

BARCELONA THE EDGE OF INNOVATION

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At the beginning of spring every year, the vibrant Mediterranean city of Barcelona becomes the undisputed capital of the world's mobile telecommunications industry, as host to the giant Mobile World Congress. With the MWC as a springboard, Barcelona is now pursuing ambitious plans to develop

into the Silicon Valley of Southern Europe, a city where entrepreneurs, researchers and multinationals come together to develop cutting-edge products and services for use around the world.

Since the Mobile World Congress moved to Barcelona in 2006, the city has embraced the transformative potential of

digital communications on an unprecedented scale. In 2011, the organisers of the MWC appointed Barcelona as Mobile World Capital, positioning Barcelona as a global benchmark for new mobile technologies. Local authorities are at the forefront of the Smart City social revolution and Barcelona is leading the way in putting the

needs of residents at the centre of its investments in digital services. At the same time, the city is stepping up its support to start-ups and forging new links between the private sector and its world-class business schools, universities and research centres, ensuring a sustained flow of innovation from Barcelona to the world. ●

MOBILE WORLD CONGRESS LEAVES LASTING LEGACY

Barcelona has become the spiritual home of the mobile telecoms industry. As Mobile World Capital, the city is a showcase for new mobile technology services and a global hub for mobile and digital business



Over 85,000 people visited the Mobile World Congress in 2014

The economic renaissance of Barcelona can be traced back to the Olympic Games of 1992, which reshaped the city and put the capital of Catalonia back on the world map for both business and leisure. However, the main catalyst for the city's current transformation has been the Mobile World Congress. Last year, the event brought around 85,000 visitors to Barcelona and in 2015 the Congress is celebrating its tenth edition in the city.

"The Mobile World Congress has been a major creator of wealth for our country. It has enabled Barcelona to become not just a global showcase for digital innovation, but also an international hub for mobile

Barcelona is an open and cosmopolitan city that is full of creative people. We are on the frontline of innovation in Spain and Southern Europe."

XAVIER TRIAS
Mayor of Barcelona

telecoms," says Artur Mas, the President of the Generalitat, the Government of Catalonia. "It has helped Barcelona develop a new industrial structure with advanced technological content."

"The Mobile World Congress and the Mobile World Capital have given us the opportunity to change the DNA of the city,"

says Agustín Cerdón, the CEO of Fira de Barcelona, which puts on the massive event every year. "For us, it is not only about hosting the event – it is about taking the chance to build on Barcelona's strengths and change who we are."

Even a casual visitor to Barcelona can hardly fail to notice the effects of this ambition; drivers receive real-time information on their phones on where to find a free parking space, based on information from smart sensors, while interactive bus shelters with touchscreens and USB ports provide passengers with real time bus information. The transport authority has launched an innovative app for residents and tourists that superimposes bus and metro information wherever a smartphone is pointed.

In the heart of the city, the former industrial district of Poble Nou is now the site of a thriving cluster of companies dedicated to technological innovation, the 22@ district. In addition to start-ups and research centres, the area is home to organisations such as Barcelona Activa, the city's agency for economic growth,

and the Barcelona Growth Centre, a high tech building that is the headquarters of the Mobile World Capital Foundation and the epicentre of Barcelona's fast-growing start-up scene.

The city's status as Mobile World Capital has turned it into a living lab for the integration of mobile technologies into everyday life. John Hoffman, CEO & Director of GSMA, the industry body behind the Mobile World Congress, says the organisation selected Barcelona to be the Mobile World Capital from a host of other candidate cities mainly because of local authorities' strategic commitment to mobile innovation and entrepreneurship. "Mobile World Capital is working to embed the mechanics of mobility in society," he says. "It's going to have a profound impact on health, education, transport and government. The entrepreneurial society that Barcelona is building around mobility is also going to pay major dividends."

Barcelona's investments in mobile technology and in digital innovation have brought it worldwide attention and the city has become a recognized global model for others to follow. "We want to point the way forward in using new digital technologies to benefit everyone who lives in a city," Mayor Trias says. ●



Far Left: MAYOR XAVIER TRIAS, Centre Left: JOHN HOFFMAN - GSMA, Far Right: PRESIDENT ARTUR MAS



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Special thanks to Newsweek for their support of this feature

"THINKING BIG MAKES US GROW"

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Managing Director of Inspirit
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Barcelona City Council appreciates the generous support of Dídac Lee.

It doesn't matter if it's a start-up or a multinational, it doesn't matter if they are small investments or large international ventures. In Barcelona, what matters are big ideas, people, opportunities... Everything has a place in one of the main European cities for international investment projects. That is why Barcelona makes you grow, makes you dream while keeping your feet on the ground, even further than the horizon.

BARCELONA, THE EUROPEAN CAPITAL OF INNOVATION.
A prize awarded by the European Commission in 2014.

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INSPIRING
INNOVATION

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BARCELONA
inspires DNA

The Mobile World Capital



The city is pioneering the use of mobile networks for new services

All three of Spain's major telecoms operators – Telefónica, Vodafone and Orange – are members of the Mobile World Capital Foundation, where they are focused on developing new digital products and services for today's hyper-connected society.

The mission of Mobile World Capital is to expand the mobile experience and use mobile technologies as an opportunity to drive change. The Barcelona-based institution is focused on the three key areas of mHealth, mSchools and Smart Living. It also runs an Entrepreneurship and Innovation programme which brings together start-ups, investors, universities, research institutes, R&D labs and business associations. As part of this programme, the Mobile World Capital puts on Four Years from Now, a sister event to the Mobile World Congress which is aimed at start-ups and investors in the digital and mobile area.

Four Years from Now is a chance for start-ups from the Mobile World Capital to show what they are doing and attract capital from funds and innovation programmes from other parts of the world," says Agustín Cerdón, who is the

Vice President of the Mobile World Capital.

Francisco Román, President of Vodafone Spain, says that the company's activities at Mobile World Capital reflect its "Mobile for Good" vision and its special interest in the social inclusion of the disabled. "We are working on projects to use mobile handsets to make cinema more accessible for the blind and to use Smart City technologies to better integrate the disabled," he says. "Mobile technology should reach the most vulnerable parts of the population. It should never be exclusive."

In another initiative, in the city's central Plaça Catalunya, Telefónica has teamed up with the Mobile World Capital to build the Mobile World Centre, a year-round showroom and exhibition centre that is designed to help ordinary people understand and experience the potential for mobile technologies to enrich everyday life. In less than a year, the Centre has received over one million visitors.

Kim Faura, Telefónica's General Director for Catalonia, says that the company's investments in the Mobile World Capital programmes form part of its transformation strategy; evolving from a traditional,



One cornerstone of our strategy has always been the fact that we own the best network."

utility-style telecoms company into a digital telco that operates at a higher level of the value chain. Telefónica has restructured to become a more consumer-facing organisation, appointing brand managers who are dedicated to developing products and services



Barcelona has been awarded Mobile World Capital status until 2018

for digital markets such as Health and Smart Cities. "Telefónica has been a pioneer in responding to today's market disruption," Faura says. "We are in a process of continual transformation."

At the same time, operators in Spain are investing heavily in fixed and mobile infrastructure to provide the ubiquitous high speed connectivity needed to enable these new business models. Last year, Vodafone acquired the country's leading cable operator, Ono, for €7.2 billion, giving it access to eight million households across the country. In October, the company began providing LTE Advanced services in a number of major cities, including Barcelona, offering downstream rates of up to 300 Mbps.

"We are accelerating the pace of our investments in Spain, especially in high-speed broadband for both mobile and fixed," Vodafone's Román says. "We were the first company in Spain to launch 3G and the first to launch 4G. Our competitors are more conservative, but we are obsessed with improving the user experience by increasing data transfer speeds." ●

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Luis Vidal, Architect Heathrow T2

Based on current information available as at 18 September 2014. Vodafone's footprint includes Iceland. Coverage may vary by location. See vodafone.com/4G

SMART CITY WITH A SOUL

Barcelona is the global showcase for a new type of Smart City, where investments in technology are driven by the needs of residents. The city is partnering with leading multinationals to develop innovative solutions to today's urban challenges

There can be few city districts in the world that seem less futuristic than the labyrinthine streets of Barcelona's Barri Gòtic, or Gothic Quarter. But it is here in the Catalan capital that technologists and local authorities are working together on a new vision of urban living, a Smart City that puts people at its heart.

"We don't want to talk about how smart we are," says

Antoni Vives, the Barcelona Deputy Mayor who is spearheading the plans. "There are many cities in the world that are filled with sensors and devices that add little value to the community. In Barcelona, we want to improve the services for our citizens and enhance their quality of life and wellbeing. That is the real aim of all our investment in new technologies."

The Smart City concept has come under fire from some quarters for its potential to dehumanize cities and turn them into over-controlled dystopias. In 2011, after a series of meetings between the City Council and CEO John Chambers, Cisco Systems began working in a long term partnership with Barcelona, one of the world's most glamorous and historic cities, to show that it doesn't



We are carrying out a real quantum leap in Barcelona."

need to be that way and that Smart City technologies can help improve the quality of life for urban communities and make city living a joy again.

"Cisco and Barcelona share a common vision of Smart Cities," José Manuel Petisco, Cisco's Managing Director for Spain says. "John Chambers realized early on Barcelona's capacity to innovate, to attract investments and to become a worldwide reference model. We have created an iconic Smart City model in Barcelona. Barcelona is very important for us at a global level. Authorities from other cities all over the world want to know what Barcelona is doing."

The partnership between Cisco and Barcelona aims to deliver innovative services powered by Internet connectivity in areas such as education, health, transportation, energy management and energy efficiency. The first initiatives have

focused on new technologies to enhance some of the most prosaic city services, such as parking and waste collection.

For example, an estimated 40% of traffic in city centres is caused by drivers looking for a place to park. In Barcelona, Cisco has embedded sensors in parking spaces to reduce this problem. Residents can download a free map application on their smartphone to find an available space, tap to reserve the space until they arrive, and pay the fee using the application. They can also use the application to renew the parking space if they need, without having to rush back to the car to top up a meter.

It's not only car drivers who stand to benefit from these Smart City initiatives. At bus stops, Cisco has installed touchscreen monitors with WiFi which provide up-to-date schedules, maps, locations for borrowing city bicycles, and information



We are learning from Barcelona citizens how best to use and develop technology."

about local businesses and entertainment. Furthermore, the city authorities and the bus company can analyse information collected from these stops to improve bus schedules.

"All these new sensors also provide information about what's happening in the city," Petisco says. "We can use this data to make city services much more efficient." ●



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A city that
feels as safe
at night as
during the day



innovation + you

See how we're improving
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PHILIPS

New initiatives in lighting and electric mobility

A new initiative by the City Council has been to install wireless sensors on litter containers which inform the waste management company when they need emptying, making collection more efficient and cost effective, as well as reducing pollution and carbon emissions from trucks.

One of the important steps that Barcelona has taken is in the area of public lighting. Working with the Council, Philips is installing thousands of smart LED lights in Barcelona's streets and squares which can be managed remotely, turned on and off automatically, or decrease and increase their intensity when their sensors detect activity. In the city's central Avinguda del Paral·lel, the heart of Barcelona's theatre and cabaret district, the company is deploying state-of-the-art smart LED systems which, in addition to separate lighting for drivers, cyclists and pedestrians, provide ornamental lighting of varying colours and intensity for special occasions.

Juan Sanabria, President and CEO of Philips Iberia, says that

as well as delivering savings of over 60% on energy costs, the smart LED systems being deployed in Barcelona will improve the quality of lighting, enhance the city's brand and support its economic growth. "LED technologies can improve the safety of the streets and



We are investing more than €100 million to produce the e-NV200 electric vehicle in Barcelona."

increase the number of visitors and people who stay for the night," he argues. "Barcelona is a showcase for us. We now want to replicate the sophisticated projects we are carrying out here and customize them for other cities around the world." As well as developing smart



Technology is enabling new services for Barcelona residents and tourists

lighting systems, Philips is also focused on using technology to develop new healthcare services that have the potential to improve the quality of life in Barcelona and even to save lives; the company has installed defibrillators in a number of Barcelona metro stations and in popular city markets.

Another core part of Barcelona's Smart City strategy is to provide the infrastructure needed for electric vehicles. In this area, a key partner to the city is Nissan, the Japanese car manufacturer which produces five different vehicle types in Barcelona, including its e-NV 200 electric van. Last year, Nissan adapted the e-NV 200 as a taxi and sold its first models to Barcelona taxi drivers, who are now benefiting from the lower fuel and maintenance costs and more comfortable driving experience provided by electric vehicles. As part of its efforts to grow demand for the e-NV 200, Nissan has signed an MoU with the City Council. Nissan is helping pay for the charging infrastructure needed and the local authorities are establishing exclusive zones and parking spaces for electric taxis and providing additional subsidies for buyers.

"It is a completely integrated initiative," Marco Toro,

Managing Director of Nissan Iberia says. "Nissan is investing in production and infrastructure for electric mobility while for its part the local Government is providing the institutional support needed for electric vehicles. The Government understands that electric mobility will have a massive impact on pollution levels, and so they are providing very attractive tax discounts and benefits for users of electric vehicles such as the e-NV200 taxis."

Barcelona's approach to the Smart City has earned it global recognition, including being awarded the European Capital of Innovation prize from the European Commission last year, for introducing the use of new technologies to bring the city closer to citizens. City authorities are travelling the world to share their blueprint for the future, and have struck agreements with cities from Rio de Janeiro to Hong Kong to promote Barcelona's City Protocol for urban transformation.

"Every city is different, but they all share a similar metabolism," Antoni Vives says. "We want to help authorities around the world use the Barcelona model and the Barcelona parameters to reproduce and customize what we are doing here in other major cities." ●

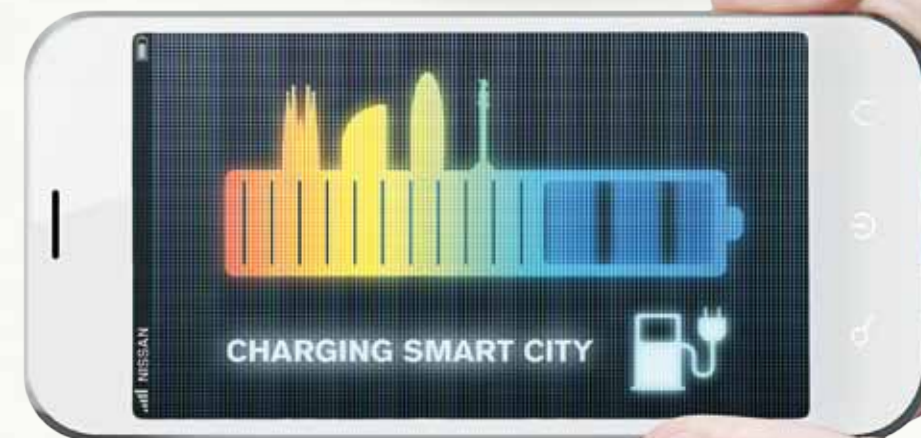


The first electric taxis from Nissan are now in operation in Barcelona



Innovation that excites

A SMART CAR FOR A SMART CITY



NEW NISSAN e-NV200.
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Zero Emission*

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EUROPEAN CAPITAL OF INNOVATION

Leading multinationals are investing in R&D in Barcelona, building on the city's celebrated heritage of design and creativity and contributing to an ecosystem of open innovation



The iconic Media-TIC building is the nerve centre of Barcelona's digital economy

As well as encouraging start-ups and entrepreneurs in the mobile and digital sectors, Barcelona is attracting significant foreign investment in R&D from major multinationals, in sectors ranging from information technology to car manufacturers.

"Catalonia has always been very open to financial, commercial and cultural exchange," Felip Puig i Godes, Catalonia's Minister of Business says. "One of the reasons behind the success of the Catalan economy is that for lack of major natural resources we have always had to be creative, efficient and open to new technologies and innovation."

"Being the Mobile World Capital is helping us to attract ICT companies to set up their European headquarters and their innovation and research centres in Barcelona, and it ensures we get a lasting industrial legacy from the Mobile World Congress," adds Sònia Recasens, Barcelona's Second Deputy Mayor.

In 2014, Cisco Systems began investing €26 million in a global innovation centre for the Internet of Everything in Barcelona's 22@ district. Cisco said its decision to open the centre in Barcelona reflects the city's commitment to innovation, as well the strength of its technological, academic

and research community. The Centre is set to open in the summer of 2016, cementing Barcelona's role in delivering and disseminating Smart City solutions. Energy management company Schneider Electric is investing in its first Centre of Excellence for city solutions and in this same building will share ideas and innovations with Cisco.

"The Internet of Things and the Internet of Everything do not just depend on the work of big companies," Chris White, Cisco's Senior Vice President of the Internet of Everything says. "They depend on mobilizing innovation and creativity from

start-ups and educational institutions, and on cities sharing their experiences and collaborating. Barcelona is now recognized as the city that is leading this initiative."

Cisco estimates that globally the Internet of Everything will be a €17 trillion market. At its innovation centre in Barcelona, the technology company will be working with its partners to translate that massive headline number into real world services on the ground. Chris White says "In Barcelona we are working very pragmatically to break down our global forecast into services that provide tangible benefits to city communities". ●

Banking on technology

Since its establishment in 1904, La Caixa has been defined by its commitment to the development of the Catalan economy and to the welfare of the Catalan people. In recent years, the institution

has put technology and innovation at the heart of its strategy for growing its market share and providing Catalonia with state-of-the-art financial services.

Following a restructuring that was completed in 2014, the

banking activities of La Caixa are now grouped into the listed entity CaixaBank, which uses the brand of La Caixa and the iconic logo created for it by Catalan artist Joan Miró in 1980.

Antoni Massanell, CaixaBank's Deputy Chairman, says that the bank's investments in multi-channel technology have helped it establish closer ties with its customers. "Having a presence on a customer's mobile phone is a means of establishing an emotional link with that person. Furthermore, by offering them a range of banking channels to use, we are able to free up

our branches to provide more efficient and personalised services to customers."

CaixaBank has an imposing share of 32.5% of the Spanish Internet banking market, the second highest market share in online banking for any bank worldwide, and it has more mobile customers than any other bank in Spain. The institution was the world's first bank to launch a proprietary app store, and the first to fit its cashpoints with contactless readers, allowing customers to withdraw cash without having to insert their card. ●



Barcelona taxis accept contactless payments thanks to La Caixa



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The art of creating value



CaixaBank



City of style inspires investment

In Barcelona, Cisco and Schneider are joining other technology leaders who have invested in R&D centres in the city. Last year, HP chose the region as the location for its global 3D printing centre. Barcelona is already home to the company's graphic arts business,



Barcelona is an inspiration for our work as we move from low cost to high emotional value."

and HP chose the city for its annual HP Discover conference in 2013 and 2014. Meanwhile, authorities are also in talks with Chinese giants Huawei and Lenovo about potential investments in the city.

In addition to these newer industries, Barcelona continues to be a powerhouse in the European automotive industry. Nissan plans to invest €300 million and hire an additional 1,000 employees for production of the e-NV 200 electric vehicle, a new pick-up, and the Pulsar at its plant near the Port. Nissan's Marco Toro describes the Pulsar as "our most Spanish vehicle yet," as the car was also largely designed and engineered in Barcelona.

Meanwhile, SEAT, which is Spain's single largest investor in R&D, employs around 900 engineers on research,

development and design at its headquarters in the Catalan town of Martorell. Investments in new design and technologies have been key to the repositioning and internationalisation of the SEAT brand, led by the successful launch of the new León in 2012. Once known for producing affordable, smaller cars such as the Ibiza, SEAT is now investing heavily in evolving to larger vehicles that compete less on cost and more on performance and brand value. As part of this shift, the Martorell plant will start producing SEAT's first compact SUV in 2016.

"For the first time in our history we are selling more Leóns than Ibizas, which is a massive change for a company that has been built on small cars," says Jürgen Stackmann, the Chairman of SEAT, owned by Volkswagen. "We are making huge progress in key European countries, with double digit growth in a market that is basically flat."

SEAT invests a total of around 500 million euros annually. As well as adding to its portfolio of cars to support the exciting change in its brand profile, the manufacturer is investing in modernizing its plant. The Martorell site is home to the largest solar power plant in the global automotive industry; SEAT has spent 35 million euros installing 53,000 solar panels which generate 15 million kWh annually, or 25% of the energy required each year to manufacture the León. The plant also uses train lines



SEAT is the largest industrial investor in R&D in Spain

to transport vehicles directly to the Port of Barcelona and to receive components from the Zona Franca, reducing carbon emissions from truck trips.

Stackmann says that the company is taking inspiration from the city of Barcelona and its celebrated culture of design, spontaneity and good living, as it looks to add more emotional value and power to the brand for this next stage in its history. "SEAT", he says, "Combines the best of German precision engineering and perfectionism with the creativity and innovation that characterises its home town. We believe that Barcelona is a city of engineered beauty, it is an international symbol of elegance, creativity and style, but this is not a coincidence - a lot of thinking and engineering has gone into it. In the same way, we see our designers here as engineers of beauty, so as well as SEAT being a part of the city of Barcelona, Barcelona is also an important part of SEAT."

For the Government of Catalonia, it is a strategic priority to attract investments from multinationals in research and development. At the same time, it has launched new

programmes to enable the transfer of knowledge from Catalonia's educational institutions and research centres to the market. To support both multinationals and local start-ups, it is also investing heavily in education at all levels to



Catalonia has always had a very open and diversified economy and the outlook for foreign investment is positive."

ensure that Catalonia has the dynamic and entrepreneurial workforce it will need in this new stage of its history. "Our most important asset is our people and our main goal is to invest in education," the Catalan President Artur Mas says. "Our vision is for Catalonia to be a leading driver of the economy of southern Europe, a strategic hub thanks to a knowledge economy that prioritizes research and innovation." ●



SEAT



SEAT LEON

SOME TECHNOLOGY BRINGS THE WORLD TO YOU.
SOME TAKES YOU THERE.

TECHNOLOGY TO ENJOY



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DRIVE PROFILE
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FULL LED HEADLIGHTS
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BUILDING NETWORKS FOR GROWTH

Investments in transport and telecoms infrastructure are helping Barcelona capitalise on its strategic location, providing local businesses with the connectivity they need to develop new relationships and new services for today's global economy



Barcelona's Free Zone, or Zona Franca, was established in 1916

As Barcelona transforms for the knowledge economy, it is building above all on the strengths of its soft assets; its global brand, the creativity of its people, its business schools and research centres and its status as Mobile World Capital. However, the city also enjoys a series of competitive advantages in physical infrastructure, transport and logistics.

Foremost among these hard assets is Barcelona's Port, which is

playing a leading role in the rapid growth of Catalonia's industrial base. In recent years, the Port of Barcelona has benefited from major investments that have increased its capacity and efficiency - notably a €300 million investment from Hutchison Port Holdings in a new, semi-automated container terminal. In 2014, Hutchison started work on a €150 million expansion of this terminal. Sixte Cambra, the President

of the Port of Barcelona, says that the Port is now focused on investing in improving road and rail access, to reduce the time and costs of transporting goods in and out. These investments will help position Barcelona to grab an ever greater slice of Asia-Europe container traffic. It is at least three days quicker to ship a container from China to Barcelona than to Antwerp or Rotterdam. These new international rail connections are

positioning the Port of Barcelona as a gateway to the rest of Europe.

"We want to enable the Mediterranean as an entry point for commercial traffic to the entire European market," Cambra says, "improvements in rail connections will be essential." The key project will be the construction of a Mediterranean Railway Corridor that will provide a freight connection from Barcelona to Marseille, Lyon and beyond.

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Port de Barcelona

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EFFICIENCY
NETWORK
Port de Barcelona

New air and telecoms connections

In recent years Barcelona's airport, El Prat, has become a major air hub for southern Europe. That status is largely the result of the rapid growth of Vueling, the low cost airline which takes around 22 million passengers a year in and out of Barcelona and flies direct to over 120 destinations from El Prat.

As befitting a Barcelona-based company, Vueling is investing significantly in technology to differentiate the airline in a growing market. "Most of our IT budget is going to mobile," Alex Cruz,

the company's CEO says. "We want to use mobile to find new ways of solving the potential problems of our customers and improve the travel experience."

Increasingly, the connectivity needed to provide these value-added experiences is being provided not by the telecoms operators themselves, but by specialist companies which run the mobile tower networks. One of the largest of these companies in the world is Abertis Telecom, which is headquartered in Barcelona and operates over 4400 telecoms towers. In



The Port of Barcelona has doubled in size in the last 10 years and is as competitive as any port in Northern Europe.

addition to its mobile assets, the company has a ten-year contract to manage Barcelona's fast growing public WiFi network, which forms one of the foundations of the city's Smart City innovations. It is Abertis Telecom that provides the connectivity needed for city

services such as Smart Parking in the district of Les Corts. "We have long-term relationships with the telecoms operators and with public administration," Tobías Martínez, the General Director of Abertis Telecom says. "We are an enabler who can accelerate the deployment of new infrastructure to the market, speeding up the rollout of innovative new services for users."

Last year, Abertis Telecom took its first steps outside Spain, acquiring over 200 mobile telecoms towers in Italy. It is now preparing to carry out an IPO to raise funds for further international expansion, which will bring the company's financial resources and technical know-how to new markets across Europe. ●

Prime Barcelona real estate

For nearly one hundred years, Barcelona's free zone has been at the centre of the city's economic development. El Consorci de La Zona Franca, the Free Zone Consortium, is now spearheading Barcelona's drive to attract investors in high technology industries.

In downtown Barcelona, El Consorci has leased floors in an iconic property in the 22@ District to the Mobile World Capital Foundation.

The cutting-edge Media-TIC building was named Building of the Year 2011 by the World Architecture Festival and has emerged as the nerve

centre of Barcelona's digital economy. Other tenants at the site include university research centres and economic development agencies such as Barcelona Activa and Barcelona Digital.

Meanwhile, in the giant industrial estate between the airport and port, El Consorci

is attracting increasing interest from manufacturers and logistics operators who want to use Barcelona as the gateway to southern Europe. El Consorci has cut the costs of leases in the free zone by 30% and is investing 24.3 million euros in modernising facilities.

We are developing
new communications
networks

With 8,000 sites, we offer a wide range of connectivity services for broadcast, mobile telephony, security and emergency network management solutions, the Internet of Things and smart city applications.

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A GLOBAL LEARNING HUB

Barcelona is a recognised international leader in education. Students and researchers come to study at its business schools, universities and research institutes from around the world, bringing new ideas and creating opportunities for change

In business education, as in football, Barcelona has pride of place in the European Champions League. Uniquely for a city that is not a national capital, Barcelona is home to three institutions in the top 25 places of the 2014 European Business School ranking produced by the Financial Times. In the 2015 Global MBA ranking published by the FT in January, IESE is the city's outperformer; the business school was in



“The future depends on connecting to the frontier of knowledge and translating that into innovation and products.”



IESE's intensive *Fast Forward* course attracts executives from around the world

seventh place worldwide and was the third highest ranked institution in Europe.

Academics and politicians attribute Catalonia's leadership in global business education to the region's historic openness to outside influence and trade, to the unbeatable appeal of Barcelona as a place to live and study, and to concerted efforts to support research, innovation and knowledge transfer. The city's institutions produce the fourth highest

quantity of scientific literature in Europe, and are among the leading recipients of European research funds, accounting for double the EU average on a per capita basis. Links between business schools, universities and the private sector are increasing, forming a world-class community of knowledge workers from around the world, with Barcelona's business schools at the centre of a fast developing culture of invention.

Specialists in globalization and creativity

“There has been a very obvious cluster effect, and as a result, Barcelona is now a major hub for business education,” Andreu Mas-Colell, a prominent economist who is Catalonia's current Minister of Economy and Knowledge, says. “Historically, Catalonia has two business schools that are always among the world leaders, but they are not alone. There are now four or five other schools which have those two as their standard of excellence.”

Minister Andreu Mas-Colell played an instrumental part in establishing one of these new schools, the Barcelona

economic research community; the Barcelona GSE has been awarded a total of 17 grants from the European Research Council.

The institution does not see itself as competing with existing business schools in Barcelona, but as providing a complementary service for a more specialist set of skills. “Our programmes do not focus so much on managerial and strategic skills as on advanced economics, analytics and data science,” GSE Director Teresa Garcia-Milà says. “They are more for people who end up working in think tanks, economics consulting firms, central banks, the World Bank, the IMF and other international institutions. The Barcelona GSE provides complementary education in economics and analysis to the business education from schools such as IESE and ESADE.”

Common to the Barcelona GSE and business schools such as IESE is a focus on globalization and innovative thinking that differentiates them from their competitors elsewhere in Europe and in the US. While business students interested in a career in finance may gravitate to one of the world's financial centres, students at IESE and other business schools in Barcelona tend to be more creative, with professional interests ranging from software programming to technology to venture capital. The institutions also tend to have higher proportions of international students than business schools in the US. ●



ANDREU MAS-COLELL, Minister of Economy and Knowledge, Catalonia

“We have an environment for research and world-class research infrastructure that is attracting a many talented people to Catalonia.”

Graduate School of Economics, where he was appointed the first Chairman in 2006. The GSE was founded by four of the city's public research institutions, with financial support from the private sector, and is now home to 160 full time researchers.

Many of these researchers are at the forefront of the European



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On IESE's full time MBA programme, 56 countries are represented and 80% of students come from outside Spain. Xavier Vives, Professor of Economics and Finance at IESE, says that the quality of life in Barcelona serves as a magnet that attracts students from all quarters. The programme appeals in particular to people looking to develop truly global management skills and immerse themselves in a multicultural environment. Pankaj Ghemawat, a well known global strategist who was the youngest full professor in the history of Harvard Business School, moved to IESE in 2006 because of the opportunities it affords for researching globalization. As Professor of Strategic Management, he now teaches the world's first mandatory MBA course on globalization.

As well as this focus on globalization, IESE is continuously innovating in its delivery of education for executives in a fast moving international business environment. The business school has launched a pioneering, multidisciplinary five-day course, *Fast Forward*, specifically designed for international executives who want to explore the long-term impacts of global social and economic trends on their businesses. The intensive course blends elements of both open

“We are using technology to personalize our educational offering and to adapt it to the changing needs of today's students.”

Dr. JOSEP PLANELL, President,
Universitat Oberta de Catalunya UOC

and customized programmes; participants choose from the most relevant research sessions held in parallel each morning, and one specific area from

“Barcelona is showing cities how to use new technologies to enable people to live better and enjoy life more than ever before.”

XAVIER TRIAS Major of Barcelona

themed tracks that run through the entire week. While students can sign up individually for *Fast Forward*, many leading multinational companies have also sent entire management teams to participate in the course.

The region of Catalonia has also played a pioneering role in university education and lifelong learning. Twenty years ago, the Universitat Oberta de Catalunya (UOC) became the

first university in the world to be completely online, enabling students to develop their careers with Bachelor's or Master's degrees later in life and while working. Around 55,000 people are currently studying at the UOC. Research into the social implications of frontier technology is a major priority for the university; the UOC is home to the Internet Interdisciplinary Institute (IN3), which specialises in research into the network society and the knowledge economy, and the eLearn Center (eLC) for research,

innovation and training in e-learning. Reflecting this focus, some of the UOC's most popular programmes are in subjects such as innovation, e-learning and the knowledge society.

As more traditional universities migrate online, Dr. Josep Planell, President of the UOCs, says the institution plans to further globalize its activities, and to continue to partner with research institutes, the private sector and

international universities to deliver lifelong learning in new advanced technology niches. “The need to train people in Key Enabling Technologies both at the vocational and the higher education levels will be enormous in the near future,” Planell says. “We have the expertise and the platform to offer this lifelong learning opportunity.”

Strengthening ties between private institutions and the public sector is key to developing the region's educational offering and to driving economic change. Xavier Vives at IESE says that the economic future of Catalonia will partly depend on maintaining close relations between the private, public and academic sectors, who are working in partnership to support innovation and improve the city's competitiveness and productivity.

Barcelona's business schools, universities and research centres are playing a critical part in enabling the city's current economic and social transformation. As well as serving as high tech factories of innovation and new ideas, they are attracting talented and creative knowledge workers from around the world, ensuring that the dynamic and inspirational city of Barcelona continues to look to the future with confidence and optimism. ●

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