



Information and Opinions about the Electronics Market

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Economy in the time
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CONTENTS

ELETTRONICA  | ISSUE 1

OPINIONS

THE EDITORIAL

3 Outbreak

by Fritz Walter

THE OP-ED

5 Stay safe. stay at home. And brace for impact!

by Alan Friedman

THE COMMENT

6 A Country in search for leadership

by Rossano Salini

MARKETS

UPSTREAM

8 Economy in the time of Covid-19: no good news

by Alan Friedman

DISTRIBUTION

12 It could have been worse!

by Federico Cellini

EUROPE

14 It was all expected

by Laura Reggiani

COMPANIES

THE DISTRIBUTOR

16 When stock and logistics make the difference

by Laura Reggiani

THE MANUFACTURER

20 Endless opportunities

by Laura Reggiani

INNOVATION

CASE HISTORY

24 Rimac's Hypercar goes with Analog Devices

by Cleopatra Gatti

DESIGNS

26 Cuffless blood-pressure measurement solution

by Cleopatra Gatti

COLUMNS

29 PEOPLE & BUSINESS

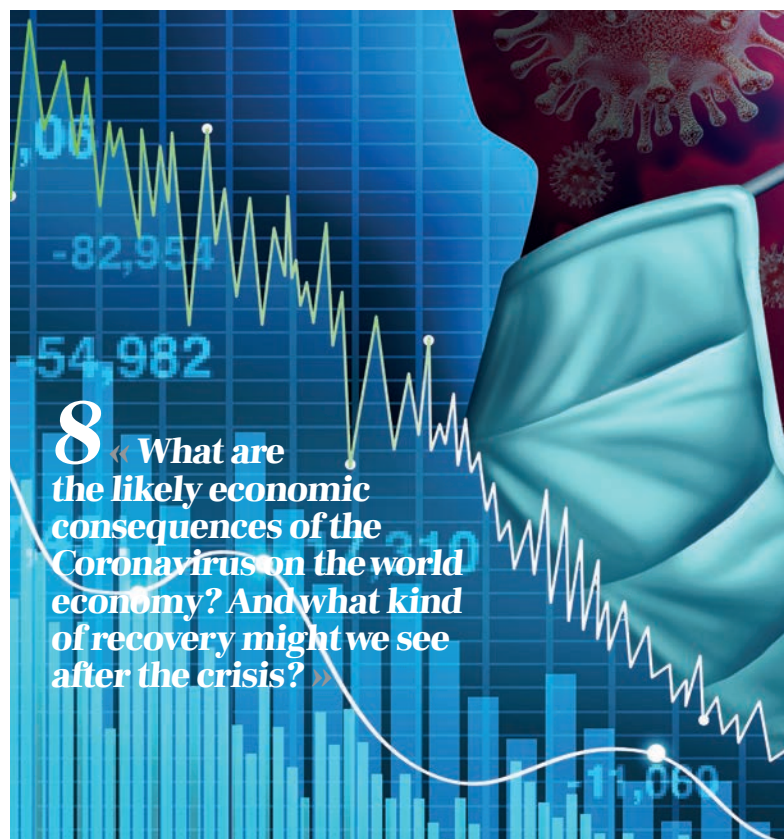
31 PRODUCTS & SOLUTIONS

English Abstract Edition



TO GAIN GREATER INTERNATIONAL VISIBILITY, **ELETTRONICA AV** HAS BEEN ENRICHED WITH A SPECIAL "ENGLISH ABSTRACT EDITION", PUBLISHED AND DISTRIBUTED IN DIGITAL FORMAT. CONTENTS ARE CAREFULLY SELECTED ACCORDINGLY TO THE MAIN TOPIC-AREAS: ELECTRONICS MARKETS, COMPANIES AND INNOVATION.

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SPECIAL-IND
prodotti speciali per l'industria

by Fritz Walter

“Outbreak”

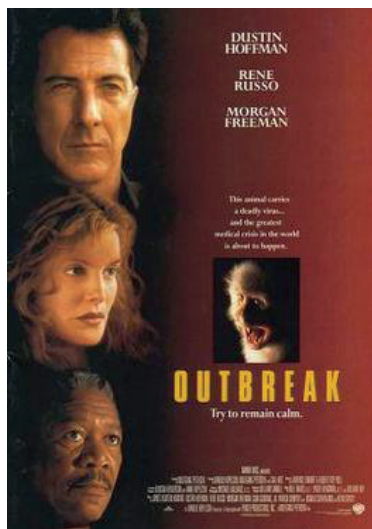
We didn't need this. We really didn't need the Coronavirus! For Eletttronica AV's first issue of FW Communication I would have preferred to write a more uplifting editorial. Instead, Covid-19 came crashing down on us, and on every home, office, factory and school in Italy. A tsunami that has been amplified by the current digital age (smartphones, the Internet, Facebook, etc.) and has accelerated the onset of the crisis started last year, particularly in the electronics industry. Above all, it has exposed the shortcomings of a socio-economic system unprepared to cope with such a massive event, not unlike the tragedy that unfolded in the Indian Ocean in 2004. And yet, here we are! In the best-case scenarios, there has been a mass race to find and test out whatever teleworking measures can keep businesses active: Skype, Zoom, Google and Microsoft. These smart working measures have enabled employees and employers to work toward shared goals without any specific restrictions on working hours or location. In less fortunate cases, lay-offs, vouchers and moratoriums have been put in effect.

As key players in a typically global market, typically attuned to technological instruments, and typically reliant on one-to-one relations, our future is uncertain. Practically all travel (domestic and international) by companies operating in the electronics market has ground to a halt. This might not be such a bad thing: flight cancellations, route suspensions, border closings are a sure way to save money, time and embarrassment. Trade shows cancelled (notably the *Mobile World Congress* in Barcelona) or

postponed (like the *Light+Building* in Frankfurt, which has been pushed back to September and October) have delayed until date “to be defined” any possibility of profitable meetings with partners, clients and suppliers. I personally give special kudos to the organizers of the last *Embedded World* held at the end of February, who, despite the dozens of cancellations by confirmed exhibitors and visitors, opted to go ahead regardless, making a show of strength in typical German fashion that resulted in a dramatic lapse in numbers and, above all, in style.

As far as Italy is concerned, clients have closed their doors, meetings with external visitors are prohibited, invoice payments are late (a virus that has plagued in Italy for decades!), and goods are stuck in factories halfway around the world, making it impossible for Italian suppliers to meet agreed delivery times. This brings us to March 8th, 2020, the date of publication of the Decree of the Italian Prime Minister that imposed further and (justifiably) stricter measures to contain and mitigate the Covid-19 “Outbreak” across Italy and beyond. The axe falls and the global stock markets collapse under the weight of the Coronavirus; a new “Black Monday” (March 9th) for the financial markets and Europe, which burns €608 billion in a single day, the worst day in 20 years surpassed only (and just barely) by the Brexit referendum crash.

But stay calm! We are Italians after all, a people of saints, poets and navigators – and who better than us is able to navigate in a sea of sh... errrr, sherry? We'll get back to you in a couple of months, Coronavirus permitting!



OUTBREAK IS A 1995 AMERICAN MEDICAL DISASTER FILM DIRECTED BY WOLFGANG PETERSEN. THE FILM FOCUSES ON AN OUTBREAK OF A FICTIONAL EBOLA-LIKE MOTABA VIRUS, IN ZAIRE AND LATER IN A SMALL TOWN IN THE UNITED STATES.

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LED SOLUTIONS SPECIALIST

by Alan Friedman

Stay safe. Stay at home. And brace for impact.

We are headed toward a deep and global recession and, in my opinion, it will most probably be a recession that will be worse than the crisis the world suffered a decade ago. Unfortunately, the economic impact of the coronavirus crisis is going to be horrible, and the key questions now are three:

1. How bad will it get?
2. What economic policies can mitigate the situation?
3. What kind of recovery can we expect?

Here are my answers.

1. In much of Europe and in North America the economy is in freefall during the current period, meaning a negative sign for Pil in the first trimester of 2020, a much steeper contraction in the second trimester and, for most countries, a negative sign for the entire year, even considering a recovery in the autumn. The smartest leaders are introducing national lockdowns because the first priority for any leader, even before the economy, is the health of their citizens. Sadly, this is easier to do for a country that has a dictator like China or an authoritarian leader like India's Narendra Modi. In European democracies the best model for a lockdown is Italy, while the worst example is the incompetent dithering of Britain's Boris Johnson. In the United States, where Donald Trump first called the virus "a Democratic hoax" and now is threatening to "re-open" the country by Easter, the situation is expected to worsen steadily in coming days and weeks.



**Alan Friedman, journalist,
writer and economics expert**

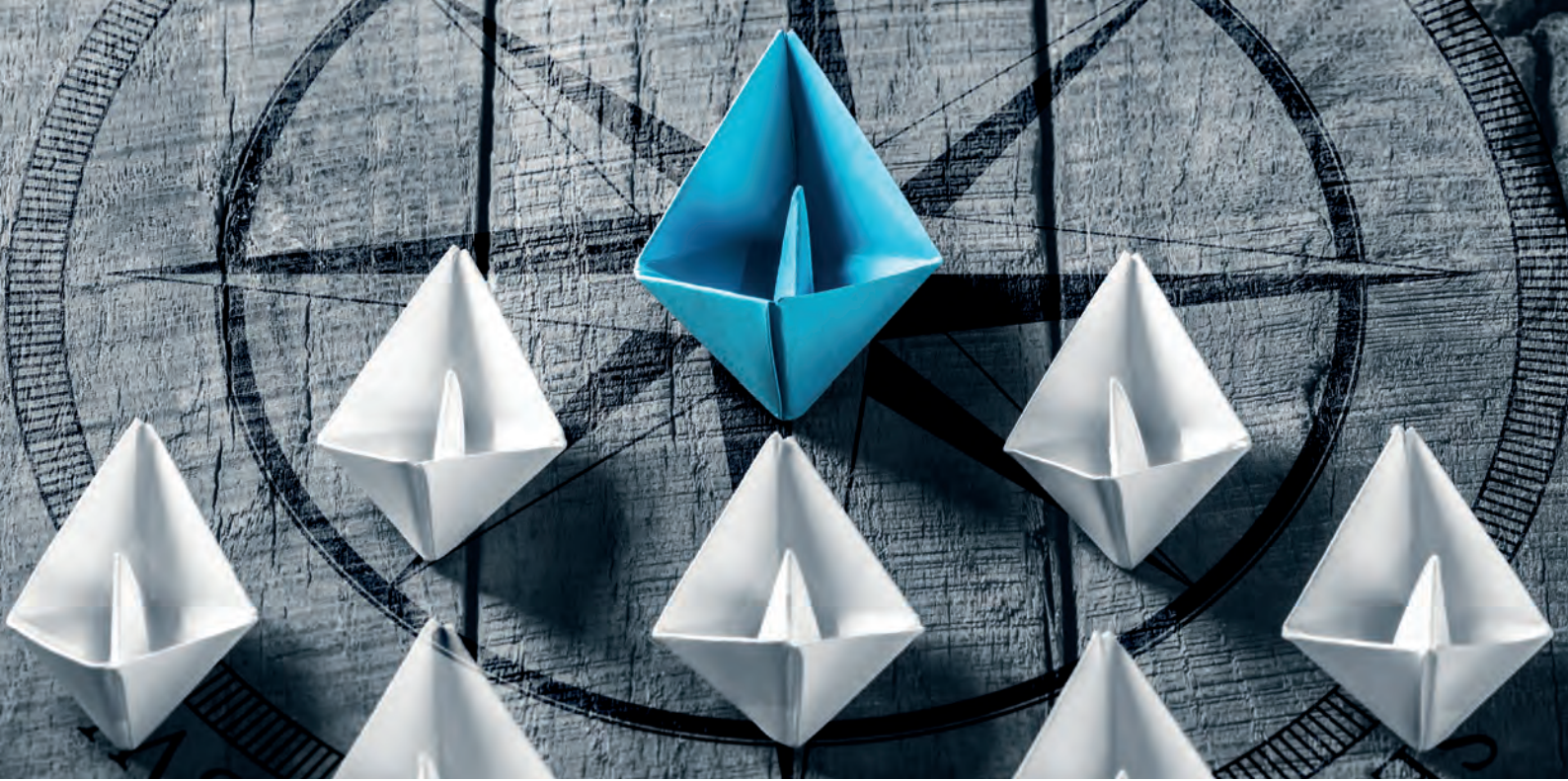
2. The economic policies that can work best, as Nouriel Roubini correctly noted a few days ago, are a monetary policy that contains the "big bazooka" of unlimited Quantitative easing, which the Federal Reserve and the European Central Bank have already announced. In short, the Fed and the Ecb have taken steps in just three weeks that after the crisis of 2008 took three years to implement. The other necessity in policy terms is to use fiscal policy to first provide unemployed workers with

what the economists call "helicopter money", or literally cash, that is given directly to workers and their families in order to survive during months in which economic activity is shut down. The other part of fiscal policy that will be needed are funds that can rescue entire industrial and service sectors that are suffering from the collapse of their incomes. Let's be clear: these are not fiscal stimulus policies; these are bailouts.

3. Some people think there will be a "V-shaped" economic recovery, meaning that after a very steep fall in the first half of 2020 there will be a very sharp recovery in the second semester. I do not believe this will happen in Europe, although it is possible in China, India and in the United States. In parts of the Eurozone, and especially in Italy, where even before the coronavirus crisis we were in stagnation, the best-case scenario is a "U-shaped curve" in which there is a gradual recovery. My fear for Italy is that unless

there is a massive amount of public spending, and that means at least 75 billions of euros, we could be facing an "L-curve", in which we see the Gdp go down very quickly and then bump along the bottom at zero growth, not for a few months, but for a year or two.

I am sorry to seem so pessimistic, but I believe in being direct, and my real message to all my friends in Italy is this: Stay safe. Stay at home. And brace for impact.



A Country in search of leadership

The presence of strong and stable leadership
able to make the **right decisions** at the **right time** is needed
now more than ever to face the current **dramatic landscape**.

by Rossano Salini

Like an unexpected and explosive storm, the global wave of Coronavirus has crashed over Italy with such fiery force that it has uprooted our daily lives and ripped apart our economic fabric. Italian companies as a result face a serious crisis, particularly a financial one, that has taken them back to the dark period of 2008, if not worse. In a situation in which citizens and companies have been swept away by such a sudden and forceful event, it is absolutely crucial to use all the necessary tools to take smart, swift, bold action and mitigate the effects of the crisis. Tools that for obvious reasons are in the hands of the States and supranational bodies. The presence of strong and stable leadership able to make the right decisions is needed now more than ever to face such a dramatic landscape.

Who pays the price?

I regret to say that such leadership in the frantic weeks of the outbreak was nowhere to be found.

Neither in Italy nor in Europe. The entities that should have stepped in to provide security and support instead proved wholly unable to stand up to the challenge and failed to take necessary action, particularly in support of the economy and enterprises. We saw no smart, swift or bold action. From the beginning, the seriousness of the situation was not understood; action was slow, with the authorities tailing behind the events instead of foreseeing them and missing the opportunity to learn from China's own experience. Essentially, nobody had the courage to take in due time any hard, albeit necessary, action for fear of being misunderstood. Instead, the situation was left to worsen to the point that the decisions eventually made could not be met with any objection. These are all mistakes that are made when consensus is valued over what is in the best interest of the people. Mistakes, it must be added, that were committed by political leaders across the whole of Europe, no one excluded – more notably by Europe's institutional bodies, specifically the Commission

and the European Central Bank. In this climate of uncertainty, second to the hospitals and the healthcare sector as a whole put under enormous pressure, the ones to pay the price have been companies, notably small and micro enterprises. In other words, those businesses that have no safety net, that day after day work hard to make ends meet and are burdened by mortgages, current expenses and taxes. These are the businesses that, faced with a situation in which the economy and employment are almost totally shut down, risk financial deadlock in a matter of a few weeks.

Lack of liquidity

Putting aside whose ever fault it was to have permitted the virus to spread so rampantly, the early decisions taken by the Italian government in support of the economy were a step in the right direction, especially from a fiscal point of view. However, an important piece of the puzzle is missing. It is an aspect that the Italian government needs to address, naturally in agreement with the European institutions: the problem of liquidity. The biggest struggle businesses, particularly small businesses, face with employment at a standstill is lack of liquidity and the inability to access any through credit institutions due to the restrictions imposed by the Basel Accord. Measures should be taken to temporarily lift these restrictions so that enterprises can not only defer payments and tax deadlines, but also have access to cash at favourable conditions as a sort of anchor of salvation to pull through this delicate phase.

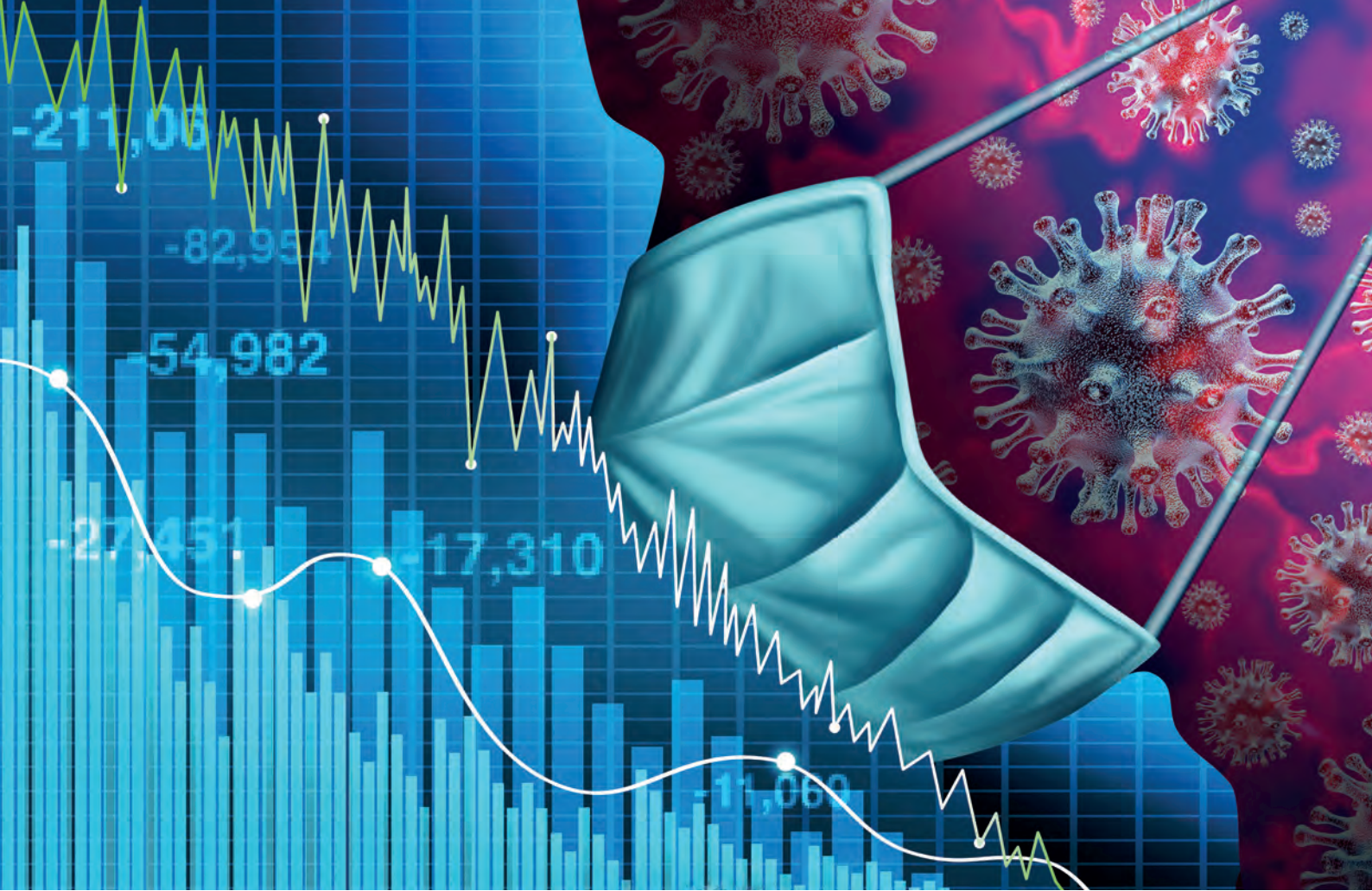
Europe's stance

In agreement with the EU institutions. Right, well... At this juncture it is worth taking a moment to point out the EU's rather lacklustre stance during recent weeks. In a time of need and at a point when Europe should have taken a strong and clear lead in encouraging solidarity among the States, the Commission instead went missing in action for entire weeks, offering a weak show of support at best only when the situation in Italy had become dramatic and unsustainable. It is not enough to have simply loosened the Stability Pact; that's the absolute least they could have done, one would be tempted to say. The point is that the Commission should have offered robust and vigorous support from the very start and taken concrete and timely action.

Not to mention the European Central Bank and the well-known recklessness of President **Christine Lagarde**, who with a single, inappropriate statement made the world's stock markets, and particularly the Italian stock market, experience a day of pure terror. This should make people think twice about the role of the Ecb. In the past, some criticized the action of the Ecb's then President **Mario Draghi**, stating that through Quantitative Easing he had overstretched the role of the body of which he was at the helm; what is certain is that he succeeded in his unequivocal goal to give breath to the economy. And one might also say that Ms Lagarde did nothing more than remind us that the purpose of the Ecb is not to reduce the spread, as ill-timed and tone deaf as her comments were. Now, if overextending the body brings about a positive effect (Draghi) and simply underscoring the scope of the body's function results in chaos (Lagarde), it's safe to say that one should ponder what exactly is the Ecb's role and make some serious changes. But the real problem is that we need people in charge who focus on the final outcome of the actions they put into place instead of getting hung up on formalisms.

A void in leadership

We find ourselves back to square one: the need for solid leadership. Like in a chain reaction, everything else depends on this. Whether at the command of a political entity or an economic institution, an essential feature of leadership is the ability to make decisions and even to imagine outside-of-the-box and risky decisions, if necessary. Feeble and babbling persons of government or rigid bureaucrats that think solely in terms of procedure and regulations are the real obstacles for our companies and the ability of these latter to catch a breath in complicated times like the ones we are currently facing. Economic problems and leadership problems go hand-in-hand and move within a general crisis that is holding Europe firmly in its grip. While we wait for meaningful action in support of our production sector, let us not forget that the central problem of adequately training and recruiting the ruling class (essentially an educational and cultural problem) is the bedrock on which everything is based. If we do forget, when the next crisis rolls around, be it a financial, health, geopolitical or migratory crisis, we will be back to square one. In other words, ill-equipped and weak. **E**



Economy in the time of Covid-19: no good news

What are the likely economic consequences of the **Coronavirus** on the world economy, on the economies of China and the United States, on the Eurozone, and on the Italian economy? And what kind of **recovery** might we see after the **crisis**?

by Alan Friedman

Warning: if you do not have a strong constitution, or cool head, you may not want to continue reading this article. This is because I am afraid that in the short term there is no good news or a positive scenario ahead of us; there is only bad news, a least-worst scenario, or terrible news, and a worse-case scenario.

The Chinese mistakes

Let us begin with China, which has shown the world both its early failings in downplaying the virus and its strength and discipline (as a dictatorship) in shutting down Wuhan and successfully flattening the coronavirus curve. At the start of this year China's Gdp was expected to grow by less than 6 percent in 2020, not a good

performance but not a disaster. Now analysts at **Goldman Sachs** say that China's Gdp may have fallen by 9% in the first quarter of the year, compared to the same period in 2019. China matters for the world economy because it represents around 18% of global income, and in a world of globalization and interdependent supply chains, China's temporary paralysis caused a domino effect around the planet.

India, which is also a key part of the global supply chain, also counts, and the decision by Prime Minister **Narendra Modi** to impose a 3-week national lockdown will also cause a sharp economic downturn for that nation of 1.3 billion people. The International Monetary Fund says it expects a global recession this year that will be at least as bad as the downturn during the financial crisis more than a decade ago, followed by a recovery in 2021. As of this week nearly 80 countries have asked the Imf for emergency financial aid, according to Managing Director **Kristalina Georgieva**.

An unprecedented decline in the United States

Then there is the United States, which scientists believe will soon become the new epicenter of the coronavirus, overtaking even Italy and the rest of Europe. When in January the Cia warned Trump of the grave dangers posed by Covid-19, Trump not only ignored the warnings; he spent the next two months calling it a Democratic hoax, or a plot, and he promised over and over again that it would soon disappear, magically.

Now that the ugly reality of coronavirus has spread across America, Trump continues to show that he is not only ignorant and dishonest, but he is threatening to reopen the US economy and force Americans to return to work even before the pandemic peaks. The President of the United States, sadly, is a malignant narcissist and his lies and propaganda will undoubtedly lead to many more deaths than would have been necessary.

As for the US economy, Goldman Sachs economists are forecasting an unprecedented 24% decline in second quarter Gdp, following a 6% decline in the first quarter, based on the U.S. economy's sudden and historic shutdown as

the country responds to the coronavirus pandemic. Even more pessimistic is **James Bullard**, the President of the **Federal Reserve Bank of St. Louis**. He has predicted the U.S. unemployment rate may hit 30% in the second quarter because of shutdowns to combat the coronavirus, with an unprecedented 50% drop in Gdp in the trimester. Bullard has called for a powerful fiscal response to replace the \$2.5 trillions in lost income during the quarter to ensure a strong eventual U.S. recovery, but so far, the Fed's big bazooka has been focused mainly on trying to avoid a systemic financial meltdown by introducing unlimited Quantitative easing. This is good, but it addresses the problem of liquidity and financial markets and not the collapse of industry and the real economy.

The reality in the United States, as in Italy or elsewhere, is that social distancing results in an economic shutdown. The smart leaders, who believe that public health is their top priority, are telling people to cease going to stores, to restaurants, to workplaces. We are insisting they stop supplying their labor, making their goods. To slow a pandemic, we are creating a recession, and perhaps a depression.

A deep recession in the Eurozone

As for Europe, we have seen the folly of **Boris Johnson's** original theory about "herd immunity", meaning allowing everybody to get sick and accepting many deaths. That has been replaced by more stringent steps, but too little and too late. In the Eurozone, meanwhile, we can expect a deep recession, and like elsewhere the depth of that recession depends on how long the contagion lasts, and how much money is deployed by governments to pay their workers to stay at home and to rescue entire industrial sectors. It is a good thing that the Growth and Stability Pact has been suspended, and it is positive that Europe has begun to learn about real solidarity, but again, it is too little to avoid substantial economic damage.

The brutal reality is that as long as the virus remains a life threat, our economies cannot recover and all we can do is increase fiscal spending to save workers and companies.

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The Italian care

This brings us to Italy, which has suffered more than any other European nation in both loss of life and economic damage. Although the Italian government was slow to take action, its nationwide lockdown and its original €25 billions measure do represent the correct steps.

The extension of lay-off, the delay of tax deadlines and the other measures are the right things to do, but they are not sufficient. I have argued for several weeks now that Italy should plan for a doubling or tripling of its original €25 billions allocation, and the government should plan for what economists term “helicopter money”, or the distribution of at least of one thousand euro checks, or more, to each worker who have a gross salary which is less than 40.000 euros a year. The cost of this is huge, €20 billions or more, but all of our traditional economic doctrines about the risks of increasing deficits and debts need to be trashed at this stage. The first task is to save lives; the second task is to save jobs and to save the industrial fabric of the nation. My belief is that Italy needs to ultimately spend more than €75 billions between now and the end of the summer, assuming the worst is over by the end of April, simply in order to stabilize the economy and lay the groundwork for an autumn recovery.

What kind of recovery for Italy?

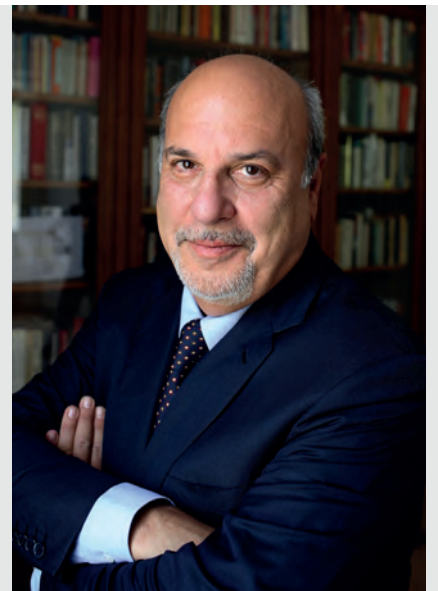
Finally, there is the question of what kind of recovery Italy is likely to see. Will it be what economists call a “V curve” in which there is a sharp recovery after a sharp drop in growth?

I think we are more likely to see a “U curve” with a very gradual and weak recovery, or even an “L curve” in which there is no substantial recovery, but we merely bounce along the bottom of the trough for many months, possibly for years. In truth, Italy is still living through a “U” or “L” curve because, a decade after the Great Recession triggered after the collapse of Lehman Brothers, Italy’s Gdp has still not recovered to its 2007 level, even before the coronavirus hit.

At the time of the start of this crisis in February 2020, the Italian economy was in stagnation, with zero growth. There should be some recovery by the autumn of 2020, but it will not be enough to even return Italy to zero growth this year, and with the collapse of stock market values and the rise in unemployment that will result from the current crisis, we are unlikely to see a substantial growth of either corporate investment or consumer demand any time soon. The best-case scenario is a return to zero growth by 2021. The worst case is more than one year of losses and structural damage to the Italian economy. Sadly, there is no better news on the horizon. I hope and pray that I am wrong. **E**

Who is Alan Friedman

Alan Friedman is a journalist, writer, television host and economist. Correspondent for the *International Herald Tribune*, global economy columnist for the *Wall Street Journal*, he worked for the *Financial Times* in London from 1979 to 1993: in this period he was awarded with the *British Press Award* four times. He also had a professional experience as Presidential Management Intern in the administration of President Jimmy Carter. He conceived and hosted several Rai Tv shows, cooperated to the creation of Rainews24 and in 2003 he worked with Robert Murdoch to the kickoff of Sky TG24. The scoop regarding the Iraqgate scandal in 1991, which involved the Cia and the Italian Banca Nazionale del Lavoro, was one of his most famous. The book “*Questa non è l'Italia*”, published by Newton Compton, is his ninth best-seller.





It could have been worse!

After five years of continuous and constant growth,
the **Assodel** market ends 2019 **down by 5%**.
A market saved in part by the positive ripple effect of 2018.

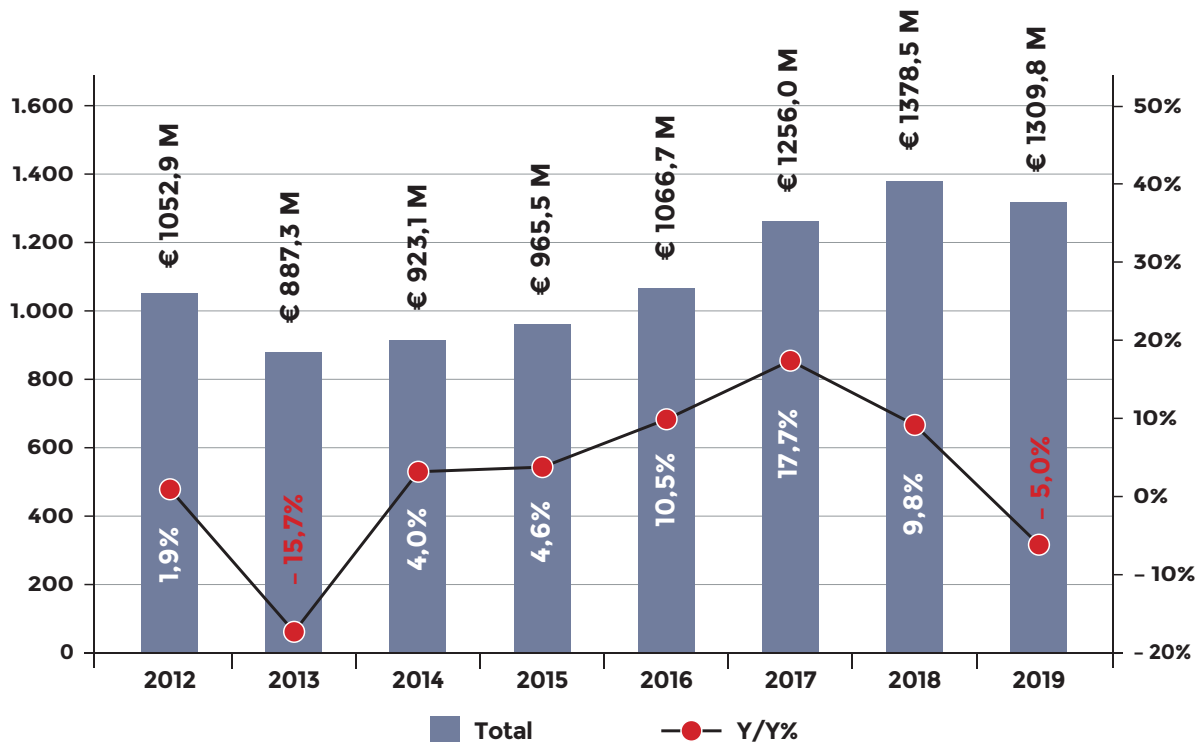
by Federico Cellini

Let's face it. We all knew that sooner or later it would happen. Since 2014, Assodel's electronic distribution market has shown constant and significant year-on-year growth: +4% (2014 vs 2013), +5% (2015 vs 2014), +11% (2016 vs 2015), +18% (2017 vs 2016) and most recently +10% (2018 vs 2017).

We all knew that sooner or later it would happen. And it did! 2019 compared against 2020: -5%! And it could have been worse! As logic dictates, figures can be reported and they can be read, but they must be interpreted. Comparison of Ytd vs full Ytd January-December: -5%. If we restrict the period and compare April to December of

PRODUCT	4Q18	1Q19	2Q19	3Q19	4Q19	Q/Q-1	Q/QY-1	Ytd
SCs	201,8	238,2	224,0	192,1	185,1	-3,7%	-8,3%	-6,0%
IP&Es	83,2	112,2	103,0	82,6	80,5	-2,6%	-3,3%	-5,7%
Systems	20,3	23,3	25,0	22,5	21,4	-4,8%	+5,6%	+9,1%
TOTAL	305,3	373,7	352,0	297,2	286,9	-3,5%	-6,0%	-5,0%
Ytd	1.378,5	373,7	725,7	1.022,9	1.309,8			

Quarterly trends of distribution sales in the Italian market
(revenue in million euro, source Assodel)



Annual trend of distribution sales in the Italian market
(revenue in million euro, source Assodel)

2018 over the same period 2019: -9% and it doesn't stop there. July-December of the same years: -10% and the third quarter reporting a whopping "minus fourteen percent!!!" The last quarter higher only than 4Q of 2016 but virtually negative if compared to the same quarter of 2017 and 2018. Bottom line: "Thank heavens" for the first quarter of 2019 when orders, still benefiting from the effects of the aforementioned positive five-year period, came to a satisfactory +4%. Over time, this result has significantly contributed to a glass-market half full rather than half empty mindset. With a 0.93 book-to-bill (ratio of orders received to amount billed for a specified period) constantly negative for 12 months, who could have expected such a satisfactory 2019?

Semiconductors down by 6%, power sees grow

In the semiconductor sector the annual loss came to -6%, equal to €52 million. A negative setback after six years of

continuous growth. The only products reporting a positive result were discretes, up +2.5%. In contrast to the net losses suffered by semiconductors, power components grew by almost 9% in 2019, thereby confirming a decidedly upward trend. Power components have long been outperforming semiconductors: in 2019, the total semiconductor market reported +44% over 2012 while the power sector grew by an incredible 79%.

IP&Es drop by 5.7% while systems hold steady

According to data, IP&E components suffered a -5.7% loss. More specifically, the worst in class have been resistances and other passive components with double-digit losses; electromechanicals reported -6% and connectors -2%. Capacitors suffered less: +0.5%. Systems have instead held steady, reporting a year-over-year growth of 9.1% with main product families such as displays showing double-digit growth. E



It was all expected

Dmass reports -16% in semiconductor revenue in Q4/2019.

The year ends with moderate decline of -4.4%. Lack of demand occurs across most countries and product areas. President **George Steinberger**:
« No one counted with the virus as a new disruption to the market »

by Laura Reggiani

The lack of demand that was visible during the second half of 2019 materialised in Q4 with a steep decline of semiconductor revenues in European Distribution. According to Dmass, sales in the European Semiconductor Distribution Market fell by 16% to 1.95 Billion Euro. 2019 ended with a relatively moderate decline of 4.4% and 8.88 Billion Euro.

Georg Steinberger, chairman of Dmass: "The level of slowdown in Q4 is just a reaction to the low bookings in the previous quarters. And without Dtam to Tam conversion happening during 2019 (suppliers taking distribution business direct) the distribution market would have been flat, which is positive, considering that the overall components market (Oem and Con-

tract Manufacturers) suffered more. With major macro-economic effects hopefully going away in Q1/2020, we could have expected a return to growth soon enough, a hope that the corona virus outbreak in China now renders unachievable. The importance of China for the global electronics supply chain is critical and ramifications are nearly unavoidable."

Nothing changed

At country and region level, the downturn basically crossed all borders, except a few smaller countries in Eastern Europe. Of the major countries, only UK declined less than 10% in Q4. Through the year, the situation was more balanced. On an annual basis, Germany

declined 6.9% to 2.57 Billion Euro, Italy by 9.3% to 747 Million Euro, the UK (without Ireland) grew by 0.7% to 612 Million Euro, France went down 7.2% to 591 Million Euro, the Nordic Countries declined 2.7% to 795 Million Euro and Eastern Europe grew 1.75% to 1.54 Billion Euro.

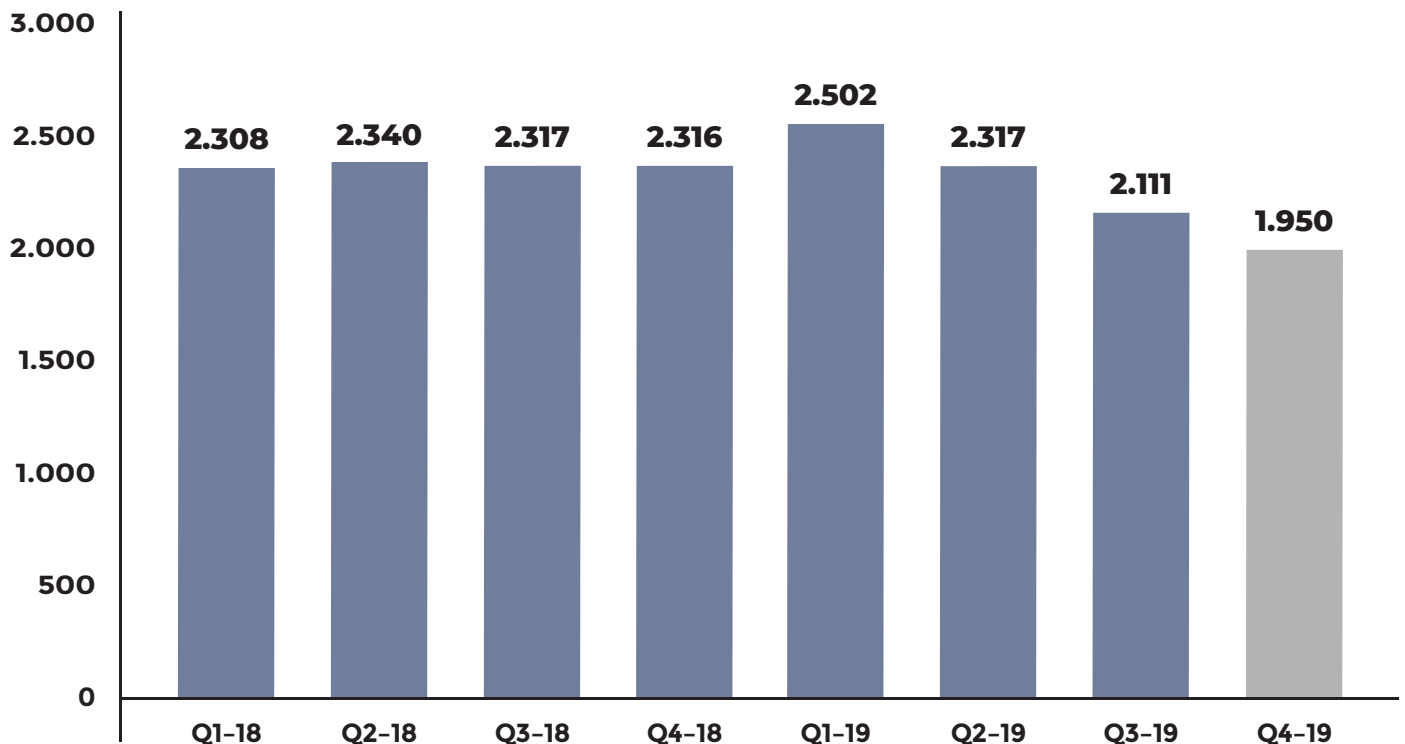
Georg Steinberger: *“Within the context of the whole 2019 decline, no material trend changed: Eastern Europe continues its momentum as contract manufacturing base, the North, Central and South remain in waiting position. And as stated before, the UK seems to be unfazed by Brexit.”*

Power and Logics do better

Product-wise, in the fourth quarter the downturn affected all product groups with more or less force, not surprising as the lack of demand grazed all industry segments likewise and distribution is involved everywhere, with the entire portfolio. On an annual basis, Discretes shrank by 9.3% to 490 Million Euro, Power by a rather moderate 0.4% to 993 Million Euro,

Opto by 5.5% to 802 Million Euro, Analog (in line with the total decline) by 4.2% to 2.6 Billion Euro, Memories by 3.8% to 803 Million Euro, Mos Micro by 7% to 1.75 Billion Euro and Programmable Logic by 6.6% to 577 Million Euro. The only major Product group that grew was Other Logic (Assp, Asic etc.) by 9% to 511 Million Euro. Georg Steinberger: *“On the product side, the notable exceptions to the slump were Power and Other Logic, both in heavy need of technical support and engineering, which tells that distribution is better by far in complex demand creation areas than commonly believed. We also see that the once equally sized markets of Analog and Mos Micro products have a different trajectory in terms of technical and price development. Very often the Analog Bom of an application is more costly than the Microcontrollers and Logics.”*

As for 2020, Steinberger concludes: *“No one counted with the virus as a new disruption to the market, however we have to see what supply chain effect it has on this quarter and the next one. The opportunities for innovation and therefore components business are still positive”.* 



European Semiconductor Distribution Market Trend

(sales in million euro, source Dmass)



When stock and logistics make the difference

Dynamics, trends and forecasts relating to a specialist sector like **IP&E** distribution, as seen by leading global distribution group **TTI** and explained by **Stefano Piccolo**, Sales Director South Europe.

by Laura Reggiani

Started as a distributor of passive components, connectors and electromechanics in 1971 in Fort Worth, Texas, TTI is now (since 2007), together with subsidiaries Mouser, Sager and the newly constituted TSG, a part of the big family of companies of Berkshire Hathaway group owned by Warren Buffet.

As Paul Andrews, founder of the company and still firmly at its command, is wont to say, TTI's success is "doing what you say you're going to do and providing exceptional service". A simple strategy that continues to fuel the company's organic growth year-after-year across all markets, especially Europe, where the company began operations in 1992. With Andrews' leadership, the goal of TTI remains true

to its founding: "Be the best, rather than the biggest distributor of IP&E components". This goal is achieved by hardworking and people who are committed to the philosophy of TTI's mission. Among them is Stefano Piccolo, at TTI since 2000 when, along with four others, he founded TTI Italia. Now he is General Manager of TTI Italia and Sales Director for South Europe.

It would be remiss of us not to start this conversation talking about the Coronavirus and its repercussions on the economy. How do you see the situation?

At this time it is difficult to make any predictions on possible future repercussions since we are still in

full emergency. We will be able to assess the damage only in a few months' time. As to the situation of electronic components in the short term, I can say that the lead times for many components have once again become critical. Not as bad as in 2018, but certainly longer. The situation depends on the single supplier and the place of production, but generally China is still having difficulties in terms of logistics, the movement of workers and staggered shifts in factories and this is slowing down production and delivery times. In some cases, the lead time for certain product families has stretched to 50 weeks. In other instances, things are more normal so that there have been delays only in already scheduled deliveries. In yet others, like for example Yageo, which has reported that delivery times have increased by 9 weeks, this as the result of a trend that was emerging already in 2019 before the Coronavirus and of production capacity issues linked to the re-start of certain productions. Essentially, I feel like the Coronavirus has simply exacerbated an already difficult market situation.

Can you give us an assessment of the last year? What were year-end figures for 2019 at corporate level for TTI? Which were the best-performing areas?

In 2019 TTI's global sales exceeded \$3 billion. Both in terms of percentages and absolute values, Europe is the area in which TTI saw the biggest growth, followed by North America and Asia, which performed the worst compared to the previous year. Growth has been modest, limited for Europe to single digits. However, it must be noted that this is compared against 2018, one of the craziest years in memory due to the allocations that led to unnatural growth. The fact that we not only maintained but even improved results makes us particularly proud as it shows our ability to grow in a market that, overall, in the best cases has remained stable.

Are there important differences between selling IP&E and selling semiconductors?

Yes, of course. Particularly in terms of the kind of problems that need to be dealt with. In the world of IP&E, stock and logistics make the difference. Regarding passive components, we are speaking in terms of huge volumes and countless transactions. Given that the average price of these types of components is very low, with sales being equal to those of semiconductors, we have to move huge volumes, both in

terms of space and number of transactions. Having components of various values, tolerances and sizes in stock and provided by at least three different suppliers means that we have tens of thousands of codes to manage, sell and send. For this reason it is important to have super-efficient logistics and a warehouse that can handle a huge number of order lines, considering that on average in one year we send out more than 250,000 order lines, in Italy alone.

Initially your offering only included IP&E. Today it has expanded to include power supply units, op-tos and sensors. Has your initial focus been lost to a certain extent?

The evolution of TTI in this sense is fruit of the evolution of our suppliers and their acquisitions. If Tyco, one of our most important suppliers, decides to enter the world of sensors, it makes sense that we would also sell sensors. If Vishay, another long-standing supplier of ours, earns more than 50% of its sales from "non passive" products, then we will also go in the direction of that type of product. So it's not



Stefano Piccolo is General Manager of TTI Italia and Sales Director for South Europe

Weidmüller

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a business decision per se, but simply our wish to follow along the same road as our suppliers, bringing on board specialists in those sectors and products so that we can maintain strategic relevance for them. In most cases, such as in the case of discretes, these products are very similar to passives in terms of problems, volumes and average sales price. And again, stock and logistics make the difference.

Buyers have many procurement tools available to them today. What services do you offer to manage the supply chain?

In a global economy with growing complexities and shorter and shorter cycles, our goal is to have the supply chain operate at its best and adapt it to any changes that may emerge so that we can achieve and maintain excellence. We strive to offer buyers solutions that allow them to optimize long-term plans and allocate orders to stock. We support all the main transactions of the supply chain to enable automated data exchange and facilitate the management of thousands of low-value stock items, eliminating transactions that do not have added value and improving the accuracy of data processing. In this way we offer a wide range of tools, from traditional to more sophisticated, and are able to adapt them to the needs of the client.

What results has TTI achieved in South Europe? What are the forecasts for 2020? What final application sectors and product areas are you focusing on for future growth?

For South Europe, which for TTI comprises Italy, Spain, Portugal, Greece and Turkey, our budget for 2020 foresees 7% growth over 2019.

We expect the best performance from Spain, where we have been present for fewer years and have

more market shares to gain. As far as end markets, we are seeing a lot of activity in the vehicle electrification sector, which after years of stagnation is finally moving and becoming a reality also in Italy. This field, which includes industrial and commercial electrical vehicles and recharging infrastructures, is very important for TTI as far as numbers and values and requires increasingly innovative and high-value components that will give us good percentage growth.

Other vertical segments we are focusing on for future growth in Italy are transport, military and industrial.

At product level, we are seeing in power supply an interesting area in which we think we can play a key role. This sector is relatively new for us but is yielding good results.

You have been at TTI since 2000. How has the distribution market changed in these last 20 years? How do you expect it to change in the coming years?

It has changed dramatically over the past 20 years, shifting from a local market to a global one.

When we began operations in Italy in 2000 we had a difficult time because we were the only distributor that worked out of a centralized warehouse. At the time, not having a local warehouse in Italy like the other distributors was our Achilles' heel.

Today, the situation has completely overturned.

Nobody has warehouses in Italy and our global logistics has become one of our greatest strengths.

As for the future, I am certain that many changes in terms of market dynamics lie ahead and that digitalization will play an important role even in the future of distribution, changing the way distributors operate and how components are sold. E

Who is Stefano Piccolo

Stefano Piccolo is born in Milan in 1975. He starts his career in electronics in 1997, working for **BI Technology**, a supplier of state-of-the-art passive components, which is now part of **TT Electronics Group**. In 2000 he joins the team who later will found **TTI Italy**. From 2001 to 2003 he is Product Manager for Passive Components, then in 2003, when he's only 28 years old, he is appointed General Manager of TTI Italy. In 2018 he becomes Sales Director South Europe and in this role he manages the business development activities for the region.





Endless opportunities

Automotive and industrial, as well as power supply and digital security are the fields of application that will enable Infineon to continue its strong growth and success.

We spoke with the company's top management in Italy.

by Laura Reggiani

With over €8 billion in revenue, more than 41,000 employees worldwide, of which over 18,000 in Europe, a leading position in the automotive and industrial, power supply and digital security industries make the German Infineon one of the world's leading semiconductor companies.

In Italy, the company is well-positioned with an organization that employs more than 200, operating between the headquarters in Milan and two research centres in Padua and Pavia, and headed by **Alessandro Matera**, Managing Director and Cfo, flanked by **Roberto Legnani** for sales in Italy and **Giuseppe Finazzi** for distribution.

Winning elements and strategies

The company ended 2019 with a reduction in worldwide sales limited to 3% and has confirmed the outlook for 2020 of revenues up by 5%. Alessandro Matera explains how these results were achieved and how the company has outperformed many of its competitors: *"There are several reasons why we performed better than the market average. Un-*

doubtedly we have benefited from a two-pronged approach: a well-diversified business, which over the decades has been refined and targeted to the most promising and less volatile markets, and a focus that for many years has shifted from product to application, thereby putting us in the position to have strong relationships with key clients who drive innovation and develop winning solutions for the future. With our automotive clients for example we provide support with strong system expertise and are able to maintain an excellent relationship."

Legnani confirms this approach: *"In unsuspecting times we aimed our corporate strategy at key applications like mobility, security, energy savings and changed our offer from components to solutions. We also better positioned ourselves in sectors that experienced significant growth and so for 2020 our growth forecasts for these markets are interesting."* The particular market situation must also be considered: *"For all of 2018 the market was characterized by strong demand, shortages of certain products and a consequent price rise. Our production strategies however enabled us to continue to serve our clients even against this backdrop,"* points out

Finazzi. *“Fortunately, clients, including distribution ones, trusted us and rewarded us for the services we offered in 2018 by continuing to order into 2019 and allowing us to achieve good results.”* For 2020, Matera confirms the outlook forecasted: *“Our long-term goal is to reach a 9% average cycle growth, while 5% growth for 2020 is a figure obtained from carefully-reviewed forecasts that will surely be reached”.*

A leadership position

Infineon is a worldwide leader in the automotive, industrial, power supply and digital security markets. With more than 40 years' experience in semiconductors for the automotive market, the company has become a point of reference within the sector and has positioned itself as the leader in power semiconductors. Infineon offers solutions to ease the transition toward vehicle electrification, sensors and microcontrollers with a view towards developing cutting-edge solutions for assisted driving and ultimately autonomous driving. The company is also an undisputed leader in power control, a position that has enabled it to turn its attention to power generation applications like recharging infrastructures for electrical vehicles as well as to the home appliance sector and claim its leadership in semiconductors and power modules based on IGBT. *“The fact of having privileged relationships with the main players, of being accustomed to working with a system concept, of having a wide range of highly reliable solutions, but especially of having expertise in highly critical areas like computing and electrification have led us to be viewed by major players in the automotive sector as an increasingly strategic partner,”* explains Legnani. The same is true with regard to digital security solutions applied to a variety of areas, from payment systems to credit cards, from electronic passports to gate opening systems, to applications for Industry 4.0. *“It is an area that we have well covered and is of interest even for Italy where we have won important design awards even for industrial applications”.*

The role of distribution

As Finazzi explains, Infineon entrusts its distribution to global players like Arrow, Avnet and Rutronik as well as to local partners such as Comelec. *“Distribution in Italy accounts for more than two-thirds of*

revenue, so an important figure that is even higher than the global figure and reflects the logic of the Italian market. Our strategies entail fostering cooperation-based relationships for both projects and services. Infineon has always had a more solid relationship with distribution than its competitors, thanks to the technical, marketing and systemic support it provides. Our distributors undergo training programmes that keep them constantly abreast of our products and solutions to give them the best tools to apply to demand creation activities”.

A strategic acquisition

Last June, Infineon concluded the acquisition of **Cypress** for €9 billion, which CEO Reinhard Ploss defined as a *“milestone in the development of Infineon's strategy”*. The transaction is expected to yield Infineon €180 million at cost level in synergies and more than €1.5 billion in revenue and marks an important step in Infineon's development strategy to strengthen and accelerate growth, putting the company in prime position to offer up a wider range of applications. *“The acquisition of Cypress, for which we are awaiting final approval from China after having just had it from the US, undoubtedly represents an important transaction that has very ambitious, long-term goals,”* says Matera. *“It was the piece that*



Alessandro Matera is Managing Director and Chief Financial Officer at Infineon Italy



EV & PHEV

3C95

Flat loss 25 to 100°C

3C97

Flat loss 60-140°C

3E65

High Bs 480/320 for bus bar choke
and high Tc @ 165°C

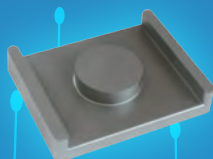
3E10

μ i 10k $\pm$ 20% for all size toroids

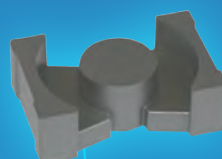
4S2

Efficient EMI suppression 30-1000 MHz

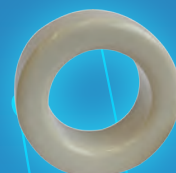
SIRI
ELETTRONICA



Planar ER core



PQ core



Coated Toroid



Roberto Legnani
is Senior Director
Sales at Infineon
Italy

was missing from our solution offering and is a strategic medium- to long-term investment. Acquisitions at Infineon are valued on the basis of four synergistic aspects: business, market and range of products,

finance and corporate culture. Cypress aligned perfectly with all four. At market level, there has never been such a complementary integration as this one: Cypress' product spectrum meshes perfectly with ours and supplements it with short-range connectivity solutions and micro offerings for less complex applications. Furthermore, Cypress is also in line with our application-focused strategy thanks to a sophisticated ecosystem of software development that will enable us not only to support clients with a range of solutions that includes software but also to make inroads into the Internet of Things market".

Continuous investments in R&D

Infineon is among the few electronics companies that have maintained a strong presence in Italy, employing over 200 people and continuing to invest in R&D activities domestically through its two research centres in Padua and Pavia. "The centre in Padua, slated to celebrate 20 years of operation next year, and the one in Pavia, a result of the acquisition of International Rectifier, benefit from the availability of qualified resources thanks to the vicinity of local universities, a good quality of life and the ability to develop production know-how. The centre in Padua focuses on automotive applications and key elements such as functional safety, develops voltage regulators and carries out microcontroller memory validation. The centre in Pavia performs industrial activity, including motor control for various types of appliances." Last May, Infineon also concluded an important 5-year collaboration agreement with Politecnico University of Milan for a joint research centre intended to provide investment in research staff and

Giuseppe Finazzi
is Regional Sales
Distribution
South West



create a state-of-the-art laboratory to develop know-how and innovative design of high-performance analogue circuits, mixed-signal and integrated circuits in the millimeter-wave frequency. Applications will range from mobility to communications, improving energy efficiency, costs and performance.

The past and the future

Since Infineon became autonomous from Siemens in 1999, a lot has changed: "In the past 20 years we have not only grown from 30 to 200 employees, but we have also evolved in terms of our entrepreneurial attitude and changed our approach towards clients and the market. All the while, we have never lost the ability, stemming from the DNA of Siemens, to build solid relationships with key players with which we define the products that will one day become standard on the market. The winning elements of our growth, including on the Italian market, are surely flexibility, creativity and our ability to adapt to processes defined by the corporate," explains Matera. "But the biggest change has been our market. We have completely lost the telecommunications sector – the seven productive poles that Italtel once had in Italy comes to mind, for example – and a few players in the automotive sector. We mainly have medium-small clients, which are also those that require greater expertise and technical support." As for the future, Matera keeps a positive outlook despite the challenges at hand: "Today we are dealing with the great unknown of the Coronavirus, which hopefully will not lead to a crisis like the one in 2009. Our outlook is positive and while some markets are experiencing a moment of stagnation, we are hopeful in the restart of applications related to electric mobility and in the pervasiveness of electronics in new areas, like the Internet of Things, a world that opens up multiple possible fields of application".

E



Rimac's Hypercar goes with Analog Devices

Rimac Automobili chooses **Analog Devices** to enable precision **Battery Management** in high performance Electric Vehicles.

by Cleopatra Gatti

Analog Devices announced that Rimac Automobili is planning to incorporate Adi's precision battery management system integrated circuits into Rimac's Bms. Adi's technology provides Rimac's Bms with the ability to extract maximum energy and capacity out of its batteries by calculating reliable State of Charge and other battery parameters at any given time.

"Rimac is a technology powerhouse in the field of high-performance electric vehicles," said Rimac Ceo Mate Rimac.

"We develop and manufacture key electrification systems for many global automotive companies and raise the bar for performance electric vehicles with our own hypercars. Our application of Bms is among the most demanding in the world, requiring the highest accuracy, massive current and voltage draws over very short time scales,

« HIGH PERFORMANCE **ELECTRIC VEHICLES** REQUIRE **HIGH PRECISION ELECTRONICS**. PRECISION ACCURACY DIRECTLY TRANSLATES TO MAXIMIZING BATTERY CAPACITY AND RANGE WITH FAST CHARGING TIME. WE ARE PLEASED TO SUPPORT **RIMAC** WITH OUR PRECISION BATTERY MANAGEMENT ICs FOR ITS LEADING-EDGE ELECTRIC VEHICLE SYSTEMS WITH THE GOAL OF ACHIEVING SOME OF THE BEST PERFORMANCE IN THE WORLD. »

PATRICK MORGAN, VICE PRESIDENT AUTOMOTIVE ELECTRIFICATION AND INFOTAINMENT, ANALOG DEVICES

and rapid dynamic adjustment within the battery management control system. We have decided to adopt the Analog Devices portfolio of battery management ICs across our complete product line of battery management systems. Adi's ICs are an integral part of our in-house developed BMS that we are using in our own vehicles, but also for many global car brands. We have benchmarked these ICs in the market and selected Analog Devices for superior precision measurement accuracy and product robustness over the lifetime of the vehicle. We look forward to working with Analog Devices in the future to achieve high performance Bms in our vehicles and battery packs”.

Rimac C_Two: designed for high performance outputs

The **Rimac C_Two** is a fully electric hypercar capable of speeds of up to 258 miles per hour. With 1,914 horsepower under the hood, the C_Two accelerates 0-60 mph in 1.85 seconds and 0-186 mph in 11.8 seconds. To support these high-performance outputs, the Rimac team designs and engineers superior underlying technologies, such as electric drivetrain and battery packs. Bms technology acts as the “brains” behind battery packs by managing the output, charging and discharging as well as providing precision measurements during vehicle operation. A Bms also provides vital safeguards to protect the battery from damage. A battery pack consists of groups of individual battery cells that work seamlessly together to deliver maximum power output to the car. If the cells go out of balance, the cells can get stressed leading to premature charge termination and a reduction in the battery's overall lifetime. Adi's battery management ICs deliver the highly accurate measurements, resulting in safer vehicle operation and maximizing vehicle range per charge. 

RIMAC'S ELECTRIC CHALLENGE

Rimac Automobili was founded in 2009 by **Mate Rimac** (then 21 y/o), converting his first Guinness-World-Record breaking electric car in a garage.

Today, Rimac develops and manufactures key electrification systems for many global automotive companies, and at the same time, raises the bar for performance EVs with their own electric hypercars.

This technology powerhouse with headquarters on the outskirts of Zagreb, Croatia, employs around 600 people, with plans for strong future growth. The company is vertically integrated with many of the components produced in-house. The next challenge is to grow from a low volume manufacturer of complex high-end electrification components, to an established Tier-1 supplier for the industry.

Rimac plans to open new high-volume production lines for battery packs, powertrain systems and the C_Two hypercar for production starting in 2020 at new facilities currently being established.





Cuffless blood-pressure measurement solution

New **Maxim Integrated** reference design enables convenient **optical blood-pressure monitoring** without requiring bulky, expensive mechanical cuffs.

di Cleopatra Gatti

Until now, accurate blood-pressure monitoring could only be achieved with bulky and mechanical cuff-based medical devices.

Now, **Maxim Integrated Products** has introduced a solid-state blood-pressure monitoring solution to more conveniently track this critical health indicator. Design engineers can develop blood-pressure trending solutions with

the **MAXREFDES220#** reference design from Maxim. Comprised of a complete integrated optical sensor module, a microcontroller sensor hub and a sensing algorithm, the **MAXREFDES220#** optical blood-pressure trending solution can be embedded into smartphones or wearables. It enables users to place their finger on a device for 30-45 seconds while resting to measure blood pressure anywhere and anytime.

« **BLOOD PRESSURE** IS A KEY VITAL SIGN, BUT HAS TRADITIONALLY BEEN DIFFICULT TO MONITOR **CONVENIENTLY** AND **ACCURATELY**. MAXIM NOW PROVIDES A COMBINATION OF PRODUCTS IN A COMPACT REFERENCE DESIGN WHICH ALLOWS SYSTEM DESIGNERS TO BUILD HIGHLY ACCURATE - AND BASED ON OUR PATIENT TESTING, THE MOST ACCURATE - **BLOOD-PRESSURE MONITORS** THAT DO NOT REQUIRE CUFFS. »

KRIS ARDIS, EXECUTIVE DIRECTOR MICRO, SECURITY AND SOFTWARE BUSINESS UNIT, MAXIM INTEGRATED

Components included

The reference design includes the MAX30101 or MAX30102 high-sensitivity optical sensor, as well as the MAX32664D sensor hub IC with built-in algorithms.

The MAX30101 (using three LEDs) and MAX30102 (using two LEDs) pulse-oximeter and heart-rate optical sensor modules combine photodetectors, LEDs and analog front-end (Afe) electronics with an integrated cover glass. This integrated optical design and lenses-on-top approach enables optimal signal-to-noise ratio (Snr) for a small, lower cost and power-efficient module. It comes in a tiny 5.6 x 3.3mm 14-pin optical package with an I2C interface to the sensor hub IC.

The MAX32664D sensor hub IC includes firmware which controls the sensor and executes the algorithms which measure cuffless blood pressure, heart rate and blood-oxygen levels.

Its ultra-small size (1.6 x 1.6mm) can easily fit into small devices to seamlessly and effortlessly connect to a device's host microcontroller.

Class-II limits Industry-best accuracy

The MAXREFDES220# provides industry-best accuracy that meets Class-II regulatory limits.

For example, under resting-only measurement conditions, the solution provides the following accuracies:

- Systolic Error: Mean = 1.7mmHg, Std Dev = 7.4mmHg
- Diastolic Error: Mean = 0.1mmHg, Std Dev = 7.6mmHg

For reference, Class-II regulatory limits are $|Mean\ Error| \leq 5\ mmHg$, and $Std\ Dev \leq 8\ mmHg$

This solution requires calibration every four weeks to maintain above accuracies. This is based on independent testing and a limited number of subjects at resting condition. 

MAXIM'S SOLUTION KEY ADVANTAGES

| Best blood-pressure measurement accuracy without a cuff

The ready-to-use reference solution measures trending blood pressure without a cuff and meets Class-II regulatory limits.

| Ease of design

Highly integrated optical modules and ready-to-use algorithms in the sensor hub IC, together with complete optical system design

guidance, enable customers to easily embed the finger-based blood-pressure solution into their devices.

| Faster time-to-market

Algorithm code runs on a small, ultra-low-power dedicated sensor hub microcontroller, eliminating the need to integrate new code into an existing application processor

LIGHTING DIVISION



MANUFACTURING

Mems sensors are “made in Finland”

Murata expands its Mems sensor manufacturing by building a new factory in **Vantaa** to increase the sensor production capacity.

MURATA IS SIGNIFICANTLY INCREASING GLOBAL PRODUCTION CAPACITY, INCLUDING MOST RECENTLY ITS FACTORY LOCATED IN FINLAND.

After having recently purchased the previously leased buildings, the company will construct a new building of approximately 16,000 square meters. The total value of the investment is five billion yen and is underpinned by the growing worldwide demand for Mems sensors used in the automotive industry and various health and industrial applications.

“The market for advanced driver-assistance systems, self-directed cars, healthcare, and other emerging technologies are expected to be significant growth drivers. Mems sensors are critical solutions for these applications and deliver proven measurement accuracy and stability in a variety of conditions”, said **Yuichiro Hayata**, Managing Director for **Murata Electronics Oy**.

“With the construction of this new production building, we will significantly increase our Mems



sensors production capacity. Moreover, by responding to the strong demand of gyro sensors, accelerometers, and combo sensors in the automotive, industry and healthcare fields, this will strengthen our business base in the automotive market, industrial equipment and medical devices market, while contributing to the economy and employment of Finland,” stated **Makoto Kawashima**, Director of Sensor Product Division in Murata Manufacturing.

With the factory expansion in Finland, Murata will strengthen both R&D and manufacturing operations with a long-term perspective for increasing utilization of this facility.

The company currently employs 1,000 people in Finland and estimates to create 150-200 new jobs in 2018-2019.

AWARDS

Avnet Abacus receives special distribution award from Vishay

Avnet Abacus has been honoured with a special distribution award from Vishay. The award recognises Avnet Abacus as Vishay’s “Fastest Growing Passive Distributor from 2016 to 2018”. Avnet Abacus recorded a progression in sales of Vishay passive components across a three-year period. This level of success has been due to the combination of technical expertise and understanding of the latest passive technologies, in conjunction with its excellent supply-chain and logistics support for customers. In addition, it has created new business development opportunities for Vishay components with successful projects in various market segments.





The Specialist in Electronic Component Distribution



With more than 20 billion components in stock, there's a good chance TTI has **exactly what you need!**

Global Distribution Centres
120,000m²

of automated warehousing
in North America, Europe
and Asia

European HQ, Munich
35,000m²

of dedicated
warehouse space

sales@de.ttiinc.com

INTERNET OF THINGS

Microchip and Arrow: collaboration on Edge IoT Security

MICROCHIP AND ARROW ANNOUNCED AN ENGINEERING SERVICES COLLABORATION TO SIMPLIFY CONNECTIVITY AND SECURITY ACROSS INDUSTRIAL, SMART BUILDING AND ENERGY MARKETS. According to Nist, cybersecurity and privacy risks for IoT devices can be conceived in terms of three high-level risk mitigation goals, including protecting: device security, data security, and individuals' privacy. **Arrow** will augment **Microchip**'s smart, connected, secure portfolio with engineering services so that Oem can decrease their time to market and meet requirements in recent government legislation and Nist IoT security guidelines. Microchip's range of secure product features span secure root of trust, secured communication, crypto authentication, certificate management, cloud provisioning, data security, encryption services, secure boot and IP protection.



Comments

"Technology, pervasively, is embedded in everything. Every industry and every system are being fundamentally shaped by connected edge technology - it is happening in our homes, our work and our factories. These intelligent edge systems are running fundamental and critical executions, and they must be secure".

Mitch Little, Senior Vice President at Microchip.

POWER

Quad-Output Dc/Dc μ Module Regulators

Analog Devices has introduced the LTM4668 and LTM4668A μ Module regulators, quad-output Dc/Dc regulators with up to 4.8A output capability. The new devices integrate switching controllers, power FETs, inductors and support components, easing the design process while reducing power consumption and board space. They are ideal for telecom, networking and industrial applications. Operating over an input voltage range of 2.7V to 17V, the LTM4668 and LTM4668A support an output voltage range of 0.6V to 5.5V. The devices support frequency synchronization, PolyPhase operation, selectable Burst Mode operation, 100% duty cycle and low IQ operation. Their high switching

frequency and a current mode architecture enable a very fast transient response to line and load changes without sacrificing stability.



MICROCONTROLLERS

The most secure boot for root-of-trust

Maxim introduces the MAX32520 ChipDNA secure Arm Cortex-M4 MCU, the first secure microcontroller with built-in physically unclonable function (Puf) technology for financial- and government-grade security. Maxim's Puf technology allows for multiple layers of protection to provide the most advanced key-protection technology in a cost-effective format for use in IoT, healthcare, industrial and computing. Designers want enhanced system defenses for their mission-critical applications where exposing secret encryption keys can bring down networks, ruin reputations, end companies and even negatively affect people's lives.

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PUBLISHER	FW Communication division of Fritz Walter srl
	
LEGAL ADDRESS	Borgo Regale, 7 43121 Parma Italy
HEADQUARTERS	c/o RTS P.zza M. Ruini, 29/A 43126 Parma Tel. +39 0521 1511514
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INTERNATIONAL PROMOTION	Sonia Parotti communication@elettronica.cloud Tel. + 39 348 3159834
SUBSCRIPTIONS	abbonamenti@elettronica.cloud
PRINT	Logo srl Via Marco Polo 8 35010 Borgoricco (PD)

 **Elettronica AV** is realized with the patronage of **Assodel** (Italian Association of Electronics Cluster)

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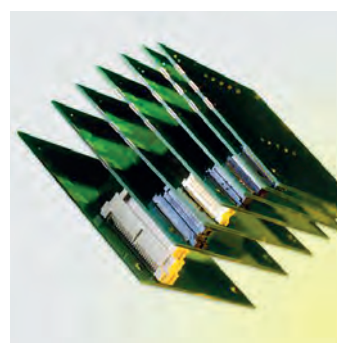
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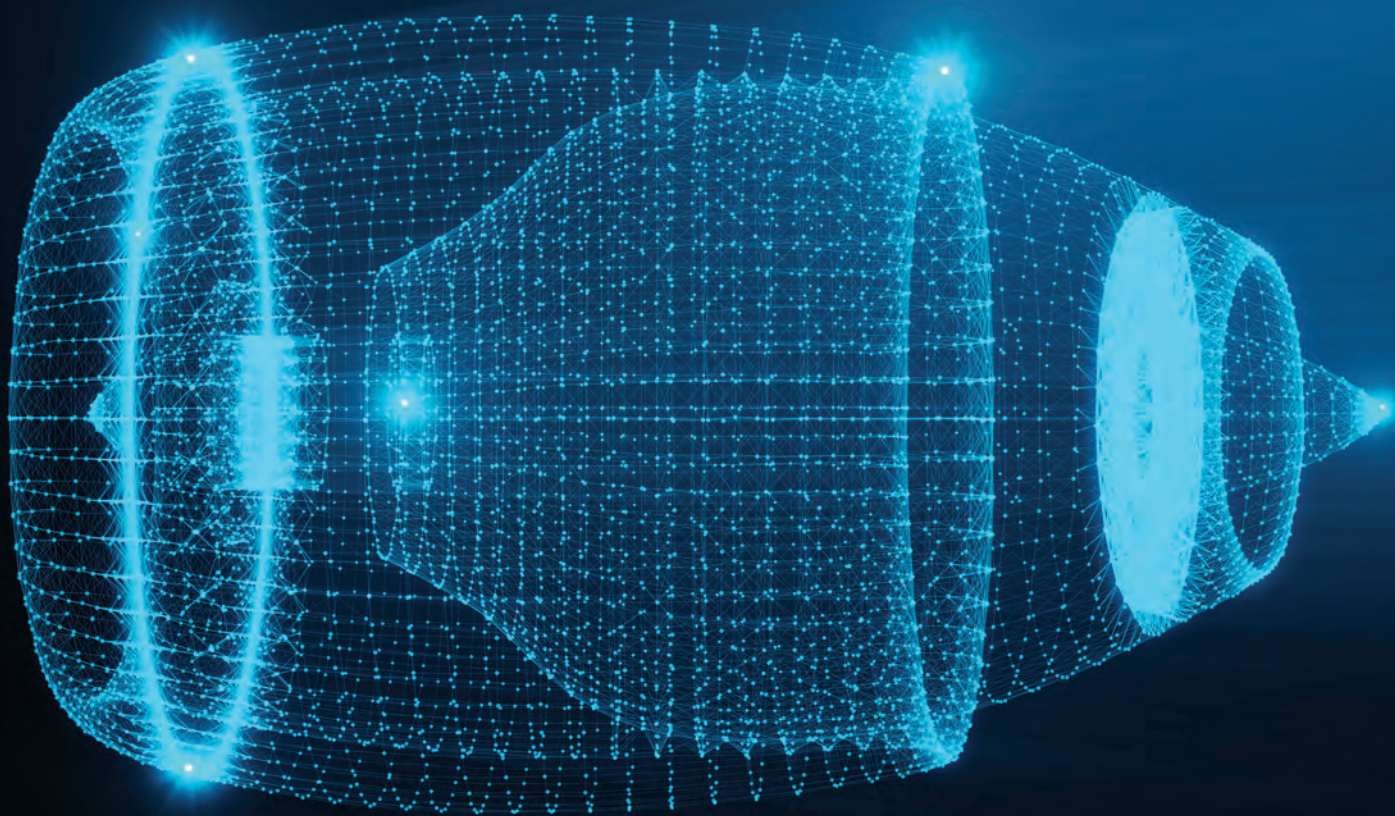


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