data controllers based on an analysis of the real risks posed by their processing activity.

Despite the effort this might entail, I believe it's important to bear in mind that coherent processing of personal data not only guards against legislation breaches but also represents an asset that can help to boost companies' competitiveness and also the trust of data subjects.

But the GDPR represents a qualitative leap not only for companies but also for government authorities, treating them both alike. In the case of government authorities it should be borne firmly in mind that the GDPR empowers EU member states to lay down specific data processing conditions when this processing is based on the exercising of a public power or the performance of a task of public interest. The fact that the same principles are applied to the private and public sector is positive, but neither should the latter's special characteristics be overlooked.

LC First and foremost I'd like to stress the importance of GDPR's legal formulation. A Europe-wide regulation means data protection standards will now be uniform throughout the whole Union: any European citizen will now enjoy the same data protection level regardless of whether he or she lives in Italy or in Finland, for example. Likewise, the regulation is equally binding on the private and public sector.

Secondly, GDPR introduces an advance data protection system based on the concept of accountability or proactive responsibility of the data controller, who must now not only abide by the regulation's obligations but also be prepared to demonstrate this. As a corollary of this accountability, the data controller is bound to keep a record of data protection activities and the regulation lays down whopping fines for any slackers.

The accountability principle and the fining system recall the environmental law principle of 'the polluter pays'. Both elements redound to the direct benefit of citizens inasmuch as they will largely prevent abusive practice and data breaches, thus boosting the trustworthiness that is one of the central pillars of any well-functioning economy and government.

The regulation lays down clear responsibilities but also reinforces citizens' rights and their control over their own data, establishing new rights too like the right to erasure ('right to be forgotten') and above all the right to data portability plus the restrictions on profiling-based decisions producing legal effects. The latter is crucial as advances in artificial intelligence mean that computers are now becoming able to take more or less autonomous decisions for themselves.

GDPR also introduces the two principles of privacy by default and privacy by design. These two principles encourage controllers to take data-protection into account when setting up their products and services. In other words they now have to think about data protection right from the start of any process, i.e. "from cradle to tomb" as this principle is usually expressed in environmental law.

But the regulation also gives companies a fair bit of leeway in terms of implementing their protection policies. This is the other side of the accountability coin: those who process data are responsible for its protection but in exchange they are given a lot of slack to be able to suit their data protection policies to the needs of their particular business.

CAN YOU GIVE US SOME IDEA OF THE EUROPEAN UNION'S GDPR-IMPLEMENTATION SUPPORT INITIATIVES, AND ESPECIALLY THOSE BROUGHT IN BY THE EDPS?

ME AEPD has been working away busily during the last two years with the clear aim of raising GDPR awareness and helping those bound to observe it. This has involved drawing up a series of materials, resources and tools, all of which are available without charge on AEPD's website in the interests of bringing the regulation to wider notice and helping all concerned to comply with it. This includes a set of GDPR guides. The guide written for data controllers explains compliance with the breach-reporting obligation and contracts between controllers and processors.

AEPD has also launched FACILITA, designed to make GDPR compliance more straightforward for low-risk data processors posing little threat to data subjects' rights and freedoms. FACILITA also furnishes processing-activity recording forms, informative clauses, processor contracts and guidelines on the security measures to be brought in, in each case tailored to suit each organization. None of this documentation can guarantee GDPR compliance but it will no doubt help in that endeavor.

The Agency has also drawn up guides for organizations whose processing activity poses a high risk, such as the Guide to Risk Analysis and the Guide to Impact Assessments for cases where the risk analysis in itself is not enough. These resources are topped up with a List of Regulatory Compliance Elements and Guide to Security Breaches, plus other contents like the Roadmaps for GDPR adaptation to the private and public sectors.

LC The European Data Protection Supervisor has no legislative remit; rather is it the European institutions and agencies' data processing control authority on the basis of a special regulation, different from the GDPR, which sets out the appointment and duties of the supervisor. This regulation has been revised in light of the GDPR and will come into force next autumn; this means the data protection standards of European institutions will be equivalent to those of member states. We are now helping EU institutions to negotiate this transition towards the new data-protection standards of the GDPR.

Another important EDPS contribution to GDPR development is the provision of the secretariat of the new European Data Protection Board (EDPB), which is a new EU body created by the GDPR. The EDPB has its own legal personality, and its founding remit is to ensure uniform GDPR enforcement throughout the European Union, doing so by setting up close cooperation arrangements between national control authorities plus a coherence mechanism. This body is independent of the EDPS, but in recognition of the EDPS's experience and to avoid overlaps, European law has given it the responsibility for providing this Board with the personal and material resources for carrying out its function.

¿HOW IS THE EUROPEAN DATA PROTECTION SUPERVISOR COLLABORATING WITH NATIONAL SUPERVISION BODIES AND THE AEPD IN PARTICULAR?

ME AEPD's relations with the European Supervisor have always been cordial and cooperative. At this particular time this cooperation is being stepped up in line with the European Data Protection Committee (EDPC).

The GDPR designates the European Data Protection Supervisor to host the EDPC secretariat. One of GDPR's innovations is precisely this Committee, which has its precedent in the Data Protection Working Party of Article 29, but its characteristics are different. The European Committee has its own legal personality under the EU whereas the Working Party was a cooperation and analysis forum with limited powers in this terrain. EDPC's powers, on the contrary, are much more highly developed, including the right to take legally binding decisions to solve any GDPR-application or -compliance conflicts that might crop up between members or issue opinions to back up authorities' activities in certain matters. This is why the existence of this new

committee is so crucial as the body where the cooperation of all authorities will come together, including the European Supervisor.

LC European Supervisor's relationship with the la AEDP, which, by the way, is a data protection byword in the European Union, is excellent. Slightly less than a year ago the AEPD director honored us at EDPS with a visit, giving us a chat on the looming challenges and her view of the future. The AEPD, thanks to the praiseworthy work of its employees and excellent leadership of its directors, is one of the leading authorities in Europe and Latin America. Its current director, Mar España, has added a telling strategic touch to the thoroughgoingness of all her forerunners.

> «One of the main aims of the General Data Protection Regulation (GDPR) is to strengthen individuals' control over their own personal data»
>
> *Mar España*

EDPS, as well as providing the secretariat of the new EDPB, is also a member of the board and cooperates very closely with the other control authorities.

THE DEGREE OF PRIVACY DEVELOPMENT AMONG THE VARIOUS MEMBER STATES IS PATCHY. WHICH COUNTRIES DO YOU SEE AS BENCHMARKS IN THIS SENSE AND HOW DO THEY STAND OUT?

ME In the EU as a whole the average level of data protection is high. The EU passed its Directive 95/46 back in 1995; this has since served as member states' common data-protection baseline for over two decades, based on data protection as a right for all citizens.

It's true that some countries have more longstanding and extensive data-protection traditions, for cultural, social or even legal reasons. Germany, for example, passed Europe's first ever data-protection law and also set up the first ever Data Protection Commissioner back in the seventies of last century. Another important factor here is that both practice and outlook differ from one country to another. Scandinavian countries also tend to have a different approach to data protection from Mediterranean countries.

In the legal terrain Spain's data-protection law (*Ley Orgánica de Protección de Datos*: LOPD), no longer fully in force, is probably one of the laws most faithful to the Directive's contents and objectives. It is also quite likely that, of all European Agencies spawned by the Directive, Spain's is one with the most highly developed powers in terms of informative, awareness-raising and penalizing procedures. I believe this has helped to nurture in Spain a greater data-protection culture than in other EU countries.

LC This patchiness among member states is undeniable. Indeed, it's one of the reasons why a regulation has been passed instead of a directive, leaving states a certain margin of appreciation precisely to close these gaps. Each member state has its own data-protection idiosyncrasies. Germany, for example, has a decentralized system with control authorities in each länder; the Netherlands already had a data-breach notification system in place beforehand. Spain is without doubt a data-protection benchmark at European and international level, since even before the GDPR; its own data protection law is strong and longstanding and it has a control authority empowered to penalize any breach of data protection principles.

WHICH PRIVACY AWARENESS-RAISING MEASURES WOULD YOU DEEM TO BE MOST EFFICIENT?

ME First and foremost I would like to draw attention to FACILITA, which is designed to help SMEs and the self-employed to comply with data-protection legislation themselves without resorting to third parties, experts or companies that wish to cash in and offer their services on a so-called zero-cost basis. FACILITA has by now clocked up over 450,000 hits in its Spanish version.

That said, where AEPD has made its biggest effort is probably the task of bringing the GDPR to wider notice, by means of meetings, sessions, conferences, workshops and encounters with enforcers, both in the public and private sector. Informative sessions have now been held with entrepreneurial organization from almost every Spanish region. We have held encounters and workshops with activity sectors where data processing is essential, such the major distribution chains and the sectors of tourism, power supply, gas and publicity.

The self-employed or liberal professionals have also come into the Agency's sights, special heed being paid to the healthcare sector. This has been done by means of informative and awareness-raising activities or participation in the programs of other institutions, such as the sessions on the digitalization of SMEs given by Red.es. Other actions were targeted at other groups and government authorities, making sure they hit the ground running in terms of GDPR compliance.

In all likelihood all these actions taken together have helped to ensure that 63.5% of SMEs are aware of the GDPR and 59% of the obligations it stipulates, as recorded in a survey on Spanish companies' degree of GDPR readiness, held by AEPD together with the Spanish SME Confederation (*Confederación Española de la Pequeña y Mediana Empresa*: CEPYME).

LC Data protection is a fundamental right enshrined in the treaties setting up the European Union. This right is also intimately linked with the concept of human dignity, which the European Charter of Fundamental Rights lays down as an inviolable principle in its very first article. Personal data is a very wide-ranging concept; data could be almost anything, from an email address to a credit card number or medical diagnosis.

If data are processed well and rationally, citizens are then protected from any discrimination (on the grounds of health, for example) or theft (internet phishing, for example) and society as a whole is stronger and freer.

Education is vital; it is essential for citizens to comprehend that they have these rights and that their data has to be processed responsibly. It is equally essential for personal-data processors to be aware of the tenor of the law and their responsibilities. This is why I believe that data protection should be taught from the schools up. In the digital era data protection should be part and parcel of the education given on new technology. Pre-teenage children have to be taught not only the opportunities that technology offers but also the concomitant risks.

The goal, at the end of the day, is very simple: to inculcate a privacy-respecting, data-controlling culture. This is where awareness-raising actions come in, such as conferences, information campaigns and education from the schools up.

GDPR IMPLEMENTATION IN ORGANIZATIONS CALLS FOR THE SUPPORT OF SPECIALIST COMPANIES. WHAT ROLE DO YOU SEE THESE SPECIALIST SERVICE PROVIDERS PLAYING IN GUARANTEEING CYBERSECURITY AND DATA PRIVACY?

ME In a context evermore heavily influenced by SME digitalization and the use of artificial intelligence, it is important to remember that its data is any company's biggest asset and its reputation will depend greatly on the ability to protect properly the personal data it is processing.

Just as there are organizations that might need external consultancy in matters like taxes, the environment or the prevention of occupational risks, external consultancy services might also come in handy in the field of data protection in certain circumstances, bearing in mind the sheer volume and complexity of processing arrangements.

It is also crucial to bear in mind here that the GDPR looks out for effective citizen protection, so whether the consultancy is external or internal, it must be carried out by skilled professionals who can guarantee a top-quality service.

LC It's hard for EDPS to pronounce on this point because we have no practical experience with these service providers such as consultants and specialist lawyers.

Our recommendation is that, as far as possible, the data protection officer (DPO) should form part of the firm. After all, if data protection advice and consultation is to be truly useful and constructive, it can only come from an in-depth knowledge of the particular business's needs. It's understandable that SMEs might want to outsource this function but in organizations of a certain size, involving a substantial amount of personal data processing, it should be possible to designate a DPO on at least a part time basis, to deal with the matters and be regularly invited to board meetings, as is the case of other internal control officers.

ONE OF THE MOST EYECATCHING GDPR MEASURES IS THE OBLIGATION OF NOTIFYING ANY PERSONAL DATA SECURITY BREACHES. WHAT RECOMMENDATIONS WOULD YOU GIVE TO ORGANIZATIONS OF COUNTRIES LIKE SPAIN THAT HAVE NEVER HAD TO DEAL WITH THIS OBLIGATION BEFORE?

ME This measure is not totally new. In Spain an incident recording obligation already existed. The difference now is that this incident has to be reported to the control authority whenever the security breach poses a risk to individuals' rights and freedoms. Said incident must be reported without delay and within a maximum deadline of 72 hours.

It should be borne in mind here that security breaches do not always have to be reported, only when they jeopardize the rights and freedoms of the data subjects concerned. Another factor to remember is that notification does not always imply a penalty. Indeed, security breaches are reported in the first instance to the Agency's Technological Studies and Assessment Unit (*Unidad de Evaluación y Estudios Tecnológicos*: UEET).

LC My recommendation is that they think ahead, that they set up prevention mechanisms beforehand, because prevention is better than cure. The ideal situation would be for security breaches never to occur, but if they do, it's vital for the data controller to have a damage-limitation procedure in place and to make an effective notification within the regulation's deadline.

THIS NEW FIGURE OF THE DPO IS ONE OF THE SECTOR'S MAIN CONCERNS AND PREOCCUPATIONS. WHAT SKILLS AND ABILITIES DO YOU THINK A SUCCESSFUL DPO SHOULD HAVE?

ME The Data Protection Officer (DPO) necessarily has to be appointed by any organizations that process data on a large scale or deal with sensitive data. To this extent we might even speak of a new profession. His or her duties include all the following: informing controllers, processors and employees involved in data processing of their GDPR obligations; supervising GDPR compliance and also observance of other data protection provisions of the EU or member states; offering advice on data-protection impact assessment and cooperating with the control authority and liaising with this authority for any processing questions.

Data protection officers must in any case always have the necessary skills for the job and, in particular, specialist knowledge of law, data-protection practice and the necessary capabilities for performing GDPR duties.

Moreover, the Agency has also promoted a DPO certification scheme to ensure the people who are going to fulfil this profession and the organizations hiring them are endowed with the necessary security and trustworthiness. Although this certification is not a DPO eligibility requisite we do believe that this scheme does help to accredit the necessary DPO skills and professional capacity, and also furnishes controllers with a market-trustworthiness benchmark.

LC In fact the DPO has been a recognized figure in European agencies, institutions and bodies for a decade now. For example, the European Parliament and the European Commission both have their own DPO, helped by a small team of people. The DPO has been crucial for the ongoing development of data protection in European institutions.

Taking my inspiration from the experience we have built up with these European DPOs, I believe that the overarching mission of a national DPO should be to encourage a data-protection culture in the company or organization concerned in each case. His or her remit is to inform, guide and advise on data protection, but also to supervise its proper enforcement.

So a successful DPO should not only be a troubleshooter but also someone who participates proactively in any business developments that might impinge on users' privacy, thus heading off future problems such as a breach or accidental leak, for example, which might make the firm liable to a big fine and significant reputational damage.

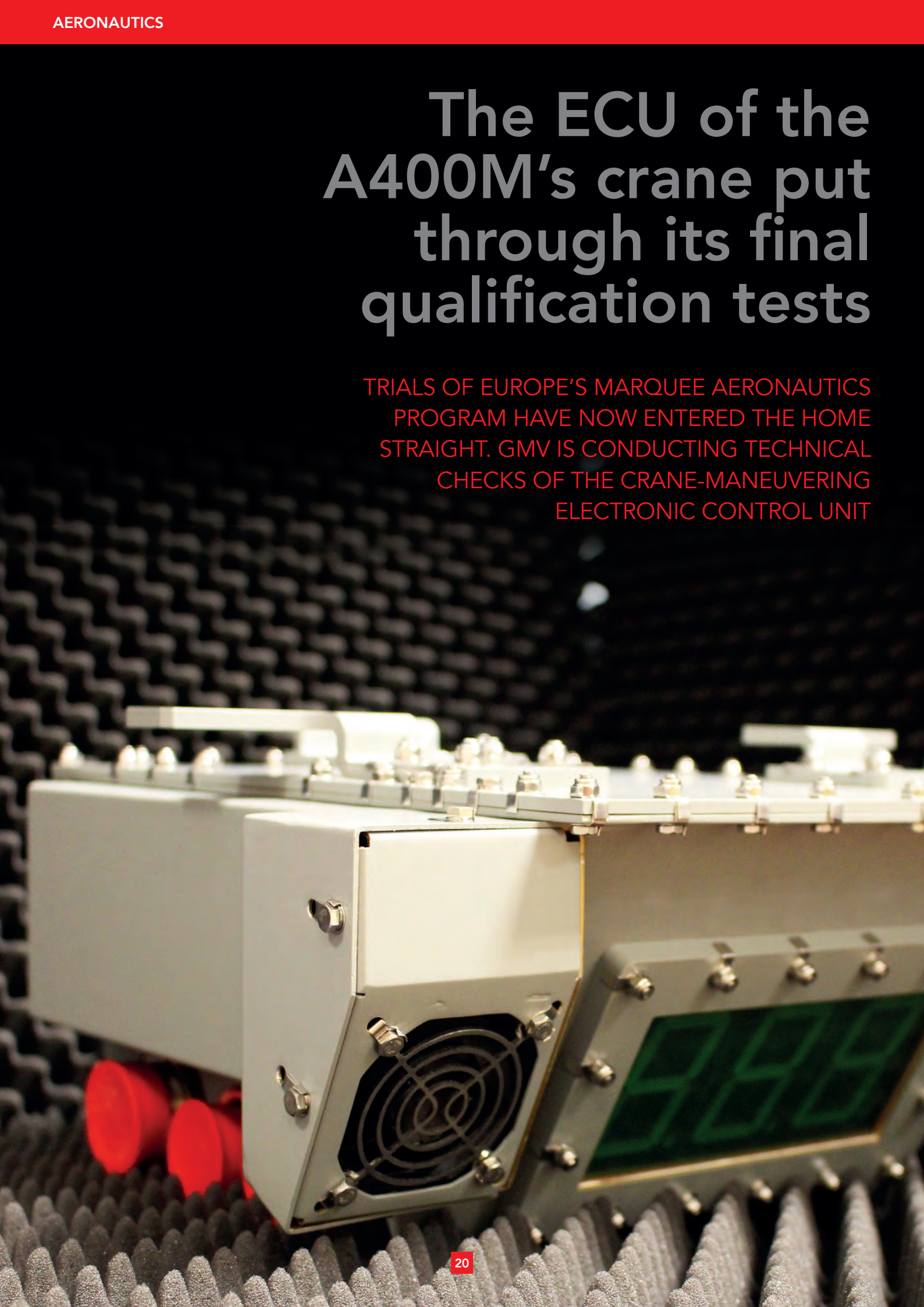
In sum, a DPO should be proactively preventive and set up a relation of leadership and confidence with the organization's decision makers. A good or bad in-company DPO is often the difference between organizations that have managed to interiorize the data protection culture and those who haven't.

«Any European citizen will now enjoy the same data protection level regardless of whether he or she lives in Italy or in Finland»

Leonardo Cervera

The ECU of the A400M's crane put through its final qualification tests

TRIALS OF EUROPE'S MARQUEE AERONAUTICS PROGRAM HAVE NOW ENTERED THE HOME STRAIGHT. GMV IS CONDUCTING TECHNICAL CHECKS OF THE CRANE-MANEUVERING ELECTRONIC CONTROL UNIT



In recent months the Electronic Control Unit (ECU) of the Airbus A400M's crane system has been put through a rigorous qualification-test campaign.

The Airbus A400 is a long-range strategic transport and air-tanker aircraft. It is due to replace the C-130 Hercules and the C-160 and represents one of the most important tractor programs of Europe's aeronautics industry. This aircraft has been specially designed to achieve high-speed loading and unloading without any need for specialist ground support staff. For this purpose its crane system runs on built-in fuselage rails, enabling up to 5 tons of cargo to be hoisted aboard and transported.

Developed by GMV for CESA (*Compañía Española de Sistemas Aeronáuticos*), the ECU has the function of controlling and braking the crane's motors according to the operator's orders and the data furnished by system sensors (loading cells, proximity sensors fitted along the rails, inclination sensors of the crane cable, temperature and speed sensors of the engines, etc.).

GMV's activity within the development of this onboard equipment, starting back in 2015, takes in not only the design and manufacture of the unit, under the strictest aeronautical standards such as DO-178B and DO-254, plus numerous inhouse Airbus standards, but also its supply for all A400M aircraft throughout their whole useful lifecycle, lasting at least 30 years.

Within this test campaign GMV is conducting electric- and electromagnetic-compatibility-tests. July also saw the start of lightning-strike tests, carried out in the National Aerospace Technology Institute (*Instituto Nacional de Tecnología Aerospacial*: INTA), to confirm that the ECU still works properly even when the aircraft is hit by lightning. The lightning-strike test forms part of the last phase of tests before the start of series production of the equipment, the first delivery of which is scheduled to be fitted in an aircraft in the coming months.

This project complements GMV's other activities within the A400M program, involving participation in engineering simulators (especially landing gear simulation models) and modelling of the mission-planning system. The project also follows on from a strategic line of other complete aeronautic developments (hardware and software) and avionics projects such as the flight computer of RPAS ATLANTE.

Seville hosts the 4th ADM

For yet another year, the aeronautics and aerospace sector met up in Seville's Aerospace & Defence Meetings, Spain's most important BtoB meeting within this sector.

To this new edition, held in May, GMV ran a stand showcasing its engineering, critical-software development and system- and equipment-development skills. Featuring prominently in this display were all the following: the Flight Control Computer (FCC) of the long-range, un-crewed tactical aircraft ATLANTE; the navigation and synchronization system for armed-forces vehicles, ISNAV; the electronic control unit for the crane of the strategic transport aircraft A400M; the SGPM-PC system, the voice-and-data communication and image-capturing equipment for fishery surveillance installed onboard the Dauphin AS365N3 helicopters recently transferred to the Guardia Civil's air service; and, last but not least, LGB10, GMV's inhouse ruggedized mission minicomputer that guarantees necessary and optimum connectivity.

This biennial event, which this year attracted a turnout of over 375 organizations and more than 1200 trade professionals, is organized by Andalusia's regional Ministry of Economics and Knowledge (*Consejería de Economía y Conocimiento*) in collaboration with Andalusia's External Promotion Agency (*Agencia Andaluza de Promoción Exterior*) and BCI Aerospace, a specialist aerospace-event organizer.

ESA awards GMV the contract for maintenance and upgrading of Galileo's Ground Control Segment

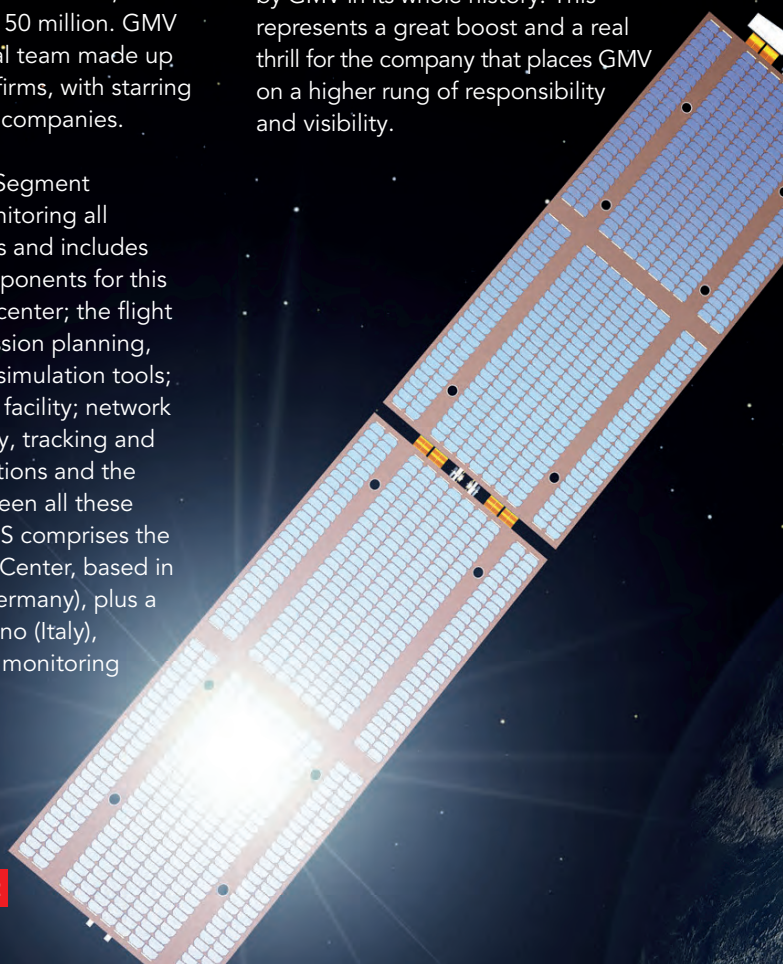
GMV has won the European Space Agency (ESA) contract for maintenance and upgrading of Galileo's Ground Control Segment (GCS). Galileo, the veritable flagship of the European Union's flourishing space business, is Europe's own global navigation satellite system.

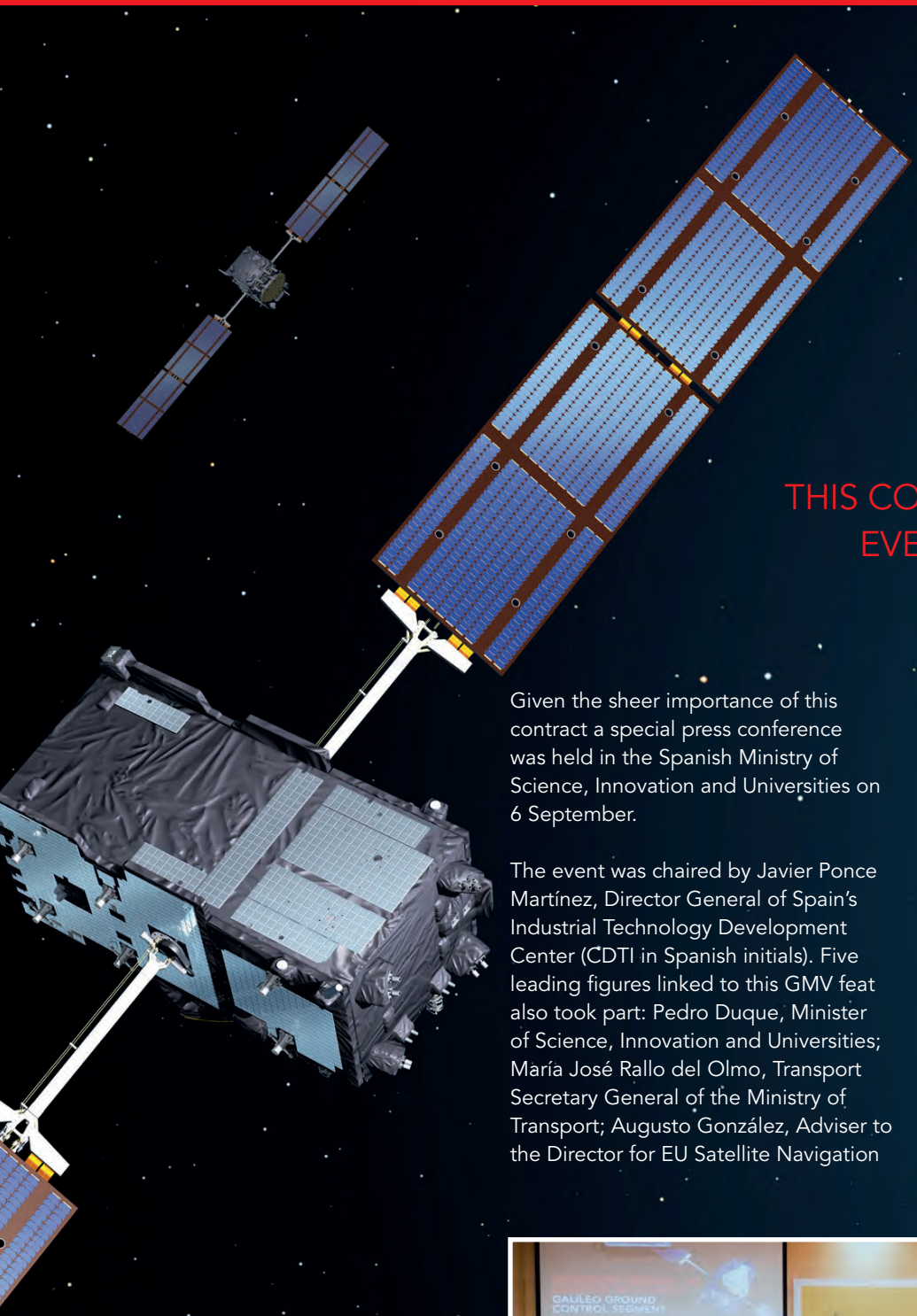
GMV's framework contract with ESA is worth a total sum of €250 million, already including a signed-and-sealed contract for the first Work Order, in itself worth around €150 million. GMV is leading an industrial team made up by several European firms, with starring roles for Group GMV companies.

The Ground Control Segment is responsible for monitoring all constellation satellites and includes all the necessary components for this purpose: the control center; the flight dynamics system; mission planning, operational support; simulation tools; the key management facility; network security; the telemetry, tracking and command (TT&C) stations and the interconnection between all these components. The GCS comprises the main Galileo Control Center, based in Oberpfaffenhofen (Germany), plus a backup center in Fucino (Italy), as well as the various monitoring stations spread throughout the world.

As well as taking on critical GCS items, GMV, as part of its overall responsibility for the whole ensemble, will also see to management of all the abovementioned functions, in all the sites identified, doing so in liaison with the subcontractors of the various components and the European Space Agency (ESA) itself, as client.

This contract is the biggest ever signed by GMV in its whole history. This represents a great boost and a real thrill for the company that places GMV on a higher rung of responsibility and visibility.





THIS CONTRACT IS THE BIGGEST EVER SIGNED BY GMV IN ITS WHOLE HISTORY

Given the sheer importance of this contract a special press conference was held in the Spanish Ministry of Science, Innovation and Universities on 6 September.

The event was chaired by Javier Ponce Martínez, Director General of Spain's Industrial Technology Development Center (CDTI in Spanish initials). Five leading figures linked to this GMV feat also took part: Pedro Duque, Minister of Science, Innovation and Universities; María José Rallo del Olmo, Transport Secretary General of the Ministry of Transport; Augusto González, Adviser to the Director for EU Satellite Navigation programs; Paul Verhoef, Director of Navigation of the European Space Agency (ESA); and Jesús B. Serrano, GMV's CEO.

Besides these A-list guests other representatives from the various European organizations involved in the project were also present: European Commission, GNSS Agency and ESA; high-ups from public institutions; delegates from government authorities and the various ministries involved; representatives from academic organizations plus representatives from the private sector too.

GMV presents the results of the Galileo Regional Service GINAMIC project

On 6 June GMV presented in Brussels the main results of the GINAMIC project (Galileo Innovative Advanced Mission Concepts).

GINAMIC's main objective has been to define and study the feasibility of a Galileo Regional Service in Europe, in order to improve navigation performance in adverse and high-latitude environments. It has also looked into the potential provision of additional communication services, while also searching for synergies with the European EGNOS augmentation system.

The GINAMIC project, forming part of the European Commission's Horizon 2020 (H2020) research-and-innovation framework program, has been carried out by a GMV-primed consortium including also VVA (Belgium), NSL (UK) and ADS (Germany).

The presentation formed part of the "EGNSS, Research and Technology Development" congress, organized by the European Commission in collaboration with the European Space Agency (ESA) and the European GNSS Agency (GSA), to present to member states the recent results of this H2020 European GNSS (EGNSS) program, which kicked off back in February 2016.

These results were keenly received by members of EU states, of EC, of ESA and GSA attending the event

GMV and Tecnobit to tailor Skydel SDX GNSS simulator for Europe

GMV, Tecnobit and Skydel have signed a collaboration agreement under which SDX, Skydel's GNSS simulator, will be brought into line with the latest Galileo developments. The overall aim is to provide corporations, universities, and research labs with a reliable, advanced simulation system that closely follows the latest Galileo capabilities.

Drawing on SDX's unique software-defined architecture, this three-way alliance is now working to make Skydel's solution compatible with Galileo's Public Regulated Service (PRS).

Skydel and GMV are also joining forces to develop SDX's capabilities for signal authentication with Galileo's Commercial Service (CS) and Open Service (OS). The idea is to increase the safety level of signals and head off their falsification or fraud; this is currently a unique feature that only the Galileo constellation can offer. Skydel and GMV are also collaborating on projects that aim at providing signal simulation solutions for Galileo's second generation (G2G) satellites, slated for launch in 2025 and beyond

The partnership between the three companies truly unites the unique strengths of each one. While GMV brings its expert knowledge of both the European market and the Galileo system and Tecnobit brings its expertise as developer of cryptographic systems, Skydel adds its versatile and extensible GNSS simulator, resulting in a solid technical and commercial synergy for establishing an improved GNSS service for Europe.

How can Earth Observation data help in climate adaptation activities

Satellite Earth Observation (EO) technology has major potential to inform and facilitate international development work in a globally consistent manner. Since 2008, the European Space Agency (ESA) has worked closely together with International Financial Institutions (IFIs) and their client countries to harness the benefits of EO in their operations and resources management.

In this context, GMV leads the consortium set up to run the Climate Resilience project of the EO4SD (Earth Observation for Sustainable Development) programme, the ESA´s initiative Earth Observation in support of climate adaptation, which aims to achieve a steady increase in the uptake of satellite-based environmental information in the IFIs' regional and global programmes. Applying a systematic and user-driven approach, longer-term, strategic geospatial information needs are met in specific developing countries. Among the identified thematic priorities of EO4SD, the focus of this activity is placed on climate resilience.

While there is not only a scientific consensus on the reality of climate change, climate change is also one of the most important societal challenges humanity is currently facing. Its impacts on socio-economic systems and vulnerable populations put increasing pressure on the livelihoods of developing countries and threaten the majority of the 17 United Nations (UN) Sustainable Development Goals.

The links between development and climate change are clear and need to be addressed. Many national governments are looking to adapt to the impacts of climate change in an effort to improve the resilience of livelihoods and production systems to climate variability and related risks. Climate resilience has emerged as a key concept for policy and programme development and is defined by the Intergovernmental Panel on Climate Change (IPCC) as the ability to anticipate, absorb, accommodate, or recover from climate change in a timely and efficient manner.

In collaboration with key IFIs, this activity will develop an EO-based integrated platform for the provision of climate services, including the screening of climate indicators and assessment of climate change risks to help manage the risks and capitalise on the opportunities related to both human-induced climate change and natural climate variability. The solution shall provide a quick and easy assessment of climate anomalies and rapid calculation of climate risk indicators, their historical evolution and associated extreme events.

GMV is leading the project consortium and participates in the activities for provision of EO-based climate services, capacity building in developing countries and stakeholder engagement.

GMV features at FIA 2018

From 16 to 22 July Farnborough International Airshow 2018, a biennial event held in Hampshire (UK), brought together the cream of the world's aerospace industry.

GMV's aerospace prowess was on show in the Space Zone, located in the British Hall run by the UK Space Agency. Here, the company showcased its skill and developments in space robotics, ground-segment systems and its input to Space Situational Awareness (SSA) programs, among others.

This year's airshow was opened by the UK Prime Minister and attracted a turnout of close to 1500 participants representing nearly 100 countries.

The airshow included a whole host of activities, such as a lively question-and-answer session with three special guests: Al Worden, a retired American engineer and Apollo 15 astronaut; Tim Peake, a British ESA astronaut; and Shini Somara, Doctor in Mechanical Engineering and BBC science reporter.

Other prominent features in the action-packed agenda were the debating forums, the Meet the Buyer zone devoted to networking or the innovation spaces and initiatives such as the Future Days, designed to encourage youngsters into STEM careers. As part of this same initiative the UK Space Agency's Tim Peake also launched the competition to name the ESA's ExoMars rover due to land on Mars in 2021.

During the event the UK Space Agency set out some of the milestones that will mark out its mid- and long-term future, such as a new British spaceport to be built in the Scottish county of Sutherland.

GMV works to demonstrate the efficacy of new forms of measuring navigation time

The Galileo System Time (GST) timescale is the cornerstone for the operations and performance of the Galileo System. GST should be stable, traceable and always available. The current system time is provided by an ensemble of on-ground atomic clocks.

A time scale built with pulsar measurements, i.e., measurements from celestial objects emitting radiation in pulses, would typically be less stable than one built using atomic or optical clocks in the short term, but could be competitive in the very long term (several decades, a period over which individual atomic clocks will cease to work). An additional advantage of a pulsar time scale is that it would be independent of the clock technology for the generation of the oscillation mechanism (neutron star rotational period as opposed to atomic transitions in Rubidium, Caesium or Hydrogen atoms).

In this context, GMV is leading a consortium comprising the University of Manchester and UK's National Physical Laboratory (NPL) for the development of the PulChron. The objective of the PulChron, abbreviation built with the words "Pulsar" and "Chronos" (Χρόνος), which is the ancient Greek term for "Time",is to demonstrate the effectiveness of Pulsar Timescale for the generation and monitoring of navigation and GNSS time in general, and of GST in particular.

Within the PulChron, a physical clock will be built which will use radiotelescope measurements from pulsars to steer an atomic clock, thereby feeding a Galileo Experimental Station (GESS), and generating an alternative System Time Scale taking the benefits from atomic clocks and Pulsar clocks simultaneously.

The project is funded by NAVISP, the ESA Programme for Innovation and Competitiveness in Positioning, Navigation and Timing.

GMV features at Space Ops

The latest International Conference of Space Operations, SpaceOps 2018, organized by AIAA in collaboration with the French Space Agency CNES, was held from 28 May to 1 June. After previously being held in countries like the Korean Republic, USA and Sweden, the turn has now come of Marseilles in France to host the 15th conference.

Space Ops is the ground-systems and space-missions-operation forum that brings together scientists, academics, operators and representatives from space agencies and research institutes. It aims to provide a platform for exchanging knowledge on methods, trends and tools, responding to the need of harnessing capabilities better and more often and improving the cost-benefit ratio of space missions.

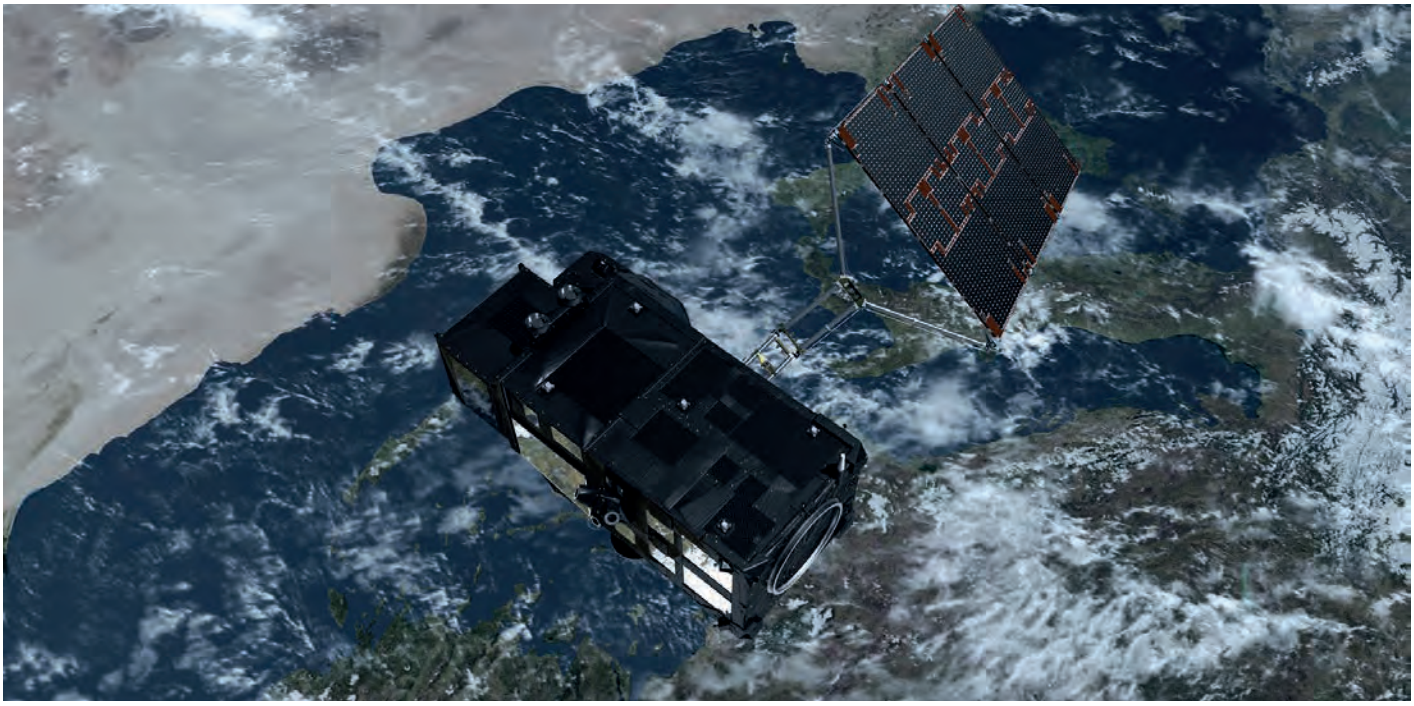
As has by now become a tradition at events of this kind, GMV featured large on the various panels held during the forum. A total of 11 papers were accepted for presentation at the congress, their quality being evidenced by the keen reception in each case.

GMV was equally to the fore in the exhibition area, showing the various clients and visitors GMV's latest inhouse developments, including satellite control systems, planning, flight control and payload-management systems, Cybersecurity and operational support.

One of the star activities showcased was GMV's ongoing responsibility for developing the constellation control system for Oneweb's satellites. The technological challenges posed by this system and the solutions presented in the design represent yet another telling example of GMV's prowess in this field.

Seventh satellite-launch of the Sentinel Earth Observation constellation

THE SENTINEL-3B SATELLITE, TWIN TO SENTINEL-3A, IS NOW IN ORBIT, SUPPLYING INFORMATION ON THE OCEANS, LAND MASSES AND ATMOSPHERE. GMV IS THE AUTHOR OF VARIOUS DEVELOPMENTS IN THE GROUND AND FLIGHT SEGMENTS



At 17:57 GMT on 25 April the Sentinel-3B satellite, just like its twin satellite Sentinel-3A back in February 2016, was blasted into space onboard a Rockot launch vehicle from Russia's Plesetsk Cosmodrome. This is the seventh launch of the Copernicus program's constellation.

The Sentinel-3s make up the most complex pair of satellites of the European Copernicus program. Their main remit is to monitor oceanic parameters such as marine topography, the degree of pollution and sea-level change. But they also give thoroughgoing land-surface information, such as biodiversity, the atmosphere and the planet's ice masses.

GMV has been directly involved in various phases of the project right from conception, including both the flight- and ground-segments. In relation in particular with onboard instruments, GMV has developed the onboard software of the Ocean and Land Colour Instrument (OLCI).

Mention must also be made of the development and delivery of the control center, housed in ESA's European Space Operations Centre (ESOC), from where the mission is monitored during the Launch and Early-Orbit Phase (LEOP) and the commissioning phase, to check the mission meets established requirements. GMV has additionally made a significant contribution to development of the flight control systems, as well as providing satellite-launch support.

GMV has also been responsible for development of the control center required in the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) during the routine mission phase, to which must be added development of the orbital control system, the mission planning system, the Integration, Verification and Validation (IV&V) activities of the whole set as well as support for associated operations.

Last but not least GMV regularly and continually provides the Precise Orbit Determination (POD) service under a EUMETSAT framework contract. This service is necessary for processing and using the mission's onboard instrument data.

GMV has been directly involved in various phases of the project right from conception, including both the flight- and ground-segments

MED-GOLD, working towards sustainable and efficient agriculture

GMV IS TAKING PART IN THE FOUR-YEAR EUROPEAN MED-GOLD PROJECT, WHICH INTENDS TO BRING OUT THE IMPORTANCE OF CLIMATE INFORMATION FOR AGRICULTURE

On 12 June the olive-oil cooperative DCOOP in Antequera (Malaga, Andalucía) hosted the workshop of the European MED-GOLD project (*www.med-gold.eu*) to pinpoint the areas in the olive sector most likely to benefit from climate services.

The purpose of MED-GOLD is to demonstrate the proof-of-concept for climate services in agriculture, especially as a decision-making support tool; it will promote the creation of adapted, highly specialized services based on seasonal and ten-year climate forecasts and even long-range climate projections, taking into account the present and future environmental context.

MED-GOLD is a 4-year, 5-million euro, EU H2020 project. The project is being led by the Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), and the project partnership includes Barcelona Supercomputing Center (Spain), Barilla (Italy), BeeToBit (Italy), National research Council (Italy), DCOOP (Spain), GMV (Spain), Horta (Italy), Joint Research Center (European Commission), Met Office (UK), National Observatory of Athens (Greece), Sogrape Vinhos (Portugal), Universidad Militar Nueva Granada (Colombia), three colleges of the University of Leeds (United Kingdom) and the University of Thessaly (Greece).

This research and innovation project draws on climate prediction models, in-situ climate observations and satellite-based earth observation systems to analyze three staples of the Mediterranean food system: grape, olive and durum wheat. It centers on such parameters as the impact of given climate conditions on crop yield forecasts, pest damage, selection of varieties, planning of farming work, among others.

Workshop European MED-GOLD project

In this first phase of the project various workshops and focus groups have been set up to identify the critical operative and strategic climate-variable and bioclimatic-index-related decisions in the three target sectors. The first was held in Oporto (Portugal) in early May, hosted by SOGRAPE Vinhos to analyze the needs of the wine sector. The second, in mid-May, attended by all the key durum wheat stakeholders, was hosted by Horta in Ravenna (Italy). Finally DCOOP in Antequera (Spain) has held the olive workshop, with the aim of finding out the sector's productive characteristics and pinpointing the relevant climate information, then characterizing and analyzing it to bring out its value as a climate service to support decision making.

All the data and information culled in these workshops is now being analyzed by the consortium before making a start on development of the climate service prototypes best suited to each stakeholder, and planned within the framework of the MED-GOLD project. Another expected result is the replicability of said climate services to other farming sectors.

focusoc

Commercial Collision Avoidance Service based on the Joint Spacecraft Operations Centre (JSpOC) Catalogue

Over the last few years the space debris field has drawn satellite operators' attention due to the growing population of uncontrolled objects orbiting the Earth, all of which pose an increasing risk of collision with operational satellites.

To mitigate this major threat GMV has started to provide some of its customers with a service from its ***focusoc*** (focus Operations Center) based on an ad-hoc augmented catalogue derived from the Special Perturbations (SP) catalogue provided by JSpOC (Joint Spacecraft Operations Centre).

GMV is targeting a cost-effective solution tailored to customer needs (in terms of availability, accuracy, timeliness, etc.) while avoiding superfluous functionalities and excessive performances not required for the delivery of a set of Conjunction Assessment (CA) and Collision Avoidance (COLA) services perfectly suited to their needs.

The main objective of the CA service is to detect upcoming conjunctions of operational satellites with other space objects, assess associated collision risk and support collision avoidance operations in case of high probability. A second service level can be activated upon demand and consists of the collection of optical data for collision risk assessment refinement.

The ***focusoc*** services are available through the service desk with 24x7 access for operators. Additionally, GMV provides specific manned support on a daily basis, mainly by email and telephone. At present GMV is providing this service in a trial period. Thirteen satellite operators are currently assessing the ***focusoc*** service. GMV will continue investing effort in this initiative to satisfy the high expectations generated among the satellite operator community.

GMV is targeting a cost-effective solution tailored to customer needs

GMV develops the operational simulator of Sentinels 1C and D

A GMV-led consortium also involving Terma has won the contract for developing the operational simulator of the C and D satellites of the Sentinel 1 mission of the Copernicus earth-observation program.

Sentinel-1 is an imaging radar satellite, designed to provide continuity of crucial data for user services, initiated with ERS and Envisat satellites, in particular for the following objectives: monitoring sea ice zones and the arctic environment; surveillance of the marine environment; monitoring land-surface motion risks; mapping of land surfaces: forest, water and soil, agriculture; mapping in support of humanitarian aid in crisis situations.

Sentinel-1 is a shining example of Europe's technological prowess. It has been designed and constructed by a consortium led by Thales Alenia Space and Airbus Defence and Space. The Sentinel-1 mission was conceived as a multi-satellite system in which each satellite carries an image-taking C-band Synthetic Aperture Radar (SAR).

Image courtesy of ESA

The Sentinel-1 A and B satellites were launched in 2014 and 2016 respectively. The two new Sentinel-1 C and D satellites, slated for a 2021 launch, are the second generation of Sentinel-1 satellites, each carrying a SAR like its forerunners.

GMV has already developed the Sentinel-1A and B simulators. The design of the Sentinel-1 C and D satellites, however, has evolved significantly with respect to the Sentinel-1 A and B satellite design, to allow for new system requirements, lessons learned and obsolescence. This means that a new simulator has had to be developed to suit.

GMV is playing a key role in the Copernicus program, participating actively in various projects for both the ground and space segment. During launches it also provides support services for the mission planning and control systems.

Portugal Space 2030" in the limelight

In the past 3 years, Space has been a hot topic in Portugal – marked by the publication of a National Space Strategy up to 2030. Other key events have been a draft of the Portuguese Law of Space and definition of an Agenda for Research and Innovation dedicated to Space and Earth Observation within the 2030 horizon, as well as the announcement at political level of a reinforcement of the national Space budget, in particular the key contribution to ESA activities. Furthermore, the Atlantic International Research Centre (AIR Centre) has been created as a result of an intergovernmental initiative to unleash the potential of the Atlantic for Society. GMV is a founding AIR member in Brazil. The AIR centre's aims is to foster knowledge-driven solutions for Atlantic and Global Societal challenges that require interdisciplinary research and innovation of complex Earth systems through cooperation targeting the Atlantic. In this context, some key initiatives have been under discussion in Portugal such as a System for Satellite Surveillance and Tracking (SST) and the spaceport.

GMV has participated actively in the national discussions, contributing to the Strategy definition while also debating, from an industrial perspective, the thematic Research and Innovation Agenda. Recently, Lisbon hosted the first New Space Atlantic Summit, an event organized by the Fundação para a Ciência e a Tecnologia (FCT) in collaboration with Ciência Viva - the Portuguese National Agency for Scientific and Technological Culture, and the Space Frontier Foundation. PLD Space, the young space company GMV has decided to support and for which it is now supplying the ARION 1 and ARION 2 avionics, took an active part in the discussion about micro launchers and access to space.

GMV presents its space strategy in Portugal

On 30 May GMV in Portugal organized a press conference to present its positioning and strategy in the space sector.

Several media outlets attended this event, from both the general and technical press, who heard the General Director of GMV in Portugal Alberto de Pedro present the company and the sectors where it operates as well as some of its most important milestones. Alberto de Pedro made a brief presentation of GMV and the growth it has chalked up during its years trading in the national market. He also talked about the importance of people in the success of the company, which currently has around 100 employees. He highlighted the importance of education and training in this sector where it is still difficult to find human resources. Alberto de Pedro also added that the space sector is responsible for more than half of the group's revenue.

Teresa Ferreira, Director of Space, spoke about GMV's leadership role in the space sector on an international level, but also in Portugal. She explained the areas in which GMV operates in the Portuguese market, namely the company's role in the supply chain of space systems, satellite navigation and Earth observation, among others. Among the Space projects in which GMV participates, Teresa emphasized the provision of operational services for SATCEN under the Copernicus Security Service and Support for External Action, the development of control, avionics and robotics for space vehicles as well as its telling contribution to the next generation of the Galileo system and its services.

"*It's important to highlight GMV's leading role in the space sector in Portugal, where it holds a leading position and is arguably a benchmark supplier of the European Space Agency,*" says Teresa Ferreira. "*It is from this experience and acquired know-how that we have been able to create products and services capable of serving the market for the applications of space technologies.*"

Also featuring at this event was João Lousada, a GMV INSYEN employee, who talked about his work as a flight operations engineer at the Colombus control center. João also told the audience about his most recent participation in the mission AMADEE-18 as an analogue astronaut.

Outer Space for Development: Policy, Business and Regulatory Summit

Lisbon held in May the Outer Space for Development: Policy, Business and Regulatory Summit, organized by Vieira de Almeida (VdA) in collaboration with the European Centre for Space Law (ECSL) and Nova Law School. Speakers included high level representatives from the UN Office for Outer Space Affairs (UNOOSA), European Union, European Space Agency and the Portuguese Government.

During this Summit the developments taking place in the Portuguese space sector were presented, with a particular focus on industrial development, national space strategy and the development of a national space law. Teresa Ferreira, GMV's Director of Space in Portugal, participated in the round table dedicated to "The role of the private sector in outer space", stressing the importance of space in the development of modern societies and its future in the national and international context.

Space Rider, a European Space Agency project slated for a 2020 launch, represents Europe's next step in Space access

The Space Rider transportation system comprises a re-entry vehicle and an orbital module. The re-entry vehicle is an evolution of the successful Intermediate Experimental Vehicle (IXV) that will host payloads and return them safely through a soft landing on a runway in the Portuguese island of Santa Maria in the Azores. The orbital module is an adaptation of VEGA's orbital stage AVUM to support months-long manoeuvres and operations in orbit.

Space Rider's capability of acting as a space laboratory by allowing affordable, independent, reusable, end-to-end routine access to space with short turn-around times will enable a variety of applications such as experiments in microgravity, technology demonstrations, exploration and Earth observation, and in-orbit inspection.

By providing critical Space Segment and Robotics services and technologies, GMV is playing a key role in the developments that will lead to a maiden flight in 2020, which is then scheduled to be followed by an operational phase and commercial exploitation.

GMV is working on both the elements that compose the Space Rider transportation system that are designed, integrated and validated by two different primes: AVIO responsible for the Orbital Module (OM) and Thales Alenia Space Italy for the Re-Entry Module (RM). GMV has a key role in the OBSW (On-Board Software) and GNC (Guidance, Navigation and Control) design and validation for both these elements.

The project development involved GMV´s personnel from Spain, Portugal and UK. In Spain GMV is mainly involved in OBSW and GNC for the RM and providing some critical elements in the OBSW of the OM. In Portugal GMV is responsible of the design of the Orbital Module's Guidance, Control and Fault Detection, Isolation and Recovery. It is also supporting the development of the Software Validation Facility and Missionization for the RM. Finally, in the UK, GMV is supporting RAMS (Reliability, Availability, Maintainability and Safety) activities for the OM.

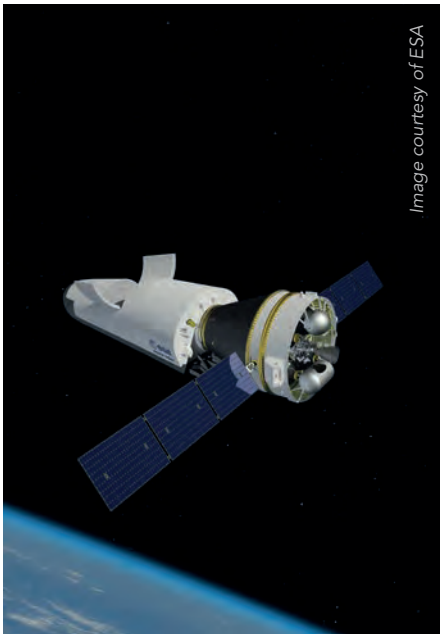


Image courtesy of ESA

GMV analyzes improvements to VEGA's launch engine

The italian aeospace company AVIO and GMV have signed a contract for the study of the VEGA Upper Stage Engine Control (VUSEC).

In this study, GMV will receive an engine model to be implemented in a Functional Engineering Simulator; the simulator will be completed with sensors and actuators models and a prototype of the Control Unit will be developed and preliminarily validated.

The project has the purpose of assessing the benefit of having closed a loop system that controls the engine valves in function of measurable parameters instead of the actual open loop approach. Control algorithms shall be also validated in a dedicated microcontroller to verify and validate real time performances.

Although GMV has already provided significant support in the design and validation of earlier VEGA phases, this new activity opens the door to a whole new phase in future cooperation between AVIO and GMV within VEGA-E activities. VEGA-E is a European project led by the Italian aerospace company for upgrading the VEGA launch rocket, carried out jointly by the Italian Space Agency and the European Space Agency since 1998.

The VUSEC activity will last for 2 years will go through the typical cycle of a product starting from the technical specification and ending with validation and verification phases.

GMV provides EUMETSAT with high-precision clock and orbit GNSS products

Germany recently hosted the KoM of EUMETSAT's Radio Occultation Support Network (RSN) project, which aims to set up a worldwide service (with SLA) of high-precision GNSS products, mainly clocks and orbits, in quasi real time for assimilation of RO data into Numerical Weather Prediction (NWP) models.

It is also planned for RSN to provide auxiliary information for the Second Generation of EUMETSAT Polar System (EPS-SG) not only for GPS but also for Galileo and most likely for other constellations of GNSS satellites. The products will be generated with GMV's inhouse ***magicGNSS*** from two independent processing centers located in 2 GMV sites; Tres Cantos and Darmstadt, thus ensuring a service availability rate of over 99.5%.

This contract award consolidates GMV's status as worldwide provider of high-quality GNSS products under a service level agreement (SLA) and enlarges the roster of services of this type based on ***magicGNSS***.

GMV collaborates in the design of the launch service for PLD Space's ARION-2 microlauncher

GMV forms part of a consortium primed by PLD Space to carry out a European Space Agency study for the definition, analysis and design of a self-sustainable launching service making use of a microlauncher.

The first step in this study was a microlauncher market supply and demand study. This focused on nano- and micro-satellites as target payloads for a microlauncher (from 1Kg up to 200Kg, class 4 up to class 2 for mainly LEO/SSO orbits). With the support of Euroconsult, GMV carried out a market demand analysis for potential microlauncher clients.

In the technical part of the study GMV will take on responsibility mainly for definition and analysis of trajectory optimization, of the avionics system (including GNC), telemetry and the ground segment for the launch service, focusing on PLD's ARION-2 microlauncher.

GMV will also perform analysis for orbit trajectory optimization and ground-element definition to clarify the selection of potential launch sites (i.e. Kourou, Canary Islands, Azores, Esrange or UK). A business plan will be prepared by PLD and tailored to the PLD's microlauncher ARION-2 to demonstrate that the solution defined in the context of MLAUNCHER activity is self-sustainable.

Working from these results, a proposal will then be sent up to ESA of the complete launch service of a microlauncher (ARION-2), identifying and defining all service elements and assessing costs (recurrent and non-recurrent).

GMV presents in GEOGLAM RAPP the services and future activities within the AfriCultuReS project

It is now estimated that the world's population will have grown to 9 billion by 2050. This of course means that land occupied by crops, pasture or scrub (or any combination of them) will come under increasing anthropic pressure to raise its yield in terms of both biomass and animal proteins to meet the world's soaring demand for food.

Group on Earth Observations (GEO) and its initiative GEO Global Agricultural Monitoring (GEOGLAM), under international umbrella organizations like UN-FAO and WFP, are therefore now working jointly with international earth-observation organizations and the science, cooperation and development community to set up a worldwide pasture-monitoring system to estimate its dynamic and productivity in real time. This particular activity is being carried out by the GEOGLAM Rangeland and Pasture Productivity group (GEOGLAM-RAPP).

In this context, as an invited guest of the International Livestock Research Institute (ILRI) GMV went to Nairobi (Kenya) in May to present the AfriCultuReS project (Enhancing Food Security in African Agricultural Systems with the support of Remote Sensing) in the 6th GEOGLAM-RAPP & Sustainable Development Goals Workshop.

Funded by the European Commission's H2020 program and coordinated by GMV, AfriCultuReS aims to design, implement and operationally validate an integrated monitoring, analysis and early-warning system to help improve food security in Africa. AfriCultuReS sets out to monitor both cropland and pasture and, indirectly, livestock output. AfriCultuReS will contribute to the European and African chapters of GEO and GEOGLAM.

The presentation, given by GMV, explained the activity framework for the upcoming years and the specifically designed pasture-monitoring services.

The role of Data Science in the Space Industry

GMV was one of the companies supporting the event "Data Science in (Astro) particle physics and the bridge to industry" held in Lisbon (Portugal).

The information era has now become the data-creation era… and more and more data. This data explosion forces systems to be redesigned to be able to meet storage and processing needs, setting up the challenge of extracting useful information for added value products and services.

Talk is therefore turning to data science, the science that delivers tools (like machine learning, artificial intelligence, data mining) for data processing that can be used in several areas.

During this event GMV presented some of its space projects and talked about how system architectures are being revolutionized as well as how GMV's knowhow is being applied to the processing of data from telescope, satellites or even inside ITER (nuclear fusion reactors).

The main goal of the event was to show students, PhDs and young post-docs that fundamental physics now represents a career opportunity offering huge synergies with the job market and the needs of modern society. The event also set out to find interlocutors for establishing communication channels with the industry for exploring partnerships and joint projects, to compete for international grants, and also to show the capabilities of the Laboratory of Instrumentation and Experimental Particle Physics (*Laboratório de Instrumentação e Física Experimental de Partículas*: LIP) and (Astro) Particle Physics in general in the field of Data Science. This event helped to bring together the two sides and create the framework to enlarge mutual knowledge of daily work, favoring the creation of practical synergies from Data Science in fundamental physics into Data Science in industry.

GMV INSYEN provides support for the latest launch to the International Space Station

On June 6, the 42 year-old geophysicist Alexander Gerst, along with his crew mates, NASA astronaut Serena Auñón-Chancellor and Russian cosmonaut Sergei Prokopyev, lifted off from the Russian Cosmodrome in Baikonur (Kazakhstan) at 13:12:41 CEST (17:12:41 local) on board the Soyuz MS-09 spacecraft, bound for the International Space Station (ISS).

The spacecraft docked to the ISS on June 8 at 15:01 CEST and hatches were opened at 17:17. Alexander, Serena and Sergei then joined the 3 crew members already on the Station: Oleg Artemyev, Drew Feustel and Ricky Arnold.

He will take up the role of Flight Engineer 3 for the Expedition 56 increment before, in October, taking over as Commander of the International Space Station for Expedition 57. In so doing, Alexander will become the second European to command the Station (the first was the Belgian Frank De Winne in 2009) and the first German astronaut to do so. He will complete a total of 67 European experiments, of which 41 come from Germany.

Alexander, also known as Astro-Alex, became very well-known in Germany during his first mission to the ISS (May to November 2014). He was always being shown in German media, and was famous for his beautiful photographs of the Earth. Even children knew him from the various children's television shows he appeared on. As a result of his popularity, the public become more cognizant of the ISS and the space industry as a whole.

For the Soyuz launch, several TV broadcasting companies and many representatives from the media were at DLR in Oberpfaffenhofen to interview our colleagues and record their impressions of the launch. A celebratory event was organized in the foyer of the German Space Operation Center (GSOC), attended by local politicians, astronauts, scientists and DLR employees and contractors.

GMV INSYEN video engineers were responsible for feeding the on-site DSNGs (Digital Satellite News Gathering vehicles) with live video from the launch received from Russia, real-time voice loops and control room camera feeds. GMV INSYEN ground system engineers and flight controllers will perform their standard duties in supporting the Horizons mission with its upcoming experiments, public relation events and more.

GMV INSYEN video engineers were responsible for feeding the on-site DSNGs with live video , real-time voice loops and control room camera feeds

Advanced maritime monitoring services to meet the new challenges of the sector

In the last 15 years maritime monitoring has continually taken up new data sources to carry out its work. By now there is a whole series of services and applications covering part of the main users' operational needs, especially public organizations holding the remit for maritime safety, border control and regulation of on-sea economic activities. Nonetheless, today's operational needs are still racing ahead of classic services (vessel detection), outgrowing them due to their failure to boost the authorities' decision-making capacity.

Enter MARINE-EO, a European Commission project whose main aim is to develop satellite-image post-processing modules in support of technological solutions that enable users to procure advanced maritime awareness services.

GMV will be inputting its expertise in the design and implementation of a safe, flexible and scalable platform upon which different processing modules can be easily grafted

Under this project, also involving the companies Hidromod and Skytek, GMV will be inputting its expertise in the design and implementation of a safe, flexible and scalable platform upon which different processing modules can be easily grafted. These modules will be independent of each other and are conceived like Lego bricks that build up to a complete and complex processing chain. GMV will also be contributing its knowledge about how to develop part of the modules, especially change- and illicit-activity-detecting modules. The work draws from GMV's experience in the development of the operational product SIMONS, which caters for ship-detection, -categorization and -tracking by joint SAR and AIS ship-positioning data.

MARINE-EO takes in two separate services: on the one hand the detection of changes by analysis over time of a stack of images, and, secondly, the detection of irregular activities by joint processing of diverse data sources, including data as variegated as socio-economic and social networking site information.

Service provision will be based on a technological platform capable of dealing with a data catalogue, user requests and any added-value reports that might be generated. The platform will be generic in concept, taking in distributed processing and Big Data management infrastructure. It will also include different logistic modules catering for a flexible and advanced process management solution, so that any processing chain can be configured by means of a simple processing-module library.

MARINE-EO has been configured in three phases in which three operators will design the technical solutions. The contractor will then evaluate all three before passing on to phase 2 those deemed to be most important. Phase 2 will focus on implementation of the selected solutions, which, after being vetted, will pass on to phase 3 for execution.

The European Commission announces the NEXTSPACE results

After four years of work, the NEXTSPACE framework contract, led by GMV together with the Belgian firm SpaceTec Partners and the French companies FDC (France Développement Conseil) and Noveltis, takes another firm stride towards fulfilment its objective of pinpointing the necessary developments for Europe's long-term space infrastructure.

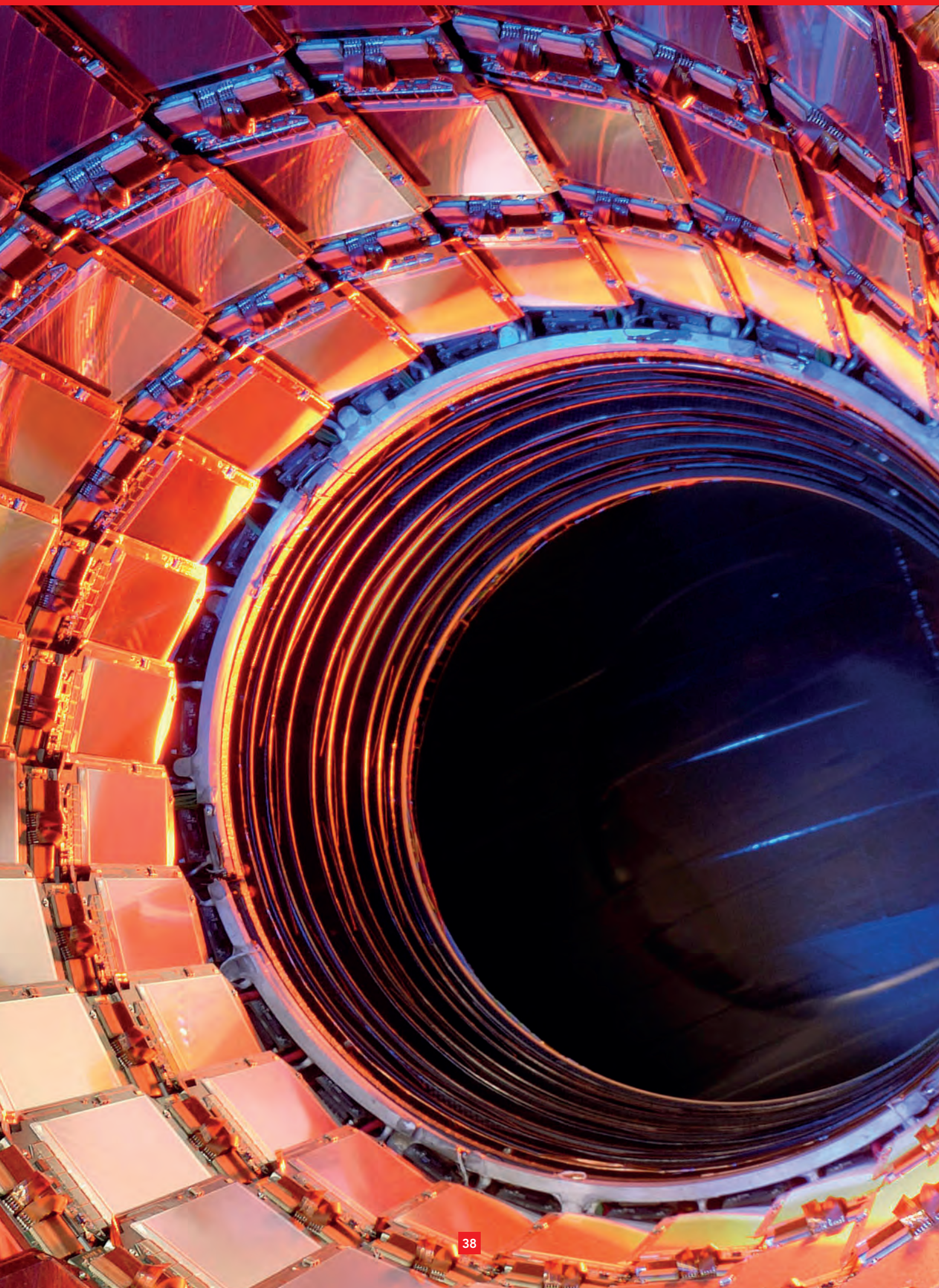
NEXTSPACE kicked off back in 2014 with the remit of collating user expectations for the future satellite generation of the Copernicus Programme, thus providing the necessary feedback for planning development of the Copernicus Space Component as from 2030, i.e., development of current Copernicus satellites and definition of the next generations.

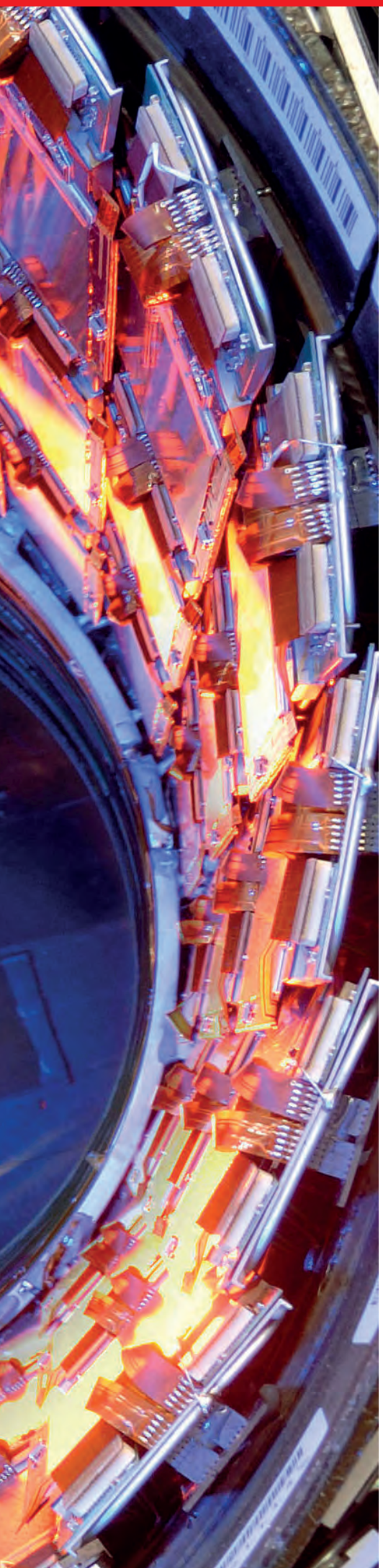
As a result the European Commission has now published a list of over 4000 technical requirements, compiled from European organizations and users from different domains and sectors, to help in definition of the next generation of earth-observation satellites and their derivative services. The databases can be checked out in the Copernicus Programme Document Library.

NEXTSPACE activities include transformation of user needs into satellite observation requirements and prioritization of the latter according to their social and economic impacts and effect on EU policies. Under the contract an in-depth analysis will also be made of the characteristics of current and future space missions to determine how to respond to the demand of observation requirements.

The Copernicus earth-observation program got underway in 1998 during a meeting held in Baveno (Italy) between the main players of Europe's space sector. It was enshrined in the Baveno Manifesto signed by ESA, EUMETSAT and representatives of the French, British, German and Italian space agencies. The Baveno Manifesto marked the birth of the Global Monitoring for Environment and Security (GMES) program, which changed its name to Copernicus in 2011.

Last May saw the 20th anniversary of the Baveno Manifesto, which paved the way for Europe's earth-observation program. To celebrate this anniversary the European Commission organized a commemorative event in Baveno on 20 and 21 June last, which included the official launch of the Copernicus Data and Information Access Services (DIAS), to facilitate access to satellite services and Copernicus services.





IFMIF-DONES, declared to be strategic research infrastructure for Europe

THE IFMIF-DONES PARTICLE ACCELERATOR CREATES, TOGETHER WITH ITER AND DEMO, THE FUSION ENERGY ROADMAP

At the end of June the European Strategy Forum on Research Infrastructures (ESFRI) selected six new scientific infrastructures to be incorporated into its road map, including Spain's bid for Granada's candidature to host the IFMIF-DONES facility. The incorporation of this project in the roadmap means that the future research infrastructure is now eligible to receive European funding.

DONES, the DEMO Oriented Neutron Source, with a construction budget of between 400 and 600 million euros, is part of the International Fusion Material Irradiation Facility (IFMIF). It is fruit of a worldwide initiative to set up a neutron-bombardment material irradiation lab and is complementary to the International Thermonuclear Experimental Reactor (ITER) now under construction in southern France.

ITER is an experimental reactor that sets out to reproduce the fusion reactions that take place in our sun and other stars, with the aim of generating clean, sustainable and limitless energy.

The purpose of IFMIF-DONES is to develop the materials for constructing future fusion reactors like DEMO, the successor to ITER.

Spanish participation in IFMIF-DONES is being led by the Technological and Environmental Energy Research Center (*Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas*: CIEMAT) with collaboration from the Spanish Ministry of Science, Innovation and Universities, the Regional Authority of Andalusia (Junta de Andalucía), Granada's Provincial Council (Diputación) and City Council (Ayuntamiento) and the Industrial Technology Development Center (Centro para el Desarrollo Tecnológico Industrial: CDTI), among others.

Within the framework of IFMIF-DONES, and apart from its contributions to the IFMIF validation phase, GMV is participating in a consortium along with other Spanish firms in the ACTECA project, standing in Spanish for Accelerators and Associated Technology for Big Science Facilities. ACTECA is a 7.5 million euro project that aims to develop the necessary technology for driving Spanish participation in the construction and operation of the critical DONES elements. In particular, within ACTECA, GMV is responsible for development of the virtual plant model, doing so in close collaboration with CIEMAT.

The decision was taken in the ESFRI meeting held in Corfu (Greece), which brought together representatives from the 28 EU member states and from 12 other associated countries.

Development of NDS drivers for µTCA® PTM-1588 boards

CODAC (Control, Data Access and Communication) is the core of the control and instrumentation system of the ITER experiment, based on free software tools like EPICS (Experimental Physics and Industrial Control System) and including all hardware and software for running ITER.

ITER's data acquisition systems, used mainly for diagnosis systems, are integrated in CODAC using NDS (Nominal Device Support). This means that specific hardware boards from different vendors can be integrated into the system.

Within this overall context the objective of this development awarded to GMV is to provide NDS-development, -maintenance and -support services for the high-performance PTM-1588 timing boards as used in the core of the CODAC system.

This project taps into GMV's wealth of experience and specialization in real-time critical software engineering on various projects and client services, in particular the design and development of EPICS-based control and implementation solutions.

GMV present at Soft 2018

GMV has been presented at the 30th Symposium on Fusion Technology (SOFT 2018), organized by the Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA) and held in Sicily from 16 to 21 September.

This biennial Symposium on Fusion Technology is the most important conference in this field in Europe. It regularly attracts more than 800 scientists, engineers, industry representatives and exhibitors from all over the world and focuses on the latest developments on fusion experiments and activities. SOFT includes invited, oral and poster presentations as well as industrial and R&D exhibitions.

GMV presented the poster "FPGA-based interlock system for the chopper of the Linear IFMIF prototype accelerator injector", developed under the leadership of the Universidad Politécnica de Madrid through the Applied Acoustics and Instrumentation Research Group (Grupo de Investigación en Instrumentación y Acústica Aplicada) and the Particle Beam Laboratory (IZPILab) of the Basque Country University (*Universidad del País Vasco /Euskal Herriko Unibertsitatea*). The poster proposes a COTS-based solution for providing a reconfigurable embedded system for data-acquisition and control applications.

In the words of Juan Carlos Llorente, GMV's Head of Business Development in this sector, "*GMV's presence at this event stands as yet more proof of its capacity of adding value in big-science control applications for fusion and particle accelerators, even in the design and analysis phases that are usually carried out by public research bodies and universities*".

GMV carries out a rover field test campaign

GMV chose Dehesa de Navalvillar to the north of Madrid in Colmenar Viejo as the site for the field tests under the European Space Agency (ESA)'s GOTCHA project (GOAC TRL Increase Convenience Enhancements Hardening and Application Extension).

The GMV-primed GOTCHA project, also involving the participation of the Madrid university Universidad Carlos III, aims to achieve an autonomous framework for planetary-exploration rovers, increasing their Technology Readiness Level (TRL) for use in future space systems such as the upcoming Mars Sample Return mission.

One of the biggest challenges to be met in terms of improving planetary exploration, Mars in this case, and achieving rock- and soil-sample-return capabilities, is the development and demonstration of the technologies and capacities needed by any rover for making long runs and making autonomous and independent decisions (without communicating back with Earth) on its progress, risk reduction and harnessing all science-information compilation opportunities that turn up.

With this aim in view the May field tests focused on the testing and vetting of key Mars-exploration technologies that work in a totally autonomous and independent way (on long runs without having to communicate with the control center back on Earth). For this purpose an autonomous system has been fitted on the ESA's RAT prototype rover, equipped with the GMV-developed LUCID software system.

In order to boost the autonomy level GMV has added several robot software elements to the GOTCHA project: a robotic controller, path-planner and trajectory control, plus an onboard mission planner that controls the actions of the rover platform in order to achieve high-level goals (e.g., gather science on a given area).

Test results were a resounding success and served to demonstrate the validity of these three key components, especially for use in future space missions. The software developed in the project (particularly the agent) has been used as the basis for other projects in which GMV is involved, and is now expected to be used in future GMV projects.

Budding talent's take on lunar exploration

This is the second year that UKSEDS, has organized and run the Lunar Rover Competition in Harwell (UK). GMV could hardly miss out on an initiative of this type, not only supporting it as a partner but also forming part of the jury made up by industry experts.

The competition, for which university undergraduates from the whole country are eligible, sets the challenge of designing, building and testing a lunar rover (based on a potential future robotic mission to a crater on the lunar South Pole).

The challenge began 9 months back with the design, construction and fine-tuning of the rover, culminating on 30 June when the teams from universities like Bath and Edinburgh demonstrated all the work put in over these months. The students ran their rovers past a review panel of industry experts and the rover was then put through its paces in a moon-like terrain on RAL Space's site.

Mobility over a lunar analog surface and sample collection are two of the challenges that the competitors had to meet. This competition represents a great chance for students to practice in a career environment and see how things work in the space industry. The winning team from the 7 entrants came from London's Imperial College, which also won the prize for the best Critical Design Review. The team from Sheffield University, for its part, won the best innovation prize for its advanced scoop mechanism to retrieve lunar samples, while the Manchester University team was rewarded for its rover-related outreach program to encourage more young people to study science subjects at school.

UKSEDS (UK Students for the Exploration and Development of Space) UK's national student space society, sets out to help and educate youngsters and inspire them towards space exploration and research. To do so the society organizes and runs a whole host of activities. UKSEDS is the UK chapter of the global SEDS movement, working alongside sister organizations all around the world in Canada, Mexico, Nepal, Spain and the United States, among others.

GMV collaborates with the latest ASTI Robotics Challenge

On 12 May last Burgos (Spain) showed its most technological face to the world, hosting the 2nd Asti Robotics Challenge in the Human Evaluation Museum (*Museo de la Evaluacion Humana*: MEH). This second collaborative mobile robotics challenge outstripped the attendance figure of the previous year, bringing together nearly 200 participating students and a total audience of over 1800.

The competition is organized by the ASTI Talent & Tech Foundation with the collaboration of MEH itself, ASTI Mobile Robotics and the charity arm (Obra Social) of the bank La Caixa, and with the support of GMV.

The participants' main task is to build a mobile robot in teams. The result is first presented on social media and then put through its paces in each leg of the challenge.

The teams had to submit their projects to a 13-person jury including Mariella Graziano, Director of GMV's Space Segment and Robotics.

Prizes were awarded in four categories: best competing school; best project management; best robot in the GMV sumo tests and best tournament performance.

GMV welcomes top experts in artificial intelligence, robotics and space automation

From 4 to 6 June Madrid hosted the 14th International Symposium on Artificial Intelligence, Robotics and Automation in Space (i-SAIRAS 2018), a must for the world's top experts and organizations working on these cutting-edge space applications.

The organization of this biennial event falls each time to different worldwide space agencies (CSA-ASC, DLR, JAXA, NASA or ESA), with the aim of sharing the venue around the continents. The turn this year came of ESA's Automation and Robotics group, choosing Madrid as the venue to bring together representatives from the space robotics industry and from the main space agencies, like NASA, ESA, JAXA, the UK space agency, CNES and CDTI.

In this year's forum, which has aired the latest ideas and developments, GMV has taken part not only as sponsor but also as speaker, giving various papers on the different developments and projects it is currently working on. These included the LUCID field-test campaign conducted in 2018 in Tenerife, the preliminary design and experimental study project of the High Mobility Sample Fetching Rover, the SPARTAN rover navigation system and the European Robotic Goal-Oriented autonomous controller (ERGO). ERGO aims to enhance the European Commission's autonomy system (H2020 PERASPERA program) for planning, reprograming and forecasting the autonomous onboard execution of robotics systems in order to carry out all necessary basic activities to ensure the mission is performed according to pre-established high-level goals.

Furthermore, with the support of Spain's Industry Technology Development Center (CDTI in Spanish initials) ESA also organized a guided tour on the last day through the head offices of three sector companies, SENER, Thales Alenia Space Spain and GMV, all housed in Madrid's Tres Cantos Technology Park.

The GMV tour showed the visitors around different GMV robotics labs like ***platform-art©***, which staged several demos of the projects on which GMV is currently working. The visitors on this guided tour included many leading figures from the space robotics world, such as Richard Volpe, Manager of the Mobility and Robotic Systems Section of the Autonomous Systems Division of JPL (NASA).

Forums of this type are crucial, allowing top professionals to swap notes and share knowledge. The very same ESA section that has organized i-sairas this year also puts on every two years the ASTRA conference, which looks into space automation and robotics.

GMV brings navigation and simulation technology to the future F-110 Frigate

GMV IS COLLABORATING IN THE SPANISH NAVY'S FUTURE F-110 FRIGATE PROJECT, AMONG OTHER TECHNOLOGY PROGRAMS OF SPAIN'S MOD

Since 2017, while waiting for the official go-ahead to begin manufacturing of the new, state-of-the-art F-110 frigates, GMV has been playing a key role in the technological programs and accompanying R&D project.

The future F-110 frigates will replace the current Santa María class frigates, which have been in operation carrying out escort duties since the mid-eighties of last century. They have been jointly designed by the Navantia shipyard and the Spanish Navy. The program comprises a multi-mission design with a variety of capabilities ranging from undersea and surface warfare to asymmetric warfare and anti-aircraft defense.

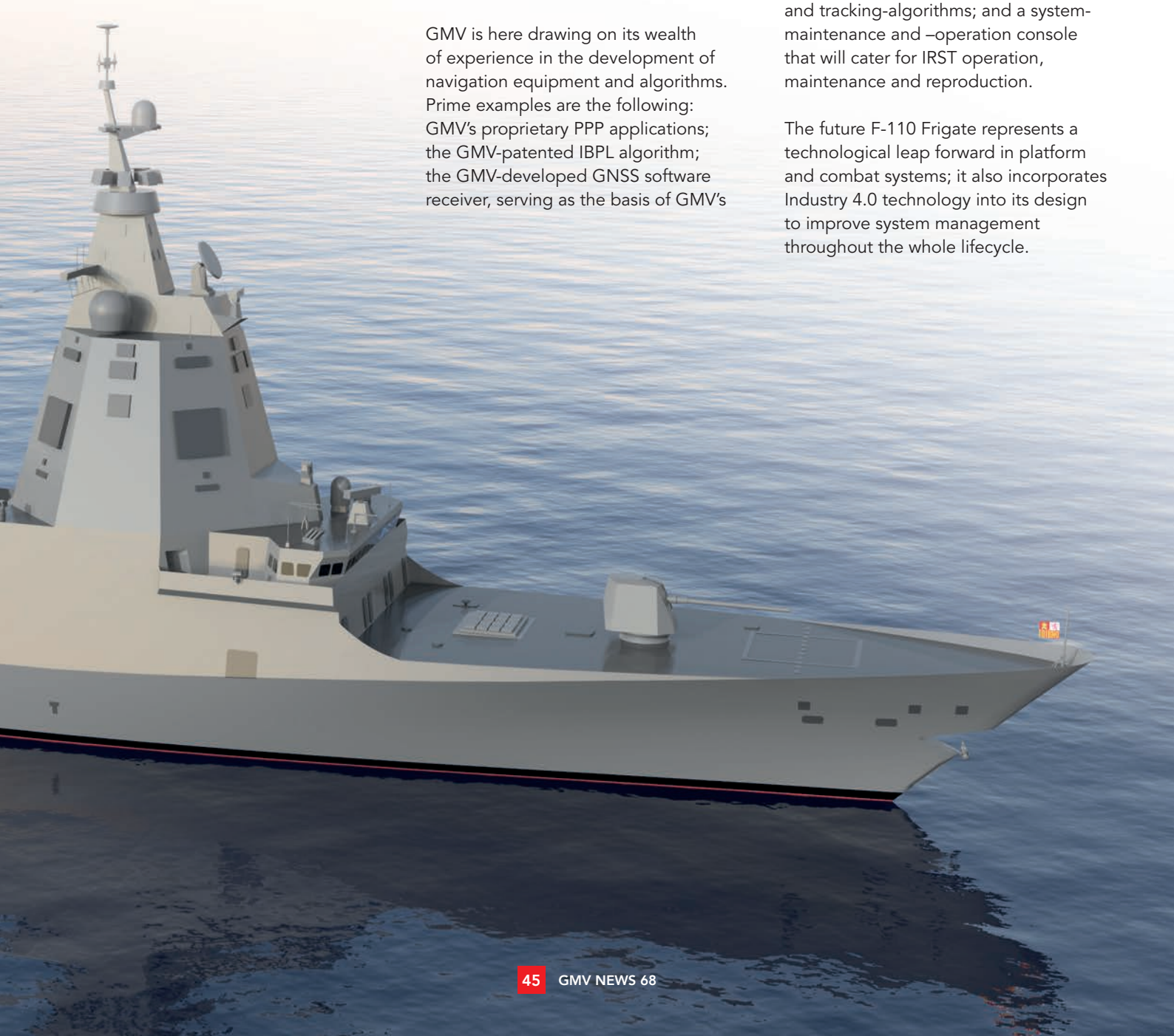
GMV's participation in the Technology Programs initiated by the Directorate General of Armaments and Materials (DGAM) centers on two areas: the SENDA navigation system and infrared search and track (IRST) system.

Under a contract with Navantia, GMV is developing the F-110 frigates' SENDA navigation system. The main purpose of this system is to provide a national solution for the F-110 Frigate's navigation system with functions analogous to those of the American NAVSSI system fitted on F100 frigates but with substantial upgrades due to the incorporation of new navigation technologies and systems.

GMV is here drawing on its wealth of experience in the development of navigation equipment and algorithms. Prime examples are the following: GMV's proprietary PPP applications; the GMV-patented IBPL algorithm; the GMV-developed GNSS software receiver, serving as the basis of GMV's ***SRX-10i*** jamming detector and the Galileo PRS receiver currently under development by GMV; the navigator of the Remotely Piloted Aircraft (RPA) ATLANTE, or the ISNAV navigation system under development by GMV for the VCR 8x8 program.

Moreover, working with the joint venture UTE Indra-Tecnobit, GMV's participation in the naval IRST project has the following aims; implementing an IRST software model in MatLab/Simulink, enabling functional validation of the IRST system for different targets, scenarios and atmospheric conditions; the creation of an IRST model simulator capable of generating 360° environments, making it possible to analyze the behavior of the various types of sensors and detection-, classification- and tracking-algorithms; and a system-maintenance and –operation console that will cater for IRST operation, maintenance and reproduction.

The future F-110 Frigate represents a technological leap forward in platform and combat systems; it also incorporates Industry 4.0 technology into its design to improve system management throughout the whole lifecycle.



GMV forms part of the delegation accompanying the Portuguese prime minister on his visit to Canada

In May, Portugal's Prime Minister António Costa made his first official visit to Canada, with a strong emphasis on economics and Portugal's evolving diplomatic style, and GMV was one of the companies invited to make up the Portuguese delegation.

The program of the visit included stops in Ottawa, Kingston, Toronto and Montreal. The Prime Minister was accompanied by a delegation that included Vasco Cordeiro, President of the Regional Government of the Azores, and José Luís Carneiro, Portugal's Secretary of State of Portuguese Communities Abroad as well as representatives of Portugal's business community including José Neves, GMV's Director of Security and Defense in Portugal.

Business leaders and members of the Portuguese community, in their meetings with Canadian governmental officials, discussed the benefits of trade between the two countries.

The mission included bilateral meetings and technical visits, where GMV had the chance to present its capabilities and innovative products to more than 20 Canadian aeronautical and defense-related industrial players.

First Innovation Forum and Defense, FID2018

GMV was one of the companies present at the first Innovation Forum and Defense 2018 (FID2018), put on by Aéro Montréal in collaboration with Canada's National Research Council (NRC) and held in Portugal, to promote defense-based research-, development- and innovation-initiatives.

The main goal of FID2018 was to provide an open space for discussion on Defense R&D that promotes mutual understanding, cooperation between the entities and favors the creation of national value, focusing on the National Defense R&D Strategy; the challenges and emerging opportunities, particularly in the context of the programs Preparatory Action for Defense Research (PADR) and European Defense Research Program (EDRP); and the cooperation between the Research Centers of Army Forces, the Defense Technological and Industrial Base, the National Scientific and Technological System and other agents of society.

The FID2018, that took place in May, was arranged in the form of panels of speakers that brought added value to the Forum. João Cintra, Section Head Homeland Security and Defense of GMV in Portugal took part in one of the conference panels presenting the company and the main sectors and projects where GMV operates.

GMV sponsors the 4th NATO CD SDP Conference

GMV was one of the main sponsors of the 4th NATO CD SDP Conference – "NATO–EU Cooperative Cyber Defence Capability Building, How Smart Defence and Pooling & Sharing can foster Cooperation, Transformation and Innovation" –, organized by the Ministry of Defence of Portugal (MDN).

The event, that was held on April 19, aimed to offer a free, open and wide discussion forum, providing a unique opportunity to present and discuss new ideas, solutions and technical capabilities.

During the event, José Neves, Security and Defense Director of GMV in Portugal, was rewarded with sponsor recognition.

Warsaw hosts the first Driver+ testbed trial

From 21 to 25 May the Warsaw headquarters of Main School of Fire Service (SGSP) hosted the first of the four trials scheduled for the DRIVER+ project (Driving Innovation in Crisis Management for European Resilience).

Driver+, a European Commission, FP7-financed project, aims to come up with an answer to the current and future challenges posed by the increasingly serious consequences of natural disasters and terrorist attacks. In pursuit of this overarching aim the project will assess and implement groundbreaking solutions that can be used jointly to cope with the various types of large-scale crises.

This involves the holding of four trials and a final demonstration to investigate innovative solutions under simulated crisis conditions, doing so by (1) gradually adapting them to operational constraints, (2) encouraging acceptance among users through their active involvement and (3) showing decision makers that they are cost-effective.

Each one of the trials, to be held, respectively, in Poland, France, the Netherlands and Austria, will provide priceless feedback for the pan-European testbed being developed under the project. The DRIVER+ testbed will create a unique opportunity for a transformative change by developing a coherent infrastructure for trialing solutions well into the future. This will open up the pooling and sharing of resources across Europe, allowing experience from trialing in different contexts to cross-fertilize.

The results of the assessment of the solutions will be stored in the Portfolio of Solutions (PoS), a website that describes the capabilities of all the available DRIVER+ solutions. The PoS will then be made available to any external organization, enabling it to share data and experiences on its own solutions. This should in turn pave the way for successful implementation and use of solutions by other practitioners.

As well as participating in all DRIVER+ subprojects, GMV is also helping to work towards a pan-European testbed to deal with crises. Furthermore, the solutions included in the PoS, all of which will be put through their paces during project trials, take in GMV's complete ***SOCRATES OC*** operating center.

Specifically, in this first trial, GMV has acted as coordinator of all included solutions while also adapting ***SOCRATES OC*** for participation in the defined scenario.

GMV is also helping to work towards a pan-European testbed to deal with crises

Data protection, a sine qua non of lawyers' offices

LAWYERS' OFFICES USUALLY HANDLE A HUGE AMOUNT OF DATA. THIS MEANS THEY HAVE TO SET UP A CYBERSECURITY STRATEGY TO PROVE THEIR TRUSTWORTHINESS, HEADING OFF ANY INFORMATION LEAKS, LEGAL REPERCUSSIONS, PENALTIES AND LOSS OF IMAGE

Any lawyer's office deals daily with a host of sensitive data, representing tangible assets of great value to the offices themselves and their clients. Should any of this data be lost, filched or broken into by unauthorized third persons, the information could be commercialized or used for other undesirable purposes. The situation could become really alarming for the legal sector, forfeiting their clients' trust as information is leaked or other vulnerabilities come to light. Lawyers' offices are therefore duty bound to set up a cast-iron Cybersecurity strategy to merit their clients' trust, preventing any information leaks, legal repercussions, penalties and reputational damage to the lawyers' office.

Information leaks usually stem either from organizational lapses (lack of classification, failure to delimit the scope of distribution, lack of knowledge and training, absence of procedures or nonexistence of confidentiality agreements) or technical errors (malicious code or malware, unauthorized access to systems and infrastructure, generalization of the use of cloud services or use of mobile technology for daily work).

In most cases information leaks mean Cybersecurity procedures are absent or deficient. This in turn means inadequate control over the information handled, greatly increasing the likelihood of an incident leading to an information leak.

We at GMV stress that the main concerns for lawyers' offices are perimeter security, protection from any type of attack and proper control over the exchanging of information with their clients.

May 2018 was a watershed moment in Spain's Cybersecurity sector. Firstly, 9 May was the deadline for EU member states' national transposition of the European NIS Directive concerning measures for a high common level of security of network and information systems across the Union. Another red-letter day came on 25 May with the coming into force of the General Data Protection Regulation, shortened to GDPR.

We at GMV bend over backwards to help companies with very demanding management systems set up a higher level of security and control, ensuring proper management of client information and business continuity in the event of any attack. GMV's constant aim is to identify existing threats, protect the assets, detect attack attempts and, where necessary, restore things to their previous state as quickly as possible.

Integral security of new assets

The connection between physical and logical security is the raison d'être of SEG2, the yearly event organized by the two security reviews Seguritecnia and Red Seguridad. This year, under the banner "Integral security in the protection of new assets", the security encounter clocks up a decade. For yet another year it brought together Spain's leading security firms, like GMV itself together with Mapfre, Eulen, Abanca and Endesa.

Sector experts took this chance to take stock of the current state of global security in Spain. GMV's particular remit was to deal with the existing mechanisms for speeding up IT-technology takeup by the OT (Operational Technology) world. Ángel C. Lázaro, Business Partner of GMV's industry sector stressed during his speech such security concepts as the "design principle" in the application of digital enabling technologies for developing new industrial solutions. These enabling technologies as applied to the OT world will make liberal use of IT technologies. As such they need to work from solid Cybersecurity principles that allow them to catalyze, with all due guarantees, the digital transformation process that companies are now immersed in as part of their ongoing quest for new, groundbreaking, market-transforming business models.

In this new scenario the challenges faced by the industrial sector and particularly the OT world are extremely complex. In many cases they represent a radical change in the company's asset-protection paradigm, calling for closer collaboration with the IT world to maximize the trawl of Cybersecurity experience.

Artificial Intelligence to fight against Trojans

GMV is now using artificial intelligence techniques to help the banking sector's fraud-prevention and Cybersecurity teams in their daily fight against new-generation Trojans. Today's tools are not able to detect certain types of malware, which typically fly under the radar of any user's habitual operations.

At OpenExpo, the benchmark open source & free software event, GMV has taken the chance to showcase the company's latest breakthroughs in the ongoing fight against this problem. José Carlos Baquero, Manager of GMV's Big Data and Artificial Intelligence division, led a session to show how, tapping into the Apache Spark framework and a groundbreaking behavior characterization technique, GMV is able to protect its clients from attacks launched by the mafias lurking behind banking Trojans.

GMV proposes a trailblazing web-session characterization- and coding-technique that shows up the footprints of illicit activity in any user's Trojan-affected remote banking transactions. Used in combination with automatic learning algorithms it has enabled the company to develop an efficient, adaptive and flexible solution for a random and ever-changing type of fraud. A sine qua non here is real-time detection.

10th academic course of GMV-UPM Collaboration in Cybersecurity

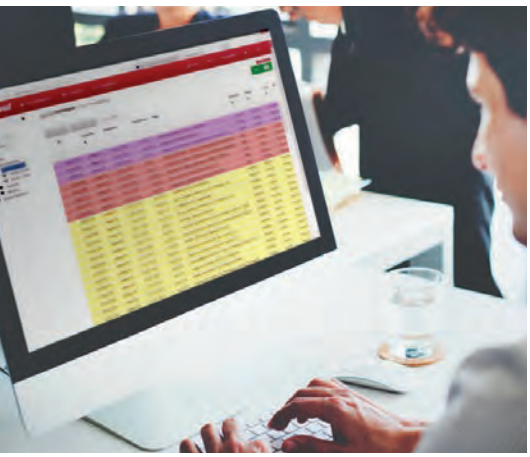
GMV has been collaborating for a decade now with the Polytechnic University of Madrid (*Universidad Politécnica de Madrid*: UPM) in the training of university students in security and information, within the IT School's official syllabus.

For students of the university's master's degree in IT engineering, given on the Montegancedo campus, this collaboration takes the particular form of the subject "IT System Assurance and Assessment", a compulsory course for obtaining the degree.

Mariano J. Benito, CISO of GMV's Secure e-Solutions sector, acting as an external professor, input some of his experience in setting up IT System Assurance and Assessment measures. The sixteen master's degree students this year, together with Erasmus students and postgrads from other universities, gained priceless insights into information security, technological risk, system pentesting, legal regulations and security or encryption standards. A standout feature this year was the implications of Europe's General Data Protection Regulation (GDPR).

This collaboration is particularly valuable for the university and its students, giving them a practical, market-savvy slant on the subjects they are studying. It also opens students' eyes to the new fields of career activity like consultancy and information security, which are largely overlooked in current syllabi. The upshot has been GMV recruitment of several students in previous years, first to continue their training period in consultancy and security and then to work as project engineers.

gestvul, the vulnerability management solution



GMV has developed the *gestvul* solution to manage vulnerabilities in a large number of assets or involving a high number of responsible parties

One of the biggest security headaches of today's companies worldwide is the proper management of their vulnerabilities. The continually soaring number of devices, apps and network services is goading professionalized cybercriminals to look for organizations' security breaches. This undertaking is now deemed a "profitable" business, since zero day vulnerability fetches a high price on the black market.

Vulnerability management is complex but not impossible. With the aim of informing and warning organizations, helping them to manage their vulnerabilities properly and ward off today's threats, GMV has developed the ***gestvul*** solution, designed and conceived to manage vulnerabilities in a large number of assets or involving a high number of responsible parties, with the aim of streamlining this management and enriching stakeholder information.

As a vulnerability management platform ***gestvul*** finds vulnerabilities in good time, decides on the best way to deal with them, passes on this information to interested parties and monitors developments over time. Some of the benefits it offers are control of the real situation of existing vulnerabilities and swift reaction to any crisis situations, as well as heading off future attacks by shrinking the exposure window.

In short, a constantly evolving solution in support of a management service, showing at all moments the state of vulnerability management throughout the whole lifecycle.

3rd MCCD Cyberdefense Conference

"Cyberspace invades everything today and is now becoming an ever-present component of people's working and private lives." With these opening words the Commander of the Joint Cyberdefense Command (*Mando Conjunto de Ciberdefensa*: MCCD), Carlos Gómez López de Medina, inaugurated the 3rd Cyberdefense Conference, in the company of the Head of the Joint Chief of Staff (*Jefe del Estado Mayor Conjunto*: JEMACON), Admiral Francisco Javier González-Huix.

This GMV-sponsored event is a forum for exhibiting and debating the state of the art in all aspects of Cybersecurity, to bring out all the achievements, common challenges while at the same time bringing closer together all security stakeholders and generating new cooperation opportunities.

Mariano J. Benito CISO of GMV's Secure e-Solutions sector together with Alberto Hernández, Director General of Spain's National Institute of Communication Technologies (Instituto Nacional de Ciberseguridad de España: INCIBE) and Patricia Tejado, Manager of Public Digital Services of GMV's Secure e-Solutions sector.

Technology to help in the early diagnosis of Alzheimer's disease

GMV DEVELOPS THE TECHNOLOGY OF THE H2020 CLINICAL-SCIENTIFIC RESEARCH PROJECT, MOPEAD (MODELS OF PATIENT ENGAGEMENT FOR ALZHEIMER'S DISEASE), THE MAIN AIM OF WHICH IS TO SET UP AN EARLY ALZHEIMER'S DIAGNOSIS SYSTEM UNDER THE "CITIZEN SCIENCE" MODEL, IN WHICH ANONYMOUS CITIZENS COLLABORATE IN THE RESEARCH

One of the most groundbreaking features of the MOPEAD project is the wide-ranging participation of citizens from various European countries to investigate a disease that now affects about 35 million people worldwide. In all it involves 2000 people aged 65 to 85 from Germany, Sweden, Slovenia, Spain and the Netherlands. Another key aspect is the application of Big Data technology for turning raw data into valuable evidence.

MOPEAD research will help to define new therapeutic interventions and to select the ideal people to take part in clinical trials for developing new medicines capable of checking or slowing down the disease. In the words of Mercè Boada, medical director of the foundation leading the project, Fundació ACE, and leading MOPEAD researcher, "*identifying disease symptoms as soon and as efficiently as possible is key to our understanding of the neurodegenerative process and finding more effective treatment in the early stages of this dementia*".

Inmaculada Pérez Garro, GMV's Health Manager, put it like this: "*When dealing with a health problem of this scope, technology enables us to improve research results by working with two key concepts: data and evidence*". To do so "*we need to maximize the patient-recruitment effort and harmonize the data obtained from citizens themselves, health services, the industry, research … guaranteeing*

privacy and with the ongoing commitment of obtaining evidence".

RECRUITMENT PHASE

The first project phase, the online recruitment of citizens at risk of suffering from cognitive problems, is conducted by means of a GMV-developed platform applying Big Data technology and healthcare software engineering to anonymize and safeguard the data. This will allow people worried about their mental health to come forward as candidates to take part in the study.

The web platform, designed on the Citizen Science model, has incorporated online marketing strategies into its design, drawing on concepts like user friendliness and advanced analytics. This means that anyone looking online for concepts related to memory care, healthy living or Alzheimer's will easily find what they're looking for.

Once on the platform the citizens then have access to various tests designed by neurologists and neuropsychologists for a preliminary evaluation of their mental health. In a second stage, those identified as in need of further study will be assessed online by specialists, using a GMV-developed web platform. Anyone showing mild cognitive impairment will be eligible to form part of the study group.

Another recruitment vector is voluntary onsite screening, involving neurologists, neuropsychologists, primary care physicians and endocrinologists. These experts identify patients with vascular risk factors or type-2 diabetes, whose likelihood of Alzheimer's onset is higher. The huge volume of data culled in citizens' neuropsychological tests both online and in clinics specializing in mental diseases or in health centers will be processed by GMV using Big Data technology, extracting vital research information.

To facilitate the onsite recruitment work, GMV has also developed a Big Data technology information system to evaluate different strategies and then identify the most precise among them.

The MOPED project is backed by the European Federation of Pharmaceutical Industries and Associations (EPFIA) and the Innovative Medicine Initiative (IMI), which was set up ten years ago to improve the health of European citizens by speeding up the development of and patient access to innovative medicine. In the organization's 10th anniversary celebration Adrián Rodrigo Salas, GMV's Business solutions - Smart Health Manager, presented the project's technological advances now that it is halfway through its three-year span.

MOPEAD, led by Fundación ACE – the Barcelona Alzheimer Treatment & Research Center – is brokered by the European Union's public-private consortium Innovative Medicine Initiative (IMI). Other partners in the project are Eli Lilly and Company Ltd.; ASDM Consulting; AstraZeneca AB; the European Institute of Women's Health; Karolinska Institute; KITE Innovation (Europe) Ltd.; Spomincica-Alzheimer Slovenia; Cologne University Hospital; Ljubljana University Medical Center; Vall D'Hebron-Institut University Hospital Recerca; Stichting VUmc; Alzheimer Europe and GMV as technological partner.

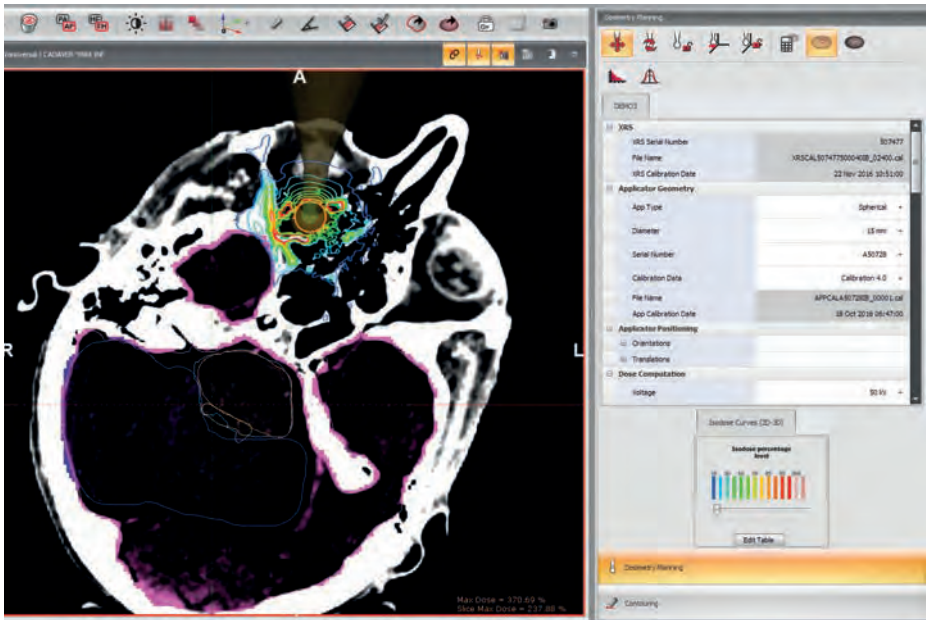
NAVIPHY, algorithms for greater precision in soft-tissue tumor surgery

GMV's simulation, navigation and planning experience, not only in surgery but also in intraoperative radiotherapy, stood it in good stead for being chosen as technological partner of the NAVIPHY project, the goal of which is to improve surgical planning by means of simulation.

GMV, together with the Universidad Rey Juan Carlos, Hospital Universitario de Gran Canaria Doctor Negrín and Hospital Universitario La Paz, will be working on the NAVIPHY project for more than three years. Its research remit is to improve preplanning by bringing in surgery simulation tools as well as achieving greater precision in anatomical representation and surgical navigation.

As technological leader of the project, GMV takes on the challenge of developing surgery simulation algorithms and vetting them in cases of breast-, brain- and maxillofacial-cancer. It will also explore the use of intraoperative imaging in interventions of this type; it will develop and assess the proposed surgical-navigation demonstrator and its combination with intraoperative imaging with interoperable software.

GMV-developed products like ***radiance™*** or ***insightArthroVR***, successfully taken up by specialists, vouch for the company's ability to fulfill the goals sought in this project of the Spanish Ministry of Science and Innovation's ERDF-funded scheme called "Research Challenges: 2017 R&D Projects".



MICA, finalist in the "Innovating together" competition

GMV's healthcare technology idea called "Integral Treatment in Cardiology" (In Spanish "*Manejo Integral en Cardiología*", shortened to MICA) has made it through to the final of the "Innovating Together" (*Innovando Juntos*) competition, in the "Cardiology Challenge" (*Reto Cardio*) category. This competition is promoted by the biopharmaceutical company MSD, the universities of Malaga and Sevilla, the Science-Technology Parks of Cartuja (Seville) and PTA (Malaga) and the Technological Corporation of Andalusia (*Corporación Tecnológica de Andalucía*: CTA).

The purpose of this competition is to find solutions for healthcare's main technological challenges, calling for ideas from healthcare technology companies. Cardiology is the first specialty for which a call has been announced: the Heart Team Companion to which GMV has submitted its MICA project.

In the words of Inmaculada Pérez Garro, GMV's Healthcare Manager, "*GMV's solution will help to reduce the cardiologist's workload by standardizing treatment for each particular pathology*". She adds, "*it will also cut down clinical variability, boost patient safety and open new lines of research into the therapeutic approach*".

The winning proposal will collaborate with the Andalusian Cardiology Society (*Sociedad Andaluza de Cardiología*: SAC) to fine tune its idea to suit the needs of clinicians. As the GMV executive points out "*it would be a real privilege for us to collaborate with a team of top experts committed to promoting the study, prevention and treatment of heart diseases, the main cause of death in Spain even though most of the risk factors are known and modifiable*".

GMV and IntraOp set up a strategic electron beam IORT alliance to combat cancer

GMV, world number one in intraoperative radiation therapy (IORT) planning and IntraOp Medical Corporation, worldwide benchmark in electron-beam IORT devices, have signed a strategic agreement to make further headway in the oncology field. Under this contract IntraOp will be the exclusive distributor of GMV's IORT planner ***radiance™*** for worldwide electron beam IORT users.

radiance™ is the market's only specifically designed IORT planner. IntraOp's Mobetron®, for its part, is the first mobile, self-shielded electron beam linear accelerator (LINAC) designed to deliver IORT to cancer patients during surgery, bringing together the work of surgeons and radiation oncologists and making up a formidable alliance in the fight against cancer.

Electron-beam IORT has been used for locally advanced and recurrent cancers, achieving excellent clinical results, both in terms of local control and survival rates, especially with parts of the body where it is difficult to achieve surgically certain margins, such as pancreatic-, bowel-, head- and neck-cancers or soft tissue sarcomas. In a single two-minute breast-cancer treatment the Mobetron can deliver the equivalent to six weeks of external-beam radiation.

Intraoperative radiation therapy administered with Mobetron and planned with GMV's software significantly increases treatment accuracy and efficacy, allowing radiotherapy physicists to plan and simulate treatment in 3D using computerized tomography images.

In the words of Derek DeScioli, IntraOp's Global Sales Vice President, the alliance signed by the two companies strengthens the market penetration capacity: "*we're delighted to add* ***radiance™*** *to our portfolio of products. IntraOp has always been at the cutting edge of IORT technology and GMV's planner represents a significant improvement in planning and treatment sophistication, whilst also empowering healthcare professionals to achieve the best possible results with their patients*".

For his part, Luis Fernando Álvarez-Gascón Pérez, General Manager of GMV's Secure e-Solutions sector, expressed his great satisfaction with the agreement reached. He stressed the fact that "*collaboration with IntraOp, world leader in electron-beam IORT, reinforces GMV's ongoing pledge to transform the world by developing and integrating state-of-the-art technology*". Likewise, this common aim "*means that patients' treatment- and recovery-time has been cut down*". Precise IORT planning with ***radiance™*** "*is GMV's contribution to the safety of electron-beam intraoperative radiation therapy and optimization of its results*".

GMV present at HIMSS Europe 2018

The European arm of the world's largest health IT membership organization, HIMSS (Healthcare Information and Management Systems Society), has held its HIMSS Europe and Health 2.0 Conference in Spain. Julio Vivero, International Business Partner in GMV's Secure e-Solutions sector and secretary of the healthcare subgroup of the European Cyber Security Organisation (ECSO), moderated one of the panel discussions.

Under the title "Securing Data, Protecting Privacy" this panel tackled such aspects as driving a cultural change to ensure the healthcare sector offers the best Cybersecurity guarantees while also making sure safety always overrides security.

Julio Vivero shared his knowledge as editor of the healthcare report drawn up by the European-Commission-brokered public-private partnership, ECSO, whose aims include pinpointing and bringing out Cybersecurity enablement needs to drive EU growth and employment and achieve greater Cybersecurity for EU citizens.

Other issues addressed were the Konfido project (*http://www.konfido-project.eu/*) focusing on the creation of a paradigm to overcome the limitations of epSOS and ensure the secure inner- and cross-border exchange, storage and overall handling of healthcare data (medical records) among EU member states; security in network-connected medical devices and the need of considering Cybersecurity right from the start of any development, with the creation of a Cybersecurity certification or stamp to vouch for this.

GMV presents research advances with *radiance™*

AT ISIORT GMV PRESENTS *radiance™* RESEARCH RESULTS TO SCIENTISTS AND CLINICIANS FROM AROUND THE WORLD

ISIORT, the annual meeting of the International society of Intraoperative Radiation Therapy, has chalked up its 10th anniversary this year. This time round it was held jointly with ILEXIUM, the International Low-Energy X-ray IORT User Meeting.

Carlos Illana, product manager of GMV's Secure e-Solutions sector, presented at ISIORT 2018 the results of research carried out by specialists from the Radiophysics, Radiation Protection and Radiotherapeutic Oncology Services of the Hospitalario Provincial de Castellón de la Plana. These results have proven ***radiance™***'s capacity to help in assessment of the total radiation dose to be applied in combined intraoperative radiotherapy and external treatment.

During ILEXIUM, Illana also presented the results of the SURNAV project for navigation of radiotherapy equipment in the operating theater, together with specialists from the Hospital Universitario de Gran Canaria Doctor Negrín, with application in IORT planning for breast cancer treatment.

GMV at SEIS's 25th National Conference on Healthcare and Innovation

GMV has taken part in the 25th National Conference on Healthcare and Innovation organized by the Spanish Healthcare IT Society (*Sociedad de Informática de la Salud*: SEIS). Inmaculada Pérez Garro explained Big Data's potential in personalized treatment and diagnosis, and shared with the meeting some of the conclusions reached by GMV from working on flagship healthcare Big Data projects like Harmony, HEXIN and MOPEAD.

GMV's executive was a member of the debating panel called "Treating each cancer with the best procedure", alongside leading figures like Julio Mayol, Tenure-Holding Surgery Professor of the Universidad Complutense de Madrid and Medical Director of the Hospital Clínico San Carlos; Rafael Solana, Secretary General of Healthcare Research, Development and Innovation of Andalusia's Regional Healthcare Ministry, and Josep Pomar, Manager of the Hospital Universitario Son Espases.

In her speech she stressed that Big Data technology lays down no restraints in terms of integrating data from very diverse fields (demographic, survival, histological, phenotypes, genetics, etc) and is able to discern within them specific patterns of particular tumor subtypes".

The company also took part in the National Antibiotic Resistance Plan Workshop, led by Doctor Jaime Lora Tamayo from the Internal Medicine Service of the Hospital Universitario 12 de Octubre.

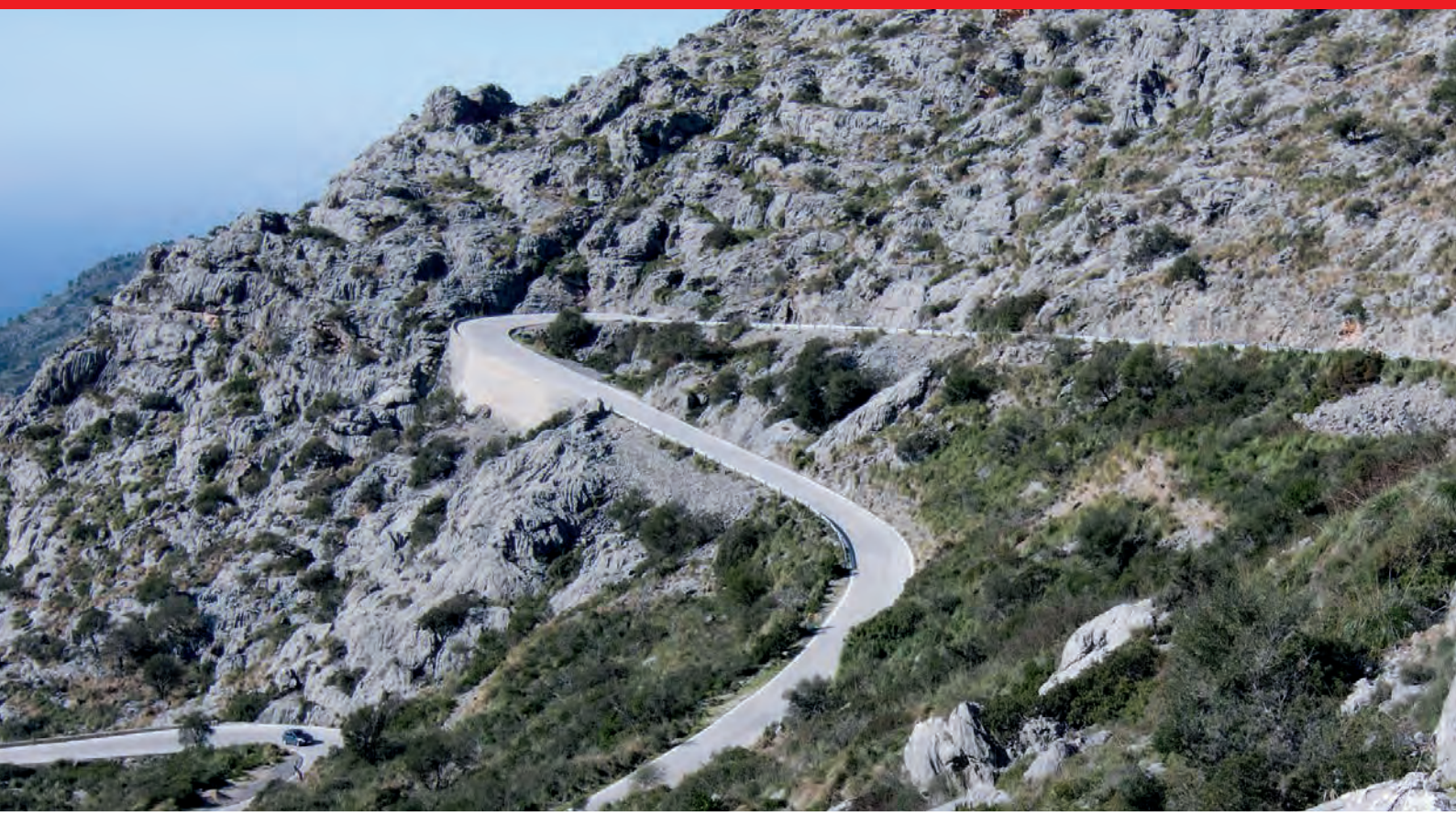
It is a known fact that failure to stick to the prescribed treatment causes more than 25,000 deaths a year in the European Union. A national hospital-level study conducted in 2011 showed that only 40% of the surveyed hospitals systematically monitored the use of antibiotics. In light of these telling figures, GMV-developed telemedicine platforms like antari could play a crucial role in turning this situation around.

Healthcare Big Data features at the 1st EIT Health and IESE Think Tank

EIT Health and IESE Business School called together a Think Tank of hospital managers, physicians, researchers, academics, consultants and technologists to discuss "*The use of existing Big Data to improve healthcare: the Spanish contribution*", with participation too by GMV.

Inmaculada Pérez Garro, Manager of GMV's healthcare sector, input her knowledge of Big Data applications in research, disease prevention and personalized medicine, among other topics. She drew on all her experience in leading national and European Big Data healthcare projects like HEXIN, Harmony and MOPEAD in giving an eminently practical explanation of the impact on peoples' healthcare of mining clinical and epidemiological data.

Some of the key subjects dealt with in this event's presentations and debates were all the following: the exchange of medical records; the use of information for improving disease diagnosis; striking the right balance between transparency and privacy in compiling and storing data; limits laid down by law; the adoption of instruction and training programs to meet the new needs generated by Big Data; reinforcement of data science subjects in syllabi; and the creation of a code of conduct to ensure secure collaboration between the public and private sectors. The opening speech was given by Jan-Philip Beck, CEO of EIT Health.



Supply of new ticketing system with EMV technology for the Consorcio de Transportes de Mallorca

GMV HAS WON THE TENDER FOR THE SUPPLY OF TECHNOLOGICAL COMPONENTS FOR THE NEW FARE SYSTEM OF THE MALLORCA TRANSPORT CONSORTIUM (*CONSORCIO DE TRANSPORTES DE MALLORCA*), WHICH TAKES IN BUS, TRAIN AND METRO EQUIPMENT. THIS IS A TRAILBLAZING PROJECT IN SPAIN AND ALSO SETS A NEW BENCHMARK FOR EUROPE'S FUTURE PUBLIC-TRANSPORT TICKETING SYSTEMS

GMV has won the tender for the supply of technological components for the new STI-R4 fare system of the Consorcio de Transportes de Mallorca, which takes in the collective public transport of the Balearic Islands, including the islands of Mallorca, Menorca, Ibiza and Formentera. The contract is for an intermodal transport system, supplying technology for buses, trains and metro.

Under this new benchmark ITS contract in Spain GMV will be rolling out an integrated multimodal fare system in the public transport network of the Balearic Islands, after which it will supply technical assistance for the first three years of operation. The technological equipment to be supplied for this purpose is a blend of EMV technology and smartcards (habitually used public-transport farecards), including the EMV payment service and incorporating all the advantages of an account based ticketing (ABT) system.

GMV will roll out 1652 validators and 611 dual EMV/SmartCard desks, 1247 video-surveillance cameras plus 611 inside information panels. GMV will also see to the adaptation in metro and train stations of 238 ticket barriers and 62 Ticket Vending Machines to allow the system to work with EMV technology and the new payment platform.

GMV will also be incorporating its groundbreaking ***Deepsy®*** platform, which will enable the Consorcio de Transportas de Mallorca to develop its own onboard ticketing software regardless of the equipment hardware configuration. Nonetheless, in the particular case of the 200 buses of the Municipal Transport Company (Empresa Municipal de Transportes) of Palma de Mallorca, GMV will be developing the entire onboard ticketing software.

GMV will supply an end-to-end payment solution that adapts EMV technology to the Consorcio de Transportes de Mallorca's new integrated STI-R4 fare system, thus allowing the traditional smartcard system to work alongside EMV bank cards. The incorporation of EMV technology will allow any would-be passenger with a physical or cellphone-virtual bank card to access the public transport system without previous registration and in the certainty that a post-payment system will guarantee him or her the most favorable fare in accordance with the actual use made of the transport system.

This a trailblazing project in Spain, featuring as it does the incorporation of EMV technology in an account based ticketing (ABT) system and driven by the Consorcio de Transportes de Mallorca's determination to set up a marquee system that stands out from the rest; it also serves as a benchmark in Europe for any upcoming public-transport ticketing systems.

Under this new benchmark ITS contract GMV will be rolling out an integrated multimodal fare system in the public transport network of the Balearic Islands

GMV renews its maintenance contract with Malta Public Transport

GMV has renewed the maintenance contract of the transport network of Malta Public Transport (MPT), taking in the advanced fleet management system, video surveillance system and electronic fare collection system of the 409-bus fleet (33 buses more than in the previous maintenance contract).

The maintenance management is based on a schedule of preventive, corrective and predictive actions, often succeeding in heading off any faults before they actually occur.

Both client and provider are given an exhaustive vision and control of the whole system by means of a monitoring document recording the cause of any fault, the time taken to deal with any client-reported incidents, the mean repair time, etc.

Throughout this maintenance period, moreover, its scope is to be enlarged. It is now to include maintenance of the passenger information system and the repair of certain types of vandalism.

The advanced fleet-management system and video surveillance system is made up by GPS-, 3G- and WiFi-enabled onboard equipment with door sensors, connection to 1440 onboard video surveillance cameras with a recording system and online streaming, together with a complete electronic fare-collection system fitted with QR code reader and integrated with Malta's contactless "Tallinja card". This whole system is rounded out with a recharging network with 7 recharging and customer-attention points in offices, SMS coupons for telematics recharging plus a web portal for online recharging and checking remaining travel credits.

The current mean ridership of this public-transport system is 100,000 a day, so system maintenance has to ensure a top-quality service

GMV features at SilesiaKOMUNIKACJA 2018

On 24 and 25 April 2018 Sosnowiec hosted the public transport fair "SilesiaKOMUNIKACJA". Held for the tenth time this year, it aroused keen interest, attracting a notable turnout of over 1800 visitors and 100 exhibitors.

For years now this fair has been backed by the most important transport companies and industry institutions from the Silesia region. As in previous years, various systems and devices in the field of public transport, including mobility, warehousing and logistics, were displayed at the fair.

The event also included a comprehensive lecture program dealing with various topics such as the investments planned in the Tarnów conurbation network. There was also a meeting on "Metropolitan Transport Organization".

GMV showcased its whole range of public-transport solutions, including its fleet management systems for urban and interurban transport, its passenger information systems and electronic fare collection systems. The stand also displayed a mobile ticket vending machine, which the visitors could try out for themselves. Other items on display were the video surveillance system and ***GMV Planner*** *powered by DPK Systems* for the organization of bus lines.

Grupo ALSA shows its trust in GMV once again

Grupo ALSA has turned anew to GMV, recently confirming the contract award for renewal of the current ticketing system originally contracted from GMV back in 2009 for the 201-bus fleet of its Moroccan subsidiary ALSA CITY AGADIR, the operator running the urban and suburban transport of the city of Agadir.

Upgrading to the new ETC-606i-8 ticketing machines, fitted with a GPS receiver and communications modem, means that the buses can now offer the functions of a complete onboard fleet-management system. The central ticketing system is therefore now combined with the central fleet management system, with all the following advantages: control and management of all services, GIS screen display of the movements of the whole fleet, availability of vehicle positioning information for calculating ETAs or sending text messages between drivers and the control center, among others.

Both central systems (fleet management and fare collection) will be based on multi-fleet, multi-operator web applications, enabling more than one operator to be integrated in a single platform, allowing access by each one to its own private information while Grupo ALSA itself will have master-key access to the pooled information of all signed-up operators.

The system includes online farecard-recharging applications, Smartphone APPs and a website for giving would-be passengers information on the time the bus will pass each stop, line schedules and runs. The system also includes 3 LED panels giving ETAs in the biggest bus stations plus 15 inspection handhelds.

As for farecard recharging, as well as the possibility of online recharging requests, passengers will also be able to recharge their cards onboard the buses, while automatic card vending and recharging machines will be installed at the city's two main bus stations plus 12 attended recharging posts throughout the city.

ITS for more sustainable cities

On 14 and 15 May Nicosia hosted the 5th European Conference on Sustainable Urban Mobility Plans (SUMPs), bringing together all the stakeholders involved in Sustainable Urban Mobility Plans.

The banner theme of this year's event, organized by the European Commission in collaboration with the Urban Mobility Observatory Eltis, the City Council of Nicosia and the Ministry of Transport, Communications and Public Works of the Republic of Cyprus, was "Planning for Multimodal Cities" in passenger and freight transport, with the aim of achieving more sustainable and better-functioning cities.

GMV attended as sponsor and also as an invited guest of the Ministry of Transport, Communications and Public Works of the Republic of Cyprus, the authority responsible for running Cyprus's extensive urban and suburban bus network, currently being modernized by implementation of GMV's intelligent transportation systems (ITSs). Additionally, together with the Ministry of Transport, Communications and Public Works of the Republic of Cyprus, GMV gave a paper on its ITS developments and solutions currently being implemented in the country.

The conference was attended by representatives from local and regional authorities, related politicians, urban mobility planning stakeholders, academics and other mobility professionals.

Solution to help the visually impaired

Transports Metropolitans de Barcelona (TMB) has once more turned to GMV for developing a solution to help the visually impaired identify and use the city's buses.

The project consists of installing a Bluetooth beacon in each bus of TMB's 1080-vehicle fleet. These beacons will continually emit announcements telling visually impaired passengers key service parameters like the bus identifier, the line and destination of the buses passing the stop, all this information provided on a handheld app. The signal issued by these beacons not only helps the visually impaired passenger to estimate the distance of the bus but also warns the driver through an onboard interface that someone with special needs is about to board the bus.

This solution enables visually impaired people to cope with the very challenging situation of identifying vehicles at multiple, crowded bus-stops where buses pick up passengers from different points.

At present visually impaired passengers are working with a GMV-developed radiofrequency device that announces which bus has arrived at the stop before they board it. This new solution now under development takes things one step further, giving these passengers more precise information on their cell phones without needing to buy new devices and with the added possibility of phasing in new services in the future. The driver is also provided with feedback on how the system is working.

GMV showcases its technological breakthroughs in France

A total of 11,000 trade professionals took part in the 8th Transport Publics, a biennial event held this year from 12 to 14 June in Paris, organized by the French organizations Groupement des Autorités Responsables de Transport (GART) and Union de Transports Publics (UTP), as well as the not-for-profit association GIE Objectif Transport Public.

Politicians, experts, operators, manufacturers, representatives from urban and interurban transport stakeholders from Europe and the whole world came together in this biennial event to check out the latest developments in the train-, bus- and coach-sectors plus other means of sustainable transport like carsharing or cycling.

GMV attended the event to showcase its planning, fleet-management and fare-collection systems for public transport operators. It also displayed its latest breakthroughs, such as the electric-vehicle management system and passenger-information mobile Apps.

Of all the products displayed on GMV's stand, one that aroused special interest was the demonstrator of the geolocation and communication system supplied by GMV for the Spanish national railway operator, RENFE; this system enables operation of the advanced fleet-management and passenger-information system (SAEIV in Spanish initials).

Another system presented by GMV at the show was its ***GMV Planner*** *powered by DPK Systems* for designing and optimizing schedules, services, shifts and quadrants of the public-transport network, allowing operators to provide more and better services with the same resources.

Also featuring at the event were France's benchmark sector firms, like the manufacturer ALSTOM, working with GMV as a trusted partner on all its new worldwide trams, and the operator Transdev, whom GMV is already supporting in cities like Los Angeles (guest of honor in Transports Publics'18) and Sydney.

As could hardly be otherwise at such a cutting-edge fair, hybrid and electric buses featured large among other latest developments. GMV has developed systems for efficient planning and running of vehicles of this type.

GMV supplies several systems to equip RENFE's new high-speed "AVE" trains

TALGO HAS AWARDED GMV THE CONTRACT FOR SUPPLYING THE EMERGENCY INTERCOM AND PUBLIC-ADDRESS SYSTEM, THE HUMAN-MACHINE INTERFACE SYSTEM AND THE COMMUNICATIONS PLATFORM OF RENFE'S NEW HIGH-SPEED TRAINS

This new contract award arises from the procurement by Spain's national railway operator, RENFE, of 30 self-propelled high-speed units to run on its main commercial corridors. These new units, supplied by the Spanish train manufacturer Talgo, will run on both Spanish and French lines, so the systems fitted also have to be adapted for operation in both countries.

The first of the systems supplied by GMV for these trains is the emergency intercom and public-address system, a solution already supplied by GMV for Talgo's high-speed line in Saudi Arabia (Mecca-Medina). This system is very similar to the one already supplied for Talgo in Arabia; it is based mainly on digital technology with analog redundancy by means of a UIC communications bus. The system supplied is made up by all the following: public-address systems to be fitted on each of the cars, the voice-input points enabling the crew to make passenger announcements plus an intercom between onboard personnel and the emergency intercoms allowing passengers to speak with the personnel in the event of any serious incident.

The system operates in various languages and is safeguarded by several redundancies to make it ideal for running in critical situations.

The second system to be supplied by GMV is the Vehicle Human Machine Interface (VHMI). This system is designed for unit supervision by onboard technical personnel. The VHMI incorporates information and diagnosis terminals fitted on each car to connect with the Train Control and Monitoring System (TCMS), showing diverse train states and technical information. It also allows orders to be sent up to the train's TCMS.

Lastly, Talgo will be equipping its AVE units with the communications platform already supplied by GMV for RENFE's other trains, including the whole range of high-speed, long- and medium-haul and the local commuting service. This system gives RENFE centralized and uniform control of the whole fleet. The communications platform is a variant of GMV's inhouse railway fleet-management system (***SAE-R®***); as such it includes the basic functions of train tracking, two-way text messaging and voice communications between the control center and train. It also combines these basic functions with other more advanced features such as display of onboard technical and service documentation and filling in of the unit's fault report, among others.

One particular feature of this product is that it integrates seamlessly with the train's many existing systems, such as the passenger information system, the public-address and intercom, the video-surveillance system, the juridical recording unit, the energy meter and the diagnosis system. These integrations mean that real-time data can be obtained of each system (state, faults, real-time video, etc.), while historical data such as events, energy readings and diagnoses can be downloaded for later reference. Last but not least the platform also sends service information from the control center to the onboard unit, to be displayed on the LED panels and video-entertainment models and announced on the train's PA.

GMV supplies the new ticketing system of Cádiz and San Fernando

GMV has won an open public tender held by the Metropolitan Transport Consortium of the Bay of Cadiz (*Consorcio Metropolitano de Transportes de la Bahía de Cádiz*: CMTBC) for renewal of the ticketing equipment of the operator Tranvía de Cádiz a San Fernando y Carraca. This tram operator forms part of CMTBC and runs the urban transport in the city of Cádiz as well as other types of suburban services.

The operator's 68 vehicles will be fitted with the electronic ticketing machine ETC-606i-8; this in turn will be fitted with a GPS tracker and communications modem for sending real-time information up to CMTBC, among other functions. This information includes the position of the bus, the ticket sales and validations, to be fed into CMTCB's own fleet-management system.

The new ticketing machines will replace the current ETC-500s supplied by GMV in late 2008; they will likewise be integrated into the existing fleet-management system, also supplied by GMV in 2010. Under this new integration arrangement the ticketing machine will also act as a fleet-management console; connections between both systems will be improved by an Ethernet connection with retention of previous features such as sending ridership figures to the fleet-management control center, reception of the parameters of the service to be provided, messaging between drivers and the fleet-management control center, audio requests for voice communications and display of regulation indications to tell drivers if the vehicle is running ahead of or behind schedule upon passing each stop.

Another important feature of the project is integration of the new system with the operator's current farecards and the integrated cards of CMBC itself, both using Mifare Classic contactless technology. At the same time, the new cards will be Mifare-Desfire enabled to replace the former cards in the near future.

Maintenance and technical assistance for Zaragoza's trams

The joint venture "UTE Mantenimiento Tranvía de Zaragoza", made up by the companies FCC and ACCIONA, has recently turned once again to GMV for carrying out the maintenance and technical assistance tasks on the advanced fleet management system supplied by GMV for Zaragoza's tramline. This new two-year contract represents the fifth renewal of the original since the tramline came into operation in 2011.

The scope of the contract takes in the preventive and corrective maintenance of GMV's whole system for Zaragoza's tramline: hardware and user applications in the control center (operation and backoffice), user applications and equipment onboard the 21 trams of the fleet plus RFID trackside tracking balises for precise tram tracking.

The whole maintenance service is sized and designed to ensure Tranvías de Zaragoza continual availability of its fleet management system, offering 7x24 troubleshooting for any grave problem that might crop up. At preventive level continuous activity monitoring guarantees a complete check of the tram fleet every 10 days, plus a weekly check of control center operations.

Alongside the routine maintenance tasks, this year's contract renewal has been topped up with the replacement by GMV of several pieces of hardware that are now approaching the end of their useful life (e.g. onboard driver monitors) plus extension of the AVLS Backoffice application with a new driving-time and driver-rest monitoring report.

The contract also includes training up new operators in the use of the fleet-management operator post application.

Modernization of the Dynamic Passenger Information System in Warsaw

The Dynamic Passenger Information System, implemented in 2015 by GMV for Tramwaje Warszawskie [Warsaw Trams], included over 520 trams with onboard computers equipped with GPS and GPRS modules, a central server with an SAE [FMS] application responsible for prediction of the times of arrival at the stops as well as 68 stop displays in LED technology. Regardless of the number of stop displays installed in the city, the SAE system predicts the arrival time for all 550 tram stops in Warsaw. This information is made available by Tramwaje Warszawskie on a special PIS website with a virtual display, to which the passenger can gain access in several ways, e.g. by scanning with his/her smartphone the QR code placed at each stop.

In June 2018, after many months of preparations to design a new architecture for the PIS system, Tramwaje Warszawskie turned to GMV for modification of the system and its adaptation to work with an open API ensuring the possibility of data exchange with external devices, in accordance with the standard developed by Tramwaje Warszawskie. As part of its programming work, GMV will also implement new system functions, such as detection of non-standard stoppages of the vehicles on the route, which will be reflected in the information provided on the stop displays.

Within the scope of this new project, GMV will phase in all other trams not initially included in the system, will provide the wireless data transmission service between all 530 vehicles and the server and will be responsible for maintaining the software and the devices in full efficiency in order to ensure the highest quality of system operation.

GMV and ANAPAT reach a collaboration agreement

GMV and the National Association of Mobile Elevating Work Platform Hire Firms (Asociación Nacional de Alquiladores de Plataformas Aéreas: ANAPAT) have reached a collaboration agreement giving ANAPAT members preferential access to GMV's inhouse telematic fleet-management system, ***MOVILOC®***.

With this agreement ANAPAT seeks to encourage the use of ICTs among its associates to boost productivity and favor the takeup of ***MOVILOC®*** services with exclusive discounts for associate firms.

MOVILOC® allows companies of the aerial platform hire sector to keep track of their vehicles in real time. They can also find out the real number of hours worked by each vehicle, enabling them to optimize the performance and efficiency of each one. Another of the most highly valued features is the possibility of immobilizing any vehicle if stolen or kept beyond the agreed hire term.

Vehicle maintenance tasks can also be carried out more efficiently, according to the hours worked. The fleet manager will now be able to set up "maintenance alarms" to flag up when each vehicle is due its routine service.

Cybersecurity of the connected and autonomous car: a worldwide headache

Although there is some diversity of opinion about specific dates, 2020 looks set to be a turning point in takeup of the totally-connected and autonomous car. From this moment truly driverless cars will be running on our roads. Automated driving aims to cut out human error, reduce the accident rate and make life easier for drivers and passengers. As well as many undoubted advantages, however, this change also comes beset with many stiff challenges that are now starting to worry both carmakers and users alike, as well as other C21st mobility stakeholders.

One of the main barriers to development of vehicles of this type is the existence of cybercriminals who might tamper with autonomous cars and even take them over completely. Carmakers are therefore having to set up protection against unauthorized access and forestall hacker empowerment.

To tackle this problem GMV's Security Consultant, Carlos Sahuquillo, took part in the 4th VLCSOFTING conference, organized by the IT Technology Institute (*Instituto Tecnológico de Informática*: ITI). His paper, focusing on the car hacking concept, explained the vulnerabilities that have come to light in connected cars and the main hacking entry-points.

Cybersecurity of the autonomous and connected cars is a worrying problem and threat at worldwide level. There have already been cases of people who have managed to take over remote control of a vehicle fitted with connectivity systems. Risks range from theft of passwords, remote door-opening and -closing, car tracking to physical control of the vehicle. Indeed, several vehicles now on the market suffer at source from vulnerabilities. Several car-hacking stories have hit the news in recent months, including attacks exploiting vulnerabilities of the vehicle's mobile apps or Relay Station Attacks, when hackers manage to mimic the vehicle's key signal, enabling them to gain entry and even start it up without ever needing to get hold of the key itself.

This situation is becoming more pressing for the sector by the day. Carmakers and the whole ecosystem of the connected and autonomous car now need to make a big effort to tackle this problem head on, offering clients and users a joined-up Cybersecurity strategy that guarantees a totally secure vehicle ready to fend off any future cyberattacks.

GMV participates in Transport Research Arena 2018

The Transport Research Arena 2018 took place in Vienna, Austria, from 16 to 19 April. During the 4 days of the event several sessions looked into the future of mobility and transport.

The TRA 2018 exhibition gave a good idea of what is being offered by key industry and academic players, ranging from the latest in electric vehicles, to autonomous driving, with many insights along the way of how these players want to shape the future of mobility.

Bruno Gonçalves, from GMV in Portugal participated as a panellist in one of the invited sessions "Infrastructure as a Service", presenting GMV's take on a connected future of collaborative services provided by the infrastructure but enriched by all road stakeholders.

Also during TRA 2018 the Portuguese government officially announced Portugal's candidature to host TRA 2022.

ESCAPE Project test campaign

FROM 9 TO 13 JULY THE UNIVERSITÉ DE TECHNOLOGIE DE COMPIÈGNE (UTC) IN FRANCE HOSTED THE INTEGRATION TESTS OF THE ESCAPE PROJECT (EUROPEAN SAFETY CRITICAL APPLICATIONS POSITIONING ENGINE)

ESCAPE, co-funded by the European GNSS Agency (GSA), aims to harness the services offered by Galileo, Europe's satellite-navigation system, for the purposes of autonomous driving. Primed by Ficosa, ESCAPE brings together Europe's top research and industrial institutions to create a positioning engine for automotive safety-critical applications, i.e., applications involved in highly automated driving.

GMV boasts an important technical role in the ESCAPE project. As well as responsibility for technical management of the project, within the development of the EGE positioning engine (ESCAPE GNSS Engine), GMV is also furnishing the algorithms that will process the readings of the vehicle sensors, the cameras and GNSS receiver to provide the positioning service together with the integrity required by the connected autonomous vehicle. It will also be providing the intermediate data-fusion layer software, in charge of binding all the communication components together into a synchronized, well-integrated system.

For a five-day period the teams of Ficosa, GMV and Renault put their heads together with UTC scientists to carry out a complete series of tests on the software and hardware interfaces of the prototype EGE positioning engine.

During these tests the EGE positioning engine was fitted on a Renault ZOE and then exposed to diverse operational conditions, including static and dynamic vehicle, open sky, suburban and urban scenarios.

The results of these tests represent a real milestone in the project and will be fundamental for improving and upgrading the prototype.

GMV once more collaborates with ASEPA in the third Autonomous-Vehicle Course

After the resounding success of previous courses, 18 May saw the start of another "Autonomous- and Connected-Vehicle Specialization Course", organized by the Spanish Automobile Professionals' Association (*Asociación Española de Profesionales de Automoción*: ASEPA) in collaboration with the University Institute for Automobile Research (*Instituto Universitario de Investigación del Automóvil*: INSIA-UPM).

The 50-hour course is divided into two modules: one dealing with the autonomous vehicle and the other with the connected vehicle. The former takes in both hardware and software aspects and involves practice runs on test tracks. The latter delves into the technical aspects related to the connected vehicle, taking in not only communication systems, but also applications, services and cooperative systems, again with test runs.

The course was given by 17 experts in these future specialties, including researchers, academics, representatives of the main firms and the most advanced brands in this field of autonomous and connected vehicles.

Sara Gutiérrez, manager of GMV's automotive business unit, gave one of the papers, presenting different vehicle-to-vehicle communication application cases, giving details of a wide range of connected-vehicle services where GMV is inputting its wealth of experience.

The qualification for completing the course is the academic certification of the *Instituto Universitario de Investigación del Automóvil* (INSIA-UPM).

The course was given by 17 experts in these future specialties, including researchers, academics, representatives of the main firms and the most advanced brands

SafeCOP GA took place in Lisbon

On April 10 and 11 last GMV hosted the latest general assembly of the SafeCOP project in Lisbon. A total of 40 participants discussed the current status of the project, the upcoming second year review and the next steps to be taken.

The general assembly consisted of a series of plenum meetings and parallel discussions, culminating in a marketplace where all project use cases were presented.

SafeCOP is a European project co-funded by ECSEL JU that targets cyberphysical systems-of-systems whose safe cooperation relies on wireless communication. In particular, SafeCOP will provide an approach to the safety assurance of such systems in the healthcare, maritime, vehicle-to-vehicle and vehicle-to-infrastructure sectors. A final demonstrator is expected by 2019.

One of these use cases was the Control Loss Warning demonstrator, in which a platooning solution is being developed along with additional safety and security features. GMV is leading this use case and is also responsible for the V2X communications and the vehicle control monitoring mechanisms.

The European Commission reviews the results of the ENABLE-S3 project

From 3 to 5 July, with two years of the project now run, IBM Research in Dublin (Ireland) hosted the general assembly, review and exhibition of ENABLE-S3 (European Initiative to Enable Validation for Highly Automated Safe and Secure Systems), presenting the developments and upgrades of the demonstrators, simulators and videos of what will be the definitive platforms of this project, which is paving the way for automation of critical systems.

Funded by the European Commission's Horizon 2020 R&D program (H2020) within the ECSEL Joint Undertaking, ENABLE-S3 is being carried out by a consortium of partners from over 15 countries. Its remit is to pave the way for accelerated application of highly automated and autonomous systems in the automotive, aerospace, rail and maritime mobility domains as well as in the healthcare domain.

GMV is participating in two use cases. It is leading Traffic Jam Pilot with V2x, focusing on the automotive domain, while also taking part in the Thales Alenia-led Reconfigurable Video Processor for Space, carrying out activities centering on the space domain.

In the automotive use case GMV's activities will produce a highly automated pilot system to increase road safety, reduce congestion and benefit the environment.

In the space domain GMV will apply ENABLE-S3 methodologies to validate a technology demonstrator under extreme space conditions. This demonstrator, also resulting from this project, will involve the use of inflight-reconfigurable FPGAs to exchange vision-based navigation implementations to suit the characteristics of each phase of a space mission. In other words, reusing the same hardware to cut down costs and load.

This three-day encounter served to audit and take stock of the project; each use case presented the developments to the European Commission in the form of several demonstrators and showed the roadmap till the end of the project.

As a participant in the project GMV has taken part in the various chats to weigh up any difficulties in partners' collaborative processes observed in this first year of the project and also to define the activities that need to be tackled within the project. Together with its partners GMV has likewise taken part in the break-out sessions corresponding to its use cases.

The meeting also included a demonstrator exhibition day to showcase work and ideas as well as the state of other use cases.

Both ECSEL and external Reviewers of the project were carefully listen to all the presentations of the Demonstrators, highlighting the good technical level and cooperation among partners.

Expert Consultation for decarbonisation of transport in EU

GMV was invited to participate in an expert consultation session for the EUCalc project.

This session took place in Vienna on 19 April last; its goal was to review the current model, levels of ambition and levers for transport. Bruno Gonçalves from GMV in Portugal participated in the joint discussion and group review of all items.

The EU Calculator: Trade-offs and pathways towards sustainable and low-carbon European Societies (EUCalc) is a European project with the aim of helping policy makers (at EU and at member state level) and giving them better insight into the transition pathways that are possible for Europe. It is funded by the EU Horizon 2020 program.

Opinion

Technological innovation, a constant feature of the financial world

The financial sector is living through interesting times. It has proven capable of adapting itself to (some would say generating) the major changes we are now experiencing as a society, turning itself into a driving force of innovation.

The first computers that came out of military centers ended up in the headquarters of the major financial companies (or was it the other way around?). The rest is history. The replacement of written records by electronic records, process automation, connection between offices and branch networks, the advent of new electronic means of payment, financial self-services, mobile banking …. And the whole concomitant industry of consulting, engineering, integrators, manufacturers, service providers, etc.

At the same time the financial sector has had to grow, consolidate itself, internationalize, adapt itself to financial and economic crises of all ilk, not to speak of the social changes that have transformed its clients, ranging from the oldsters who still want to update their bankbooks to the new generations who nowadays never set foot in a bank and do all their transactions online.

THE CONSTANT FEATURE OF CHANGE

The financial institutions, together with the major service firms, were once "owners" of millions of clients; now, not without some misgivings, they have seen how midget firms born in garages in some lost corner of San Francisco Bay have transformed themselves almost overnight into giants with millions of users. Companies capable of rolling out worldwide services in a matter of months; adapt to their users' changing tastes and preferences in a matter of days; or try out new concepts with millions of accounts in a matter of hours. Companies capable of gleaning, storing, processing and analyzing huge amounts of data and coming back with new proposals that make them an even more attractive prospect. After much chewing over the phenomenon, someone coined the term Digital Transformation to describe it. And the financial sector didn't take its eye off the ball.

This Digital Transformation impinged on financial institutions' baseline, forcing a reengineering of the model

"THERE IS A CURSE. THEY SAY: MAY YOU LIVE IN INTERESTING TIMES."

***Terry Pratchett**, Interesting Times*

from the highest spheres of the business right down to the information-system pipelines plus the processes and professionals that underpin it all.

And like canny students of the socioeconomic reality, they soon cottoned on to the fact that this transformation is not a destination or an end but rather a way of understanding how things should be done in these times.

TECHNOLOGY AS AN ENGINE

Few other sectors have managed to harness so efficiently the advantages put forward by technological innovation. Just think: in less than 20 years we've gone from the first dry runs of electronic banking to total capillarity on the strength of mobile networks and smartphones. From a tiny set of electronic operations to the management of all our assets from the palm of a hand.

New alternative means of payments, cryptocurrencies and blockchain, Big Data, machine learning and artificial intelligence, virtualization and cloud computing... the rate of change is breathtaking.

And amidst all this maelstrom, the need of continuing to be a bulwark of the economy, facing up to the new threats that jeopardize the whole system (cybercrime) while keeping consumers sweet too (privacy, data protection).

The financial sector is certainly living through interesting times.

Roberto López Navarro, Director of Financial Services Industry of GMV's Secure e-Solutions Sector

Groundbreaking technology at the service of people with functional diversity

Fundación Vodafone has organized the 3rd Connected by Accessibility Encounter (*III Encuentro de Conectados por la Accesibilidad*) with the aim of increasing the participation and autonomy of people with functional diversity, improving their quality of life and favoring their inclusion in society. During the encounter several projects were presented that use ICTs in various spheres of daily life, precisely with the needs of each person of our society in mind.

With the overarching aim of promoting the development of groundbreaking services and solutions that favor all-round, across-the-board accessibility, GMV has showcased the benefits to be offered by Amazon's virtual assistant Alexa, in combination with other devices, to facilitate many actions of our daily life.

According to World Health Organization (WHO) figures, more than one billion people in the world live with some form of disability, of whom nearly 200 million experience considerable difficulties in functioning. In the interests of building an all-embracing society, all of us must be capable of using ICTs as a fountainhead of resources to favor social inclusion of one and all.

A sound use of technology promotes equality by improving learning processes, strengthening the acquired learning, facilitating and improving information-access and communication, among many other benefits. Technology should hence be used as a means of spanning the digital divide, both for people with disability and those without.

We at GMV are committed to carrying out innovation-based, diversity-favoring social actions to confront the growing number of challenges presented by today's environment.

Collaborative robotics: a great opportunity for industrial automation

The rapid advance of collaborative robotics and its integration with new development models based on IoT, Big Data, Cloud Computing and Artificial Intelligence, in combination with other disruptive technology, are bound to change the industrial environment for good, acting as catalyst to favor Industry 4.0 and the connection between machines, tools, systems and even component parts, maximizing efficiency and coming up with a quick and fleet-footed response. These new development models open up a whole range of opportunities for industries like process mining, predictive maintenance, simulation, cloud robotics, artificial vision, machine learning, route optimization and many more.

Ángel Cristóbal Lázaro, GMV's Expert in Enabling Technologies, has taken part in a series of lectures organized by enerTIC on technologies applied to Industry 4.0 energy efficiency, explaining how collaborative robotics and new development models can help to make industry more efficient.

Drawing on their hallmark lightness, flexibility and precision, collaborative robots (cobots) need no rest or downtime and can carry out tasks nonstop and more quickly; they are capable of producing more in less time, using up less energy. Application of Artificial Intelligence techniques like algorithms deployed in Cloud Computing platforms can generate a whole host of scenarios that maximize process parameters such as energy consumption or component part wear, helping to shorten the investment breakeven period. Moreover, the accuracy of these devices means a big reduction in the material and energy wastage rate during production.

Knowledge, innovation and talent ahead of the digitization challenge

At world level the digital economy represents a chance for socioeconomic development. Apart from favoring access to basic services (education, health, government, financial services, etc.), this digitalization gives companies from all sectors a chance to boost their efficiency and competitiveness.

The Fundación Luso-Española, the Fundación Euroamérica and Casa de América Latina, with the aim of seeking areas of cooperation between Latin America and the European Union ahead of the digitization challenge, have put on in Lisbon the seminar "Challenges of the digital transformation and knowledge in the Ibero-American space". In the opening session Luis Fernando Álvarez-Gascón, General Manager of GMV's Secure e-Solutions sector, analyzed how this technological revolution is transforming our economy and society. The day-long seminar analyzed the present and future of the economy ahead of the digital challenge, tapping into the experience of companies from various productive sectors and of Ibero-American organizations involved in the region's development and several institutions.

The authorities and experts from Latin America and Europe agreed that there remains much to be done in order to achieve an effective digital transformation. Witness the shortfall in Latin American connectivity and infrastructure. "*Science and technology are our best allies for overcoming the great challenges now faced by humankind in areas such as healthcare or transport. But we also have to take onboard the risks associated with the digital transformation, in aspects such as privacy and Cybersecurity and tackle them properly. Europe and Latin America share culture and values in common; this favors a common stance towards these challenges*", argued Álvarez-Gascón.

Together with the investment and infrastructure challenges, another of the keys to making headway in the digital transformation lies in the people, especially in terms of digital knowledge and training of human capital. There is a clear dearth of talent at world level; a systematic effort is now needed to train up skilled professionals capable of carrying out the necessary developments.

Together with the investment and infrastructure challenges, another of the keys to making headway in the digital transformation lies in the people, especially in terms of digital knowledge and training of human capital

Ricardo Vaca Berdayes, Expert in Social Behavior and Professor of Madrid's Universidad de San Pablo CEU; Ana Teresa Freitas, CEO of HeartGenetics, Genetics and Biotechnology; Luis Fernando Álvarez-Gascón, General Manager of GMV's Secure e-Solutions sector; João Vasconcelos, former Secretary of State for Industry and founder of Startup Lisboa; Juan Jung, Public Policies Manager of the Inter-American Association of Telecommunications Firms (Asociación Interamericana de Empresas de Telecomunicaciones: ASIET); Helena Martins, Director of Public Affairs and Policies of Google Brazil; and Tiago Vidal, Director General of Llorente & Cuenca Portugal.

"Internet of Everything & Learning Machine" and their applications in companies

The day-to-day situation of organizations' has changed and will continue to do so as hitherto hazy trends crystallize in the managerial sphere of the business world. The fact is that terms such as virtual platforms, Big Data, Blockchain, IoT, Customer Experience, Collaborative Economy or Business Intelligence are now buzz words in board meetings. The corollary to this development is that firms are in ever more pressing need of forward-looking leaders capable of steering them towards success.

With this aim in mind, the Managerial Progress Association (*Asociación para el Progreso de la Dirección*: APD) put on an event in which digital leaders debated the key issues in tackling the digital present and future. Miguel Hormigo, Manager of GMV's Secure e-Solutions Industry Sector took part in this third conference to speak in the session "Internet of Everything & Learning Machine" and their applications in companies.

Internet of Things and Big Data: The perfect match in Industry 4.0

GMV has attended the conference "Digital Energy: Digitalization Solutions in the Energy Sector", organized by Energética XXI, to talk about its experience with and knowledge of data analysis applied to various environments, giving the example of the optimization of industrial processes with IIoT and Big Data and stressing the Industry-4.0 applicability of latent variable multivariate regression models.

Data processing based on interconnected devices furnishes us with priceless information for improving industry management and optimizing its resources. Along these lines, advanced data analysis is vital for transforming into valuable insights the huge amount of information coming from automatically inter-communicated sensors and machines, freeing people from repetitive chores of manual data collection, culling and processing.

Pedro José Hernández Ariznavarreta, Business Partner and Industry Big Data & Digitalization expert of GMV's Secure e-Solutions sector brought out the company's experience in platforms based on Big Data, Machine Learning and IIoT technology to improve the energy efficiency and reliability of the assets of industrial plants.

GMV supports the development of digital talent

GMV ATTENDS THE "1ST ALLIANCE FORUM FOR DIGITAL DEVELOPMENT", SPAIN'S FIRST EVER DIGITAL-TALENT ENCOUNTER ORGANIZED BY AMETIC IN COLLABORATION WITH RED.ES

The main problem faced by Spain's technology firms today is the dearth of talent, a fact that clashes with the country's sky-high unemployment figure. This reflection was made by Pedro Mier, president of the Spanish Association of Electronics, Digital Contents and ICT Companies (*Asociación de Empresas de Electrónica, Tecnologías de la Información, Telecomunicaciones y Contenidos Digitales*; AMETIC) during the presentation of the 1st Forum of the Alliance for the Development of Digital Talent (*I Foro Alianza por el Desarrollo del Talento Digital*), organized by AMETIC itself with the collaboration of Red.es and the support of Spain's cutting-edge digital-economy firms, concerned about how to solve this problem, including GMV, Microsoft, Samsung, Google, Amazon...

Pedro Duque, Minister of Science, Innovation and Universities, was present at the inauguration together with the Secretary of State for the Information Society and the Digital Agenda, Francisco de Paula Polo, and the coordinator of the Digital Economy for Spain in the European Commission, Anna Armengol.

The business world gave its ideas on how best to rise to the challenge of seeking and training up digital talent. GMV, a 1800-strong Spanish technology multinational, is a clear example to follow here; 80% of this staff hold higher technical degrees and are carrying out technological projects for major clients around the world, and always with an eye out for increasing their digital talent. Javier Zubieta, Marketing and Communications Manager of GMV's Secure e-Solutions sector, pledged the company's commitment to this "talent revolution" in the debating panel "Spearheading the Digital Transformation", hosting an interesting workshop to illustrate the type of highly-skilled Cybersecurity talent that GMV constantly seeks and finds.

This first digital talent encounter in Spain is an essential step in raising awareness and spurring on action by all digitalization stakeholders, making sure Spain's industry is capable of spearheading the digital transformation.

GMV collaborates with CEOE in drawing up Spain's R&D-driving decalogue

The Spanish Confederation of Business Organizations (*Confederación Española de Organizaciones Empresariales*: CEOE) has presented a "Decalogue of measures to drive R&D in Spain". Luis Fernando Álvarez-Gascón, General Manager of GMV's Secure e-Solutions sector and Vice President of CEOE's Research Committee, in representation of the Spanish Association of Electronics, Digital Contents and ICT Companies (*Asociación de Empresas de Electrónica, Tecnologías de la Información, Telecomunicaciones y Contenidos Digitales*; AMETIC), has collaborated in drawing up the document.

This document springs from CEOE's conviction that Spain needs to up its R&D and digitization effort in order to boost its competitiveness. This Decalogue aims to be food for thought, setting out the main reasons why R&D should be a priority for Spain; over and above that, however, it is also an action blueprint, suggesting specific measures to improve Spain's current legislative framework and the so-called innovation ecosystem.

One of the main measures proposed by entrepreneurs to improve Spain's R&D performance is a great R&D State Pact. Entrepreneurs argue that R&D should be backed by leadership from the government presidency, with more money set aside in the General State Budget (*Presupuestos Generales del Estado*).

GMV hailed as a standout firm in the GEM Spain Entrepreneurship Report

Spain's GEM Association (*Asociación GEM España*), belonging to the international observatory Global Entrepreneurship Monitor (GEM), carries out a yearly analysis and comparison of entrepreneurship indicators in Spain. This involves over one hundred researchers and the support of nearly one hundred institutions, companies and organizations.

Presentation of the eighteenth report in the series came with some good news. The Spanish entrepreneurship rate is bucking up, passing the 6% threshold for the first time in eight years, even though it is still lagging behind Europe's average figure.

In this year's report GMV has been hailed as a knowledge-based company. It now shines as a standout success story, having started out as a small university group over three decades ago, carrying out ESA space R&D projects. Driven upwards and onwards by the entrepreneurship of an ETSI Aeronautics professor and a group of students, GMV has now grown into a worldwide industrial group running subsidiaries in nine countries, employing over 1800 highly-skilled professionals and chalking up a 2017 revenue of over 160 million euros, 65% of which stems from international projects on all five continents. This growth strategy is based on continuous innovation, 10% of its turnover being plowed back into R&D.

The main recommendations of this Report, drawn up from consultations of 600 experts, revolve around the need for new government policies to cut down the tax burden and red tape for startups, favoring entrepreneurship training and driving the development of public and private financial instruments geared towards the creation of new business.

MAREK MATUSZAK

DoB: 19/8/1978

EDUCATION: Computing systems and networks IT engineer

START DATE: 20 April 2015

OFFICE: Posted at ESOC, Darmstadt (Germany)

HOBBIES: IT security investigations, ethical hacking, technology, space, (very) spicy food, beer and a good wine

DEFINES HIMSELF AS: Cheerful, outgoing, inquisitive, team player, loyal, thoroughgoing and fun-loving at the same time

Ever since I got to know the IT world, if I had to choose one thing I always wanted to be, it would be a Cybersecurity professional. Although that was not yet my job, becoming one was always top priority for me. At a certain moment of my life, after working for a time as a freelance, I decided to join a company. But not just any company. I decided it would have to be a reliable, international company that still managed to retain a human face in its way of doing business and treating its employees. With these criteria in mind I checked out the ethical hacker vacancies and the firms running these adverts. The choice soon became clear. All that remained now was to apply and get accepted. The interview, where I got to know my two future bosses, was certainly tough and demanding. In the end I came good and joined this great family that is GMV.

I joined the security consulting division (GMVSES-COS) to carry out pentesting (Penetration Testing) of applications and infrastructure. I found this to be truly rewarding work and was thought worthy of being made project head in one of our major clients. Since then I've been lucky enough to work in a highly demanding, innovating and collaborative environment. The sheer variety of projects and roles I've had, ranging from pentester, project head to trainer and leader, goaded me on to a nonstop quest to increase my skills, in both my career and personal life. Working with demanding clients always seeking the best possible quality, which is the order of the day at GMV, sometimes complicates things. At these moments I always felt myself to be backed up and shrewdly advised by my colleagues, regardless of their level within the firm. Thanks to the multisector makeup of GMV, I soon saw myself involved in space and defense projects, for which GMV had arranged the due security clearance.

It was these projects that set my sights on the space sector. Personally I've always dreamed of being able to tell my children or grandchildren that I've done my bit, however small, to help humankind explore horizons beyond the realms of our planet. A mere glance at GMV's international vacancies and participation in an email group showed me that, for those ready to travel and move, GMV is full of opportunities! There are many facilities to make the change of country much easier. A few months have now gone by since I decided to work in Germany for the European Space Agency's European Space Operations Centre, one of GMV's clients. I was privileged enough to join up as Team Leader of an information security group working in the Mission Operations Infrastructure division. In practical terms this means I collaborate daily with the people controlling all ESA's spacecraft (I'm writing these words only a few meters from the mission control room). I'm learning from the inside many details about the most thrilling projects and missions, such as the future mission to Mercury (Bepicolombo), Earth-observation (Sentinels) or Mars exploration (Exomars). A whole new world to discover! I should also point out that in my young son's eyes I'm practically an astronaut…

Shed any doubts you may have! After only 5 months I can only recommend the experience with words of the highest praise. At the end of the day, it's a small world, and life's too short to live it halfheartedly! Even our job should be an all-out adventure.

RUBÉN OCAÑA

DoB: 22/02/1994

EDUCATION: Information Systems graduate

START DATE: 02 June 2015

OFFICE: Posted at ESOC, Darmstadt (Germany)

HOBBIES: Goalkeeping, motorcycling and a bacon sandwich washed down with a cold beer

DEFINES HIMSELF AS: Optimist by default setting

I came to GMV as a fresh-faced student, while studying a then little known degree in information systems at Alcalá University. I can safely say that GMV was my first working experience, and this is what has brought me to where I am today.

I still recall the day of the interview. I arrived at least an hour early, but I ventured into an unknown (for me) Tres Cantos to kill some time and stoke up my forces with a chocolate con churros. Bad idea: the combination of the drowsy June sunshine and the stodgy churros (which I miss now in Germany) all but did me in.

Anyway, at GMV they were waiting to interview me and the session went on for an hour and a half. I left with bad vibes. In my innocence and slapdash student ways I had hardly any idea of what an SSH connection was, but there was certainly no lack of a will to learn.

I joined GMV's Tres Cantos head office, carrying out sundry tasks for various clients. Little my little I picked up expertise along the way, aided at all times by GMV's team of rock-solid and ever helpful professionals.

After eight months working as an intern, the chance came to work on one of GMV clients' site, the insurance company MAPFRE. This represented a significant step forwards but also posed a stiff challenge. There, the work rate would be completely different and it's often hard to make your way on a client's site when you're so young. Back then I was still only 21 and GMV was offering MAPFRE a service with an intense and constant workload working constantly alongside the client. It's natural that no one likes being told what to do or not to do by a mere kid, but I believe it was just a question of time. Starts are always hard and, as I've already said, carving out your own niche is just a question of effort, work and a will to learn day after day. My colleagues once more: unimpeachable.

Over the following months and years I had the opportunity of working with other GMV clients like Vodafone, BBVA, INTA, Telecinco… etc. Along the way I also did some stints of 24-hour on-call duty. I saw this as another challenge and learning opportunity; as a knock-on effect I even became better at problem solving in my private life.

Only a couple of months ago, while having a coffee with a colleague, he told me half jokingly that GMV was likely to win a contract in Germany and the job would be perfect for me if I was up for it. I applied for the job, without much idea at first of what effect it might have on my life. Fast forward three weeks; the contract had been won and I had to move to Germany with one month's notice. And then the penny dropped. This was for real, a completely new broom.. My grandma, my family, my friends... everything went out of the window. But the idea of spreading my wings (I still hadn't left home yet) and landing in such an international and powerful environment as the European Space Agency was a chance just too good to miss.

And I've now been here half a year – who'd've thought it? With the service fully up and running we are now phasing in new automation-enabling functions and smartening up the Space Situational Awareness (SSA) systems, always duly complying with ESA's requirements of availability, cohesion and security.

GUC '18

GMV USER's CONFERENCE 2018

COMING SOON...

GMV USER'S CONFERENCE

GMV is organizing the seventh GMV User's Conference, GUC 2018, to be held from 28 to 30 November in Alcalá de Henares (Madrid). This year's theme is ground segment solutions for satellite control and the conference will be attended by various representatives from space agencies, communication-satellite operators and satellite manufacturers.

The three-day conference will give all participants the chance to share their operational experiences and hold debates and panel discussions on the sector's burning issues.

Participants will also be able to receive information on GMV's current market range of products and services and watch demos, including all the following inhouse developments: ***hifly*** for satellite monitoring and control, ***focussuite*** for orbital control, ***focusoc*** for Space Traffic Management, ***smartsuite*** for payload optimization and configuration, ***magnet*** for ground station control, ***flexplan*** for mission planning and ***flyplan*** for scheduling and complete automation of operations.

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