

DISRUPTION

RIGHT HERE RIGHT NOW

THE UNCHARTED TERRITORY OF INDUSTRY 4.0

Forget business as usual. Disruption affects almost every economic activity, threatening to displace even the biggest established brands as existing models are constantly challenged and markets evolve at breakneck speed. Digital technologies are re-engineering how industry works, channeling the power of the cloud into the Internet of Things (IoT), and revolutionizing how we experience and interact with everything around us.

To not just survive, but prosper, companies must be agile, innovative and open enough to deliver what we demand now and envision what we want next. From backrooms to boardrooms, startups to multinationals, inspired

“In the future, connected street lighting could form the digital backbone of smart cities.”

Eric Rondolat, CEO, Philips Lighting

business leaders are putting people's needs at the heart of what they do. Whether it's illumination or mobility, finance or resources, consumer goods or gaming—as values change, so must value propositions.

IT giant Cisco helps corporate clients and partners “understand

how technology can play a major role in the way they transform their business,” says Tony Shakib,



Eric Rondolat, CEO, Philips Lighting

Cisco's vice president of IoT vertical solutions engineering. “Until you connect things, you do not have the connection with your assets to see how they are performing. Once you deploy IoT, you have a significant advantage over the competition.”

Last December, Philips Lighting announced a partnership with Cisco to bring the benefits of IoT into offices. Combining Philips' Ethernet-powered and connected systems with Cisco's networking know-how, the next-generation of lighting will improve energy efficiency, enhance user environments, and can even be controlled by smartphone.

But Philips' illuminating solutions go way beyond the workplace. Its cloud-based CityTouch software platform enables urban managers to analyze data, fix problems, and control street lighting networks

in real time. European cities such as London and Rotterdam have already introduced the technology. Last year, Los Angeles became the first city in the world to control almost half its 215,000 lighting fixtures using wireless CityTouch connector nodes that simply screw into the top of existing LED street lamps to make them smart.

“In cities, lighting is all around us,” says Eric Rondolat, CEO of Philips Lighting. “There are more than 300 million streetlights in the world. Less than 12% are LED and less than 2% are connected. In the future, we'll think of street lighting differently, as digital hubs able to host sensors, cameras, and other technologies to deliver new services and improve the lives of citizens.”

Lighting accounts for 15% of the planet's energy bill, yet over 1 billion people live without access to power. As the global population continues growing and migrating to urban areas, demand for electricity is rising by 3% a year. But efficiency improvements lag behind. For Philips, the only way to make up the shortfall is by balancing both sides of the energy equation.

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Produced by **the buzz business**

“If we accelerate the renovation of existing infrastructure in cities, we will save energy and create jobs,” Rondolat explains. “We have also seen that assisting developing countries to use technology will leapfrog stages of development and kick-start economies. Everything is moving in the same direction.”

Swapping traditional illumination technology for LED lighting could save cities as much as

“It's about productivity. When you connect your assets, you can see how they are performing.”

Tony Shakib, VP of IoT Vertical Solutions Engineering, Cisco

50% percent of their electricity consumption overnight. For Rondolat, controlling lighting digitally is key to capitalizing on short-term gains by delivering long-term savings over the lifetime of LED installations: “This is good for the climate, our economies, and for the people whose lives we aim to improve. It's time to speed up change.” ■

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for **TIME**
CUSTOM CONTENT

SEAT

SEAMLESS CONNECTIVITY ON THE GO

android auto™ Apple CarPlay™ Mirror Link™

TECHNOLOGY TO ENJOY

SEAT LEON CONNECT WITH FULL LINK TECHNOLOGY

In this digital world, SEAT's engineers are constantly innovating and developing technologies that allow our cars to connect you to people and places in a whole new way. We brought Full Link Technology to the road, being the first in the market to offer Android Auto™, Apple CarPlay™ and MirrorLink™ features, all in one. The SEAT Leon CONNECT combines this cutting-edge technology with stunning design, offering simple solutions to stay always connected.

NATURALLY CONNECTED

Official fuel consumption for the SEAT Leon 5D CONNECT (litres per 100km); urban 4.1 - 7.2; extra-urban 3.4 - 4.6; combined 3.6 - 5.5. CO₂ emissions 94 - 123 g/km. Standard 5EU Test figures for comparative purposes and may not reflect real driving results.

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Go Further

FORD: CHANGING THE WAY THE WORLD MOVES



Mark Fields, CEO, Ford Motor Company

After a quarter century at Ford Motor Company, Mark Fields took over as CEO in July 2014 and is guiding the brand's evolution from automaker to multifaceted, next-generation mobility business: "I have the greatest job in the world," Fields says. "I'm able to serve the company during a revolution in the industry. It's very exciting."

Last year, Ford posted record pretax profits. In March, it set up a new subsidiary, Ford Smart Mobility, in Silicon Valley, to invest in innovation and devise its own disruptive solutions. Instead of just counting units sold, it will explore how people will move

in the future, from car- and ride-sharing to developing connectivity to self-driving vehicles.

On the importance of innovation

"When I joined Ford, we were primarily a manufacturing company. Now, we're a manufacturing and technology company. Going forward, we'll be a manufacturing, tech, and information company, as our field becomes connected. Innovation is in our blood. It goes back to Henry Ford, one of the world's greatest innovators. That drives us today. At every opportunity, we talk about how to challenge custom, because, in a 113-year-old company, you get set in your ways. It's about not taking anything for granted, using

technology, focusing on consumer experience, acting quickly, taking appropriate risks, and learning to do it all over again."

On the world around the corner

"We want to disrupt ourselves. Part of that has to be imagining what the world will look like in 10 years. That is difficult, but we look at societal trends, like the growth of mega-cities and the growth of a global middle class, which is going to double over the next 15 years and means more congestion in urban areas. We're also looking at emissions. It used to be simply about environmental impact, but now we also analyze

"We are transitioning from an auto company to an auto and mobility company."

Mark Fields, CEO, Ford Motor Company

how they affect human health. And, then, we consider changing consumer behavior. Look at millennials: they're delaying buying houses, getting married, having kids. They want access to things versus ownership."

On the move to Palo Alto

"We have gone where the talent is. Silicon Valley is an ecosystem of ideas. We're working with start-up companies, incubators, and large technology companies. We now have more than 100 professionals in the Research and Innovation Center and are going to continue growing. It's helping us both uncover new ideas and understand how to work with start-ups. We're a big company, but they're teaching us a few things."

On looking back to look ahead

"Our strategy going forward is focusing on our core business, which is developing great cars and trucks, but also looking at emerging opportunities, like Ford Smart Mobility, and embracing those, so we position the company for success in each area as we envision the future.

"The 'why' of Ford, coming back to our founder, was helping make people's lives better and change the way the world moves. We are interpreting that for the twenty first century and being forward-looking to grow and look at what non traditional auto companies are doing to see if there's opportunity there." ■

LONDON'S SMART MOBILITY

In today's congested cities, people often need to go from A to B in a hurry, but may not want to return to A again. In response, Ford is rethinking mobility from A to Z, studying car-use behavior and introducing pilot programs to help users get to where they want to be.

The company has been working with London's authorities for two years: "They have been really open to different solutions and very supportive," explains Barb

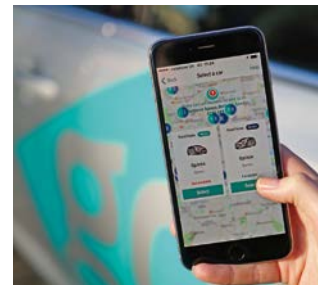
Samardzich, vice president and COO for Ford of Europe. Last May, it launched its point-to-point GoDrive scheme, with two of its best-selling models. The GoDrive app lets users locate hubs, pick up

"It's about being a consumer-focused company, staying relevant in a fast-changing world."

Mike Nakrani, Director FoE Smart Mobility, Ford Motor Company

an electric Focus or low-emission Fiesta, pay per-minute to drive with no mileage limits, and drop it off in a guaranteed parking space on arrival.

With 30% of traffic caused by people trying to park, Ford is beta testing another app, GoPark, in London to take the pain out of parking. In January, FordPass was unveiled in the U.S. and will come to London later this year. Leveraging consumer trust in the brand, it maps the way forward for personal mobility, whether you drive a Ford or not. The app



GoDrive with your smartphone

includes FordPass Marketplace, a one-stop mobility tool; FordPass Perks, featuring cross-brand collaborations; and FordGuides, a free-to-use expert service. ■



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WHAT'S DRIVING THE CONNECTED CAR?

Do you know who your car is talking to? It could be a parking meter, traffic signal, the emergency services or even other vehicles. Driven by the potential benefits of the Internet of Things (IoT), automakers are among the earliest adopters. They are rapidly rolling out connected cars, equipped to communicate with everything on the network, both inside the vehicle and out.

At February's Mobile World Congress (MWC) in Barcelona, carmakers were lining up to talk about the latest technology and

showcase their products. After premiering its Ibiza Connect model at the Barcelona Motor Show in May 2015, SEAT again chose its home city to unveil the latest evolution of its connected

“We need to provide affordable, easy solutions for people to enjoy the benefits technology offers.”

Luca de Meo,
President, SEAT

car at MWC 2016: “Barcelona is one of the smartest cities in the world,” says Luca de Meo, the company's president. “It is a fantastic testing ground for the connected car.”

Part of the Volkswagen Group, SEAT combines Spanish creative flair with German engineering. Under de Meo, it is shifting up a gear to accelerate the development of connectivity across its range, in response to the demands of the brand's young and tech-savvy target market. Developed together with partners Samsung

and SAP, the concept will link the company's cars seamlessly to IoT. ■



SEAT, Samsung and SAP join forces to develop the connected car of the future

SEAT IS REWINDING UP TO TAKE THE LEAD

Passionate and visionary Italian from Puglia, Luca de Meo has earned a wealth of auto-industry experience. He started out at Renault and Toyota before moving to Fiat and masterminding the reboot of its 500 city car. He then moved on to Alfa Romeo before joining Volkswagen in 2009. He was named head of SEAT last November and now aims to transform the Barcelona-based

manufacturer into a front-runner in connectivity.

Driving in the digital age

“I see the opportunity to create additional business in the automotive industry; we should be taking advantage of the fact that people carry devices that are part of a digital world. Everybody lives a digital life. You cannot interrupt that stream when you are driving. People are used to having access to services, possibilities, and functionality everywhere. That is why Google and Apple are getting

into this. They know cars will be an important part of IoT.”

Reaching for the reset button

“The connected car is our first priority, but it is not about technology for technology's sake. It is more about creating a digital ecosystem that enables the car to communicate with infrastructure and mobile carriers. It is not about investing in the product itself, but about harnessing creativity to build around the product. We are almost in a reset mode in the automotive industry, where we need to move from product development to an ecosystem-driven approach. Everyone is learning.”

Building confidence via tech partnerships

“Our strategy is to make technology easy and accessible. That is a key trigger to get into real volumes. Because of the purchasing power of our customers, we have to find a simple solution that not only works but makes economic sense. We are already selling one car in six with connected functionality. Technology is a tool. We have to use it to position SEAT and find our uniqueness. We need to increase customer loyalty and bring people

into our world, not just with SEAT but also through partnerships. We are doing things with SAP and Samsung, opening the company up to cooperation with

“Our intention is to be a front-runner in the connected car space.”

Luca de Meo,
President, SEAT

big players to create an ecosystem that is rich and wide enough for people to feel confident in that environment.”

Taking SEAT to the next level

“With changes in consumer behavior and technology, there is discontinuity in the automotive industry. That makes it interesting for me, even though I have been here for so long. It gives us a chance to play on the same level as those who are much bigger right now. If we combine agility with hunger for success, we can bring SEAT to where it deserves to be. This is an impressive, innovative company and I intend to push the organization to the next level.” ■



Luca de Meo, President, SEAT

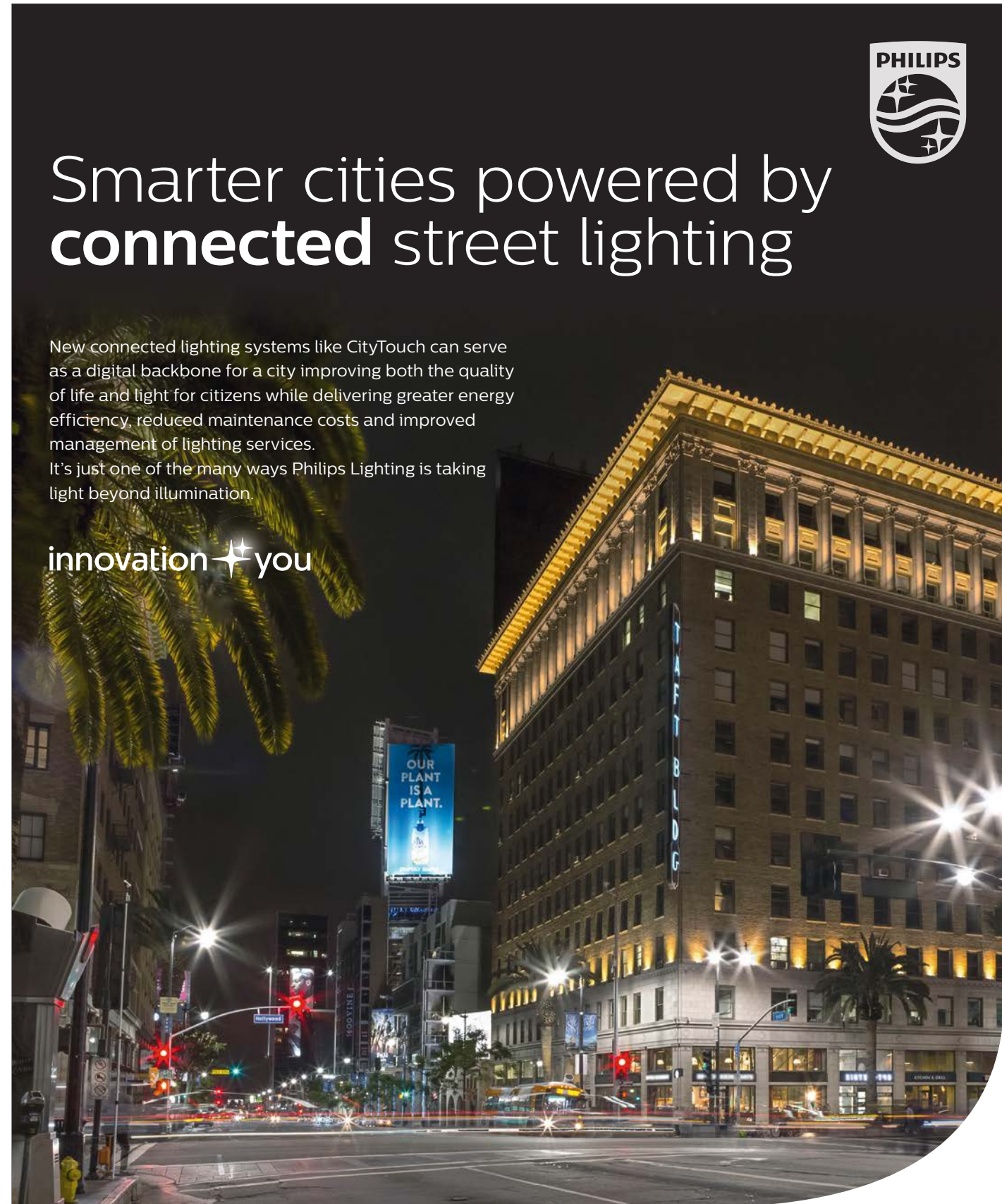


Smarter cities powered by connected street lighting

New connected lighting systems like CityTouch can serve as a digital backbone for a city improving both the quality of life and light for citizens while delivering greater energy efficiency, reduced maintenance costs and improved management of lighting services.

It's just one of the many ways Philips Lighting is taking light beyond illumination.

innovation ✨ you



Learn more at philips.com/citytouch

PHILIPS

NISSAN LEADS THE WAY TOWARD ZERO EMISSIONS

You might not hear one coming, but, just five and a half years after launch, over 218,000 Nissan LEAFs are on the road worldwide. The brainchild of Japan's Nissan Motor Corporation, part of the Renault-Nissan Alliance,

“We see the future of mobility as zero emissions.”

Gareth Dunsmore, Electric Vehicle Divisional GM, Nissan Europe

the LEAF was not just the first mass-market, all-electric car, but remains the biggest seller by miles. Amid growing concern

about climate change, it seems a silent, sustainable revolution is already underway.

“People are seeing they need to make proactive changes in the mobility choices they make,” believes Gareth Dunsmore, Nissan Europe's electric vehicle divisional general manager. “With an electric vehicle you have a practical alternative. We see the future of mobility as zero emissions. By 2020, with the right market conditions, price incentives and infrastructure, 20% of the industry volume should be electric.”

LEAF received a power hike to 30KW last September, adding 31 miles to its range. It already has a 92% customer satisfaction rating, but traveling further between charges will reach new customers, in every sense. Owners have driven over 1 billion all-electric miles in LEAFs, allaying



Gareth Dunsmore, Electric Vehicle Divisional GM, Nissan Europe

any anxiety about how far battery technology has come. And, with 2,800 quick chargers across Europe, and 10,500 globally, you can go a long way before running out of juice.

The U.K. is now Nissan's number-one market for the car and, later this year, France should take the second place in sales from Norway, an early adopter. Aside from its impeccable green credentials, the LEAF offers

plenty of other all-electric perks, like financial incentives when purchasing, significant running cost savings, dedicated and often free parking, and even the right to use bus lanes in a growing number of European cities.

“The next step,” Dunsmore says, “is using infrastructure for more than just you as an individual. It's about using it in the wider service of the community and electricity networks. This is a major disruption, not only to the car industry, but to the whole energy industry. We're working on vehicle-to-grid because the biggest issue power companies face today is spikes. If the 20% of people driving an electric car by 2020 were all connected to the grid at the same time, that would be a huge power plant to draw from, so we're not wasting any energy.” ■

POWER TO THE PEOPLE

Empowerment is the name of the game in the disruptive new partnership between Nissan and Enel to develop Vehicle-to-Grid (V2G) technology with the potential to provide power anywhere four wheels can take you. Nissan's offices in France will be the test-bed for the world's largest grid-integrated electric

vehicle system. It lets drivers park, plug in, and power up vehicles at off-peak times, storing energy for use elsewhere or to sell back to the grid during periods of higher demand.

The system is powered by 100 V2G chargers supplied by Italy's Enel, the only company in the world to make commercially available two-way chargers that can also discharge vehicle battery packs. One of Europe's biggest

energy players, Enel connects over 61 million people worldwide to power from ever cleaner sources. Almost half its 89GW generation capacity is carbon neutral and the company is committed to reaching 100% by 2050, so working with the world's leading electric car manufacturer was an obvious choice.

“For us, an electric car is a battery with wheels,” explains Ernesto Ciorra, Enel's head of innovation and sustainability. “We can aggregate numerous cars to power the grid when their owners are not using them. You don't have to do anything; the battery is connected to the V2G charger and we enable it to sell its energy-generating revenue for you. We are turning consumers into entrepreneurs.” An entrepreneur himself, former innovation consultant and university lecturer, Ciorra was appointed to Enel's senior management team as head of innovation and sustainability in 2014, giving him a voice and a vote when the company

“We are disrupting our business before someone else does.”

Ernesto Ciorra, Head of Innovation and Sustainability, Enel

commits to major investments. His job is to ensure that whatever the future brings does not come at any price: “If you are not innovative, you can't act on sustainability in an effective way,” he declares.

Ciorra is a firm believer in Enel's culture of open innovation that creates alliances with external partners, from start-ups to multinationals like Nissan, and from individual inventors to international universities: “Open innovation is admitting you cannot always be the best,” he says. “You have to be determined to change. What we are trying to do is open minds.” ■



Nissan and Enel power Vehicle-to-Grid technology



THERE'S
MORE TO
TASTE



LAVAZZA

lavazza.com

DISRUPTING THE FINANCIAL PLAYING FIELD

Naguib Sawiris has always been a force to be reckoned with, in business, politics and even international relations. Charismatic and forthright, the Egyptian entrepreneur is a visible catalyst of change in the Middle East and North Africa (MENA). He has won a reputation as a risk-taker and a critic of constraints on freedom, as well as a bellwether of the region's economic health.

"Patience is not one of my virtues," Sawiris admits. "My approach is to be daring and diligent, ahead of my time and the competition. I am driven by the excitement of new ventures and new challenges. I love the diversity they bring to life and learning and, of course, the fulfillment you get when you finally reach your goal. I don't recall any opportunity I did not grab immediately. I'm very good at spotting opportunity."

Sawiris made billions by revolutionizing mobile telecoms in the Middle East and

Africa through Orascom Telecom Holding. He founded the Free Egyptians Party in 2011 to represent liberal, secular interests in response to the rise of the Muslim Brotherhood in his homeland. And, last September, he offered to purchase a Mediterranean island from Greece to house refugees fleeing from conflict in Syria. The offer is still with the Greek government.

Last summer, his Media Globe Networks spent \$40 million to snap up a majority stake in Euronews, the multilingual television news network. As viewing habits change and younger generations focus on smaller screens, Sawiris believes the sector, like all

"We are going to make Belcap an important investment bank for Egypt, both nationally and internationally."
Naguib Sawiris

traditional media, is ripe for disruption: "If an entrepreneur could move in and reinvent the industry, it would flourish," he declares. "We were confident we could create



Naguib Sawiris

value by bringing in an accelerated concentration on digital."

Sawiris' latest passion is finance—"something I always wanted to get into," he says—and he is now planning to take on MENA's investment banking incumbents by putting together an entirely new player, via a strategic acquisitions drive that began late last year. First, he bought out Beltone Financial for \$83 million last November and, in February, announced a bid to purchase CI Capital Holding in another deal worth \$104 million.

"We plan to combine them to create a larger, more competitive company," Sawiris explains, "and then build that up by adding

other activities, like leasing and micro-finance, to develop a new financial group, Belcap. The values of Beltone's shares on the stock market have quadrupled, because people believe in me and my vision. We are going to make Belcap an important investment bank for Egypt, both nationally and internationally."

Sawiris insists there is now more opportunity than ever for financial players to be disruptive in noncore operations: "They are now ripe to be taken over by banks like ours," he declares. "I had vowed to invest in Egypt, as I believe the economy is bouncing back. It is a prime time to invest here."

A track record in mergers and acquisitions—Sawiris has completed M&A deals worth \$65 billion and borrowed \$48 billion during his career, by his calculations—has given him the kind of experience required to replicate his success in banking: "Other people who might think of getting into this industry don't have the courage or the vision to excel," he feels. "They are afraid of failure. If you are afraid of failure, you fail." ■

DRIVING DIGITAL PAYMENTS INNOVATION

According to the World Payments Report 2015, non-cash payments are growing 7.6% annually, accounting for almost 358 billion transactions worldwide in 2014. Alternative payment methods, like peer-to-peer providers



Contactless payments on London's Tube

PayPal and Square Cash, and smartphone digital wallets, are disrupting an industry which long offered just three options: cash, check, or card.

Providing secure technology to power payments, MasterCard facilitates commerce worldwide. Capitalizing on its expertise, MasterCard Enterprise Partnerships is extending MasterCard's influence to larger ecosystems, such as cities and transportation systems, in collaboration with leading private- and public-sector players.

"We are a tech company that happens to have a payments business," insists Hany Fam, the president of MasterCard Enterprise Partnerships. "We think about

targeted innovation, look at points of disruption and inefficiency, and

"We think about targeted innovation. We look at points of disruption."
Hany Fam, President, MasterCard Enterprise Partnerships

have the luxury of being global and touching every single industry."

The company harnesses in-house solutions to make mobility simpler and more sustainable in cities like Athens. In January, MasterCard supplied payment technology for Masabi's end-to-end JustRide application, which enables a million

people to buy and display tickets on smartphones every day: "In six weeks, we changed the Athens transit system," Fam says. And, in December, at COP21 in Paris, MasterCard Enterprise Partnerships announced an agreement with C40 Cities Climate Leadership Group that will help the 83 affiliated cities manage mobility better.

"There are 3.5 billion people in cities today and this will rise by 70% in the next 40 years," Fam says. "There are 300 different ticketing programs. We provide a standard technology platform and payment integration. We can tell you how best to get from A to B in partnership with cities." ■

THE COFFEE REVOLUTION

In May 2015, Samantha Cristoforetti drank a small cup of coffee and took a giant step for coffee-kind. An astronaut on the International Space Station, she made the first zero-gravity espresso, using a specially designed and amusingly named ISSpresso machine, developed by two companies from Italy: Argotec, an aerospace design firm, and Lavazza.

Lavazza has been doing things differently for 120 years, introducing revolutionary ideas that have changed the way coffee is made, distributed, and consumed today. Its founder, Luigi Lavazza, was the first to mix different varieties of beans to produce blends, back in 1895. In 1950, the company was the first to vacuum-pack coffee to preserve aroma and flavor for longer. And, in March 2015, it became the first Italian manufacturer of compostable capsules, making single-serve coffee more sustainable.

"Innovation has always been part of our history," affirms Antonio Baravalle, Lavazza's CEO. "In the last four years, we have more than doubled investment in R&D, because we are convinced the combination of tradition with innovation and sustainability is key to future success."

Over €30 billion (\$34 billion) has been poured into consolidating the coffee industry in the last three years and Lavazza has done some shopping of its own, investing over €1 billion (\$1.1 billion) for future growth. It bought Danish roaster Merrild in June 2015 and completed the purchase of France's Carte Noire brand in February. It now controls 20% of the French market: "Our competitors are not going to stop," Baravalle says.



Antonio Baravalle, CEO, Lavazza

"There is only one possibility if we stay passive. We are obliged to grow."

The Lavazza Innovation Center, across the street from the company's roasting plant in Turin, reflects its obsession with every detail of coffee consumption. A natural evolution of the Coffee Research and Study Center founded in 1979, today the Center's two units—Coffee Design, with its recipes, and the Espresso School, with its courses—combine to create a place where passion for coffee meets tradition and a flair for experimentation and innovation.

"To spread the Italian concept of coffee worldwide requires training a lot of people," Baravalle notes. "Last year alone, we trained over 30,000 baristas, catering staff, distribution partners, employees, journalists, and more. As an Italian brand, it is crucial we sell our culture of coffee everywhere."

Sustainability is "an issue the whole world has to face," Baravalle says, and something Lavazza takes very seriously. A non-profit organization established in 2004, the Giuseppe and Pericle Lavazza Foundation,

supports charitable initiatives in the fields of health, social care, and environmental protection, both in Italy and abroad. In 2010, Lavazza became a founding member of Coffee&Climate, a project developed by International Coffee Partners to help families who cultivate coffee worldwide respond to the challenges of our changing climate.

"We cannot just stand by and watch," Baravalle insists. "We must invest in sustainability and quality, cooperate with farmers on know-how, technologies, and tools to tackle climate change, improve farming techniques, and minimize every impact. With Coffee&Climate, we initiated a pilot project involving over 3,000 growers in phase one. They share best agricultural practices and recent scientific developments. The goal is to reach 25 million growers worldwide."

Lavazza believes that being a premium brand goes way beyond the product. The company is committed to delivering an authentic coffee experience that consumers find credible, from the field to the cup: "Customers today are not the same as 10 years ago," Baravalle says. "They

"Innovation, quality, and sustainability are part of the same triangle."

Antonio Baravalle, CEO, Lavazza

are incredibly conscious of quality, the value of products, and sustainability. For a brand like Lavazza, if we want to avoid falling into the mainstream coffee industry, we have to continue to leverage our ability to be different. Quality is our mantra." ■

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SHINING A SPOTLIGHT ON STADIUMS

A short video shot during an evening game at PSV Eindhoven's soccer stadium last October, shows what Philips ArenaVision LED floodlighting does far better than words can convey. The Philips Stadion,

“LED lighting adds a stunning entertainment effect to the stadium experience.”

Mike Simpson, Global Application Lead, Philips Lighting

originally built by the company over a century ago, is full of light. Light that pulsates in time with music. Light that dies instantly, as thousands of light-emitting diodes switch off, plunging the pitch momentarily

into darkness. Light that floods the arena anew when the home team scores a goal, bringing the crowd to its feet.

“The more you captivate people, the more you are going to entertain them,” says Mike Simpson, Philips Lighting's global application lead. “Our ArenaExperience is all about that. We sit down with a club like PSV and plot the fan experience and then see how we can use our lighting to enhance it. People look to us for inspiration. I often get calls from architects designing stadiums to make sure they will be future-proofed when they are still on the drawing board.”

For almost 125 years, Philips Lighting has been at the forefront of illumination innovation, from the first carbon-filament lamps to the latest energy-efficient, long-life LEDs. Today, it is the undisputed leader in sports, providing floodlighting for 55% of the world's largest soccer stadiums, 70% of the U.K.'s Premier League



Philips connected LED lighting for the Allianz Arena façade

clubs, and a host of other major venues. In 2015, it installed 300,000 LEDs to illuminate the façade of Bayern Munich's Allianz Arena, transforming it into “one enormous canvas,” Simpson says, upon which light, quite literally, plays.

LED stadium solutions provide significant advantages for all stakeholders. The action on the field is brightly lit and free from glare, helping players and fans to follow the ball. High-definition television cameras and viewers at home enjoy the benefits of flicker-free lighting. And furthermore owners

computer-control every aspect of illumination, pulling crowds in, heightening the atmosphere and cutting operating and maintenance costs.

“LEDs have changed things enormously,” Simpson insists. “The next thing coming is all the systems and services we offer as we bring lighting into the digital age. Customers want to know how lighting fits into IoT and the exciting opportunities that brings. We are moving from hardware technology into a world of software applications. Things are moving really fast.” ■

VICTORY FOR FREE-TO-PLAY

From two brothers writing code in Minsk to 150 million users playing its massively multiplayer online (MMO) games worldwide,



Victor Kislyi, CEO, Wargaming

Wargaming has come a long way in the last 18 years. “When a computer beat Kasparov at chess, that was it,” recalls the company's founder and CEO Victor Kislyi. “We knew IT was the future.”

Kislyi's genius move was to apply the free-to-play model to strategy games with its successful World of Tanks franchise in 2010. Installed on 110 million PCs, Wargaming's signature title—which earned \$446 million in 2015, according to SuperData Research—migrated to mobile in 2014, and World of Tanks Blitz has already reached 40 million downloads. Follow-ups World of Warplanes and World of Warships have 16 million users combined.

“Free is good,” Kislyi smiles. “We all love free things. Companies like Google or Facebook showed you can attract customers who do not pay up front if you provide value and monetize them in a different way. Anyone anywhere can download the game on any device and play without being asked to pay first. I like to give people happiness. We are making millions of people on the planet happy through game play.”

“The next big thing is virtual reality and there's no going back.”

Victor Kislyi, CEO, Wargaming

According to Newzoo's latest Global Games Market Report, the global gaming industry will grow 8.5% in 2016, with revenues reaching almost \$100 billion. Mobiles will overtake PCs in market share, Asia-Pacific will remain the biggest market, and the convergence of games and video will be the top industry driver.

Wargaming is way ahead of all those trends. Last October, it transformed a subsidiary, DropForge, into a dedicated

mobile division. The company has four offices across Asia and a partner, KongZhong, in China. This year's Wargaming.net League Grand Finals were watched by more than 2 million unique users.

“Entertainment has always been part of our lives,” Kislyi insists. “Civilization is moving online, toward social networks and increased connectivity. Our interaction in social networks is meaningful because users have to win a battle, and that involves more intense cooperation than sharing pictures of cats. Games are everywhere, on your mobile phone, in your living room. When you watch a movie or read a book, there is nothing you can change. Good games let you write the story.” ■



SCI FI DEEP-SEA MINING

Just as Jules Verne's famous fictional submarine ventured 20,000 leagues under the sea, its modern-day namesake, deep-sea miner Nautilus Minerals, is carving out a new niche in the extraction business. The pioneering player is bringing together tried-and-tested technologies from other industries to send cutting-edge, remote-control robots into the depths of the Pacific to explore for massive sulfide deposits, which could contain rich seams of high-grade metals and minerals.

“The largest accumulations of copper, cobalt, manganese, and nickel, and significant deposits of gold, lead, silver, and zinc, are on the seafloor, not on land,” Mike Johnston, the Canadian company's president and CEO explains. “As we move to a more technologically based society, copper requirements

increase exponentially. Mineral consumption in a green economy is greater than in a traditional one. These minerals are all in abundance on the seafloor.”

Nautilus has sourced solutions from the offshore hydrocarbon, dredging and mining sectors to develop a proprietary production system that will significantly cut the



Pioneering seafloor mining equipment

cost and time frames of traditional mining. Moreover, Johnston says, an independent report by Earth Economics revealed that deep-sea mining will impact ecosystems less than land-based mines.

At its Solwara 1 project in the Bismarck Sea, off Papua New Guinea, Nautilus intends to anchor a floating Production Support Vessel (PSV) and use a riser and lifting system to pump mineralized materials, cut by its robotic seafloor production tools (SPT), up to the PSV for recovery: “The cost of building one of these systems is about \$480 million,” Johnston explains. “To produce the same amount of copper, a mine on land would cost between \$1.5 and \$2 billion.”

The firm's operations are moving forward at a rate of knots. This March, three SPTs arrived in Oman to commence shallow-water testing, the PSV should be delivered in late 2017, and Nautilus expects to start extracting material from the seafloor in the first quarter of 2018.

With significant and highly prospective acreage in the territorial waters of Fiji, the Solomon Islands, Tonga, and Vanuatu, as well as Papua New Guinea, Nautilus has

lots of seabed to explore. Thankfully, its shareholders—including Omani conglomerate MB Holding, Cypriot-Russian Metalloinvest, and Anglo

“Seafloor mining is a major game changer in the global mining industry.”

Mike Johnston, President and CEO, Nautilus Minerals

American—“understand disruptive technologies,” Johnston says, and are convinced about the company's prospects in uncharted waters.

“We saw there was a real niche that was going to develop,” Johnston says. “In mining, the first people in can, theoretically, get the best ground. The other driver is to patent technology. We own significant components of our technology. You also build a reputation, and that is worth real currency.” ■

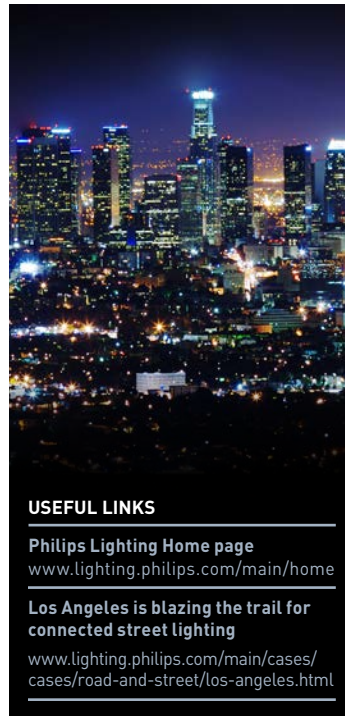
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The Q&A

LIGHTING THE WAY TO ENERGY EFFICIENCY, SMART CITIES AND SUSTAINABLE LED TECHNOLOGY



USEFUL LINKS

Philips Lighting Home page
www.lighting.philips.com/main/home
Los Angeles is blazing the trail for connected street lighting
www.lighting.philips.com/main/cases/cases/road-and-street/los-angeles.html

ERIC RONDOLAT, Chief Executive Officer, Philips Lighting

Q: How has illumination been disrupted by LED?

A: The lighting industry has changed more in the past decade than in the previous century. LED was the catalyst because of its long life and energy savings of up to 90% over conventional lighting. As LED is digital, it can be connected to sensors and management systems to increase savings by delivering light only when and where it's needed. By connecting lighting to other systems, apps and devices, we can enable new experiences and services.

Q: What about energy efficiency?

A: Our climate is changing and we consume energy faster than

we conserve it. We need to at least double the annual rate of energy efficiency improvement to 3%. The IEA says energy efficiency has to do two thirds of the job of tackling climate

“ Lighting has the highest return on investment-generating energy efficiency.”

change, to put the world on a sustainable development track. This makes it not only our business, but everybody's business. The Global Goals for Sustainable Development

show lighting impacts many of them, like poverty reduction, education, consumption, cities, and infrastructure. We need to move from agreeing what needs to be done to doing what was agreed.

Q: How can smart cities help?

A: Smart cities can balance energy supply and demand. To make a city smart, you need connected streetlights, smart homes and smart buildings with connected lighting, such as offices, industry, retail environments, and hospitals. We typically save a minimum of 50% of energy where we implement our systems, which is massive for cities. ■

MIKE SIMPSON, Global Application Lead, Philips Lighting

Q: What has LED brought to sport?

A: Sport needs a lot of light focused on a small space from a long distance. With LED, we can change lighting levels from 10% to 100%.

“ We have remodeled ourselves with the LED revolution.”

Clubs can add entertainment to the stadium experience, which is stunning. LED is flicker free. Broadcast images are much better

at standard frame rates, but particularly in slow motion. LED meets broadcasters' current and future demands, providing the quality of light they want.

Q: What challenges does stadium lighting present?

A: If you are building a stadium for 2020, because LED technology is developing fast, it is about predicting where it is going to be and ensuring the stadium can accept something that maybe does not exist yet. We try to future-proof the process to integrate lighting at the latest possible stage. For London 2012, the lighting went

in right before the event, but was planned five-six years before.

Q: How sustainable is LED technology?

A: The average club probably only uses lighting for 250 hours a year. It is not like street lighting that is on all night. Where LED technology wins is that they only have it at full output for the game. The rest of the time they can run it low, which leads to savings. In terms of the life of the product, if you have a lifespan of 20,000 hours and you use it for 250 a year, the lighting might outlast the stadium. ■



TRANSFORMING MOBILITY THROUGH DIGITALIZATION, CONVENIENCE, AND CONNECTIVITY



LANCE BRADLEY, Managing Director, Mitsubishi Motors UK

Q: What advantages do electric cars have?

A: Electric cars are better to drive than internal combustion models. Once people have electric vehicles, they don't want to go back. They are smoother, quieter, plus you get better performance. People find they don't have to go to the petrol station anymore. That's a convenience. Kids in the future will be shocked that we used to interrupt journeys, instead of refueling with electricity when we weren't using cars.

Q: How important is charging infrastructure?

A: Infrastructure is key and changing all the time. The benefit of our plug-in hybrids is that you don't need charging stations, because you can do it at home.

“ It changes the world if we become less dependent on oil.”

It's not a pure electric car where you need a recharge or you're stuck. We launched plug-in hybrids without the infrastructure. When we started the I-MiEV, people asked if we were going to pay for the infrastructure. We are in the business of selling cars. The government can help set it up, but technology can't survive on state support. It is like the plug-in car grant; we know that will disappear one day—as it should. ■

WILKO A. STARK, Vice President Daimler Strategy & Product Strategy and Planning, Mercedes-Benz Cars

Q: How will connectivity transform vehicles?

A: Connectivity is just part of digitalization, which is leading to profound changes in the industry that will affect our business in every way. Our target is to become the leader in digital technologies. We see four trends that will change mobility in the future as fundamentally as the invention of the automobile did 130 years ago: e-mobility, autonomous driving, shared mobility and digitalized ecosystems. At Daimler, we

see digitalization as an opportunity. It will make our products more convenient, personalized, up-to-date, and safer, providing greater pleasure and relevance to our customers.

“ It is our responsibility to shape the future of safe, sustainable mobility.”

alone traffic jams cause macro-economic costs of over \$19 billion a year. Preventing them can save fuel and avoid emissions. Vehicle-to-vehicle technology helps do that. With autonomous driving technology, we can expect another increase of efficiency. The intelligent operating systems on our hybrid cars adjust acceleration and braking to the road ahead. On the production side, IoT allows for leaner production methods, reducing the use of natural resources and waste. ■

Q: How does that affect sustainability?

A: Connectivity makes personal mobility more efficient. In Germany



ALEX BAZIN, Vice President and Head of IoT, Fujitsu TAKAAKI SUGA, Head of the IoT Business Division, Fujitsu

Q: How does the Fujitsu Hyper-connected Van work?

A (Bazin): We built it for the utilities industry, but it has broader applicability. There are lots of benefits, particularly for mobile field offices. The core feature is to improve what we call “first fix.” Someone comes to fix something but doesn't have the right parts, so has to come back later. That's disappointing for customers and expensive for industry. Visibility of mobile stock inventory, using RFID

tagging, is really valuable. The other part provides connectivity and widgets into a mobile Wi-Fi hotspot. One of the challenges in field conditions is engineers have no signal inside buildings to look at manuals. The hotspot can get into facilities to give them continual connectivity back to base.

“ Nobody buys IoT. What they buy is a solution to a business problem.”

Alex Bazin

Q: What is Human-Centric Innovation about?

A (Suga): We aim to benefit people through ICT. Our concept has quantitative—productivity and costs—and qualitative—making life richer, providing better working environments, and motivating people—aspects. I don't think many competitors are using this approach. When you talk about IoT, that's a huge range of devices, from big to small, and you have to integrate them all. That's where we can help. ■



TECHNOLOGY TO MANAGE DATA, SUSTAIN INNOVATION AND REVOLUTIONIZE BUSINESS

JAMES PETTER, Vice President EMEA, Pure Storage

Q: What's driving demand for Flash storage?

A: Disk spindles spin no faster now than they did 30 years ago. The only thing that changed was drive density. There was a bottleneck in the data center and, six years ago, Pure Storage came to market and built the Flash category. Some applications needed greater performance and Flash was able to provide it. It's evolution.

Q: How big a market is it?

A: The storage market is between

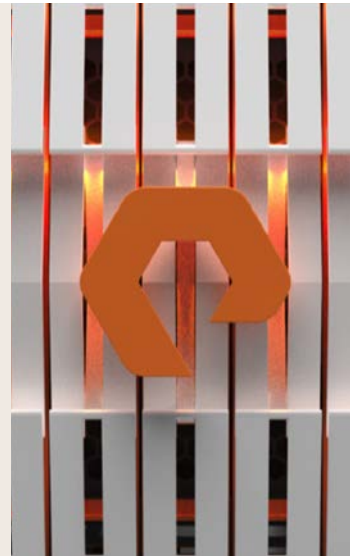
“ We want people to have technology that can grow over time.”

\$60 and \$80 billion. Around \$1.5 billion is Flash-based, but by 2018, it will be at least 50% of the total. Once you move away from old technology, you don't go back. It's like the recording industry. We may enjoy vinyl, but streaming

is how the next generation expects music to be delivered.

Q: What advantages does Flash offer?

A: Firstly, speed, the way you manage applications, the response rates that you can get. Secondly, density of the capacity. You can put much more information onto an array than on a traditional disk-based system. Thirdly, manageability. We take machine data and correlate, aggregate and analyze it to do proactive customer support. ■



DR. MARTIN CURLEY, Vice President and Director Intel Labs Europe, Intel Corp.

Q: Can the technology industry continue innovating?

A: Three trends are enabling something unique. There is Moore's Law; mass collaboration, via increased connectivity; and the recognition that we need a new global paradigm of sustainability. When these come together, it creates the opportunity for innovation. Moore's Law is a competitive challenge and we have to work beyond it. Our smart grid research takes better advantage of renewables to make consumers

prosumers, using and generating electricity for individual homes and nationally, storing energy for a more efficient, resilient grid. It is a

“ Economists are fixated on productivity but what really drives growth is innovation.”

brilliant example of IoT and swarm intelligence, where you optimize for 500,000 homes in a sustainable way.

Q: What's the timeline for this kind of disruption?

A: The technology is there. The question is whether we are ready to embrace it. It is about figuring out the best combination of technology, usage and business model to make systems viable on a very large scale. The overarching approach to move these technologies into the mainstream is open innovation. We are trying to bring together stakeholders around a common vision to prototype and pilot these technologies and get them disrupted. ■

DAVID CHALMERS,

Vice President and Group Chief Technologist EMEA, HP Enterprise

Q: What is the potential for IoT to transform business?

A: Almost limitless. We will not be able to do everything at once

“ We will see the word device having a much more vague definition.”

and take advantage of everything possible, but the impact will be felt across every industry. Every

customer I talk to is looking for ways to use new technology to be more than cost-efficient. Ten years ago that was the game, but it is not so important now. People need to transform the way they interact with their customers. Many organizations want to interact with their customers' customer, so we see a more sophisticated business network evolving.

Q: How will IoT data be managed?

A: There is an explosion in

the number and sophistication of devices that create data. Everything from technology that will go into the clothing we wear, packaging around the food we buy, and pharmaceuticals we consume. Traditionally, you create data from a personal device, move it to a center where it is stored, secured and analyzed so that you can take action from that information. We cannot do that in the world of IoT. We have to take the processing to the data. ■

