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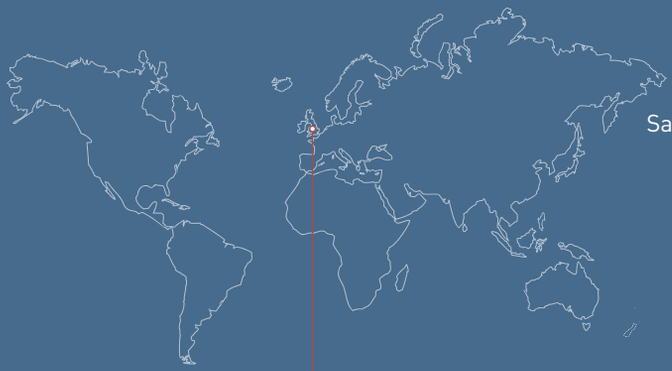

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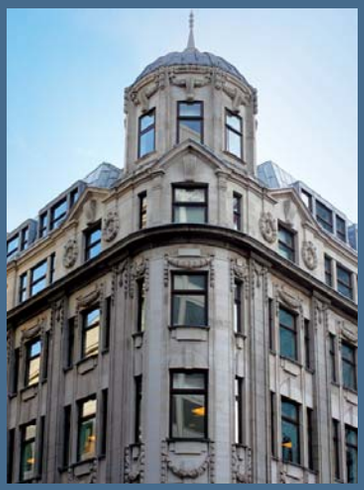

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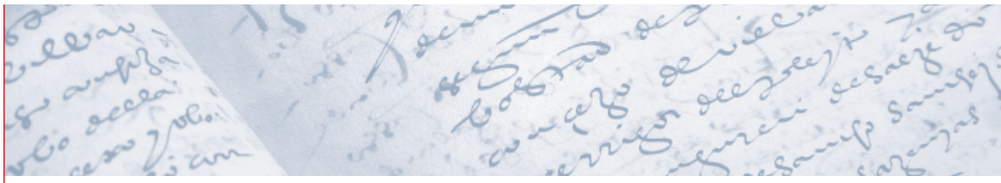


editorial

We are living in the "Bio Era", Dr. Ana Luisa Villanueva, Life, Health and Personal Accident Chief Medical Officer at MAPFRE RE, reminds us in this issue of Trébol. This is the term used in medicine to describe the time that has arrived through the appropriate combination of many scientific disciplines such as biology, chemistry, physics, IT and environmental technology, amongst others. The most immediate achievement in the medical field is the predictive assessment of diseases, with patients being the ones to benefit most, as they receive maximum-efficiency individualised treatment. Transferring these advances to the field of insurance, Dr. Villanueva thinks that the study of biomarkers and predictive tests should gradually be incorporated in order to identify possible adverse situations at an early stage, as long as the methods have been rigorously validated. And this is not science fiction.

After having published various analyses on the consequences of the implementation of Solvency II in previous issues of Trébol, this time we include a practical exercise. Dr. Held runs the Swiss-based company PERILS AG, his mission being to provide the European insurance and reinsurance sector with information on windstorm exposure and losses. As part of the most recent Quantitative Impact Study (QIS5) for Solvency II, PERILS has worked with the European market, offering its assessment of gross exposure to the effect of storms. The information involved is undoubtedly very valuable because of its direct relationship with the capital level that the insurance and reinsurance sector will need once the new arrangements apply and will continually have to update as the Solvency II framework becomes established.

Talking about "cloud computing" in IT -a term coined in 2006- is not the latest news. Today, being "in the cloud" is a metaphor for the Internet and is nevertheless a reality which is transforming the way in which IT services and data are provided. Trébol interviews Enrique Riesgo, Head of Innovation and Solutions at CSC, to look at the advantages and risks that the use of cloud computing brings for companies. This represents a revolution in working methods which has already been incorporated in the finance and insurance sector and presents big challenges for users.

Communication builds bridges between cultures, economies and personal relationships. The Spanish language is the heritage of 500 million Spanish speakers and, in an interview given to Trébol, the Director of *Instituto Cervantes*, Carmen Caffarel*, emphasises its economic potential as an industry. *Instituto Cervantes* may also be considered a cultural ambassador and precursor to Spain's international relations, operating the "soft policy" that oils the wheels of major socioeconomic agreements. Present in 44 countries at 77 locations, *Instituto Cervantes* has just celebrated its 20th birthday and remains alert, developing different forms of communication between Spanish speakers in the world of new technologies.

Biomedicine, Biomarkers, Biomechanics and Predictive Medicine

Ana Luisa Villanueva
Chief Medical Officer MAPFRE RE
Madrid - Spain

Biomedicine, gathering up all science

We are living in the "BIO Age", that is the age of the combination of science and technology. Everything is redefined from a global perspective, using all available knowledge and applying principles that were previously just considered for a particular specialty.

Bioscience encompasses different scientific fields such as biology, chemistry, physics, medical technology, pharmacy, information technologies, nutrition and environmental science.

Scientific and technological developments have given light to new disciplines such as genetic engineering and promise to bring in innovative solutions to key challenges in the fields of medicine, food, agriculture and environment.

Medicine is redefined as Biomedicine which entails the knowledge and research common to medicine, veterinary, odontology and Biosciences such as biochemistry, chemistry, biology, histology, genetics, embryology, anatomy, physiology, pathology, biomedical engineering, zoology, botany and microbiology.

Biomedicine implements natural science principles to clinical practice through the study and research of patho-physiological processes, ranging from molecular interaction to the dynamic function of the body, using the methodology applied in biology, biochemistry and physics.

This approach allows the development of new drugs and the improvement of early diagnosis of disease, facilitating the evaluation of the quality of new treatments.

Like all areas taking part of the individual's activity, there is a need to measure or asses the development of such activities. To do so, we use tools similar to those used for management. These management indicators such as ratios of investment, production, sales and benefit, among others, will help us to learn the business we are in at a glance.

Biomedicine opens for new ways for new drug developments, improving early diagnosis and quality of treatment

Biomarkers: the modern healthcare alerts

In Biomedicine we use substances or parameters that work as signals of a biological state, the Biomarkers.

Biomarkers are used to validate diagnosis/ prognosis as a therapeutic target

Biomarkers are indicators at molecular, biochemical or cell level which are present in particular situations. Not all found molecules are valid as indicators, they must meet certain criteria.

Most Biomarkers studied up to date are based on their utility from the standpoint of diagnosis/prognosis, although we must remember that, ideally, they should also provide a therapeutic target. There are other Biomarkers with no diagnostic or therapeutic value that provide information on the genesis of the disorder under study.

The ideal Biomarkers must enable:

- Early diagnosis of disease.
- Screening to test candidates for drug therapy.
- The identification of subgroups of patients responding to treatment.
- The follow-up of the therapy.
- The evaluation of progression/regression of the disease.

Nowadays, there are several types of Biomarkers:

Cardiovascular:

Mainly involved in:

- Development and rupture of the atherosclerotic plaque
- Ischaemic heart disease and infarction

Tumor:

For early diagnosis, efficiency of treatment and follow-up of disease in cancers such as:

- Breast
- Lung
- Colon
- Ovary
- Liver
- Thyroid
- Bladder
- Endometrial
- Cervix
- Skin
- Head & Neck
- Prostate
- Testes

Bone remodeling:

Linked to:

- Osteoporosis
- Bone resorption

Muscle function:

Mainly linked to:

- Miositis
- Degenerative disease

Linked to brain injury

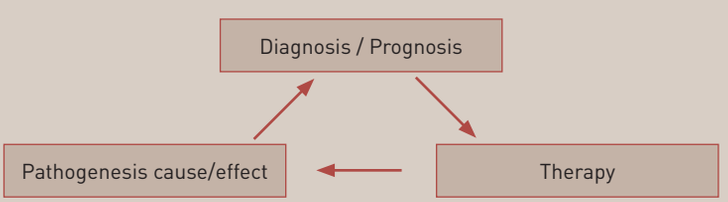
Linked to Glucose metabolism:

Next table shows a detailed list of these Biomarkers.

Characteristics of a Biomarker

Specific	For a particular disease.
Sensitive	Easily quantifiable.
Predictive	Relevant to disease progression and/or treatment.
Robust	Fast, simple and with cost analysis.
Estable	Equal concentrations at any time of the day.
Non-invasive	Easily obtained samples (blood & urine).
Preclinical & clinical importance	Valid for animals / cells models & humans.

Action points of the ideal markers



The development of Biomarkers is closely related to General Biopathology. This term includes all diseases with an organic origin affecting the human body.

Thanks to the global vision on the study of this General Biopathology and the use of new technologies, indicators with multiple applications are under development to enable

Cardiovascular Biomarkers

Related to		Marker
Development and rupture of the atherosclerotic plaque	- Endothelial dysfunction or damage of the inner layer of the vessel wall. - Inflammation. - Oxidative stress or imbalance between the production of ROS -reactuve oxygen species- and the ability the system to detoxify or repair the damage. - Proteolysis or imbalance between the synthesis and degradation of the extracellular matrix proteins. - Thrombosis or destabilization and disruption of the atherosclerotic plaque leading to thambus formation.	- Lipids: LVL, HDL, VLDL, TG ICAM-1, VCAM-1 - Chemokines, Interleukins, C-Reactive-Protein - Phospholipase LP-PLA2 - Metalloproteinase - CD40/CD40L
Ischaemic heart disease and infarction		- Cardiac Troponina T, CPK, CK, CPK-MB, myoglobin

Tumor Biomarkers

Organ	Marker
Thyroid	- Tyroglobulin (follicular carcinoma) Calcitonin (medullary carcicoma)
Gastrointestinal	- CEA, Ca 125, Ca 72,4, Ca 19,9 (pancreatic carcinoma), Ca 50
Liver	- AFP
Bladder	- CEA, BRA, TPA
Ovary	- Epithelial Carcinoma: CEA, Ca 125, Ca 19,9, Ca 72,4 - Germ cell tumors: AFT, HCG
Endometrium (uterus/ womb)	- CEA, Ca 125
Cervix	- CEA, CYFRA 21,1, SCC
Skin	- SCC (epidermoid carcinoma) - S-100 protein (melanoma)
Head & Neck	- SCC, TPA
Lung	- CEA, Ca 125 (adenocarcinoma), SCC (epidermoid carcinoma), CYFRA 21,1 (epidermoid carcinoma and non-small cell carcinoma), NSE (small cell carcinoma), TPA
Breast	- Ca 15,3, CEA, MCA, Ca 549, TPA
Prostate	- PSA (PSAL/total PSA ratio), PAP
Testes	- AFG, HCG

Specific Biomarkers

Related to		Marker
Bone remodeling	- Osteoporosis - Bone resorption	- Total alkaline phosphatase & isoenzyme, osteocalcin, PICP, PINP - Tartrate-resistant phosphatase, urinary calcium to creatinine ratio, hydroxyproline, PYR, DPYR
Muscle function	- Miositis, degenerative disease	- Myoglobin, LDH isozyme
Brain injury	- Demencia, Alzheimer - Brain damage - Inmediate head injury - Thrombosis or destabilization and disruption of the atherosclerotic plaque leading to thrombus formation	- TAU protein, Alpha-amilase - CK-BB - SD-100 Protein - CD40/CD40L
Ischaemic heart disease and infarction		- Cardiac Troponin T, CPK, CK, CPK-MB, myoglobin
Glucose metabolism	- Diabetes	- Glycosylated haemoglobin HbA1c

understanding the physiopathology or genesis of the disease and its clinical manifestation.

Within the **General Biopathology**, there is the **Special Biopathology**, dedicated to a specific range of action. In Insurance Medicine, in addition to general medical considerations, three more specific areas can be found:

- Forensic or Medico-Legal Biopathology.
- Occupational Biopathology.
- Sports Science Biopathology.

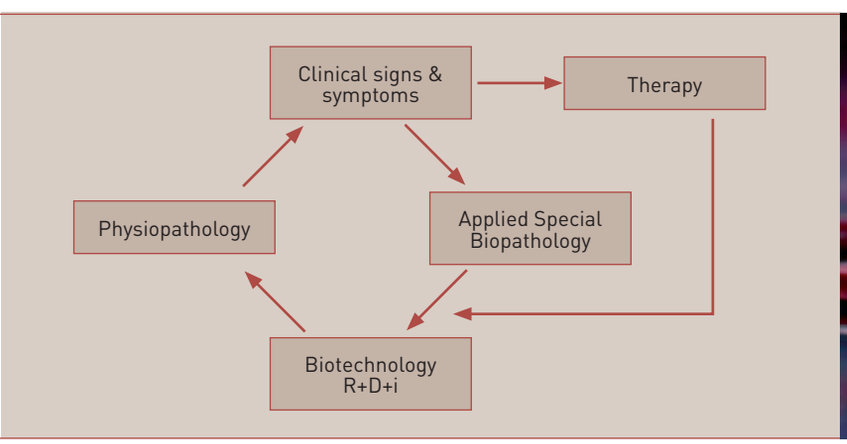
Inside the **Applied Special Biopathology**, there is another BIO element, **Biomechanics**.

Biomechanics and physics

Biomechanics refers to the science that studies the mechanical impact (force, acceleration, etc) exerted on biological material. This damage from impact can either be a failure in the mechanical function, a bone fracture, a muscle rupture or a functional injury.

Biomechanics

- Identifies and determines the mechanism of injury.
- Quantifies the response of the human body, systems, organs and tissue to a particular action.



- Determines and quantifies the threshold of the injury.
- Develops and designs materials and structures to reduce and manage the impact and energy transfer to the body.
- Develops efficient Biomechanical tools to study the behaviour of the body and materials.

Below there is an example of the integrated protocol where biomechanical exam and biomarkers are used.

There are several Biomechanical evaluation systems:

- **Surface electromyography (SEMG)**. It records the electrical potential generated in muscle membrane through electrical signs.
- **3D motion capture. Photogrammetry**. It allows capturing the movements of one or multiple joints in 3D, as well as its charac-

Biomechanics studies the mechanical impact on the tissues of our body

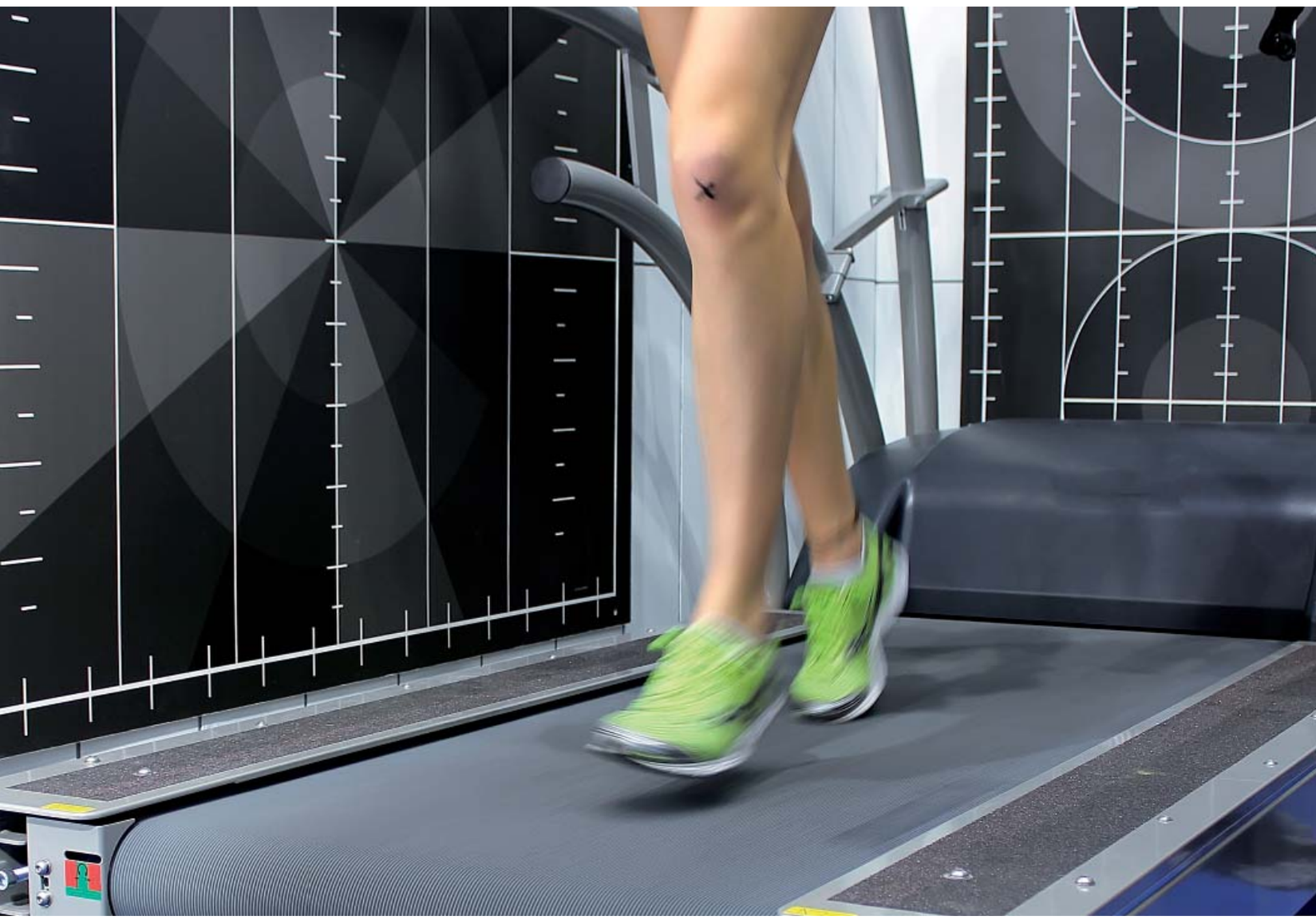
Table 5 Integrated Medico-legal protocol for bodily injury evaluation. Source: *"Biomecánica en la Valoración Médico Legal de las Lesiones"*. 2011. BAASYS. Editors: Santiago Delgado Bueno. Domingo Montes de Oca Hernández and Néstor Pérez Mallada

1. **Medical history and evaluation of data**
   - > Accident report (delta-V or speed evaluation)
   - > Medical records
2. **Patient Exam**
   - 2.1. Physical exam
     - • Complementary test
       - A.1. Biomechanical exam
       - A.2. Radiological tests
         MRI LNC & WAD *
         Sonogram
       - A.3. Lab test (general & Biomarkers)
   - 2.2. Psychopathologic exam
     - • Complementary test
3. **Medico-legal Remarks**
   - 3.1. Injury and sequelae
     - • Healing time
     - • Days
   - 3.2. Previous state- preexisting condition
   - 3.3. Medico-legal criteria for causation. La *"conditio sine qua non"* or "but for causation"
     1. Chronology
     2. Biomechanical compatibility (enough intensity and adequate mechanism to cause injury)
     3. Exclusion
   - 3.4. Simulation
   - 3.5. Sequelae

Bareme (23,24)	European (25)	AMA (26)	RD 1971/1999 (27)	Int. Inval. Melennec (28)
30/1995 Act Law 34/2003 RD L 8/2004	Impairment of Pschyco-physic Integrity AIPP	Total body deficiency	Disability degree examination	Permanent physiological impairment (PPI) or functional disability or personal disability
Points	%	%	%	%

4. **Medico-legal Conclusions**

* RMI: Magnetic Resonance Imaging, NCI: Non-Contiguous Injuries, WAD: Wishplash Associated Disorders



teristics of speed, acceleration and repetition of execution of movement taking place in the worker.

- **Dynamometric Platforms**. Platform placed on the floor embedding three axis pressure sensors.

- **Isokinetic, isotonic and isometric machines**. These machines use dynamometers to register the force from a group of muscles (speed, power, load and osteo-muscular span).

In an isokinetic movement, speed remains constant. In an isotonic movement, the load remains constant and speed changes according to the joint work and in an isometric movement, there is no joint movement.

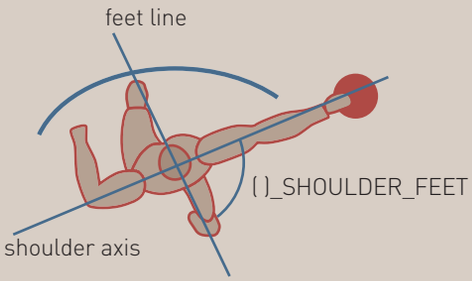
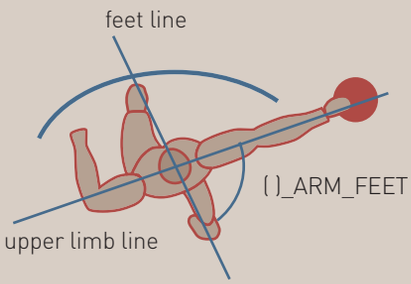
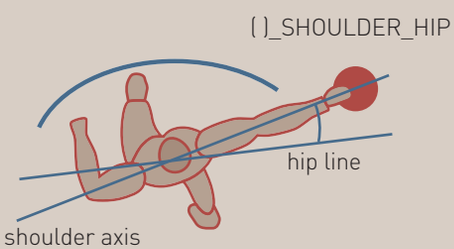
Biomechanical report provides the following information:

- The moment of maximum load (peak load during exercise).

- The maximum load/force exerted to enable the movement of an object.

- The power exerted by a group of muscles.

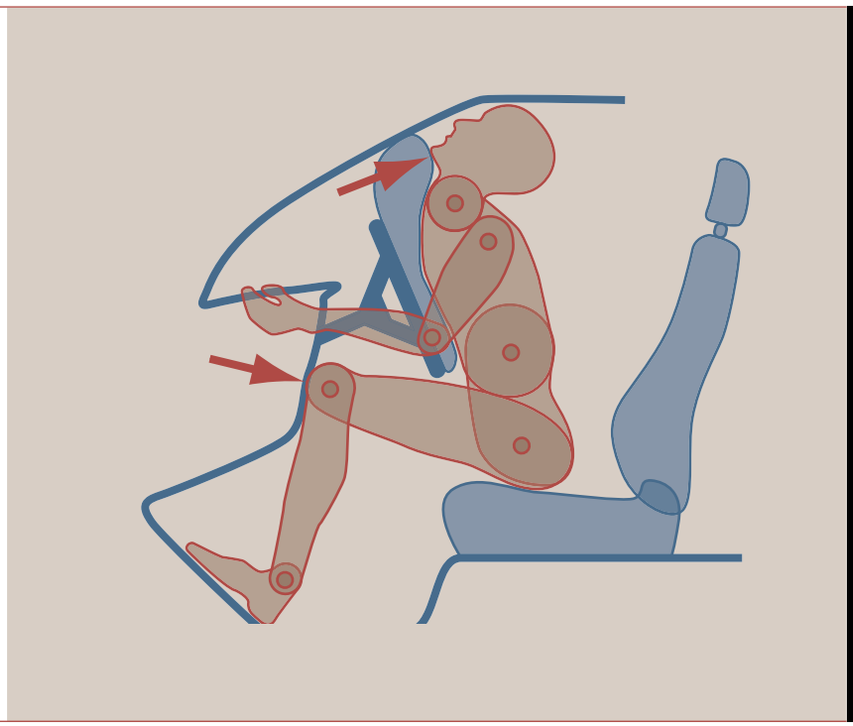
Biomechanics Applied to training by qualitative & quantitative analysis.
A proposal for Discus Throw. International Journal of Sports Science. 7(3) 49-80
Vol. 3, nº 7 (April 2007) Ferro, A., Floría, P. http://www.carfyd.com/REVISTA/00705.pdf

Biomechanical variable	Equation	Graph
Shoulder_feet angle made between shoulder axis and feet line at the moment of releasing disc	$\cos\theta = \frac{(EHOMB_x \times EPIES_x) + (EHOMB_y \times EPIES_y)}{\lvert EHOMB\rvert \times \lvert EPIES\rvert}$ EHOMB = shoulder axis EPIES = feet line	
Arm_feet angle made between executing upper limb and feet line at the moment of releasing disc	$\cos\theta = \frac{(EBRAZO_x \times EPIES_x) + (EBRAZO_x \times EPIES_y)}{\lvert EBRAZO\rvert \times \lvert EPIES\rvert}$ EBRAZO = Executing upper limb line EPIES = feet line	
Shoulder_hip angle made between shoulder and hip axis	$\cos\theta = \frac{(EHOMB_x \times ECAD_x) + (EHOMB_y \times ECAD_y)}{\lvert EHOMB\rvert \times \lvert ECAD\rvert}$ EHOMB = shoulder axis ECAD = hip axis	

Biomechanical variable in discus throw

Before releasing	Time variable	- Time interval
	Linear spatial variable	- Distance between markers - Disk coordinates
	Angular spatial variable	- Torsion angles of the athlete - Upper & lower limb joint pattern - Disc angels
	Temporary spatial variable	- Disc speed - Speed of joint points
After releasing	Spatial variable	- Distance covered by disc while flying

Graphical representation of air bag loading on head and chest and dash board on femur. Source: "Biomechanics in Medico-legal evaluation of injuries". 2011. BAASYS. Editors: Santiago Delgado Bueno. Domingo Montes de Oca Hernández and Néstor Pérez Mallada



- The speed at which muscle work takes place.
- Resilience and neurophysiologic control.

In short, it helps to:

- Decide on whether or not pre-injury normal tasks can be still performed.
- Quantify the loss of capacity, if any.
- Asses the chronicity of injuries and sequelae.
- Promote work re-entry without relapse.
- Know if the activity performed causes overload.

Biomechanics Applications

Biomechanics application to **Medico-Legal Biopathology** contributes to:

- Provide the cause/effect mechanism; biomechanical compatibility or the relationship between intensity and mechanism of production.
- Identify simulation.
- Evaluate sequelae.
- Propose therapies to promote getting back to daily life.
- Occupational therapy/rehabilitation to perform other workplace tasks.

As to **Biomechanics** application to **Occupational Biopathology**, they:

- Determine the worker capacity to automatically execute actions and tasks from his/her daily work activity.
- Identify if the injury is caused by occupation or other common causes.

- Provide biomechanical tests, changing in complexity according to each individual needs, to analyze and quantify the injuries.
- Develop preventive rehabilitation programmes.
- Identify mismatching between functional capacity and workplace requirements.
- Identify permanent and temporary disability.
- Identify simulation.

Selection of Biomechanical tools is based on what to asses: movement, force, movement span and execution, peak power, performed work and its speed of execution, to name a few.

Biomechanics application to **Sports Science Biopathology** results in a great number of improvements:

- Quantitative and qualitative analysis of training.
- Assessment of sports technique, how to train and improve it.
- Definition of efficiency criteria.
- Definition of Biomechanical variables related to technical issues.
- Identification of mismatching between functional capacity and game requirements.
- Know the activity performed and evaluate the injuries that may occur.

What if we now introduce this BIO perspective into genetics?

The idea of genetic code being similar to a personal barcode has changed; it has shifted from being static into dynamic.

New developments in genetics have found out that genes do not work on their own

Biomechanics can be applied to occupation and sports to understand the cause/effect mechanism and introduce re-entry programmes for daily living activities and work

Genes do not work on their own but interact with each other creating differences between individuals

but create networks to interact with each other. Genomics studies the interaction and when it is applied to the individual's response to drugs it receives the name of Pharmacogenomics.

The presence of specific genes involved in certain diseases and treatments can be taken as an indicator or a Biomarker. This is what has been done for some conditions. The identification of genes present in some daily common diseases, such as clotting factors deficiency; Haemophilia, the most common type, Huntington's disease or polycystic kidney disease, is a fact.

The cost and trouble in research makes it difficult to look for Biomarkers at the genetic level, for all disorders. Nowadays, the main causes of death, such as cancer or cardiovascular diseases are getting all the attention.

The most well known genes are BRCA1 and BRCA2 linked to certain breast tumors. Their presence has a close relationship with survival and treatment outcome.

Then we are heading for a more individualised and personalised medicine where the presence of indicators may enable to asses possible risk, a **Predictive Medicine**.

Current Biomedical Research legislation only allows predictive testing for genetic disorders to identify carriers of the gene responsible for a disease or detect a predisposition or susceptibility to a disease for medical or research purposes; in case of genetic counseling, if prescribed; in case of study of different individual's response to drugs; for genetic-environmental interactions or research on molecular basis of disease.

We should not take this decision as restrictive but as a preserver of diagnostic or prognostic good sense, thus discouraging to develop an industry of indicators that could take us to predict something that will never happen.

The future of healthcare for diseases such as cancer will be based on using Biomarkers to detect the early stage of a disease, individualising the diagnosis, tumor classification and choice of therapy.

We have currently identified a large number of candidates Biomarkers, including proteins, nucleic acids, metabolites and tumor cells but yet, validation methods for efficiency and more rigorous clinical trials need to be developed.

To think about

We must not forget that the individual is in constant interaction with the environment. This interaction may change his predisposition when coming in contact with new elements.

Biomarkers research and new Predictive testing, adjusted to cost effective criteria, need to be included in Risk Assessment for Insurance Medicine to be in parallel with science and respect the principles of insurance, not letting scientific developments read "the chance of an adverse situation" as a "relative certainty for such adverse situation to happen".

Conclusions

Biomarkers use enables to identify the clinical state of the patient, asses the evolution of injuries, add prognostic criteria and evaluate the effectiveness of a treatment.

Bodily injury studies and Biopathology require the use of Biomarkers to develop themselves and develop Biotechnology.

Biomarkers allow having a more homogeneous bodily injury classification of patients.

Biomechanics along with Biomarkers complete the bodily injury exam, provide medico-legal information, save resources on work re-entry programmes and disability evaluation, optimize therapy, anticipate future injuries and refine and improve sports techniques.

Medicine is heading for a personalised and individualised approach but Predictive Medicine should not be used as determinant of a future event but as a predisposition.

Medicine is becoming more individualised and personalised, looking for indicators in order to identify risk situations

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"Biomecánica en Medicina Laboral". 2011. BAASYS. Editors: Santiago Delgado Bueno. Domingo Montes de Oca Hernández and Néstor Pérez Mallada.

Calculating capital under QIS5

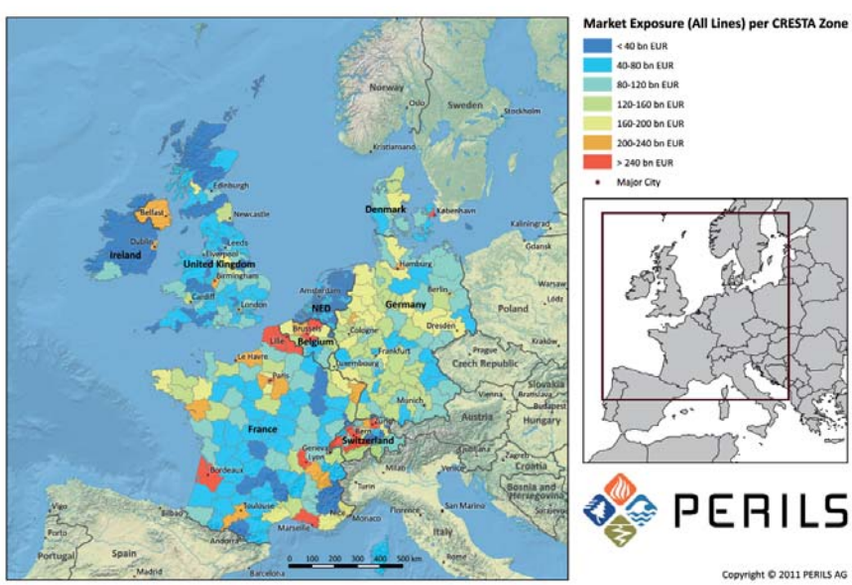
Dr. Eduard Held
Head of Sales and Products at PERILS
Zürich - Switzerland

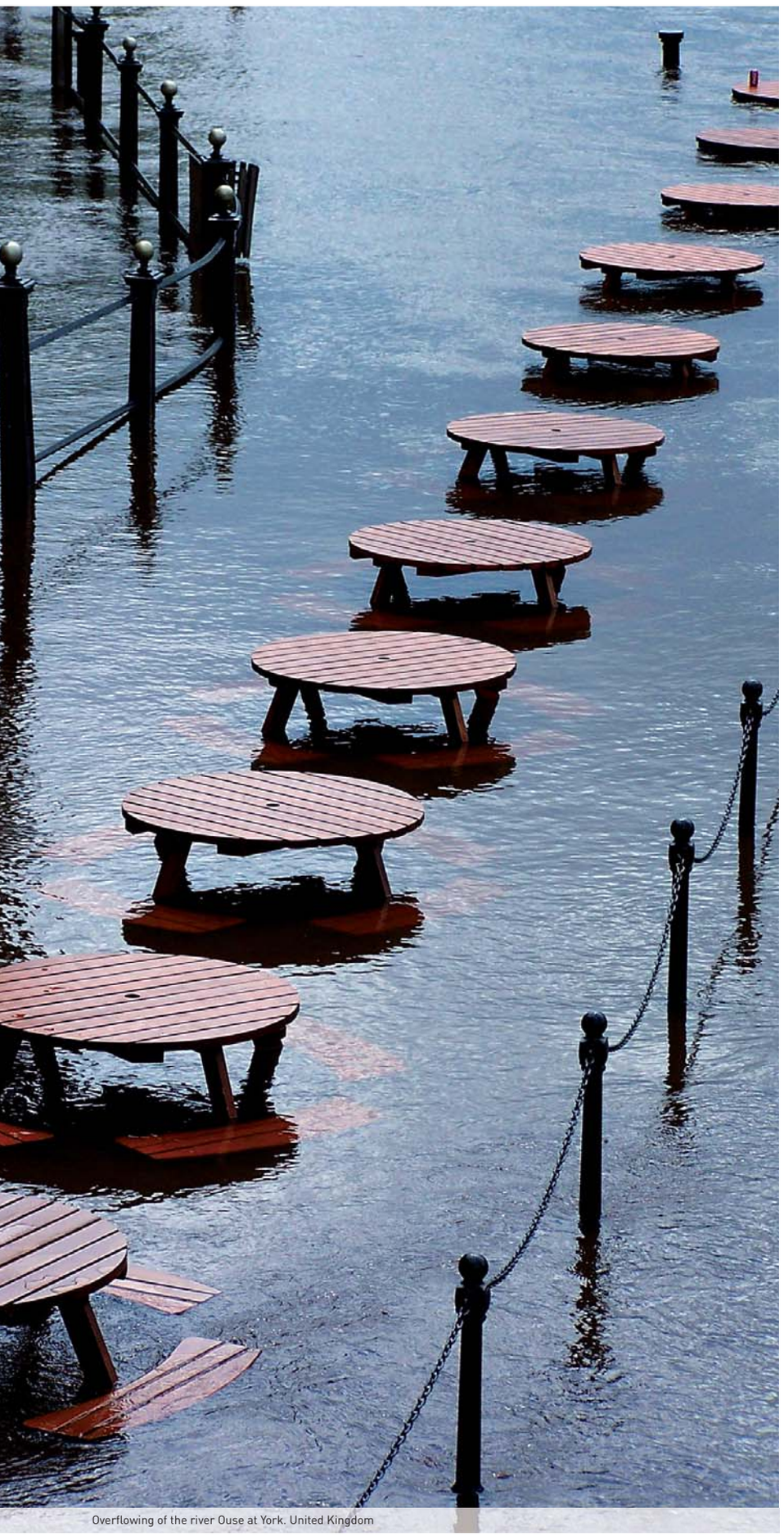
In an effort to contribute to a greater understanding of the capital requirements for natural catastrophes in QIS5, PERILS calculated the gross property windstorm scenario losses for the nine markets it covers

PERILS is an insurance industry initiative that was set up in 2009. It provides the first independent source of windstorm industry exposure and industry event loss data for eleven European countries on a CRESTA zone level (see Figure 1), which it has amassed through cooperation with over 80 insurance companies in those markets: Belgium, France, Denmark, Germany, Ireland, Luxembourg, Norway, Sweden, Switzerland, The Netherlands and United Kingdom. The QIS5 calculations are based on PERILS Industry Exposure Database 2010. The market-wide sums insured data is available per CRESTA zone, property occupancy type and coverage type.

Perils provides the first independent source of windstorm industry exposure and industry event loss data for eleven European countries on a CRESTA zone level

Figure 1: PERILS Industry Exposure Database 2011
The map visualizes PERILS' latest Industry Exposure database, available per CRESTA zone and property LoB. For the QIS5 calculations, the 2010 exposure has been used.





Overflowing of the river Ouse at York. United Kingdom

Solvency II and Natural Catastrophes

As Europe moves closer to the Solvency II Directive, due for implementation on 1 January 2013, PERILS has played its part in computing gross property windstorm scenario losses for the nine European markets it covers (two more, namely Norway and Sweden have been added since the time of writing). The computations were carried out as part of the most recent impact study (QIS5), and were released in October 2010, in an effort to aid the insurance and reinsurance industry in understanding gross natural catastrophe risk exposures, as this influences what levels of capital it will need under the new regime. For non-life insurance and reinsurance companies, natural catastrophe risk is expected to be one of the main drivers for capital requirements under the Solvency II regime.

From a pan-European perspective, the windstorm peril tops the list of catastrophe loss potentials because of the large geographical footprint a major event of this type could have. It is therefore essential for regulators and market participants alike to have a clear understanding of the potential market impact caused by such a low probability/high impact windstorm event.

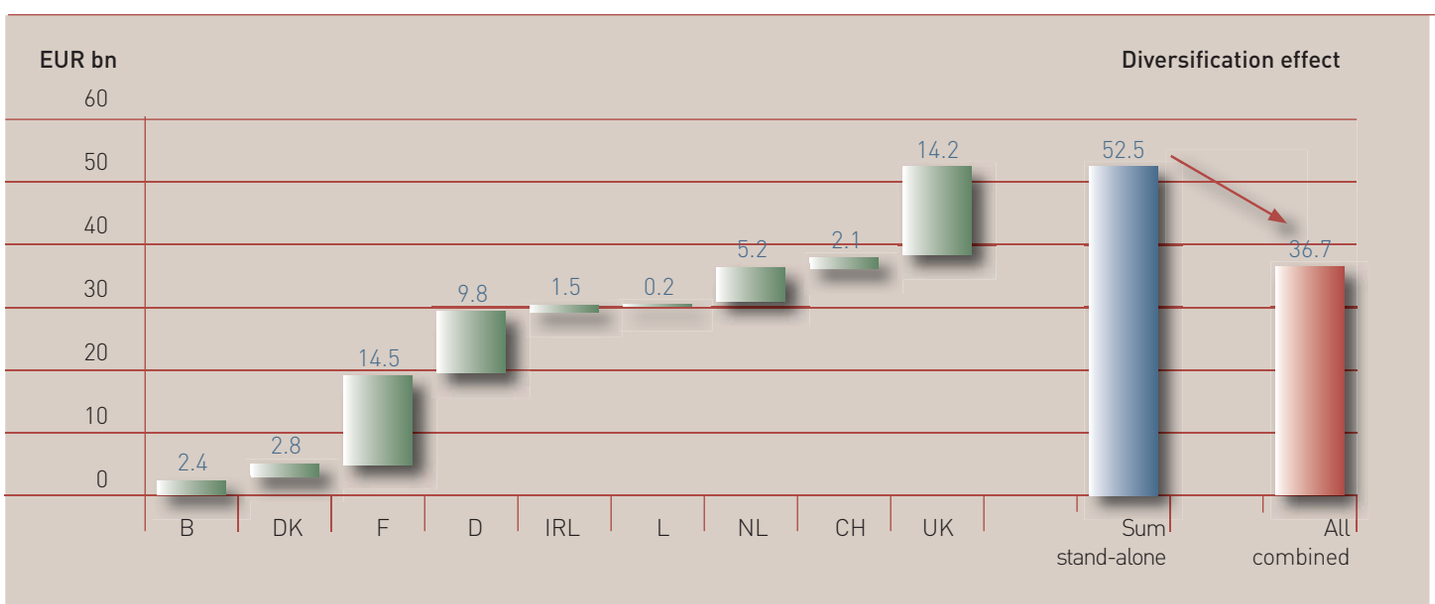
The fifth impact study, run by the European Insurance and Occupational Pensions Authority (EIOPA) from August to November 2010, is significant because it has had the widest participation from the industry to date. 70% of insurers and reinsurers took part compared with just 33% in QIS4. The purpose of the study was to test different scenarios and parameters under Solvency II in order to provide the European Commission with empirical data so that it can correctly calibrate the new framework's technical rules.

The results of QIS 5, released on 11 March 2011, indicate that in aggregate European companies hold excess capital to what will be required under Solvency II (EUR 395 bn of capital in excess to solvency capital requirements and EUR 676 bn in excess to minimum capital requirements). However, some actuarial experts believe QIS5 remains over-

Cold spell at Geneva, Switzerland

The results of QIS 5, released on 11 March 2011, indicate that in aggregate European companies hold excess capital to what will be required under Solvency II

Figure 2: QIS5 scenario loss estimates (capital charges) per country based on PERILS' industry exposure 2010
Note that the figures are indications only as the technical scenario specifications for European windstorm in QIS5 may differ from the final parameters used in Solvency II.



Comparing QIS5 industry scenario loss with actual losses from windstorm Lothar (not indexed to today's values), the figure of EUR 36.7bn is six times the loss incurred from this particular windstorm

Storm at the coast of Ireland

calibrated and there is a particular concern relating to how re/insurers with non-European catastrophe exposures will be treated. EIOPA is performing some additional work to improve the calibrations.

QIS5 windstorm scenario losses

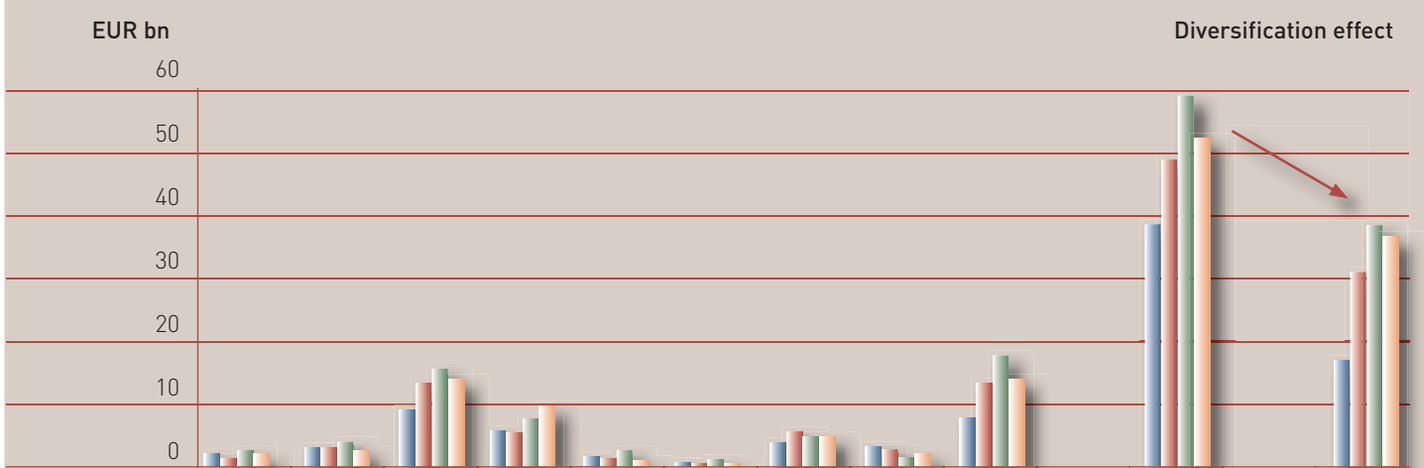
PERILS' loss estimation using the QIS5 scenarios aims to contribute to the overall understanding of industry capital requirements. In particular, PERILS hopes that the European windstorm loss results will contribute to a well-founded debate of the quantitative impact of the upcoming Solvency II regime and implications from a capital and reinsurance perspective.

By applying the windstorm scenarios of the QIS5 to these market exposures PERILS was able to estimate potential losses and related capital charges for a large European windstorm. The nine markets covered in the exercise -Belgium, Denmark, France, Germany, Ireland, Luxembourg, the Netherlands, Switzerland and the United Kingdom- are the main contributors to a large, Probable-Maximum-Loss (PML) storm event in Europe.

The resulting scenario losses are shown in Figure 2 and represent for each country an estimate of the insured property gross occurrence loss from a windstorm expected to happen once in 200 years. In other words, these are the gross occurrence-based property losses the entire insurance and reinsurance industry will have to absorb for a specific country after an event occurring once in 200 years. The figures are also an indication for the overall property catastrophe capital charge in the upcoming Solvency II specifications.

The combined total for Europe -the figure of EUR 36.7bn- represents the total windstorm capital charge within Solvency II for all the nine markets mentioned, including geographical diversification benefits. It is important to note that the calculated QIS5 windstorm occurrence losses are indications only. Final technical specifications under Solvency II for

Figure 3: Comparison of industry-wide capital charges for non-life cat risk for European windstorm
The chart compares the 1-in-200 year losses computed with QIS5 scenarios and with vendor models. All calculations are based on industry data from PERILS.



	B	DK	F	D	IRL	L	NL	CH	UK	Simple sum	Combined
Model A	2.3	3.0	9.4	6.2	1.8	0.2	4.4	3.3	8.0	38.6	17.8
Model B	1.9	3.0	13.6	6.0	1.6	0.2	6.1	3.1	13.2	48.8	31.2
Model C	2.8	4.2	16.0	7.9	2.9	0.1	5.3	1.9	17.8	59.0	38.3
QIS5 (PERILS)	2.4	2.8	14.5	9.8	1.5	0.2	5.2	2.1	14.2	52.5	36.7

Overflowing of the river Meno at Frankfurt. Germany

non-life natural catastrophe risk may differ from the current QIS5 parameters.

For insurance and reinsurance companies not using the standard formula approach under Solvency II, internal models or commercially available vendor natural catastrophe models (from catastrophe modelling companies such as RMS, AIR and EQECAT) can substitute the Solvency II calculation for non-life catastrophe risk. A comparison of the resulting losses (i.e. charges) based on the three main vendor models with the charges from QIS5 is shown in Figure 3. All calculations are based on PERILS' industry exposure data. The chart shows that while the differences can be significant, the QIS5 charges are within the same range as those derived from the vendor catastrophe models.

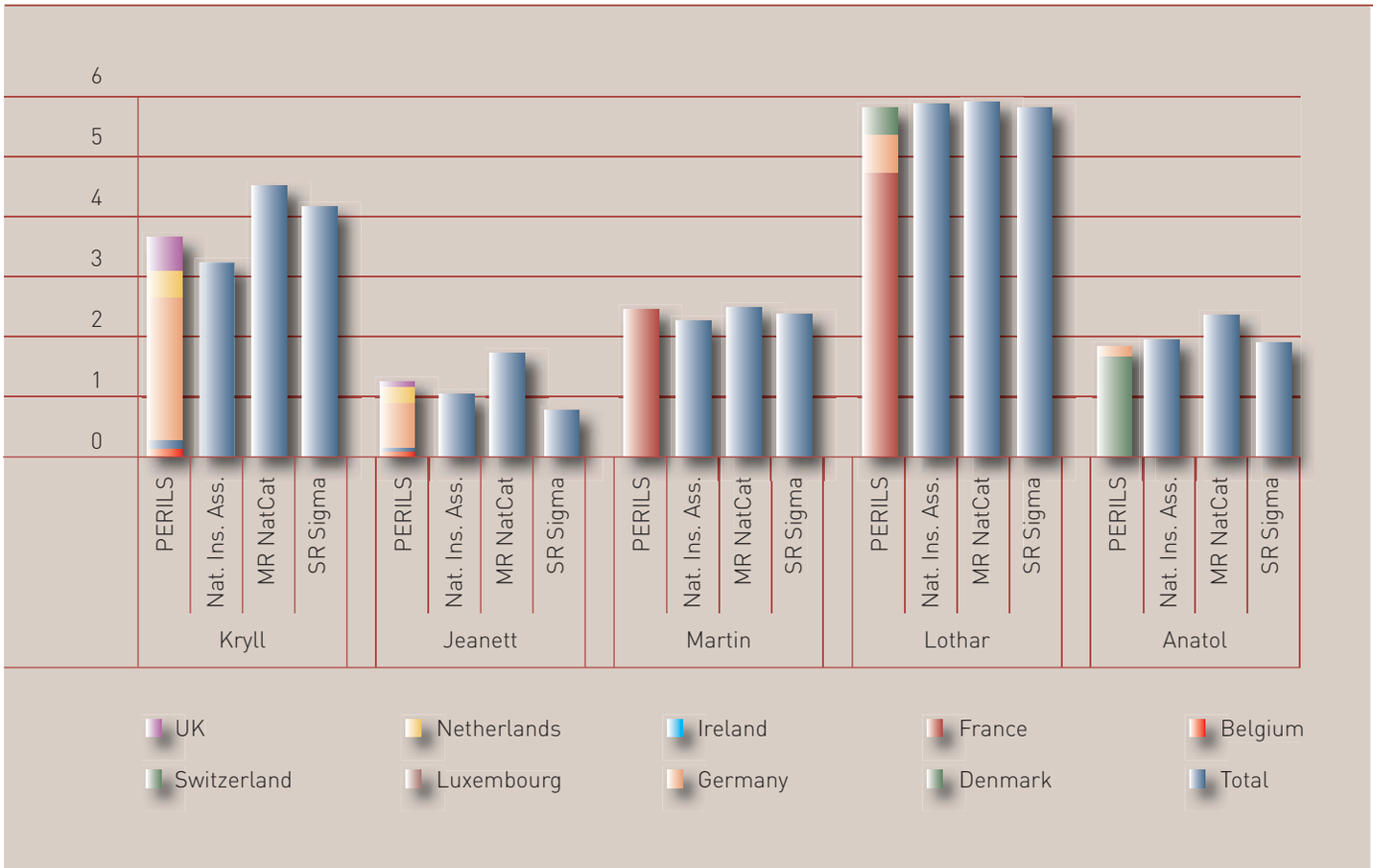
It is also insightful to look at the largest windstorms that have occurred over the last ten years and to compare total industry property losses from these events for all nine markets under consideration. Significantly, comparing QIS5 industry scenario loss with actual losses from windstorm Lothar (not indexed to today's values), the largest event since 1999, reveals that the figure of EUR 36.7bn is six times the loss incurred from this particular windstorm.

There is no doubt that QIS5 was a worthwhile exercise as the industry gets to grips with the likely impact of Solvency II and the regulators draw appropriate lessons from the study, which will be reflected in the amendments to the Level 2 implementing measures. However, it is clear from PERILS' calculations that more work will help in better understanding the impact of low probability/high severity catastrophe events and how they will affect industry capital requirements. It is therefore encouraging that EIOPA is conducting further analysis into this area. This work will take into consideration the results of its QIS5 study and it is expected that a proposal for the Solvency II level 2 implementing measures will be published by the end 2011.

www.perils.org

Figure 4: The five largest historic events since 1999 with estimates of original losses from different sources, in EUR bn.

Note that comparison with other sources is limited as different sources can cover different territories and lines of business. The highest insured property loss stems from windstorm Lothar (26 December 1999) which represents about 16% of the windstorm charge under QIS5.



PERILS: facts & figures

Year in which PERILS was incorporated (initiated by the Chief Risk Officer Forum).	2009
Number of data providing companies.	> 80
PERILS' overall market coverage per August 2011.	> 50%
Number of countries covered by PERILS: Belgium, Denmark, France, Germany, Ireland, Luxembourg, Netherlands, Norway, Sweden, Switzerland, United Kingdom.	11
PERILS final property loss estimate for windstorm Xynthia (Feb 2010).	EUR 1.32 bn
PERILS final property loss estimate for windstorm Klaus (Jan 2009).	EUR 1.57 bn
Total Cat capacity placed Jan 2010 to August 2011 based on PERILS loss index.	EUR 2.79 bn

interview with **Enrique Riesgo**

Head of Innovation
and Solutions at CSC
Madrid - Spain

Enrique Riesgo is an IT Manager and Architect specialised in distributed systems and systems integration using SOA and Cloud Computing technologies. He has over 10 years international experience in consultancy, systems integration and outsourcing of services for multinationals from a wide variety of sectors, including banking and insurance.

www.csc.com

"Cloud Computing is the greatest change to have come about in recent times in the world of Information Technology"

In the world of Chief Information Officers (CIO), Cloud Computing is a daily handled term. The resounding advantages it has to offer regarding saving, flexibility and efficiency, counteract all new challenges arisen by doubts with regard to security, availability and trust. Enrique Riesgo, Head of Innovation and Solutions at CSC, explains how still today, the private cloud has more supporters than the shared cloud. He analyses the current relationship between Cloud and Virtualization and reviews the impact on the Environment, showing a promising outlook for new technologies as a service for the financial and insurance sector as well as a labour niche for IT professionals to be trained in Cloud environment.

When was Cloud Computing created?

Curiously, the idea dates back to the sixties when it was considered that possibly, one day, the capacity for computing could be organised and delivered as a public service, in the same way as that provided by the electricity, water or gas utilities. It was not until the end of the last decade that the development and popularity of technologies such as virtualization, Internet, Utility Computing and service orientated architecture (SOA), had produced the necessary conditions for converting the idea into a reality.

The name Cloud Computing portrays the idea of providing computing services from a Cloud, which is no more than a metaphor for the Internet; something abstract, the technical details of which are of no interest.

By way of an anecdote, it is worth mentioning that it is generally accepted that it was Google that first used the term Cloud Computing in this sense, back in 2006.

What is Cloud Computing?

Perhaps the analogue most used to explain what Cloud Computing consists of is that of electricity supply. We all know exactly how it works: we contract the service through an electricity company, we have practically an unlimited supply available, we pay per use

The name Cloud Computing embraces the idea of the provision of computing services from the cloud which is nothing more than a metaphor for Internet

Google was the first to use the term Cloud Computing in 2006

and we are not really interested where the power comes from. We know that there is a risk of failure of supply, so we adopt remedies depending on our needs (from having a torch in our home to a generator in a hospital). However, for operational, financial and practical reasons, very few people consider the possibility of having their own power sources.

So, we should imagine computing resources (computing time, memory, storage, software) as if they were electricity; Internet would be the grid and the Cloud would be the electricity company with infrastructures, staff and procedures which are unknown to us but which we trust.

The Cloud Computing model has five fundamental characteristics which differentiate it from other models or technologies such as virtualization or Utility Computing. These are: on demand self service capacity, "broad" access through the Internet, the existence of a shared resource fund, rapid elasticity and measurement of the service consumption.

Traditionally, it is divided into four categories as shown in the following diagram:

Business Process as a Service (PaaS)

Software as a Service (SaaS)
Applications used by subscription
Parameterizable

Platform as a Service (PaaS)
A development platform that abstracts infrastructure, operative systems and middleware

Infrastructure as a Service (IaaS)
A Platform that abstracts the infrastructure

Advantages: What is causing the growth in the Cloud?

Greater Flexibility

- Accelerating cycles.
- Adapting IT resources to demand.
- Relieving IT limitations.
- Breaking down IT barriers to create new products.

Risk Mitigation

- Meeting performance and availability requirements.
- Mitigating risk and improving the return from new projects.
- Starting without investment in IT or waiting times.

Saving Capital

- Freeing up capital.
- Changing capital expenditure (CAPEX) into operational expenditure (OPEX) in order to improve the return.
- Managing IT expansion and containing the infrastructure.

Cost Effectiveness

- Aligning business and infrastructure.
- Using what is needed only when necessary.
- Focusing IT personnel on adding value to the company.
- Integrating physical, virtual and cloud infrastructures.

What are the possible risks that have been identified to date?

Unfortunately, using Cloud Computing at the moment is not simple and there are four typical risks that need to be analysed, evaluated and subsequently, mitigated.

The first, and most common, is security. This is mainly focused on data privacy that is outside the limits of the organization and compliance with current legislation, especially the Law on Data Protection (LODP[1]). Who can see my data? Who is protecting my data? Can these be lost? This is a very relevant service aspect and Cloud providers dedicate great efforts to care for the security and integrity of their clients´ information.

Service availability is the second risk. The impact on the business of failure of a technological service can have serious consequences. Service providers normally set up service levels to guarantee its availability within certain margins that can reach 99.95% in operational time.

Other typical risks can be the difficulties of integrating the systems deployed in one´s installations into those of the cloud, the need to standardise certain processes and the lack of professionals that are qualified in the implementation and management of Cloud environments.

Something that often causes confusion when talking about Virtualization and Cloud is: can virtualization be considered to form part of Cloud Computing or is it complementary to Cloud Computing?

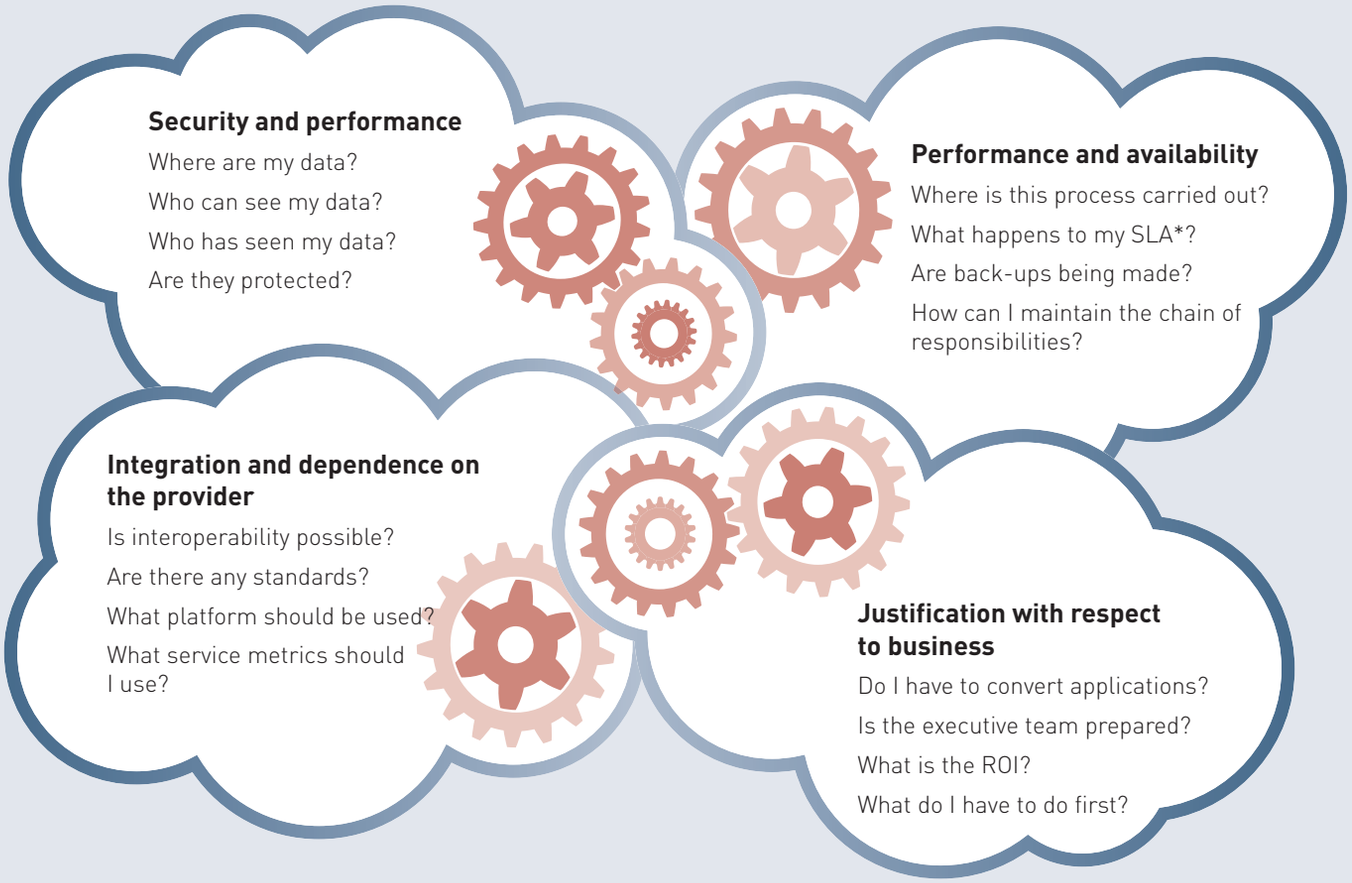
There is a close relationship between the two of them.

Virtualization is a mechanism that allows us to have at our disposal a real IT resource with different versions. The simplest example would be a hard disk with a specific physical size (e.g. 1 Terabyte) that can be converted, through virtualization, into as many disks and sizes as we like, but with the properties of the actual disc. Virtualization enables us to take better advantage of the resources at our disposal.

In the case of Cloud Computing, virtualization has enabled service providers in the cloud to optimize their physical resources (computers, disks, networks) and to define new business models through which they offer virtualized resources as a service. For

The Cloud Computing model has five fundamental characteristics: on demand self service capacity, "broad" access through the Internet, and the existence of a shared resource, rapid elasticity and measurement of the service consumption

[1] Only applicable to Spain



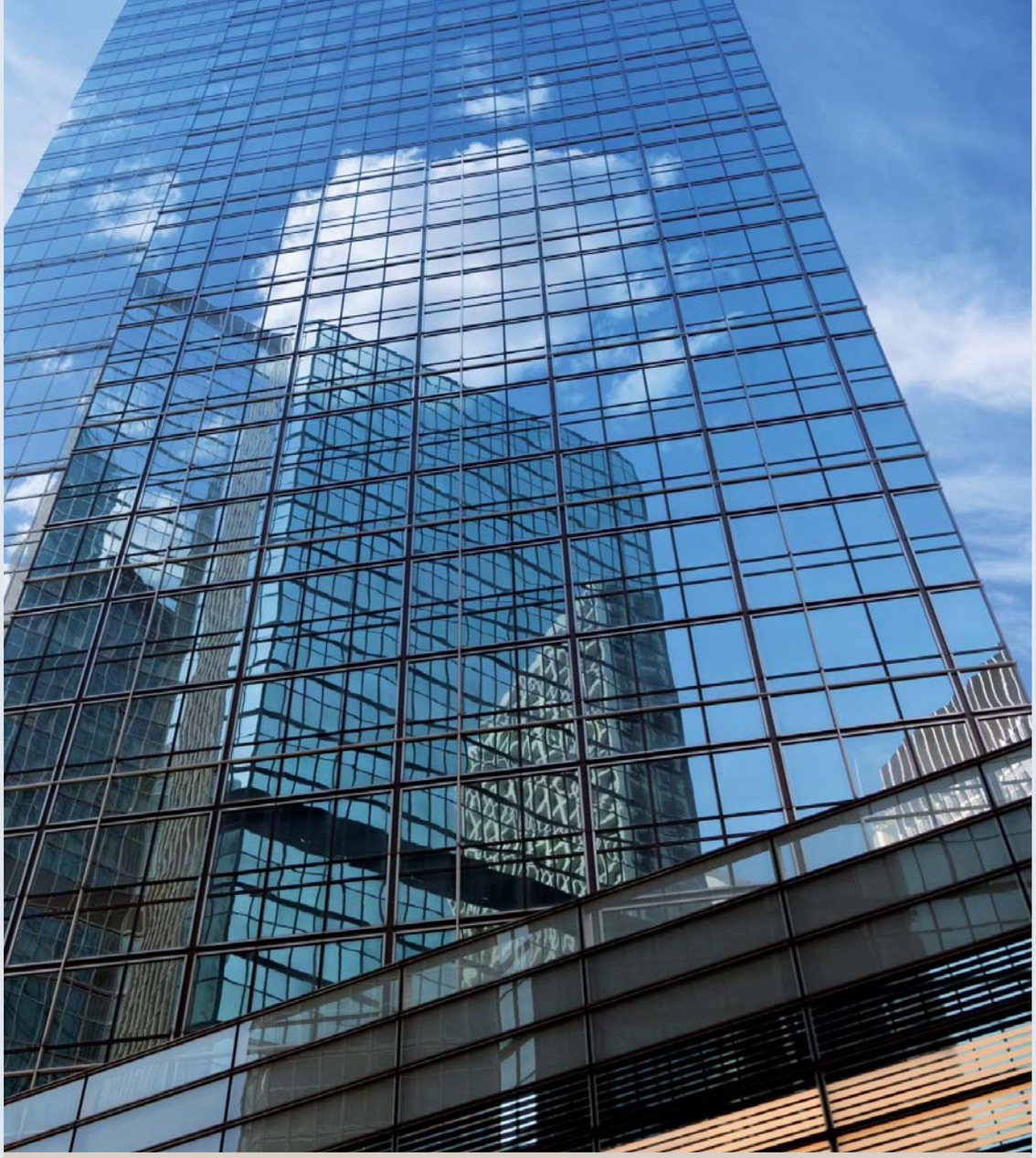
* Service Level Agreements

example, storage, virtual machines, virtual desks, etc. In other words, virtualization can be considered to be a key enabler for the Cloud Computing model.
Moreover, some companies decide to contract certain services through the Cloud Computing model and to virtualize the infrastructure that they use for their installations. The basic difference is the financial model: payment for usage (Cloud) as opposed to investment (virtualization).

Once the Virtualization concept has been grasped, could it be said that it affects both the field of software as well as hardware? Could there be some examples that enable us to differentiate when talking about Virtualization hardware or Virtualization software?
Of course, there are. The IT resources that we are talking about include both software and hardware.

The beforementioned example is a very simple case of hardware virtualization, in which a hard drive (disc) appears as several virtual drives. Other popular examples of hardware virtualization are virtual machines that operate as if they were a virtual computer with an operating system, network virtualization and memory virtualization.
As far as software virtualization is concerned, perhaps the most popular is the virtualization of applications which allows us to dissociate them from the operating system, the best known exponent of which is Citrix.

Virtualization of systems is a very trendy topic but, as far as management tools are concerned, how developed are they?
Regarding hardware virtualization, most of the work has been done. Management tools have been in the market for many years and

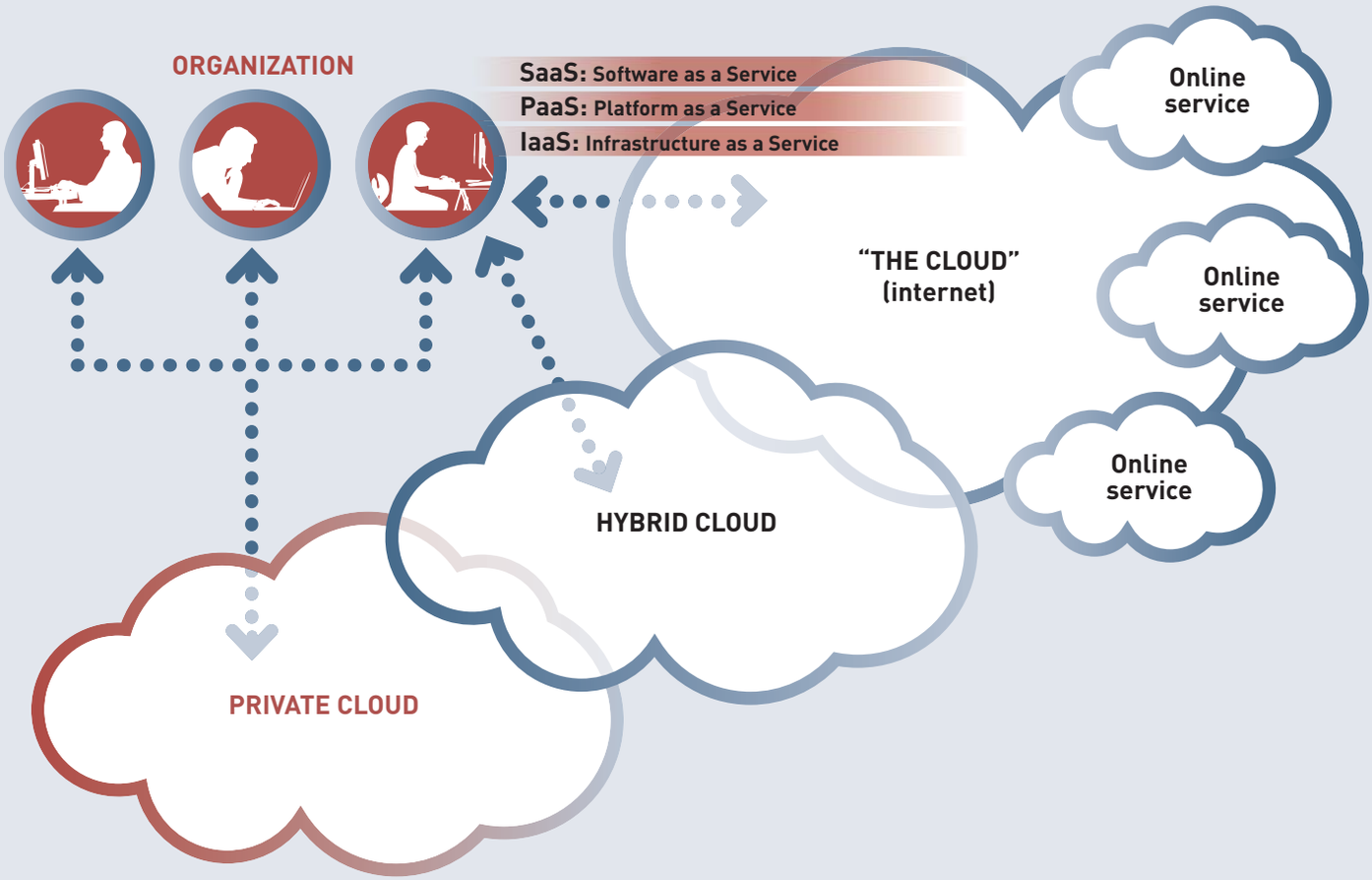


Virtualization is a mechanism that allows us to have at our disposal a real IT resource with different versions

What do you consider to be the most positive aspects associated with Cloud?
From the business point of view, we think that there are mainly four.

- The first is **flexibility**. The possibility of having the technological resources available at any time, and almost immediately, represents an important advance and has a direct impact on one´s business cycles, which can be substantially shortened.
- The second positive aspect is **capital saving**. In the current climate with such restricted credit, the availability of an instrument that allows you to innovate without investing or getting into debt is a very valuable tool for any company.
- The third point is the efficiency obtained thanks to the **elasticity** that Cloud Computing offers for budgeting and consuming only those resources required at a given time. In this way, it is possible to adjust the available resources more exactly to the business needs and to avoid having to keep resources available in case of peeks in demand or future growth.
- Lastly, there is **risk reduction**, closely related to the previous points, and which is achieved by putting together all these aspects and the consequent improvement in the return on investment.

It is much quicker, requires less investment, is more efficient and with less risk to contract electricity supply, change the amount of power when required and eventually end the contract, than to build and maintain one´s own thermal power station or solar power farm.



are well developed. For this reason, perhaps the greatest challenge is the application of good practices and suitable management processes.
In the field of applications, there are great pioneers such as the CRM Salesforce which has been serving its clients for many years with this model and other applications which have recently been seen to adopt the Cloud model.

Cloud Computing is being talked about in the Technology Forums. Could it be said that it is the new IT model? In the cloud, should we take Applications and Data Processing Centers into consideration?
Definitely. Not only it is a new model but, in my opinion, Cloud Computing is the greatest change that has come about in IT (Information Technology) in recent years. It represents an authentic revolution in the way things are done, in the way in which technology is understood, the relationship between suppliers and consumers and, above all, in the business models that surround IT.
To answer the second question, yes. The first are those applications that can be used on demand, paying only according to what we use; this model is called SaaS, software as a service. The second are data centers that service providers in the cloud use to offer their services.

Private cloud or shared cloud: what are the reasons for which a company should choose one or the other?
As a general rule, a private cloud should be the first option for those organisations that

have stricter requirements in respect of **security, performance** and l**egal compliance**. The disadvantage is that private clouds hardly help to achieve any of the four advantages mentioned before. Their start-up is slow, they require a heavy investment and many resources are wasted.

On the other hand, the shared cloud, which is generally public, provides unlimited access to all the advantages of cloud computing, especially **the financial and flexibility advantages**. However, the associated risks and dangers must be analysed and mitigated. Nevertheless, not everything is black and white and it is not necessary to adopt exclusively one single model. In fact, at CSC we think that the hybrid cloud is the model that will be most widely adopted in the future since it takes the best of both worlds by combining the public and private clouds in a transparent and efficient manner.

In the current economic climate, what should IT managers in large and medium sized companies be backing? What are Chief Information Officers talking about?

With the current debt crisis and credit restrictions, the public cloud presents an excellent opportunity to continue innovating and creating value with minimum risk and without the need to get into debt. Nevertheless, for security and confidence reasons, CIOs still prefer the private cloud as opposed to services through the public cloud, despite the limited financial advantages. For this reason, we for example, have launched a unique private cloud service with payment for usage which combines the best of both

worlds and is enjoying an excellent reception from the CIOs.

In a recent survey of CIOs in European companies, 37% identified the use of Cloud Computing to be important or very important in the forthcoming years.

Are there statistics or measurements of the acceptance level of Cloud in medium sized and large companies? How is the current economic crisis affecting this new technology?

Naturally, there are many, both for the global and national market. For example, Forrester Research[2] indicated that last year, the introduction of the different service models (SaaS, PaaS and IaaS) was between 25% and 10% in the large American and European companies. Regarding Spain, Penteo Analyst[3] presented similar numbers in a study carried out in April in which they indicated that 60% of companies with a turnover in excess of 500 million EUR, were using some form of Cloud service. Anyway, these studies only show the number of companies that make use of some type of service in the cloud but not what percentage uses cloud services as opposed to the traditional model.

Regarding evolution, the same studies show projections on the market progression over the next few years with growth rates which are always far greater than that of the traditional IT market. The current crisis simply favours the implementation of cloud since its financial advantages are undeniable.

When a company offers Cloud services to a large company, the latter is depositing all of its information in the hands of a third party, without real sight of the supporting infrastructures and the means of guaranteeing business continuity in the event of loss. How are insurance companies participating? Are there any applicable regulatory norms? Are there any covers in the market that could be applied?

It is important that clients have a vision of the situation and working of everything contracted via the Cloud Computing model. At CSC we aim to provide our clients with this vision and for this reason, we have developed the Cloud Trust Protocol to enable the integration of different suppliers´ information and, in this way, to offer transparent and reliable management of this kind of service.

Nevertheless, it is true that there are

[2] http://www.forrester.com/itprofessional
[3] http://www.penteo.com

Could you provide some examples of where these new solutions have been efficiently introduced in the world of Finance and / or Insurance?

There are various examples. Several insurers use these kinds of solutions for the management of agent and client relations. Amongst them is one of the largest European insurers for its UK business. The advantages obtained in this regard are greater flexibility (with regard to variations in the sales network), the almost immediate availability of new mobility and sales channels which are reflected in improved client response.

In the area of supplier relations, some insurers also have opted for these types of solution to improve the purchasing process. This improvement, which in many cases involves strong consolidation, gives rise to interesting cost savings and the possibility of better supplier and purchaser evaluations.

In banking, moreover, infrastructure solutions as a service are being used successfully. One of the large Spanish banks executes simulation processes contracted with the Cloud model for calculating credit risks and has drastically reduced the execution time and cost.

The same is true of a credit card issuing company that decided to execute its analysis processes for client transaction information on infrastructure contracted as a service and, in this way, managed to reduce the execution time and cost. This is a process that traditionally has taken days and can now be executed in thirteen minutes.

Both Cloud and virtualization aim to improve the utilization of physical resources and, therefore, improve aspects such as the use of industrial land or energy consumption and the carbon footprint

risks which are similar to those borne by companies when they have their systems in the traditional format but, in this case, they reside in the hands of third parties. This is an area in which insurers are not participating but Cloud insure (www.Cloudinsure.com) is an American company that has recently been set up to fill this gap. There is still a business opportunity for the sector.

There is also a lot of talk about the environmental commitment. Can it be said that both Virtualization and Cloud Computing are designed to achieve this?

Of course. Firstly, because both Cloud and virtualization aim to improve the exploitation of natural resources and therefore, improve aspects such as the use of industrial land or energy consumption and the carbon footprint.

Moreover, since the large providers of Cloud Computing services are committed to the environment, they recognise that to be efficient is not enough. Some of the large data centres, which require a higher power consumption, are setting up in places where renewable energies are available with a view to improving the impact on the environment.

To conclude the analysis of Virtualization and Cloud Computing, could we say that IT Managers have an important challenge over the next few years in having to adapt their systems to these new trends?

Exactly. That is the challenge. Everyone is talking about Cloud and many suppliers are offering Cloud solutions but not many are explaining how to transform the services provided by the existing IT Department into a Cloud environment. Everyone proposes Cloud as a catalogue of new solutions to be acquired but almost no one suggests that it is a tool to transform existing services.

For those who have already adopted some of this model´s services, the next challenge is to construct a control model that will enable them to manage these services in a way which integrates them into the company´s IT.

For additional information:

http://cloudsecurity.org/
http://cloudcomputing.sys-con.com/
http://www.cloutage.org
http://www.opensecurityarchitecture.org/

interview with **Carmen Caffarel**

Former Head of *Instituto Cervantes*

E Day Celebration at Istanbul. Turkey © Cervantes Institute

Carmen Caffarel was born in Barcelona in 1953. As daughter of the actor José María Caffarel, she moved to Madrid at the age of nine because, as she explains, there were better work opportunities for her father: "Everything happened in Madrid: cinema, theatre, television." She obtained a degree in Spanish Language, Literature and Linguistics at University *Complutense* in Madrid and in 1988 was awarded a *Cum laude* doctorate by the same university in Spanish Linguistics. She specialized in social communication because, as she states "linguistic studies did not provide me with answers as to why, if we use a common language and same codes, we cannot often understand each other".

From 1988 to 2000, she was a University Professor of Communication Theory and Research Methods at the Information Science Faculty of the University *Complutense*. She was also the vice-dean for Students, Internal Communication and International Relations of that faculty from 1994 to 1998. Professor and assistant vice-chancellor of Students and International Relations for *Rey Juan Carlos* University in 2002 and, 2003 she was elected Head of the Department of Communication Sciences of the *Rey Juan Carlos* University.

On the 23rd April, 2004, Caffarel was appointed by the Government as General Director of the Spanish Radio and Television Company. She left the position in January 2007 after undertaking a deep re-modelling and modernization of the state entity which became the RTVE Corporation. On 13th July of the same year, she was appointed Head of *Instituto Cervantes*, leaving the position in January of 2012 to take up her professorship again in Audiovisual Communication at the *Rey Juan Carlos* University.

She is co-author of various studies on the Spanish language and has published several articles, in different specialized magazines, mainly related to communication, the news media and television.

(* At the time of this Trébol issue going to press, Carmen Caffarel was relieved of her duties as Head of *Instituto Cervantes*. The editorial team decided to go ahead with the publication of her opinions in view of Ms Caffarel´s interesting answers and the informative nature of her comments and statements, which are a reflection of her extraordinary experience in running the Institute for more than four years.)

Opening ceremony of the *Instituto Cervantes* headquarters at Chicago. © *Instituto Cervantes*

"Spanish language, as a cultural industry, makes a 15% contribution to our GNP"

Spanish is spoken by 500 million people worldwide, the second mother tongue, the first being Chinese and the most studied after English. It is the official language in 21 countries and several scattered communities such as that of the Sephardi Jews.
Since its foundation in 1991, *Instituto Cervantes* has promoted and coordinated efforts to spread the Spanish and Latin-American language and culture around the world. In this interview, Carmen Caffarel*, former Head of this institution, talks about its objectives and concerns and of the progression of Spanish as a language for communication.

Would you consider the Management of *Instituto Cervantes* to be a political position? What are its objectives?

I think it requires more a technical profile. My predecessors at *Instituto Cervantes* (IC) have all been very suited to the position. They have academic or cultural backgrounds, such as writers or historians with managerial experience. The IC is a very complex institution, quite decentralised being present in over 44 countries but free to apply what it considers to be the most appropriate policies in order to achieve its objective. This is to promote Spanish, co-official languages and Spanish culture (not only from Spain but also from Latin America, that of over 500 million people who share the same language) in the non-Spanish speaking countries.

Its mission is plural, creative and spans all cultural subjects. Moreover, it tries to make Spanish recognised in other countries as a language of culture, economy and great

Instituto Cervantes Headquarters. Madrid. © *Instituto Cervantes*

The economic impact of Spanish

When does a language of communication become an industry that is noteworthy for its economic impact?
Language generates income and it is an unequivocal industry of culture. But it is not so easy to state when they become prominent. The case of Spanish is significant because being a language with a vast culture, it is considered useful for several reasons; the main one being for those that study it and their enhanced chances of finding work in Spanish speaking companies.

Is it possible to evaluate the contribution of Spanish to the economy of Spain?
The economic value of Spanish has already been quantified. This was done many years ago by Professor Martín Municio in an initial study[1]. Another research has now been carried out by Professor García Delgado[2], sponsored by *Fundación Telefónica*, that is providing with very encouraging data. Its contribution, together with all of the cultural activities, represents around 15% of the GNP. Within this percentage, we are including everything from an Erasmus student who comes to Spain to study to text books, theatrical activities and artists or actors of international renown.

Will Spanish continue being a contributor to the economic growth?
Being more and more people speaking Spanish, the consumption of culture industry in Spanish is inevitable, whether that is through text books or travel. Spain is increasingly attractive as a touristic, linguistic and cultural destination. In this respect, data indicate that culture is not an expense but rather a quantifiable and intangible investment.

[1] Angel Martín Municio (2003). *El valor económico de la lengua española*. Espasa-Calpe.
[2] *"El valor económico del español: una empresa multinacional"*, by José Luis García Delgado, Professor of Economics at the Complutense University. *Fundación Telefónica*.

Instituto Cervantes Headquarters at New York. © *Instituto Cervantes*

The objective of the IC is to promote Spanish and the Spanish culture, in the non-Spanish speaking countries

tradition. It also attempts to influence education programmes so that Spanish is learnt from an early age, because those young people will be our future leaders.

The IC presumably has a diplomatic role since it has to deal with Heads of State and government on different events.
In a way, this is true because our goals are related to this soft power which is, in fact, so important in international relations. The participation and communication of the IC and other renowned institutions is considered very positive in events such as *Premios Príncipes de Asturias* (Prince of Asturias Awards) which highlight us as excellent ambassadors for Spain. We are working with something that does not present a problem; on the contrary, it contributes to an inter-cultural dialogue so that we can get to know each other better.

Why was the IC set up? What is its vision and mission?
Once Spain had overcome the transition to democracy and international relations were re-established, President Felipe González government thought about the need to create an institution similar to the British Council and other comparable to French, Italian and German organizations in order to spread the Spanish language and culture throughout the non-Spanish speaking world. So, the IC was born in 1991 and we celebrated our 20th anniversary

E Day Celebration at Tokyo. Japan. © *Instituto Cervantes*

in 2011. Originally, we were seeking the same objectives as the institutes in other countries but with certain differences. The most significant and successful one has been not to concentrate only on the spreading of the culture of Spain but rather the culture in Spanish; that is to say, for culture in Spanish, Camilo José Cela is as important as Carlos Fuentes, García Márquez or Vargas Llosa, amongst others. This means that we become very prominent in the area of culture, and we are not just talking about literature. We are working with all of the Latin American embassies which offer us a wide projection compared to other similar institutions, such as the Goethe Institute for example, which only promotes German culture when it could also include Austrian culture.

Where and how has the IC developed?

We are present in 44 countries and have 77 locations including centres and classrooms. We can be found in the five continents where the centres have their own staff, management teams and provide both Spanish lessons and training for the teachers.

Another distinctive feature is that we issue the Spanish as a Foreign Language Certificate (DELE), an official qualification for knowledge of Spanish. It is granted by Spain´s Ministry of Education and is available worldwide. There are currently over 600 universities that offer teaching and examinations for obtaining this qualification. This is really positive because of the results that can be derived socially and economically. Last year, in Mexico, we reached an agreement with the over 100 universities of the *Universia* network whereby they would have the possibility of obtaining our qualification, provided they guaranteed a status, a quality certification.

What position does Spanish hold in the world?

According to reliable and verifiable sources, the figure for Spanish speakers has now reached 500 million, if native to those countries that speak Spanish and those that speak it as a second language are taken into account. These data make it the second mother tongue

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The message that we need to convey is that anyone in the world who speaks English and Spanish has a great advantage for communicating

in the world after Chinese. Moreover, it is important to emphasize the recognition of the communicability of Spanish which is at 95%. In the Internet, it is the third language, after English and Chinese. We have a quota of around 8% and 132 million users but this is due to the so-called digital gap. If all Spanish speakers had access to Internet, it would increase strikingly. After Spanish, there is Japanese with 5.6%, French with 4.6% and German with 4.4%.

These are outstanding figures.

Yes they are. But we should also be looking at growth. Spanish is the most studied second foreign language, after English. A few weeks ago, we presented the results of an important research which has taken more than two years and was undertaken together with the British Council as we are always asking ourselves whether, one day, Spanish will overtake English. However, that is not the question; the message that we need to convey is that anyone in the world who speaks English and Spanish has a great advantage for communicating.

In one of your presentations, it was pointed out that a North American who could speak Spanish as well as English, could have a salary difference of USD 8,000.

Around USD 7,000 or 8,000 per year. This information was released by the American census and we published it in a study on Spanish in the USA where several variables were being analysed and in this case, reference was made to people who spoke well both languages. We should not forget that the Latin American community is increasing its presence, so it is achieving greater political and economical influence. The census data provided by the USA refers to a research carried out in 2007 being published two years later. The rate of growth of Spanish in the USA is going to turn it into the first Spanish speaking country, surpassing Mexico. Recent projections indicate that by 2050, 40% of youngsters will be of Latin American origin. Practically we may say that the American continent will speak Spanish from North to South.

It is sometimes forgotten that the earliest city in the USA of today is San Agustín and that it was founded by the Spaniards in 1565 in the North of Florida. Since then, San Agustín has been continuously inhabited and in 2015 San Agustín will celebrate the 450th anniversary of its foundation. In comparison, the first English town was Jamestown in Virginia and was founded in 1607.

Spanish tradition and the Latin American footprint are very strong. There have been magnificent exhibitions on this subject. As time goes by, the North Americans' recognition of the Spanish contribution is increasing but there is still a lot of work to be done to make them aware of the Spanish influence in the founding of their first cities.

Are there budgetary restrictions due to the current crisis?

We cannot ignore the crisis but the truth is that, within the cuts made over the last two years, where the Government Budget average for Ministries was 15%, our cuts were 4% one year and 2% the next. I think that it is as a result of the recognition of the promotional work and its international nature, as well as for the achieved growth. This Institute is also open to private finance. We do have a guaranteed contribution from the Ministry of Foreign Affairs (the budget for 2011 via Government Budget was of EUR 102 million), which we seek to complement with private funds. This is achieved through income from registrations, DELE exam fees and teacher training courses; very much along the lines of other institutions. It is completed with sponsorship in material or monetary contributions. These sponsorships

Brazil, Africa and The Philipines

E Day Celebration at Manila. Philippines. © *Instituto Cervantes*

What does it mean for Brazil that Spanish, as an optional subject, has been introduced into the official education system?
Brazil constitutes a real boom, at least from the figures point of view and following the introduction of the *Lula* law, where Spanish was introduced in the official education systems as an optional subject. Data shows that in two years, the number of students has increased from one to five million. We signed an agreement there with the Ministry of Education, whereby our online Spanish course from the Cervantes Virtual Centre (CVC) could reach all the corners of a country, which is a continent in itself, training the teachers in the use of these tools.

There has been talk of the need for 45,000 Spanish teachers in Brazil. Have you been very active in this process?
Our eight centres in Brazil have their daily dynamic which comprises those who are going to learn Spanish there and/or the Latin American cultural exhibitions, as well as the work undertaken with the universities and ministries to help training the Spanish teachers in the use of the IC tools, such as DELE or the Cervantes Virtual Centre.

Apart from the interest in learning Spanish that has arisen in the Asian Pacific zone, there are still some areas to be covered, such as Africa.
In twenty years we have advanced tremendously but there is still a lot more to do. Interest in Africa does not surprise me. Looking towards Europe from Africa, Spain is the first country that you see and, besides, a Spanish speaking continent can be found to the East.
For the first time, we have opened an *Aula Cervantes* in the Sahara area in Dakar (Senegal), and there are 300,000 people studying Spanish because it provides the opportunity to communicate with 22 countries. It is a useful language. When we ask our students the reason why they study Spanish, we get different answers. In Europe, our neighbours appreciate the language for the great cultural tradition of Spain but, in Africa, the reason is to improve; to have the possibility of finding work and prosperity.

What is the position in Equatorial Guinea, the only Spanish speaking country in Africa that was almost considered on the road to being absorbed by the francophone influence?
Spanish is still spoken in Guinea. We work there and we are in contact with their writers and cultural world. It is a country with its own dynamics within a broad linguistic community.

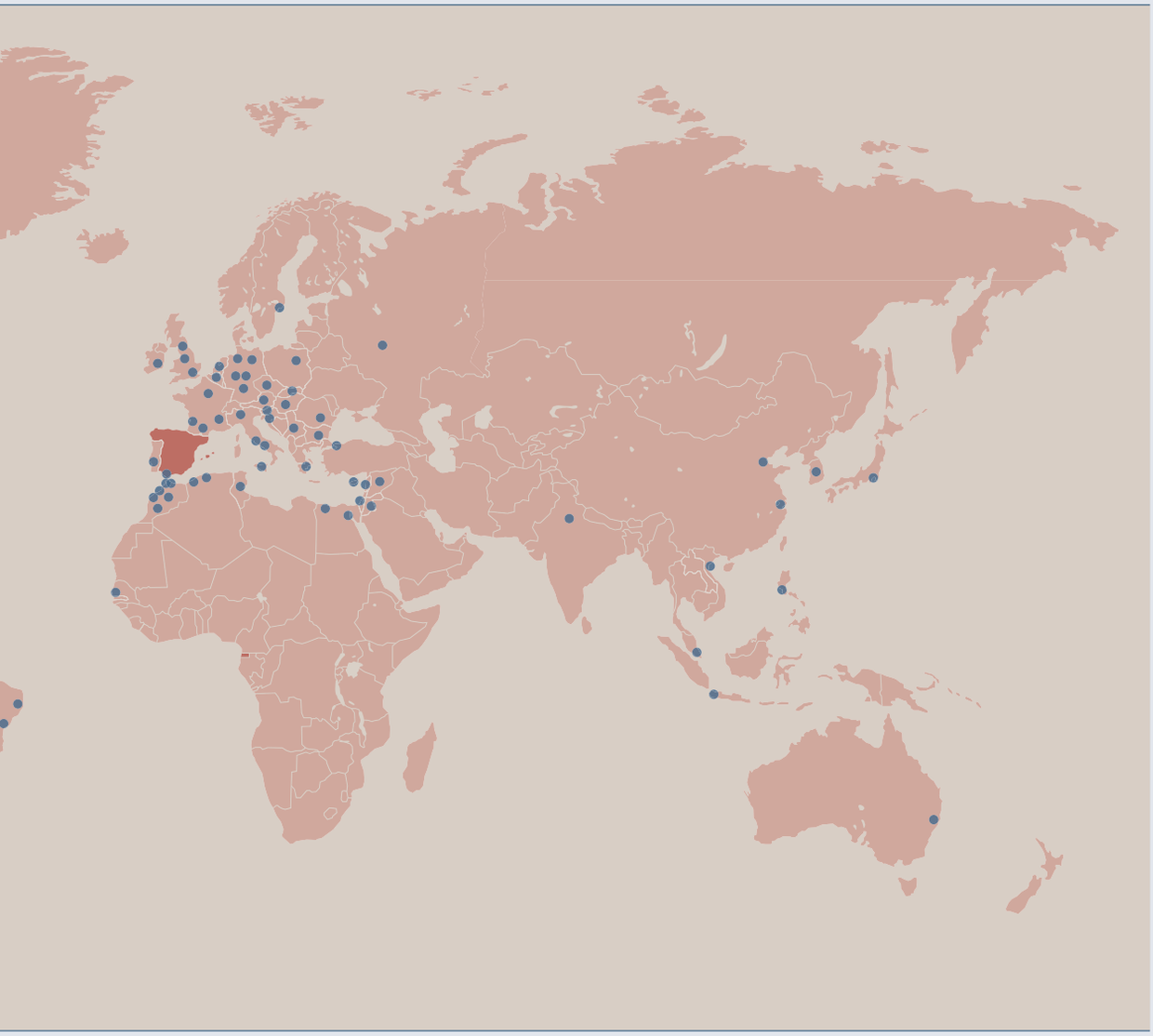
How is Spanish doing in the Philippines?
Spanish was the official language up until 1973 when the country decided to adopt English but, the truth is, we are starting to recover our influence. In this respect, two years ago we signed an agreement with the Philippine Ministry of Education to finance the education of teachers with the objective of getting Spanish back into schools. There is now a political recognition of how useful Spanish can be and we should not forget that the Philippines share an ocean with a large part of Latin America. By way of an anecdote, the Minister for Foreign Affairs told me that he requires that every one of his staff that travels must speak Spanish.

Network of centers *Instituto Cervantes*

Germany: Berlin, Bremen, Francfurt, Hamburg and Munich
Algeria: Argel and Oran
Australia: Sydney
Austria: Viena
Belgium: Brusels
Brazil: Rio de Janeiro, São Paulo, Salvador de Bahia, Brasilia, Curitiba, Porto Alegre, Recife, Belo Horizonte
Bulgaria: Sofia
Canada: Calgary
China: Beijing and Shanghai (Miguel de Cervantes library)
Cyprus: Nicosia
South Corea: Seoul
Croatia: Zagreb
Egypt: Alexandria and Cairo
Slovakia: Bratislava
Slovenia: Ljubljana
United States: Albuquerque, Boston, Chicago, New York and Seattle
Philippines: Manila
France: Bordeaux, Lyon, Paris and Toulouse
Greece: Athens
Hungary: Budapest
India: New Delhi
Indonesia: Jakarta
Ireland: Dublin
Israel: Tel Aviv
Italy: Milan, Naples, Palermo and Rome
Japan: Tokyo
Jordan: Amman
Lebanon: Beirut
Malaysia: Kuala Lumpur
Morocco: Casablanca, Fez, Marrakech, Rabat, Tangier and Tetouan
Netherlands: Utrecht
Poland: Krakow and Warsaw
Portugal: Lisbon
United Kingdom: Gibraltar, Leeds, London and Manchester
Czech Republic: Prague
Romania: Bucharest
Russia: Moscow
Senegal: Dakar
Serbia: Belgrade
Siria: Damascus
Sweden: Stockholm
Tunisia: Tunisia
Turkey: Istanbul
Viet Nam: Hanoi

List of the 21 countries, provided by the IC, in which Spanish is the official language.
Source: *Instituto Cervantes*

Argentina
Bolivia
Chile
Colombia
Costa Rica
Cuba
Ecuador
El Salvador
Guatemala
Ecuatorial Guinea
Honduras
Mexico
Nicaragua
Panama
Paraguay
Peru
Puerto Rico
Dominican Republic
Spain
Uruguay
Venezuela



Instituto Cervantes

Spain is increasingly attractive as a touristic, linguistic and cultural destination. Data indicate that culture is not an expense but rather a quantifiable and intangible investment

are channelled through the Circle of Friends of the IC and it usually involves large corporations that are aware of the reciprocity character of this kind of cooperation. One of the reasons why we have an international reputation is because we help companies to teach Spanish to their staff. On their side, companies support us with monetary or other types of contribution. It is all based on effectiveness and efficiency since, one and one do not make two but much more because this enables us to organise it from the start and to generate a widespread cultural coverage with greater projection and less money.

Self-finance might become a reality one day?

It is true that the amount of self-finance has increased and it amounts to around 30% but this is used to open more centres which, to begin with, cannot finance themselves because they have to invest in buildings and material. If one were to think solely about the profit and loss account from a business perspective, things would be very different. But as a public institution, one also has a responsibility that targets in increasing the presence of Spanish and the demand for Spanish.

The curricula at primary and secondary level in countries with developed economies usually makes compulsory to study one or two languages other than the pupils´ mother tongue. How does the learning of Spanish stand in this respect?

You cannot generalise because it varies from one country to another. In Europe, we have seen that now, more students decide to learn Spanish, rather than French or German which

Instituto Cervantes Headquarters at Krakow. Poland. © *Instituto Cervantes*

were always the traditional chosen languages. Obviously, this is a process that has been going on for some time. We try to work with the education ministries and authorities in every country because it is not just a question of learning a language but being able to rely on the teachers and appropriate means. We are involved in the training of teachers and in many countries, we adapt our DELE exams to secondary education. In some cases, such as in France or Italy, the numbers have increased tremendously. We are noticing that young people study Spanish more and more. Relatively speaking, I strongly believe that Spanish is the most chosen language for study after English.

Some foreigners say that, as Spaniards, we are not aware of how we have progressed in recent years. Do you agree?

Perhaps, as Spaniards, we are not conscious of our achievements but the IC definitely is. We cannot even respond to the wave of requests to open new centres in different parts of the world. And this is not possible due to our limited resources and the fact that we require our new centres to attain a quality standard and to be managed by professional staff. However, we are aware of this progression both in terms of quantity and quality.

INSTITUTO CERVANTES
http://www.cervantes.es

To learn more about the economic value of the Spanish language, please check:

The economic value of the Spanish language. Ángel Martín Municio.
http://www.elcultural.es/version_papel/LETRAS/8016/El_valor_economico_de_la_lengua_espanola

International Conference on the Spanish Language
http://www.fundacionblu.org/actaslengua/acta_prensa_lengua_espanola.asp?id=1

IV International Conference on the Spanish Language. Presentation by Javier Nadal. Fundación Telefónica.
http://www.fundacionblu.org/actaslengua/subir/PDFOnline.Nadal.pdf

Interview with José Luis García Delgado, Economist, Co-Director of the paper on «The Economy of Spanish»
http://www.elcastellano.org/noticia.php?id=918

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http://www.racmyp.es/docs/anales/A85/A85-30.pdf

The Economic Value of the Portuguese and Spanish Languages. José Luis Garcia Delgado
http://www.instituto-camoes.pt/files/jlgarcia_delgado_ucomplutense.pdf

UNIVERSIA NETWORK
http://www.universia.es/

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