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Bloomberg Businessweek

May 6, 2024



THE TECH ISSUE

War on TikTok. Biden's $20 billion bet on Intel. GM versus Apple. Elon versus Sweden. How to navigate Silicon Valley's many reboots

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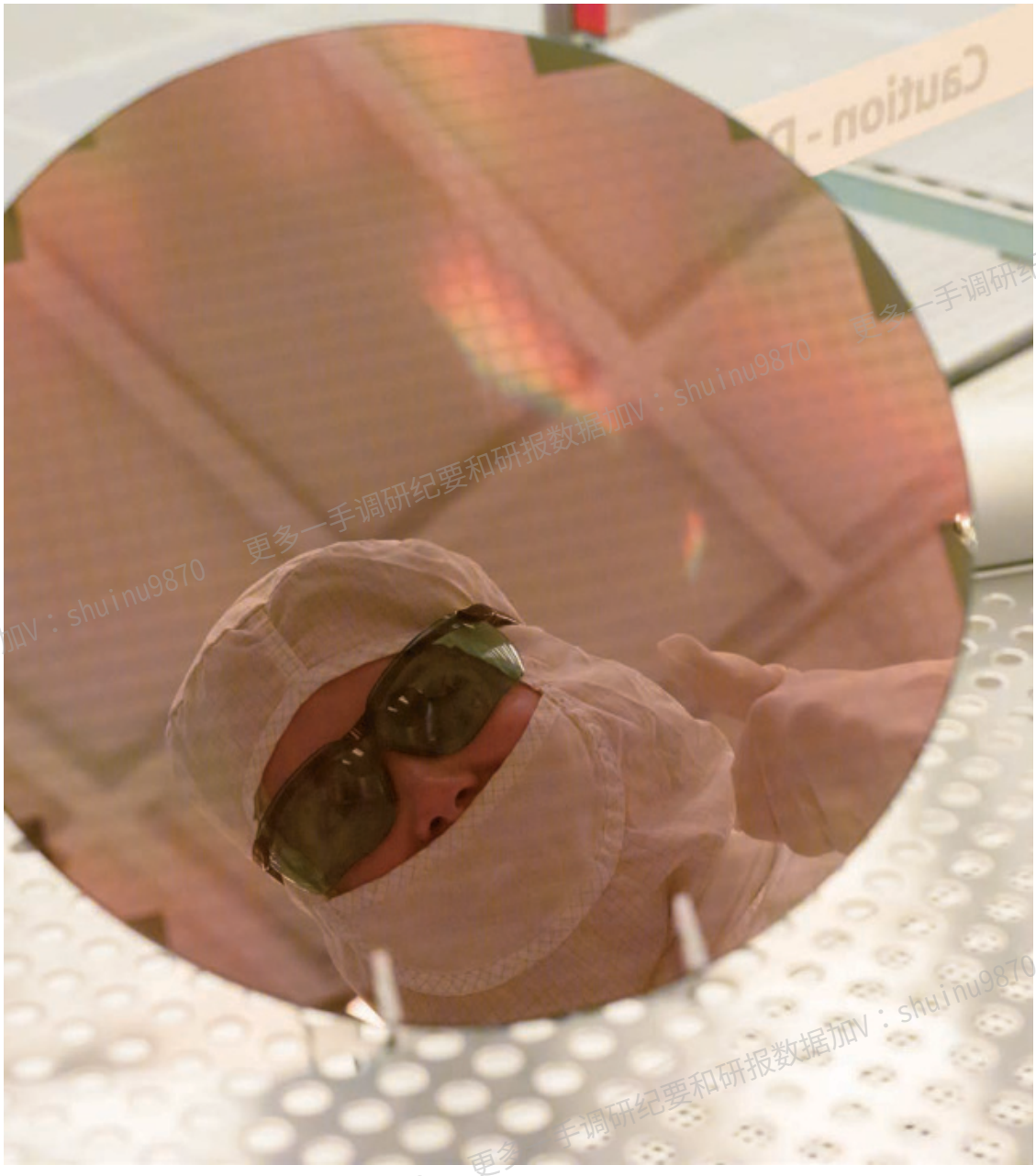


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◀ A new wafer at an Intel chip fab in Oregon

WALDEN KIRSCH/INTEL CORP

THE TECH ISSUE

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The chipmaker is spending billions to cast itself as a national champion

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■ COVER TRAIL

How the cover gets made

❶ "It's our annual Tech Issue!"

"Exciting! What's the biggest story in tech right now?"

"AI."

"OK. What else?"

"Um. It's AI."

"Heard, but say you were in a courtroom with our AI overlords, and they forced you to pick something that wasn't AI. It would be..."

"That tech is now so powerful, its biggest companies find themselves in pitched battles with bedrock social institutions during a massive year in global elections."

"Wow. That's heady."

"Also, sometimes a country's therapy records get accidentally leaked by a hacker."

"This is making me feel like we've fallen down the proverbial rabbit hole."

"Sounds like you've found your cover image."

"Better than a shot of me hiding under my desk!"



Cover: Illustration by Somnath Bhatt

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● Donald Trump was found in contempt of a New York court on April 30 and fined

$9k

for violating the gag order in his current criminal trial. Justice Juan Merchan warned him that if he continues to lash out at Michael Cohen, Stormy Daniels and other witnesses, the court "will impose an incarceratory punishment."

● War in the Middle East

▶ Israel said on April 30 that it will consider joining cease-fire talks with Hamas only when the militant group responds to the latest internationally mediated proposal for a temporary truce and hostage release. Under the latest terms, Israeli forces have agreed to withdraw from parts of Gaza.

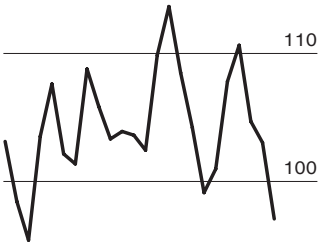
▶ The US and its allies fear that the International Criminal Court will issue arrest warrants for Israeli officials—possibly even Prime Minister Benjamin Netanyahu—just as they're closing in on a cease-fire agreement. The concern is that Israel will back out of a truce if the ICC proceeds with the warrants.



● Pro-Palestinian demonstrators rebuilt a barricade around their camp at UCLA after a clash with counterprotesters in the early morning hours of May 1. About 100 officers from nearby police departments were brought in to quell the conflict.

● US consumer confidence fell in April to its lowest level since mid-2022. The US Fed, leaving rates unchanged on May 1, won't help budge that number.

Conference Board Consumer Confidence Index



● Walmart says it's closing all 51 of its health centers.

The retailer announced on April 30 that it would shut down the clinics, which it had opened next to Walmart Supercenters in five states, as well as its telehealth business. The centers offered medical, dental and behavioral health services. Walmart declined to disclose how much it had invested in the ventures, first launched in 2019, or the revenue they'd generated.

● "It's not too late for Ukraine to prevail."



NATO head Jens Stoltenberg, at a meeting with Volodymyr Zelenskiy in Kyiv on April 29, said help was on the way. "The Russian army is now trying to take advantage of a situation when we are waiting for supplies from our partners," the Ukrainian president said. "The speed of deliveries means stabilizing the front."

● The billionaire owner of L'Occitane, Reinold Geiger, wants to take the company private, ending its 14-year run on the Hong Kong stock exchange. He's offering HK$34 ($4.35) a share in a deal that values the skin-care giant at

€6b

($6.4 billion). Several shareholders are backing the move.



● The Group of Seven agreed on April 29 to target the early 2030s to phase out coal.

The action, taken at this year's ministerial meeting in Turin, Italy, demonstrates that the G-7 nations are again focusing on sustainability. After a period of uncertainty in the energy markets following Russia's invasion of Ukraine, supply and demand have mostly returned to equilibrium.

● The Golden State is growing again. California's population expanded in 2023 for the first time since the pandemic began, thanks to a pickup in legal immigration. The state says it added more than 67,000 people, to reach a total of more than

39.1m

● The DEA is recommending that cannabis be reclassified as less risky.

Shifting marijuana from Schedule I to Schedule III would ease access to cannabis without decriminalizing it, removing additional US taxes pot companies have to pay. Cannabis stocks surged on April 30 on the news: The MJ PurePlay 100 Index, which tracks 95 global stocks exposed to the cannabis industry, climbed almost 22%.

PROTESTORS & POLICE: ETIENNE LAURENT/AFP/GETTY; STOLTENBERG: STR/GETTY IMAGES. L'OCCITANE: L'OCCITANE. SMOKE: GETTY IMAGES

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Areas Left Behind Need The Right Kind of Help From Washington

One of the main themes of President Joe Biden's approach to economic policy is "place-based" programs–bundles of measures to promote jobs and growth in distressed areas. Through a series of laws passed in 2021 and 2022, his administration has embarked on a remarkably ambitious effort, aiming to spend some $80 billion on this approach.

The president is right that a focus on helping communities most in need is overdue. Carefully executed, such an effort could provide good value for public money. But success depends on more than well-chosen investments, and directly creating good jobs in target locations isn't enough. Policymakers also need to help workers navigate a rapidly changing labor market by supporting them in developing skills, switching jobs and moving to areas of greater demand.

Skeptics argue that the place-based approach is just plain wrong. Why not shape a business climate that promotes investment and high-wage employment everywhere? The answer is that economic distress often becomes self-reinforcing, trapping people in places with low incomes, high poverty and failing services. Opportunities are diminished, communities break down, deaths and diseases of despair proliferate–and the cycle goes on. Public policy has a vital role in halting and reversing this process.

Recognizing the problem is one thing; solving it is another. Using subsidies or public investment to spur local development is difficult and, the record shows, often unsuccessful. Some of the subsidies included in the Chips Act illustrate the pitfalls. Manufacturing semiconductors in the US (page 31) is expensive by international standards–partly because of regulatory bottlenecks, but also because workers with necessary skills are in short supply. With time, those issues could be addressed. But if they aren't, the US will find itself perpetually subsidizing uncompetitive production rather than seeding thriving new enterprises.

The administration acknowledges that place-based programs aren't a one-shot treatment. Success demands many complementary and coordinated initiatives: building necessary infrastructure; attracting private investment; creating clusters of innovation; involving local businesses, colleges, unions and nonprofits. It's a complex, long-term endeavor. The right mix of interventions will vary from place to place, and it will be years before the results can be judged. Careful evaluation as they move forward is essential.

In the meantime, policymakers should complement place-based initiatives with measures aimed at enabling workers. For instance, the earned income tax credit is widely considered one of the most effective ways of boosting employment and helping the low-paid. Expanding this support in distressed areas–applying sound place-based logic to a different kind of policy–would be a simple and effective way to reduce business costs and help the workers most in need.

One more thing: Justified as the place-based approach might be, it shouldn't rule out steps to help workers improve their prospects by moving. Easier access to vocational training must be part of the formula. The administration should also urge states to cut the red tape that makes it harder for workers to move from place to place or job to job. It's good news, for example, that some states have begun to reform their occupational licensing systems, pruning needlessly demanding requirements and recognizing licenses issued elsewhere.

Aiding working families in distressed areas isn't an either-or proposition–either bring new jobs to them or help them find work elsewhere. The right approach is to do both. Ⓑ *For more commentary, go to bloomberg.com/opinion*

ILLUSTRATION BY SHWETA SHARMA

■ AGENDA



▶ Commencement at Columbia

The college where the nationwide pro-Palestinian protests kicked off still plans on a May 15 graduation. Reenacting an infamous moment from the Vietnam era, police broke into Hamilton Hall to extract protesters on April 30.

▶ The Reserve Bank of Australia sets interest rates on May 6; the Bank of England does the same on May 9. Analysts say both will likely hold rates steady, at 4.35% and 5.25%, respectively.

▶ The UK publishes its preliminary estimate of first-quarter GDP growth on May 10. Economists believe growth will edge back up, after declining 0.3% in the fourth quarter.

▶ The US reports its April inflation snapshot on May 15. The Biden administration will be watching anxiously: Year-over-year inflation rose to 3.5% in March, from 3.2% in February.

▶ Japan releases its annual inflation rate and trade balance for April on May 17. In March inflation eased a bit, and the country saw a larger-than-expected trade surplus.

▶ Palantir and Vertex report earnings on May 6; BP, Disney and UBS, on May 7; Arm, Toyota and Uber, on May 8; Brookfield, Honda and Petrobras, on May 9.

▶ Bird watchers will want to mark World Migratory Bird Day on May 11. This year's focus is insects, whose declining populations pose a systemic danger to migratory birds.

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The Delicate Geopolitical Dance Over TikTok

● A US crackdown will likely result in a Supreme Court case and retaliation from Beijing on US interests

● By Brad Stone and Anna Edgerton

Gianna Christine began her career as a social media influencer four years ago, after the professor in her college digital media class assigned students to post every day on the video streaming service TikTok. Since then, she's built an audience of 2.7 million fans on the app and earned a six-figure annual income, talking into her iPhone about everything from awkward encounters with neighbors in her New York City apartment building to the best post-clubbing late-night snacks.

Recently, though, Christine, like other TikTok stars, started to post more frequently on other services such as Instagram, Snapchat and YouTube. These efforts started in 2020, when then-President Donald Trump raised the prospect of banning TikTok, and intensified during the past few weeks as Congress suddenly advanced a bill that would remove TikTok from US app stores within nine months unless its Chinese parent sells it to an American company. The punishment would effectively kill the app by preventing distribution and even routine software updates. Christine, like many of her fellow TikTok users, views the law as the beginning of the end of TikTok in the US. "People are angry about it. We love the community," she says. "But there's acceptance, too. I don't want to lose my income if it gets taken down."

A ban of the immensely popular app has for years seemed like a long shot to overcome the effective lobbying and congressional dysfunction that have stifled nearly every other attempt to impose stricter regulations on tech companies. Then, improbably, the forces that govern the process of legislating in Washington suddenly aligned, and the provision was approved as part of an emergency bill authorizing tens of billions of dollars in aid to Ukraine, Israel and Taiwan. On April 24, President Joe Biden signed it.

This set up an inevitable legal challenge, probably on First Amendment grounds. "Make no mistake, this is a ban, a ban on you and your voice," Shou Chew, the Singapore-based chief executive officer of TikTok, said in a video on the app the day the bill was signed. "Politicians may say otherwise, but don't get confused. Many who signed the bill say the TikTok ban is the ultimate goal." It also raised the chances that China will retaliate against a US company or industry. This spat over an app best known for silly dancing videos could be a pivotal moment in an escalating rivalry between the world's two superpowers.

TikTok has about 170 million users in the US, and they spend significantly more time on it than people do on Instagram or Snapchat, according to app monitoring firm SensorTower. A Chinese company operating a giant consumer internet service in the West had always suggested an uncomfortable double standard. US-owned apps such as Facebook, Google, Instagram, Signal and WhatsApp aren't allowed in China. The disparity was largely ignored until the countries started enacting tariffs on each other's products during the Trump administration and a fierce economic rivalry burst into the open. The US limited the use of Chinese telecom equipment in 5G networks. A few years later it restricted advanced computing chips that might go into military and artificial intelligence systems.

More recently, Chinese government agencies and state-backed companies asked staff to not bring foreign devices such as the iPhone into the office, heightening tensions and making the TikTok double standard even harder to overlook. "They have already gone after our companies," said Raja Krishnamoorthi of Illinois, the ranking Democrat on the House China committee and one of the authors of the TikTok bill, on Bloomberg TV's *Balance of Power* on April 25. "They want to be able to operate here freely, unfettered, but they don't allow our companies to do the same in China."

US officials have long expressed concern that TikTok ▶

ILLUSTRATION BY REYA AHMED

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◀ could serve as a way for the Chinese government to collect data on US users and spread propaganda. Since 2020, both the Trump and Biden administrations have rejected as inadequate security measures that the company said would protect US user data, but momentum for a ban seemed stalled earlier this year. The Justice Department was still working with a small bipartisan group of lawmakers and aides to write a law that would survive judicial scrutiny and establish a drastic consequence—a ban in the US—should parent ByteDance Ltd. once again reject the government's demand to sell TikTok.

In a flurry of classified briefings between that bill's introduction in March and its inclusion in the foreign aid package, senior officials from the FBI and other federal agencies warned that the app is subject to Chinese national security laws that require turning over data and algorithms to the government in Beijing. They raised the possibility that the app could influence American politics. The bill passed the House with overwhelming support, but it appeared to languish in the Senate. The roadshow may have helped persuade skeptics like Senate Commerce Committee Chair Maria Cantwell, a Democrat from Washington, who was still cool to the idea but ultimately voted for it after securing minor changes.

The proliferation of pro-Hamas videos on the app after the Oct. 7 attacks on Israel also swayed some lawmakers, as did a series of alerts TikTok sent in March, urging its adult users to contact their representatives to express opposition to the bill. The alerts triggered plenty of angry phone calls to Capitol Hill offices, but the maneuver may have backfired on TikTok by proving that the app could in fact manipulate the behavior of Americans, according to Representative Mike Gallagher, the Wisconsin Republican who until recently chaired the House China committee.

With no organized resistance from US tech companies, which could benefit from the elimination of a robust competitor, the TikTok provision was a last-minute addition to the foreign aid bill, the culmination of what one aide describes as the "thunder run," a military term for sending a line of tanks into enemy lines with no warning. Combining the bills effectively forced the hand of skeptical senators, many of whom felt they couldn't risk jeopardizing much-needed aid to Ukraine.

Another potential obstacle for GOP backers of the provision was former President Trump, who's reversed course on TikTok and said in March that he opposed a ban. But several Republicans called and talked him down, reminding him that it was his administration that first tried to force a divestiture and arguing that this law would burnish his legacy. In the end, Trump's criticism was soft enough that it didn't have a material impact on the vote, the aide says.

Now what once seemed like an impossibility initiated by a handful of China hawks marches toward a congressionally imposed deadline. ByteDance could sell the app to a US company or investors, but Nazak Nikakhtar, a former Commerce Department assistant secretary when Trump tried to force ByteDance to sell TikTok, says it didn't happen then and is unlikely to happen now. "All these people are going to come in and say, 'I'll buy it.' Well, China's not going to give you all the code," Nikakhtar says.

"They want to be able to operate here freely, unfettered, but they don't allow our companies to do the same in China"

ByteDance figures Beijing officials would oppose the sale of TikTok's prized source code and recommendation algorithms, according to two people familiar with its thinking, who asked not to be named talking about politically sensitive matters. Executives are instead mapping out legal strategies and betting they can get an injunction to avoid an immediate shutdown, according to one of the people. They're also discussing less palatable scenarios to try to sell TikTok's US business without the underlying technology, though that makes it far less valuable and is unlikely to appeal to buyers.

The still hypothetical legal dispute, *TikTok v. US*, would almost certainly head to the Supreme Court, which would have to weigh the government's security concerns against the free speech and "expressive interests" of both its users and the app's corporate owner. The government would have some precedent on its side: The US has long restricted foreign ownership of media companies, radio stations and telephone networks. "If the question is 'will this thing hold up in court?' I think it's more likely than not that it will," says Alan Rozenshtein, a law professor at the University of Minnesota and former adviser to the Justice Department on cybersecurity and foreign intelligence.

It's all but certain that China will retaliate against the US, say China watchers. The country could restrict US access to critical minerals or other key components of the tech supply chain. It also could go after companies such as Apple, Microsoft or Tesla, which have significant manufacturing facilities in the country and sell to Chinese companies and consumers. Apple Inc.'s dependence on China, where it gets one-fifth of its sales, makes it particularly vulnerable, though its contributions to the Chinese economy could protect it from reprisal. "Is it going to cause some real pain? Absolutely," says Nikakhtar. "But do we take the pain now, when it's relatively manageable, or do we take the pain later, when too much is gone?"

For Alyssa McKay, a TikTok influencer with 10.4 million followers, the pain takes the form of sadness that a formative part of her life may soon go away. "Collectively, Gen Z, we all just gravitated to it, especially during the pandemic. It was the one thing everyone was doing all the time," she says wistfully. "I would grieve the loss of TikTok. It was such a huge part of my life and my friends' lives." Ⓑ —*With Zheping Huang*

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For Meatpackers, The Robot Invasion Can't Come Fast Enough

● Machine learning and AI mean humans aren't the only ones mastering high-precision jobs

Remote-controlled droids herd cattle on the American Great Plains for agribusiness giant Cargill Inc. Robots prep shipments and stack pallets at meatpackers' plants from coast to coast. And with poultry heavyweight Wayne-Sanderson Farms deploying one set of machines to vaccinate in-egg chicks at the start of their lives and another to eviscerate them several weeks later, US meat processors might look at first glance as if they've successfully pivoted from man to machine in one of the world's most labor-intensive businesses.

But for all the strides processors of beef, pork and chicken have made bringing automation into their factories, mechanizing the tasks with the most direct impact on profits—slicing carcasses—has been much slower.

That's because in the messy business of disassembling livestock, leaving even a fraction of an ounce of meat on the bone can erode margins over time. Although robots don't fall victim to injuries or illness, as people can, humans possess an ability to make on-the-fly decisions for each uniquely sized cow, chicken or hog coming down the line. That's traditionally given them the upper hand in precision butchery.

"Our challenge is we can't deploy automation in jobs that would then compromise yield because, given the volume we produce, our operational efficiency really drops if we do that," says Chetan Kapoor, automation chief at Tyson Foods Inc., which processes almost 40 million chickens a week.

That may be about to change. Thanks to



● Clockwise from above right: The rehang station at Wayne-Sanderson is mostly automated; a robot arm stacks chick trays; a deboner

DESIREE RIOS/BLOOMBERG

Edited by James E. Ellis and Anne Riley Moffat

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advancements in machine learning, computer vision and artificial intelligence, the hardest-to-automate tasks, such as carving the perfect chicken breast or meticulously breaking down massive hogs or cows, are finally within reach. If applied on a commercial scale, the technology has the potential to ease the industry's long-standing labor vulnerability—fully on display during the Covid-19 pandemic, when worker absenteeism contributed to bare grocery shelves.

Tyson says it has developed a sensor- and camera-equipped robotic chicken breast deboner that's more efficient than the average worker using their hands; the industry had previously struggled to entrust the high-margin task fully to robots. The machine, which has been in development since 2015, is "way beyond the testing phase," Kapoor says, showing a video of it in action during a tour of Tyson's automation center in Springdale, Arkansas. "We took out the variability caused by a very-difficult-to-staff job in a very critical part of the business." Plus it leaves less meat on the bone, he says.

Automation has long been on processors' wish lists. Their plants are cold and humid with a high turnover rate, making staffing a persistent challenge. But raising productivity became especially important during the pandemic, when the industry was slammed with a severe worker shortage. More recently, the US sector has been hit by a ▶



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◀ supply glut and high animal feed costs, which have highlighted the need to reduce expenses and boost margins.

At Wayne-Sanderson, Cargill and Continental Grain Co.'s poultry venture, robots perform almost two-thirds of chicken deboning, more than twice the pre-Covid rate, says Chief Operating Officer Kevin McDaniel. "When Covid hit and we couldn't get the labor, we were forced into it just to meet customer demand," he says. Machines are now "equal to, if not better" than handwork at deboning dark meat such as thighs." Yet when it comes to white-meat deboning, "you can't beat people doing it by hand, still."

Companies say automation doesn't necessarily mean a big reduction in head count; instead, they can reassign workers to other roles such as inspection or, frequently, just plug holes where workers have quit. Smithfield Foods, the largest US pork producer, this year expects to spend more than double what it invested in automation in 2021. Smithfield has reduced its factory floor operational workforce 6% over the past three years, helping the company weather its high turnover rates, says Keller Watts, its chief business officer. One of the new tools Smithfield rolled out was a robot capable of scanning carcasses and deftly pulling the rib from the loin, one of the most strenuous jobs for workers.

Automation has been slower in pork and beef versus chicken, where the size of animals can vary by tens or hundreds of pounds, making the breakdown almost surgical in nature. Unlike car manufacturing, where almost every product to roll off the line is identical, "every animal is a little bit different, so you cannot standardize the disassembly process," says Hans Kabat, president of Cargill's North American protein business. "You have to have sensors–including vision, feel and flexible fingers–on robots to be able to sense where things need to get done and then to actually move the product."

Only a very small percentage of beef processing can be automated because the technology is either not ready or not scalable, says Enrique Villars, manufacturing excellence leader for Cargill's North American protein business. But that could change fast as the tech improves. At its beef plant in Dodge City, Kansas, for instance, Cargill has been able to install saw lines that separate meat from bone using a 3D vision system, eliminating the need for workers to make as many as 3,000 cuts a day with a band saw.

"Computer vision is the next big thing, because it is the ability of the computer to interpret the images and pixels and translate that into real actions," Villars says. "The speed in which things are progressing is exponential."

Meat processors are putting more capital into tech projects. In 2021, Tyson said it would invest $1.3 billion in automation over three years, including building a highly automated chicken nugget factory in Danville, Virginia. Chief Executive Officer Donnie King says the plant can produce as much as 30% more product with a third less staffing than a sister plant without the same level of automation. Cargill has completed 114 automation projects and has more than 120 underway across its meat operations as part of a $700 million plan dubbed "Factory of the Future." —*Gerson Freitas Jr. and Isis Almeida*

THE BOTTOM LINE Butchering is among the most labor-intensive—and dangerous—businesses. AI is helping meat processors hand some of the more strenuous jobs over to robots.

Legendary Eyes Growth, Without a Paramount Deal

● It wants to use investor Apollo's cash to produce sequels and spinoffs of its films, even if it doesn't merge with Redstone's studio



It's been a busy season for Legendary Entertainment. On March 1 the movie operation backed by Apollo Global Management Inc. released *Dune: Part Two*, which has racked up global box office receipts nearing $700 million. And on March 29 it premiered *Godzilla x Kong: The New Empire*, which has taken in almost $500 million. The back-to-back blockbusters have made Legendary, which is in talks to develop sequels to both pictures, the most successful film producer so far this year.

GRODE: MICHAEL BUCKNER/GETTY IMAGES. ILLUSTRATION BY MARIA JESUS CONTERAS. DATA: GALLUP

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While enjoying Legendary's success, Apollo has been pursuing a much bigger prize: Paramount Global. That fight has put Legendary's future in the spotlight as well. Apollo submitted an $11 billion bid for the Paramount Pictures film and TV studio earlier this year, followed by a $26 billion offer for parent company Paramount Global. It has also held talks with Sony Corp. on teaming up on a bid for Paramount. Representatives for Paramount and Apollo declined to comment.

But Shari Redstone, Paramount's controlling shareholder, prefers a takeover by Skydance Media—which some investors have said will unfairly pay her a premium for her supermajority voting stock at the expense of common shareholders. Paramount's board is negotiating exclusively with Skydance, controlled by David Ellison, son of billionaire Oracle Corp. co-founder Larry Ellison, until May 3.

Meanwhile, Paramount announced on April 29 that Chief Executive Officer Bob Bakish would be replaced by three senior executives who will occupy a new office of the chief executive—a move some on Wall Street view as a sign that a takeover deal is likely. But no agreement had been reached by May 1.

Apollo, which controls $650 billion in assets, planned to merge the Paramount and Legendary studios and invest in expanding the combined business. It may still come back with a fresh bid for Paramount when the period of exclusive talks with Skydance ends. But while the prospect of a Paramount linkup is in limbo, Legendary Chief Executive Officer Josh Grode is charting a separate course for the company that would involve other deals financed by Apollo.

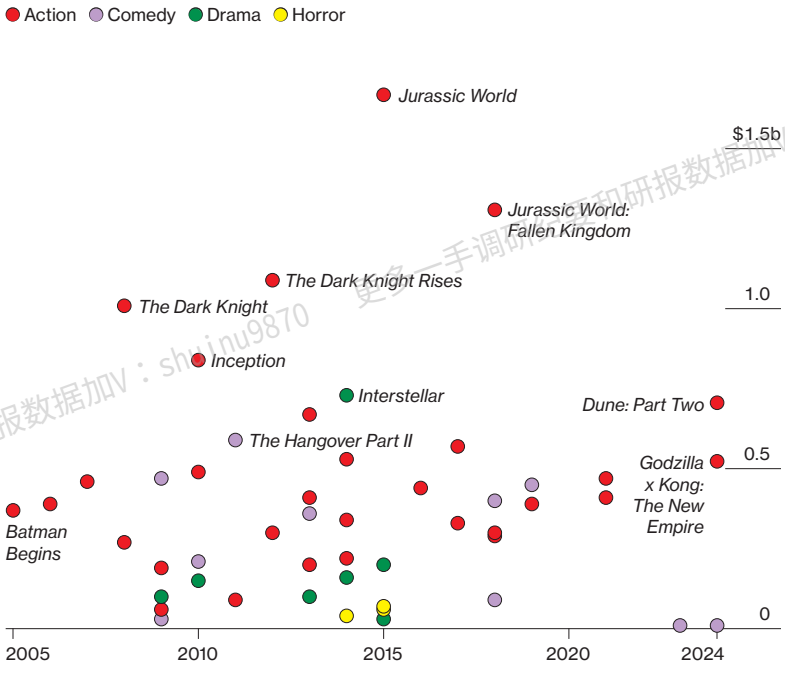
Unlike those of larger, more indebted media counterparts such as Paramount and Warner Bros. Discovery Inc., Legendary's financials are comparatively healthy. The company has no net debt and more than $500 million of cash on its balance sheet. Grode, who joined Legendary in 2018, says he's seeking to combine the momentum of the studio's movie franchises and the deep pockets of Apollo to acquire US and European entertainment businesses focused on film, TV, gaming and AI, in deals that together could be worth tens of billions of dollars.

"Apollo understands our business, they understand media, and they have capital that they're willing to deploy," Grode says, all factors in his bringing in the asset manager as a shareholder over rival suitors. "I wanted somebody who was large enough that it allowed us to be credible in any potential merger-and-acquisition opportunity." In 2022, Apollo acquired a minority stake in Legendary for $760 million from Dalian Wanda Group.

In the near term, Grode is focused on expanding Legendary as it rebounds after years of hardship.

Legendary Films

Worldwide box office gross of Legendary-associated movies with a US theatrical release



DATA: LEGENDARY, BOX OFFICE MOJO. AS OF MAY 1

The studio, founded by entrepreneur Thomas Tull in 2000, enjoyed early success financing hits, including director Christopher Nolan's *Batman* films and the *Hangover* trilogy, before being purchased in 2016 by Beijing-based Wanda. When Wanda handed the CEO job to Grode, an entertainment attorney, the company was losing more than $300 million a year.

Grode cut budgets on titles such as Netflix Inc.'s *Enola Holmes* and refocused Legendary's spending on building franchises that can boost revenue across divisions that hadn't always operated in sync. *Dune*, adapted from Frank Herbert's novels, is an example. Beyond the films, a spinoff series, *Dune: Prophecy*, is set to stream on Warner Bros.' Max service this year; Legendary licensed video gaming rights to developer Funcom Oslo AS; and the company's comics arm is publishing graphic novels tied to the movies.

If Redstone strikes a Skydance deal, Grode won't be a defeatist about it—if it's not Paramount, he'll just tap Apollo's cash for equally ambitious takeovers as Legendary seeks to put a bigger stamp on Hollywood. "I had to get everything working right internally, but now we're set up where we can start looking," he says. "I could do a fair amount of deals off my balance sheet. What I can't do off my balance sheet is the mega-megadeals, so bringing in Apollo was a very deliberate decision." —*Thomas Buckley*



● Grode

THE BOTTOM LINE Thanks to its *Dune* and *Kong* hits, Legendary Entertainment was the No.1 film studio this spring. But its expansion plans depend on having a deep-pocketed partner.

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2

Space

TECHNOLOGY



ILLUSTRATION BY CONNOR WILLUMSEN

Edited by
Mark Milian and
Laura Bliss

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Moon Race

● America is counting on Elon Musk or Jeff Bezos to do something that hasn't been done in a half-century

Five years ago, Jeff Bezos stood on a darkened stage in Washington, DC, a large black curtain covering a platform behind him. Clad in a gray suit and black shirt, he expounded the virtues of exploring the moon to a crowd of journalists and space enthusiasts. "It's nearby. It's three days away," Bezos said. "You can go to the moon just about anytime you want."

Moments later, Bezos raised his hand, and the curtain swept away to unveil a massive spacecraft called Blue Moon. It was a lunar lander that his aerospace company had been working on for three years, he said, designed to take cargo—and eventually people—to the moon's surface.

What he didn't mention is that the lander was a prop constructed for the event. Blue Origin had (and still has) years to go before it can deliver a functioning vehicle.

A more visceral moment in the new space race happened two-and-a-half months later. Elon Musk was watching on live monitors as a steel mini rocket, shaped like a grain solo, fired up its engine in the mud flats of southern Texas. Space Exploration Technologies Corp.'s prototype flew up into the air for a few brief moments and then lowered itself back down again, standing upright. This was one of the first so-called hop tests for what would become SpaceX's forthcoming Starship rocket, meant to demonstrate the technique a full-size spacecraft would use someday to land on other worlds, including the moon.

It's been more than a half-century since a human being left a footprint in lunar dust. Today's space race looks in some ways like that of the 1960s; instead of the US versus the Soviet Union, it's Bezos' Blue Origin versus Musk's SpaceX. The companies are dueling to put astronauts back on the moon's surface, funded largely by the US government.

Blue Origin and SpaceX were both founded at the turn of the century by technology moguls. That's about where the similarities end. SpaceX quickly surpassed Blue Origin by rapidly testing and launching with little concern about things blowing up during development, as they occasionally do. SpaceX has a big lead over Blue Origin in the lunar competition. Still, given that mission's complexity, it's possible that Blue Origin will land something—probably not with people on it—before SpaceX does. Blue Origin declined to comment, and SpaceX didn't respond to requests for comment.

Musk runs his aerospace operation like a typical for-profit enterprise, using money from clients (including the government) that want to hitch equipment to its rockets as a way to fund product development. Bezos has, at least until recently, treated Blue Origin more like a research laboratory. Which strategy will win this moon race should become clear over the next few years.

"SpaceX has sold things, and Blue Origin has spent money," says Carissa Christensen, founder and chief executive officer of BryceTech, a space research and analysis consultant. "SpaceX's company culture has been about taking over market after market, finding customer after customer. Blue Origin's culture has been about executing on a very demanding R&D strategy."

The mission to put people back on the moon started in 2017 with a NASA program that would become known as Artemis. SpaceX and Blue Origin won contracts worth billions of dollars for development; the companies get to keep what they build. "We're buying the service," says Kent Chojnacki, deputy manager of NASA's human landing system program. "So we never take ownership of the hardware."

Each company's task is to create a spacecraft that can park itself in orbit around the moon and await the arrival of NASA astronauts from a second craft or a space station nearby. The astronauts would transfer to the company's vehicle, which would then carry the crew down to the moon's surface. After a while, they'd load back into the lander and into lunar orbit.

For Musk, the contract presented an excuse to accelerate work on Starship, the largest, most powerful rocket system ever developed, with a top portion serving as a lunar vessel that can land upright and take off again. SpaceX's plan is to conduct an uncrewed test landing on the moon as early as ▶

"SpaceX has sold things, and Blue Origin has spent money"

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◀ next year and then a first human landing in 2026, though Musk and NASA habitually miss deadlines.

As early as next year, Blue Origin plans to send to the moon a cargo version of its lander. If this plan succeeds, Bezos' company could conceivably beat Musk's; Blue Origin maintains a less ambitious timeline to send people there by 2029.

But schedules are unpredictable in aerospace. Blue Origin's lunar lander is designed to launch on top of its New Glenn rocket, which was supposed to first lift off in 2020 but has yet to do so. New Glenn is currently due to launch in September, if all goes well. "Blue Origin needs to be much faster," Bezos said on the *Lex Fridman Podcast* in December, "and it's one of the reasons that I left my role as the CEO of Amazon."

Musk, meanwhile, remains CEO of a bunch of companies, including SpaceX, which continues to lead the aerospace industry. During its most recent Starship test flight in March, SpaceX transferred propellants from one tank to another, a small but meaningful step. A NASA advisory committee said on April 26 that while SpaceX was still analyzing the results, the experiment "was successful by all accounts." —*Loren Grush*

THE BOTTOM LINE SpaceX is the leading candidate to put a person back on the moon, but Blue Origin is determined to challenge that notion.

To Conquer Space, China Heads to Sea

● Offshore rocket launches are a key part of the country's space strategy. The world might follow

With trips to a new space station, a sample-return mission to the moon and a record number of satellite launches, China's space program has a packed calendar. The country is planning 100 launches through the end of 2024, up more than 40% from last year, as it tries to overtake the US and become the dominant power beyond Earth.

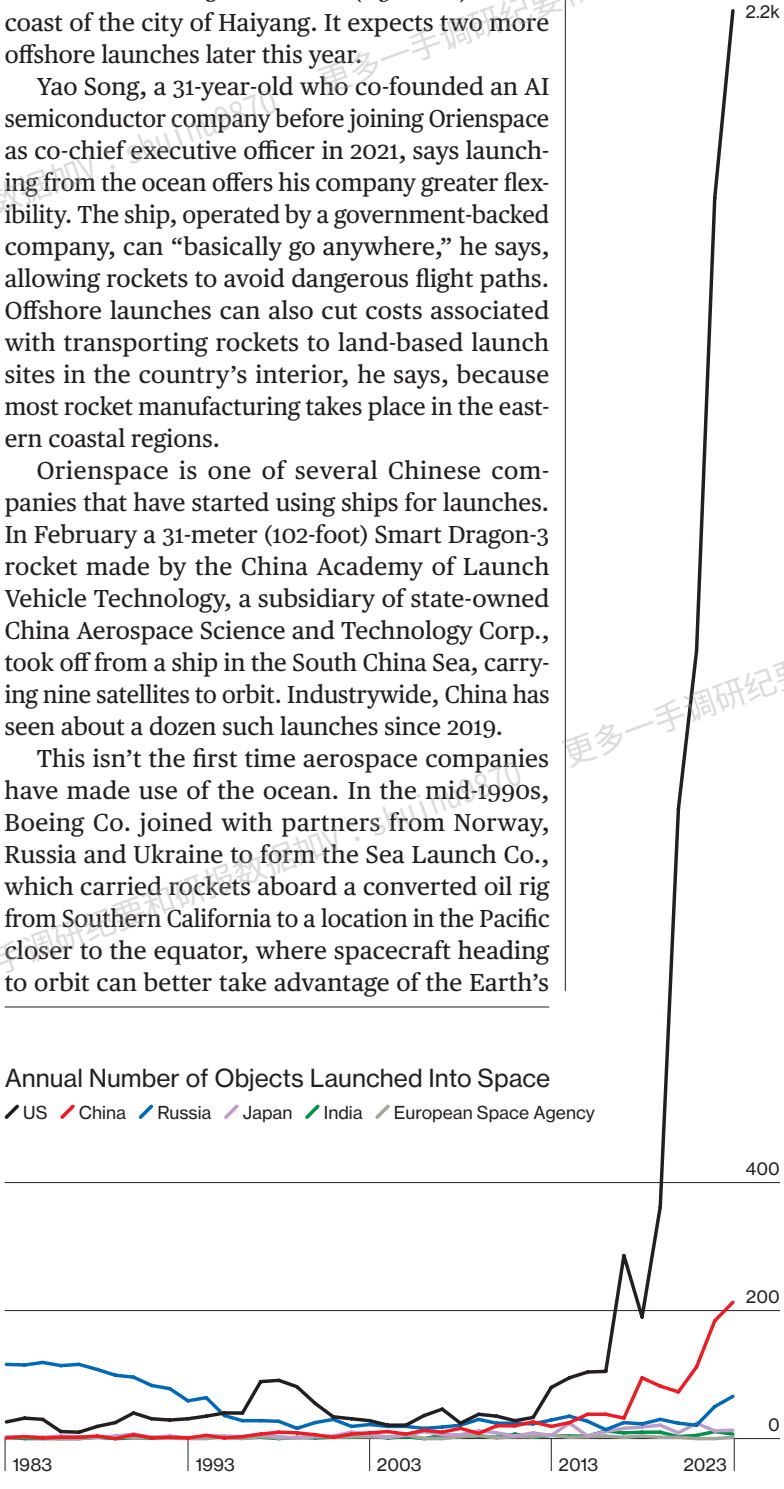
But in a land of 1.4 billion people, these efforts face a fundamental challenge: finding a safe place to launch. Although almost all US rockets take off from coastal sites where the flight path is over water—thus reducing the risks to people and property—three of China's launch sites are deep in the interior, forcing rockets to fly over land after takeoff. The fourth is on the coast of the southern island province of Hainan, with a half-million people living nearby.

For Orienspace, a startup in Beijing, the answer is to launch from beyond China's shores. In January, Orienspace sent a Gravity-1 rocket carrying three satellites to orbit from a ship in the Yellow Sea about 3 kilometers (1.9 miles) off the coast of the city of Haiyang. It expects two more offshore launches later this year.

Yao Song, a 31-year-old who co-founded an AI semiconductor company before joining Orienspace as co-chief executive officer in 2021, says launching from the ocean offers his company greater flexibility. The ship, operated by a government-backed company, can "basically go anywhere," he says, allowing rockets to avoid dangerous flight paths. Offshore launches can also cut costs associated with transporting rockets to land-based launch sites in the country's interior, he says, because most rocket manufacturing takes place in the eastern coastal regions.

Orienspace is one of several Chinese companies that have started using ships for launches. In February a 31-meter (102-foot) Smart Dragon-3 rocket made by the China Academy of Launch Vehicle Technology, a subsidiary of state-owned China Aerospace Science and Technology Corp., took off from a ship in the South China Sea, carrying nine satellites to orbit. Industrywide, China has seen about a dozen such launches since 2019.

This isn't the first time aerospace companies have made use of the ocean. In the mid-1990s, Boeing Co. joined with partners from Norway, Russia and Ukraine to form the Sea Launch Co., which carried rockets aboard a converted oil rig from Southern California to a location in the Pacific closer to the equator, where spacecraft heading to orbit can better take advantage of the Earth's



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▲ An Orienspace launch off the coast near Haiyang, China, in January

rotational speed. Sea Launch had nearly three dozen successful missions before it suspended operations in 2014, amid Russia's first invasion of Ukraine, leading to the collapse of the partnership.

Offshore launches could see a revival in countries other than China as land-based facilities around the world are stretched beyond their limits. In the US, the two most popular launch sites, Cape Canaveral in Florida and Vandenberg Space Force Base in California, are likely to get even busier as companies such as Amazon.com Inc. and Lynk Global Inc. speed deployment of satellites to compete with SpaceX's Starlink constellation.

SpaceX, which has faced local resistance to a land-based expansion plan in Texas, has signaled its own intentions to head to the sea. Although President Gwynne Shotwell told reporters in February 2023 that the company had abandoned plans to use two oil rigs as launch pads, she said that eventually "we'll have a lot of sea-based platforms."

In Europe, a consortium called the German Offshore Spaceport Alliance wants to offer an option to regional operators that doesn't involve a trip to South America. Currently, the most popular European-operated spaceport is in French Guiana, in Kourou. "It's not so easy to find places to launch from EU territory," says GOSA managing director Sabine von der Recke. "We have to look offshore."

GOSA plans to launch its first rockets from a platform in the North Sea in late June. The first flights will be suborbital demonstrations, but in the future, the alliance aims to send satellites into orbit.

Offshore launches present their own challenges. Maxime Puteaux, a principal adviser with Novaspace, a space consulting company, says ships must be capable of handling last-minute issues, which can be hard to resolve at sea. Replacing a part on land could take a few hours or days, but much longer when a ship is far away from port. "At sea you need to have everything," he says. "It's not a bad way to launch, but the costs of maintaining an aircraft or a ship for a launch at sea are still significant compared to just maintaining a launchpad on land, which is just made of concrete."

China is also expanding the country's capacity for ground-based launches, including a new complex at a spaceport in Hainan that's exclusively for private-sector companies. It's scheduled to have its first mission soon.

But for Orienspace, which in January announced the completion of a fundraising round worth about 600 million yuan ($82.9 million), using a ship can save a month of time and millions of yuan. "This is a significant improvement in business efficiency," Yao says. *—Bruce Einhorn, with assistance from Ocean Hou and Loren Grush*



● Yao

THE BOTTOM LINE Offshore launches can improve takeoff positioning and save money on transporting rockets, but there are logistical challenges.

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Q&A Advice From a Space Travel Agent

Roman Chiporukha, co-founder of SpaceVIP, on the rewards and risks of touring the final frontier
—*Stefanie Waldek*



Chiporukha

So you want to go to space? Great! We're fortunate to live in a time when that's possible, at least for those with a gigantic pile of disposable income.

As with any travel experience, there are two questions to ask yourself: What's your budget, and how do you want to get there? With space tourism options ranging from a $150,000 high-altitude balloon ride to a $55 million rocket launch with a stay on the International Space Station, the world—or rather, the space surrounding it—is your oyster.

Roman Chiporukha, co-founder of SpaceVIP, advises wealthy clients on destinations, transportation options, the risks associated with each one and how to make the most of a trip.

How did you become a space travel agent?

I own a lifestyle and travel company called Roman & Erica that caters to some of the world's most well-heeled individuals. As a result of that client base, in 2018 we were approached by Axiom Space, and they said, "We hear you work with some of the world's wealthiest people. Help us promote the first all-private astronaut mission to the International Space Station. We have three tickets, they cost $50 million each." We happily obliged.

Shortly after the mission was successfully completed, we realized the general public has no idea about all of these other space tourism operators. They know Blue Origin, SpaceX and Virgin Galactic. Clients needed one place to gather all of the information.

How do you help clients find the right space tourism experience?

It's a matter of understanding where the client is—what they know about space tourism—and then guiding them accordingly. A lot of people think the mission to the International Space Station is the same thing as a suborbital flight. No, suborbital means you have five minutes of weightlessness, if that, and then you come back down. An Axiom mission is four and a half months of training and 10 days in space. That's a big commitment.

So why should we go to space?

With the conversations about trips to low Earth orbit, one of the first questions is, what is the mission purpose? You'll be in space for a substantial period of time, so what research is interesting to you?

There's a brilliant company that we're working closely with that grows organic matter in space. They 3D-print it. So if we can print organic matter in space, we will stop animal testing. Figuring out how to grow plants with a fraction of the water that we use on this planet will yield massive results.

How do you address risk with clients?

We utilize the "unsell" method, which is to tell you about why you should not go, about all of the risks associated. People should know that yes, they may die. That's something they should consider, and they should get their affairs in order. But if you're looking purely at statistics, you have more chances of dying in a car accident or walking on the street than you are flying on an airplane or doing space-related activities. It's a matter of engaging with trusted operators, and it's important to tout substantial testing and regulation. It was risky to fly in an airplane 100 years ago, but people did it, and now you and I could fly to London for $400 in economy class.

This interview was edited for clarity and length.

PHOTOGRAPH BY JUTHARAT PINYODOONYACHET FOR BLOOMBERG BUSINESSWEEK

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A Prayer for Bill Hwang

The once-soaring financier who lost $36 billion in a week must now fight to stay out of prison

It came to him in a dream. That's what Bill Hwang told people.

In his vision, the blood of Christ washes over New York, cleansing the great metropolis of its sins. Hwang—creator-destroyer of one of the world's great fortunes—was so moved by the idea that, like a modern Medici, he commissioned a famous artist to bring his dream to life.

Today the striking artwork hangs in the Midtown offices of the Christian charity Hwang established while building Archegos Capital Management, his family office, into a treacherous force that rattled markets. Rivulets of red paint, symbolizing the blood, ooze down the spire of the Empire State Building and the surrounding grayscale skyline.

It was in these offices just before Easter, with the first spring blossoms in Central Park framed through the 22nd-floor window, that three dozen people squeezed around a conference table in front of Hwang for a talk on scripture. Looking as impeccable as ever—thick, stylish glasses, green quarter-zip sweater, graying hair swept roguishly back—he stood before a large screen.

"Money Failed!" the slide flashed. Those words from the Bible, in Genesis 47, don't even begin to capture the wild arc the enigmatic financier has traced, or what is about to happen next.

In near total secrecy, Hwang amassed a fortune that briefly eclipsed $36 billion, only to see it wiped out very publicly. In the end, the Archegos flameout inflicted billions of dollars in losses at banks that did business with him—even hastening the death of Credit Suisse.

On May 8, the man born Sung Kook Hwang is due to appear at the federal courthouse in Lower Manhattan in what promises to be one of the most closely watched Wall Street trials in recent memory.

The US Department of Justice has accused the son of a Korean pastor of lying to some of the world's most powerful banks as they plied him with financing to make wagers that sent stocks soaring and crashing. Raising the stakes, federal prosecutors are invoking racketeering laws famously used to take down mob bosses. These could put Hwang away for 20 years. He has pleaded not guilty. "This is one of the biggest market-manipulation cases ever charged," says Josh Naftalis, a former federal prosecutor. "The big question now is, will this guy go to jail for it?"

It's all the more riveting because Hwang is a former acolyte of hedge fund legend Julian Robertson, founder of Tiger Management, making him a so-called Tiger Cub. "They are regarded as the most sophisticated traders out there," Naftalis says. "That's why people care."

It's not the first time Hwang, 60, has tangled with the law. His Tiger Asia Management hedge fund, the precursor to Archegos, pleaded guilty to wire fraud in 2012, while Hwang himself settled US civil claims that he engaged in insider trading. He didn't admit wrongdoing.

The Archegos fiasco left Wall Street executives red-faced as their banks tallied more than $10 billion in losses. Despite the investor's earlier run-in, they'd treated him as a prized client—with a thirst for risk that generated lucrative fees. Archegos' wipeout, in March 2021, took away all but a sliver of Hwang's peak fortune, which has shrunk to less than $100 million, according to people with knowledge of his finances, who asked not to be identified discussing private matters.

"I'm a great fan of Bill, and it could probably happen to anyone. But I'm sorry it happened to Bill," Robertson said shortly after Archegos blew up. Robertson, who died in August 2022, tagged Tiger Global Management's Chase Coleman and Hwang as two young investors destined for success in a 2007 interview.

Hwang had long seen his role as a Christian capitalist, someone seeking to make money to spread the faith. Since Archegos collapsed, his Grace and Mercy Foundation has become a refuge for former employees—and a lucrative one for some. Tax records show several Archegos staffers collected over $500,000 for work overseeing the charity in 2022, which had $528 million by the end of that year.

Prosecutors have sought to prevent Hwang from mentioning any "prior good deeds," including

Edited by David Rocks

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charity and philanthropy. There might be those who think Hwang is using his religion as a shield, says Andrew Field, a pastor at Redeemer Presbyterian, who's seen Hwang at New York events. "The knee-jerk reaction is he's being manipulative. There are plenty of people who've used that tactic," Field says. "For him it's bone deep, it's 100% legit."

A big question on Wall Street minds: How did Hwang ever think he could safely exit the outsize investments he'd amassed in ViacomCBS and several Chinese companies? His strategy, in retrospect, seems like market suicide. Archegos borrowed heavily from banks in Asia, Europe and the US as he bid up stocks to stratospheric heights. But selling would have brought their prices back down. When some slipped, lenders began issuing margin calls, toppling the house of cards.

Prosecutors say Archegos wasn't honest with banks about the extent of its borrowing and the concentration of its wagers. Credit Suisse lost $5.5 billion, which—along with other missteps—eventually culminated in the bank's emergency takeover by UBS Group AG. Nomura Holdings Inc. lost almost $3 billion, and Morgan Stanley more than $900 million.

Loyal friends insist Hwang did nothing wrong. They say he simply made bad investment decisions. In the end, these people say, money failed him; God didn't. That idea was the subject of Hwang's talk at the foundation in mid-March, photos of which were shared by a Grace and Mercy employee online. The discussion centered on the Old Testament account of Joseph, whose prophetic dreams and wisdom during a time of famine are often read as a story of God's power of redemption. "Bill shared how money had failed him, but the word of God doesn't fail," says Emerson Collins, who flew in from a Christian ministry in Colorado to be there.



The foundation has become even more central to Hwang as he awaits trial. He's often seen at book club meetings and Bible readings there, according to fellow participants. A signature effort is called Public Reading of Scripture, which, as the name suggests, emphasizes reading the Bible aloud. The project extends to prisons.

Grace and Mercy has become the employer of some people who used to work at Archegos. As of 2022, the foundation counted nine Archegos veterans among its officers and highest-paid employees, according to its most recent tax filings.

"Bill shared how money had failed him, but the word of God doesn't fail"

Those people include the family office's former chief financial officer, Patrick Halligan, a co-defendant in the Justice Department's case, who was paid $539,000 plus benefits in 2022 in his role as the philanthropy's treasurer. He has pleaded not guilty.

Diana Pae, the former co-president of Archegos who previously was a managing director at Goldman Sachs Group Inc., was the highest-paid employee, with a salary of about $1 million. Before the blowup, the nonprofit's tax filings showed that senior Archegos employees, such as Halligan and Andrew Mills, had donated their time.

Many of the Archegos employees used to trade for the investment firm and the nonprofit as part of their old job, and now only one of those entities is left, one of the people says. The foundation doesn't outsource its trading activities, the person says, and its assets grew significantly in 2023, capitalizing on ebullient markets.

Brendan Sullivan, a former Archegos employee who sued Hwang to claim up to $50 million in compensation, alleges in his suit that at Archegos retreats in 2018 and 2019, Hwang told staff that Grace and Mercy was his "fallback plan" if anything ever happened to his investment firm. During a company call on March 29, 2021—detailed in Sullivan's suit—Pae told employees that 15 to 30 Archegos employees could transfer to the foundation. "Hwang and Pae misrepresented these opportunities as a way of trying to triage the legal risk they knew they faced—civilly and criminally—by co-opting employees who might make claims against them or go to the authorities," Sullivan alleges.

Hwang's lawyer said in a court filing that Sullivan failed to establish that Hwang misrepresented ▶

◀ Hwang outside federal court in Newark, New Jersey, in 2012

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◀ anything, "let alone where, when and to whom."

By all appearances, Hwang himself continues to eschew the trappings of extravagant wealth. Since Archegos collapsed, he has lived in the same place he did when he was flying high: a modest corner of suburban New Jersey, plus a rented apartment in Manhattan for the trial.

Visitors arriving at the Grace and Mercy Foundation pass the artwork of Hwang's vision, stretching nearly from floor to ceiling and covering a large section of the wall. James Lillis, a senior pastor at a Connecticut church, shared a photo of the piece and the inspiration behind it with his online followers after visiting Hwang at the foundation in March.

The artwork is rendered in metal mesh by renowned South Korean artist Seungmo Park. Park also created a larger-than-life depiction of Olympic runner Sebastian Coe for Nike's headquarters in Oregon and the façade of Gucci's flagship store in Seoul. One of his works graced the upscale home at the heart of the 2019 Oscar-winning South Korean film *Parasite*.

At the March gathering where the story of Joseph came up, neither Hwang nor his visitors discussed the looming criminal case, says Collins, the Colorado attendee. Hwang spent time with his visitors throughout the event, and they even went to a synagogue to hear the Torah read aloud, to observe and emulate the public reading of scripture. "We still continue to pray for him," Collins says. —*Sridhar Natarajan, Ava Benny-Morrison and Katherine Burton*

THE BOTTOM LINE The man behind the spectacular rise and fall of Archegos goes to trial this month with his faith unshaken by his recent troubles.

The Growing Excitement Over Boring Banks

● A year after SVB's failure, regional lenders have embraced their fundamental stodginess

In March, PNC Financial Services Group Inc. introduced TV ads and plastered signs across its branches arguing that it's "brilliantly boring." On an April conference call, Fifth Third Bancorp Chief Executive Officer Tim Spence boasted that the lender's results were "boring." And on April 25, Frank Namdar, chief credit officer of Columbia Banking System Inc., described his property loan portfolio as "really quite boring, which somebody like me loves to see."

A year ago, as regional lenders found themselves thrust into the public spotlight, banking was anything but tedious. For an industry underpinned by trust—the belief that customers' deposits will be safe—the rapid implosion of Silicon Valley Bank and two other large regional institutions offered a heart-stopping glimpse of a less-than-boring financial sector.

In a few frenetic days in March 2023, SVB plummeted into receivership. Even as the government stepped in to guarantee all deposits at the troubled institutions beyond the normal insurance limits, investors recoiled and skittish consumers and corporations increasingly directed their business to behemoths like Bank of America, Citigroup and JPMorgan Chase. That set off intense competition among smaller lenders, who saw margins shrink as they increased the interest rates they paid on deposits to win new customers and retain existing ones.

Now, regional banks are working to rebuild trust and explain all the ways they're not like the high-flying companies that failed. And the industry is coalescing around a new image: stodgy, stuffy and dull. "Banking should be boring," says Mike Mayo, a Wells Fargo & Co. analyst who's covered the sector for decades. "It should be like turning on the faucet and seeing water run out."

Bank executives and analysts have uttered the word "boring" at least a dozen times on conference calls this year, double the level of all of 2022, before the SVB meltdown. Throw in terms such as "cautious" and "conservative" and widen the lens on the tumult of last year, and you get to the most ardent embrace of the humdrum in a decade or more. In its TV spot, for instance, PNC tells viewers it's so pedestrian and dependable that its customers don't need to be. In a crisis, "banks that are boring and do their basic job tend to leapfrog the banks that are trying to be heroic in an industry that doesn't need heroes," says CEO William Demchak.

In recent years, SVB had stood out as a thrilling growth machine. Its client list brimmed with ambitious startups rolling in venture capital cash, providing it with a vast pool of deposits. SVB loaned that money out to others or invested it in securities that were considered safe. But VCs pulled back

▼ Share of US survey respondents who report "a great deal" or "quite a lot" of confidence in banks

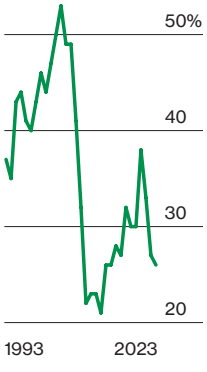


ILLUSTRATION BY LUCAS BURTIN. DATA: GALLUP

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in 2022, spurring startups to drain their balances just as inflation was taking off.

The tension between these forces exploded as more and more clients pulled cash from the bank and SVB had to sell the securities at a loss. Then an attempt to raise capital fell apart as the stock plunged. Depositors yanked additional billions, and SVB collapsed into receivership. New York's Signature Bank and San Francisco-based First Republic Bank, similarly plagued by fleeing depositors, soon suffered the same fate.

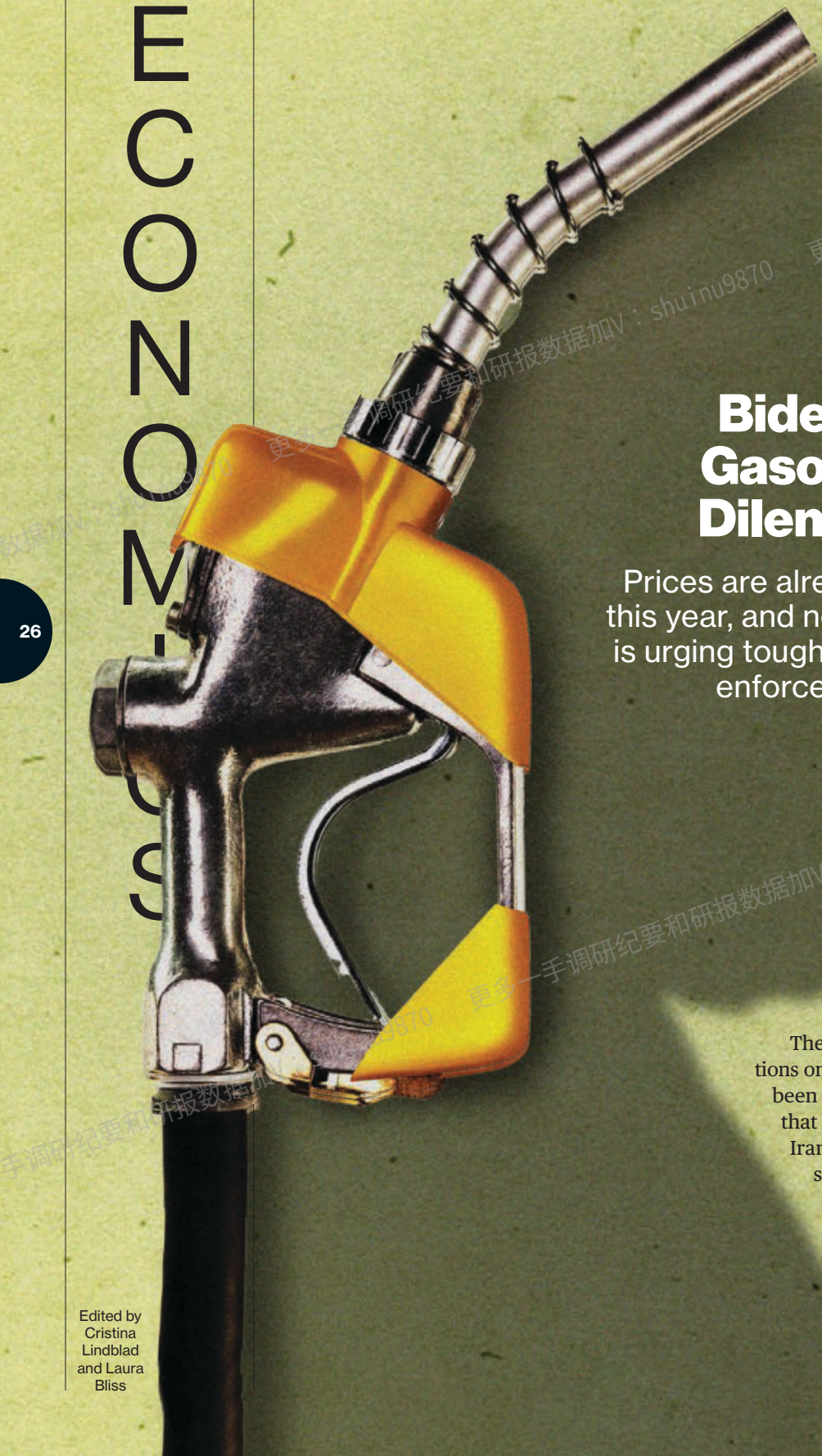
Politicians and academics have long made the case that regulators should force banks to be as uninteresting as possible. In the wake of last year's failures, Massachusetts Democratic Senator Elizabeth Warren told CNBC that she wanted banking to get back to "where it ought to be, and that is boring." Lev Menand, an associate professor at Columbia Law School, says banks should be treated like utilities. But deregulation that began in the 1980s has allowed lenders to build nationwide networks and seek to supercharge profits with riskier bets on the market. "You don't get up one day and worry that your electric utility company is going to fail," Menand says. "It used to be like that with banks."

Faith in banks typically ebbs and flows along with the perceived strength of the financial sector. An annual survey by Gallup, published last summer, shows it falling back toward the levels of the late aughts, when failures on Wall Street triggered the global financial crisis. As SVB circled the drain last year, online health-food retailer FarmboxRx frantically tried to pull millions from its account there, then soon emptied another—at the ill-fated First Republic. Today the company keeps its money at megalenders Wells Fargo and Bank of America Corp. "We've had two smaller banks fail on us," says founder Ashley Tyrner. "We've definitely taken the too-big-to-fail route."

Customers, of course, never want to worry about their bank's durability. And for investors, after watching once-skyrocketing regional banks collapse, a conservative lender's steady dividends and dependable growth have a renewed appeal—exactly what some in the business have long stressed. "We are still boring," Richard Davis, then CEO of U.S. Bancorp, told Bloomberg more than a decade ago. "Boring means we won't get in and out of stuff we don't know." —*Bre Bradham*

THE BOTTOM LINE Lenders are working to rebuild trust and explain why they're not like their swashbuckling rivals that failed, leading to an increasingly ardent embrace of the humdrum.

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Biden's Gasoline Dilemma

Prices are already up 18% this year, and now Congress is urging tougher sanctions enforcement

With only six months to go before the election, President Joe Biden's strategy to lower gasoline prices is in jeopardy.

The administration's soft approach to sanctions on oil from Iran, Russia and Venezuela has been key to its efforts to tame fuel costs. But that leniency is becoming politically riskier: Iran's attack on Israel has intensified pressure on Biden to crack down on crude exports from the Islamic Republic. The OPEC member produces approximately 3 million barrels a day, equivalent to about 3% of global supply. And though Iranian crude might not find its way into US gasoline tanks, its presence generally helps to limit price gains.

Edited by Cristina Lindblad and Laura Bliss

PHOTO ILLUSTRATION BY 731; PHOTOS: GETTY IMAGES (1); AP PHOTO (1); DATA: AAA, US DEPARTMENT OF ENERGY

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The calculus is getting tricky for Biden before an election in which the rising cost of living is expected to figure prominently in voting decisions. History has shown that the fortunes of US presidents are closely tied to prices at the pump, even though they have little control over the oil market in the short term. As violence roils the Middle East, US gasoline prices have surged 18% this year—and the summer driving season hasn't started.

"The Biden administration is just pathologically allergic to anything that would increase oil prices, and they have telegraphed that over and over again," says Jim Lucier, managing director at Capital Alpha Partners, a research group in Washington. But, he adds, there's not much the president can really do about it: "Biden is in a box on this question."

Tried-and-true strategies are reaching their limit. Take, for instance, the president's approach to crude from Iran, Russia and Venezuela. Despite more than a decade of US sanctions, Iran's oil production in March surged to a six-year high of 3.3 million barrels a day. That's up 75% from the low point in late 2020 under then-President Donald Trump, who stiffened penalties for those that violated existing prohibitions. Currently about 80% of Iran's exports of roughly 1.5 million barrels a day go to China, where they're refined by small independent refineries, according to a congressional report.

Led by the US, Group of Seven countries implemented a $60-per-barrel price cap on Russian crude in September 2022. The goal: to curb the Russian government's revenue to fund its war on Ukraine without choking off a critical supply source. And even though the Biden administration reinstated oil sanctions on Venezuela, to punish President Nicolás Maduro for reneging on a pledge to hold free and fair elections, it's allowing Chevron Corp. to continue operating in the country.

Now lawmakers are pushing the administration to take a tougher stance on the Iranian government in the wake of its drone strike on Israel in April. Congress is trying to force the president's hand, with provisions in the new Ukraine aid package spelling out sanctions that extend to foreign ports, vessels and refineries that knowingly accept Iranian crude.

Biden, who still has plenty of enforcement discretion, is unlikely to curtail Iranian oil exports significantly. Still, Republicans designed sanction waivers under the Ukraine aid measure to be public—potentially to embarrass him into taking action or, otherwise, to help them make the case that he's been too soft on Iran.

If Biden tries to "lower gasoline prices by providing sanctions relief, then Republicans will be able to pin him on it in the political theater that is this election cycle," says Kevin Book, managing director at ClearView Energy Partners LLC.

The risks may be especially acute for Biden, because he's taken pains to proclaim lower gas prices a priority. His high-profile pronouncements on the issue have included accusing oil companies of "war profiteering." He's also resorted to emergency measures to increase oil supplies, as a way of easing prices.

Since 2022 the president has authorized a historic release of more than 200 million barrels from the US emergency oil stockpile, draining the Strategic Petroleum Reserve to a 40-year low. And he's issued waivers allowing widespread summertime sales of higher-ethanol E15 gasoline, which generally costs less than its conventional E10 counterpart. "Joe Biden is going to keep fighting to lower prices that squeeze families' budgets, like gas prices," Biden campaign spokesman Charles Lutvak said in an email.

There's also been a behind-the-scenes aspect to the administration's efforts to tamp down prices. In February, Vice President Kamala Harris asked Ukrainian President Volodymyr Zelenskiy to abstain from attacking Russian oil refineries, according to a person familiar with the matter, who asked not to be identified describing a private diplomatic conversation. And during a visit to Saudi Arabia this fall, national security adviser Jake Sullivan told officials the US would like to see the Organization of the Petroleum Exporting Countries start unwinding production cuts.

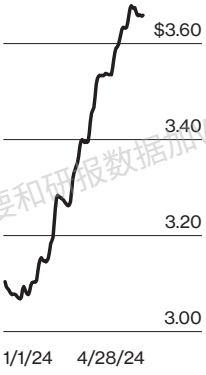
At home, Biden could once again tap the Strategic Petroleum Reserve, even though it's only half full. Speaking at a conference last month, White House climate adviser John Podesta refused to rule out another SPR release.

Some Democrats would like to see Biden curtail exports of American crude and refined fuels to lower prices temporarily. But over time, moves to lock in supplies domestically could backfire by leading to a glut, driving down prices and causing US refiners to dial back output. Similarly, oil companies might respond to export curbs by cutting production.

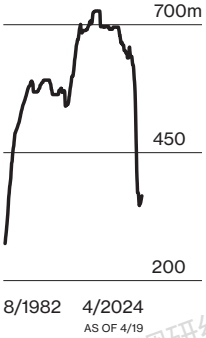
"There is a limit to what presidents can do," says Dan Yergin, vice chair of S&P Global and the author of the Pulitzer Prize-winning *The Prize: The Epic Quest for Oil, Money & Power*. "Presidents never get credit when gasoline prices are low, but they always get blamed when gasoline prices are high." *—Jennifer A. Dlouhy and Ari Natter, with Daniel Flatley, Akayla Gardner and Justin Sink*

THE BOTTOM LINE The White House is running out of options to lower gas prices, which, fairly or not, are often tied to voting decisions.

▼ Regular gasoline, average US retail price per gallon



▼ US Strategic Petroleum Reserve, in barrels



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Modi Sets Sights on A 'Developed India'

● Economists are skeptical GDP can grow fast enough to meet the prime minister's 2047 target

In an August 2022 speech delivered at the historic Red Fort in New Delhi, Prime Minister Narendra Modi made a bold pledge: India will be a developed country by 2047.

The annual Independence Day address is often big on promises and grand visions, so the pronouncement didn't stand out at the time. Yet more than a year later, the phrase "Viksit Bharat"—or "Developed India"—has come to define Modi's economic vision for a likely third term in office, in national elections that began on April 19 and run through June 1.

The phrase has cropped up in at least 23 of the 29 official speeches Modi has made since March. His Bharatiya Janata Party highlights the goal prominently on the first page of its 76-page election manifesto and goes on to mention it 11 more times. It also regularly surfaces in presentations by government ministers and has filtered into policy documents. Central bank staff members have published their own road map for reaching it.

"This decade is crucial for fulfilling the dreams of a Viksit Bharat," Modi said at an event in March. "This decade is about fulfilling those aspirations that once seemed impossible to the people."

There's no standard definition of a developed country, and Modi hasn't announced any specific targets, making it difficult for economists to assess India's chances of meeting his goal.

The World Bank ranks countries from low to high income. Analysts at Oxford Economics crunched the numbers and concluded India would need to raise per capita income levels from $2,434 last year to $13,845, based on 2023 prices, to attain high-income status by the centenary of its independence from Britain. This would require boosting gross domestic product more than sixfold, to about $23 trillion, which would necessitate economic growth of at least 8% a year for the next quarter century.

Modi's target "is highly ambitious," Alexandra Hermann, Oxford Economics' lead economist, said in an email. "Never say never, but our own forecasts are for the economy to grow by 6.6% per year on average over the next five years, with the pace of expansion slowing over the medium term as the economy develops further."

Even though India's economy grew more than 7% in the fiscal year ended in March and is expected



◀ Modi greets the public at a roadshow on April 6 in Ghaziabad

ELKE SCHOLIERS/ZUMA PRESS

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to match that in the current one, achieving a consistent 8% pace would be extremely difficult. China was one of the few countries to manage it—growing an average of 10% a year for about three decades after it initiated economic reforms in the late 1970s—yet the World Bank still classes it as an upper-middle-income country.

"Given that India has never consistently achieved 8% growth per year, I think it's pie in the sky," Tom Miller, a senior analyst at Gavekal Research, said in an email. "India is more financially constrained than China was, and nor is its economy structured to grow through massive China-style investments." That doesn't mean India can't expand fairly rapidly and "develop successfully over the next quarter century, which is what actually matters," rather than meeting some arbitrary target, he said.

China's per capita income stood at $12,720 as of 2022, according to the World Bank. President Xi Jinping's target is to make it a "medium-developed country" by 2035—a goal that's also not clearly defined but which economists say implies a doubling in the size of GDP from 2020 levels.

The United Nations' Human Development Index, which takes into account health and education metrics, along with other criteria of quality of life, is often used as a yardstick to measure a country's prosperity beyond income levels. By that gauge, India currently ranks as medium level, with an index score of 0.64. A country is generally considered developed with an index level above 0.8.

Among India's biggest challenges will be improving its education system and providing more jobs for the millions of young people who enter the labor market every year. Research from the International Labour Organization shows that almost a third of university graduates in the country are unemployed, a level almost nine times higher than for those who can't read or write. More than half the population of 1.4 billion is younger than age 30.

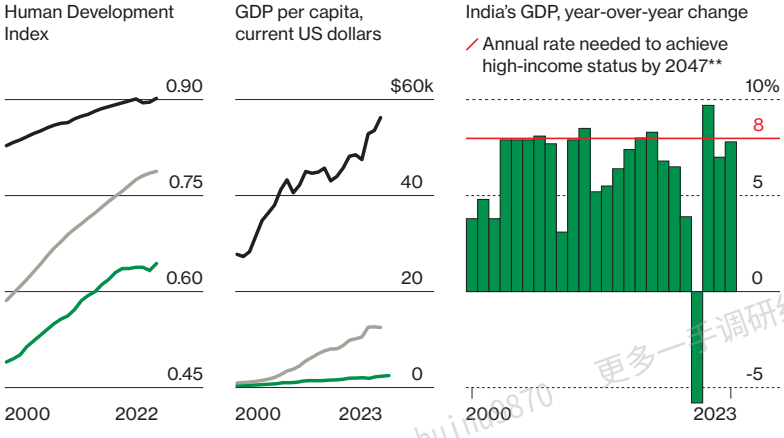
Raghuram Rajan, India's former central bank governor and now a professor at the University of Chicago Booth School of Business, has said it's "nonsense" to talk about being a developed economy without improving education. Modi's supporters and government officials have roundly criticized Rajan on social media for his views.

Viksit Bharat is less about hard targets and more about tapping into the aspirational spirit of Indians who see their country growing in stature globally, says Milan Vaishnav, director and senior fellow of the South Asia Program at the Carnegie Endowment for International Peace. "Even if India does not achieve the benchmarks Modi has laid out, few will fault him for setting a marker down," he says.

In his almost 10 years as prime minister, Modi has rolled out several campaigns to boost India's stature. His administration's "Make in India" program, which aims to turn the country into a world-class manufacturing hub to rival China, is credited with helping increase annual foreign direct investment by more than 40% since 2014. Besides lobbying US businesses such as Apple Inc. and Tesla Inc. to expand or open factories in India, his government also has courted investors in the Middle East. As chair of the Group of 20 countries last year, Modi positioned India as the voice of the so-called Global South of developing countries.

How India Stacks Up

India China Advanced economies*



*VERY DEVELOPED COUNTRIES (HUMAN DEVELOPMENT INDEX); ADVANCED ECONOMIES ACCORDING TO THE IMF (GDP).
**BASED ON AN ANALYSIS BY OXFORD ECONOMICS. DATA: UNITED NATIONS DEVELOPMENT PROGRAM, INTERNATIONAL MONETARY FUND

Although officials haven't publicized economic targets to reach the 2047 goal, internal estimates by the Ministry of Finance project the economy will reach $6.69 trillion by 2030 and $29.02 trillion by 2047, before adjusting for inflation, according to people familiar with the figures. In the next six years, Modi's goal is to double per capita income, to $4,418, they say, asking not to be identified because the discussions are private.

"Leaders like Modi love coming up with grand development targets, especially when they are lapped up by domestic audiences," Gavekal's Miller said in his email. "Yes, it's good to be ambitious—and China, for one, has used targets to direct policymaking. But I don't put much store in the target date itself." —*Ruchi Bhatia and Anup Roy*

THE BOTTOM LINE India is unlikely to reach developed status by 2047, which would require a sixfold increase in GDP. But that may not matter politically for Modi.

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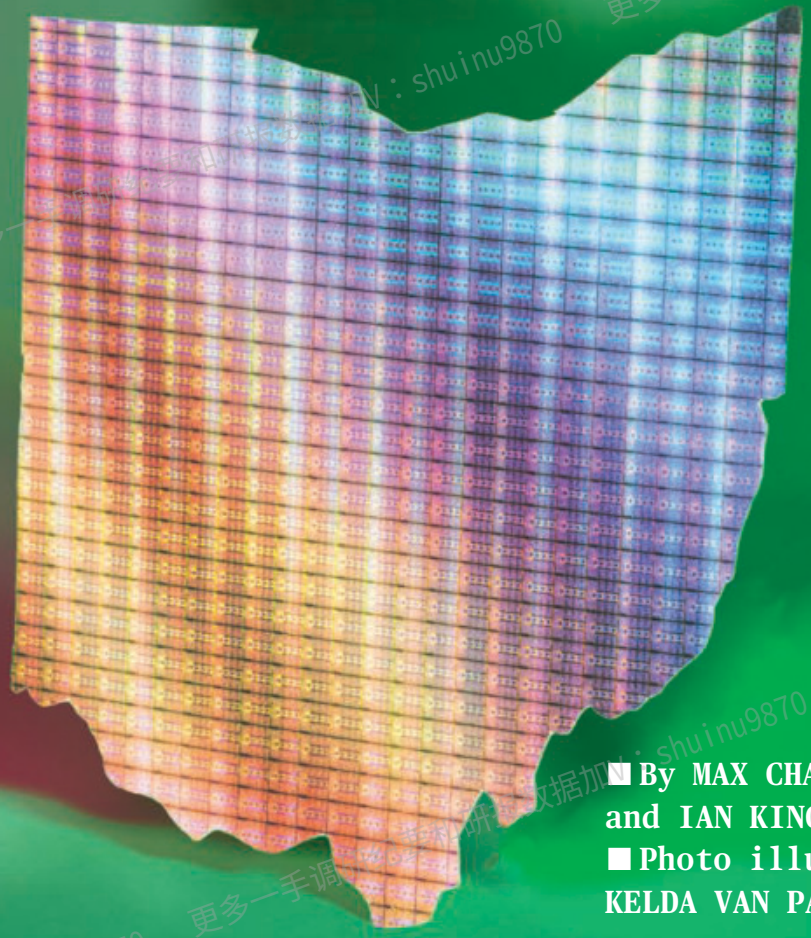
THE TECH ISSUE

In this historic election year, it's clearer than ever that the technology industry is playing a key role in the geopolitics and policymaking that shape our world. This edition of our annual Tech Issue looks at how the industry is wielding power in these spheres, who stands to win big, and what that means for the rest of us. Sometimes it's a surge of construction jobs in America's heartland. Other times it's a fresh crop of get-rich-quick schemes on the blockchain. But when all else fails, it'd be nice if the car stereo just worked.

—THE EDITORS

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INTEL INSIDE OHIO



The company that defined Silicon Valley has spent a decade flailing and been overshadowed by Nvidia. It's betting its comeback runs through the Midwest

■ By MAX CHAFKIN and IAN KING
■ Photo illustration by KELDA VAN PATTEN

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A FEW MONTHS AGO, A TUGBOAT SET off from New Orleans, pushing a barge up the Mississippi River. It moved northward through the Deep South and then cut east, past Indiana farmland along the Ohio River. The barge was carrying a cold box for a gigantic air separation unit, a piece of industrial equipment that pulls nitrogen from the atmosphere for use in manufacturing. The cargo was so big that transporting it through Cincinnati, where container ships usually unload in southern Ohio, was impractical. At 270 feet long, 19 feet wide and 24 feet tall, it wouldn't fit under the highway overpasses near the port. So the boat floated 75 miles or so upriver before stopping at an abandoned dock just outside the tiny village of Manchester. For weeks now, it's been sitting by the bank, waiting for the final leg of its journey, set to begin later this spring.

Then a team of workers will load the cold box onto a massive semitrailer designed for so-called superloads. While police cars clear the roads between the river and the tower's destination, cherry-pickers will push power lines and traffic lights out of the way. This convoy-slash-roadblock will proceed at about 8 mph to New Albany, Ohio, stretching out a trip that most cars can make in two hours to about two weeks. Over the next few months, a similar operation will take place 20 more times, delivering air separation and crane parts to a construction site that many in the region are betting will be the future of the semiconductor industry.

This is Ohio One, a future "mega fab"—or factory—being built by Intel Corp. The company has committed $28 billion to build a fab that, if all goes well, will be able to credibly compete for contracts to manufacture state-of-the-art chips used in smartphones and in the training of next-generation artificial intelligence algorithms. Ohio One, says Chief Executive Officer Patrick Gelsinger, could eventually be the biggest chip factory on Earth. Not to be grandiose or anything, he adds, but it's part of a strategy that will also stave off America's economic decline, because chips are essential to almost every manufactured good. "I just view this as existential to our economy, to our national security," Gelsinger says at Intel's headquarters in Santa Clara, California. "I don't view failure as an option."

The fab isn't scheduled to open until at least 2027, but politicians are already taking credit for even the tiniest bits of progress, posting videos of the superload trips on social media and using every opportunity to talk about the potential job creation. These officials include state Republicans as well as members of the Biden administration, which has made the Intel plant a showpiece for its economic policy. In his State of the Union address two years ago, President Joe Biden called the Ohio One site a "field of dreams," describing it as "the ground on which America's future will be built." This past March the US announced it had agreed to provide Intel with $19.5 billion in loans and grants to help finance the project in Ohio, along with similar ones in Arizona and Oregon, as part of the Chips and Science Act. "Folks, it's about time," Biden said, announcing the Intel subsidy package. "Even though we invented the most advanced chips, we make 0% of them today."

The subtext wasn't very sub. From war-making to basic communication, the world runs on semiconductors, and most of the best ones are made in Taiwan. In the event of another pandemic or if Beijing decides to invade Taiwan, US supplies of all kinds of hardware could be crippled. In the weeks that followed the announcement of the Chips Act award, there were more subsidies for chip factories in the US: $12 billion for one being built in Arizona by Taiwan Semiconductor Manufacturing Co., better known as TSMC, and $6 billion for one in Texas being built by South Korea's Samsung Electronics Co. These domestic facilities can't produce everything the US needs. But while they don't represent chip independence, they're at least an insurance policy and, maybe, a start.

Today, Biden's field of dreams is mostly a muddy expanse on the edge of a pig farm. Still, things are happening. Suppliers are renting real estate, community colleges are spinning up programs to train future semiconductor technicians, and 1,400 workers are digging trenches, laying foundations and pouring concrete for the building itself. That's the easy part. Semiconductor fab production is arguably the most challenging and expensive act in all of business, a mess of attempts to turn experimental science into mass production.

If the stakes are high for the US, they may be even higher for Intel. The company that turned the phrase "Silicon Valley" into a metonym for the tech industry, and was one of the world's largest by market value two decades ago, has been upstaged by TSMC and a raft of chipmakers that outsource the actual making of chips. Nvidia Corp., once a bit player best known to gamers who coveted its graphics cards, is now worth more than $2 trillion, or more than 16 Intels. Sales of Intel's once-dominant processors are stagnant, its stock has fallen more than 30% this year, and its manufacturing, once the crown jewel, is bleeding money. In April, Intel disclosed that the manufacturing operation lost $7 billion last year, with more losses to come.

"Huge numbers, atrocious numbers," says Gelsinger, a wiry, intense engineer who, at 63, has spent most of his professional life at Intel. But Gelsinger blames those losses on the previous regime. He says that when he took over three years ago, Intel was months away from being sold for parts. Now, he says, the company has embarked on a yearslong plan to restore its dominance, just as it did in the 1990s when it overcame what seemed like insurmountable competition from Japanese chipmakers. "This is gonna be hard, multiyear, heavy, expensive," he says. On the other hand, he adds, "we've done it before."

AT BOTTOM, THE MODERN TECHNOLOGY industry requires somebody to figure out a way to arrange tiny electric circuits, known as transistors, onto polished silicon discs. Robert Noyce and Gordon Moore pioneered the process at Fairchild Semiconductor, a company they co-founded in 1957, and industrialized it at Intel, which they started 11 years later. Intel created the first commercial microprocessor, the 4004. The 4004 included about 2,300 transistors, with circuits that were about one-tenth the thickness of a human hair, intricately arranged in a thumbnail-size package with the processing

OVERHEAD: COURTESY INTEL. GELSINGER AND BIDEN: GAELEN MORSE/BLOOMBERG

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power of a computer that would have once occupied an entire closet. This was done using photolithography, a printing technique in which the silicon disc—a "wafer"—is covered with a light-sensitive material and hit with light, burning an intricate pattern. The process has only gotten more complex. In 1976 the top-of-the-line chip had 29,000 transistors. The first Pentium, released by Intel in 1993, had 3.1 million. The company's Xeon chips, which enabled the rise of Gmail, Netflix and other cloud computing services, have billions.

Intel has defined itself, and the rest of the industry, largely in terms of this sort of escalating complexity. In 1965, Moore predicted that the number of transistors on a state-of-the-art chip would double every year. Moore himself regarded this prediction as more of a guess—decades later he described it as "wild extrapolation"—but Intel took the idea, which has since become known as Moore's Law, and helped turn it into something like a Silicon Valley religion. Elon Musk has applied it to batteries for electric cars, Masayoshi Son has employed it as a justification for SoftBank Group Corp.'s wild investments in robotics, and Ray Kurzweil has made it central to his theory that someday we'll all upload our brains to computers and live forever.

While Moore's Law has exploded in popularity as a metaphor, its predictive power has weakened. In 2006, Gelsinger, then an Intel senior vice president widely seen as a potential CEO, wrote an essay for an engineering newsletter that declared "the genius lives on," noting "we see no end to Moore's Law in the coming decade." But about this time, developers found they could no longer make a chip twice as efficient by simply doubling its number of transistors. As breakthroughs grew tougher and fab costs rose, the market drove more manufacturers out of the business. This included Intel's main US competitor, Advanced Micro Devices Inc. (AMD), which eventually outsourced its production of high-end edge chips to TSMC instead. In 2009, Intel announced a reorganization that sidelined Gelsinger, and he left to become chief operating officer at EMC Corp., which makes memory systems for servers.

Gelsinger, who'd joined Intel as an 18-year-old trade school graduate from rural Pennsylvania, hasn't forgotten how it felt to be pushed aside. He'd been at the company for 30 years and was a mentee of legendary CEO Andrew Grove. "It took me a long time to get over it," he says, before invoking the five-note jingle that still plays at the end of Intel's commercials. "I did the Intel Bong as I went to sleep each night, and I didn't stop doing it for three or four years after I was gone. I wanted to run this place."

His departure coincided with a series of increasingly dire missteps at Intel. The company passed up the chance to manufacture chips for Apple Inc.'s iPhone and struggled to find a way to break into that market in the years that followed. Rivals that took the job—Samsung and, later, TSMC—rode the smartphone boom and used the cash to chase Moore's Law. There, too, Intel shrank from a challenge.

Intel had worked closely with a Dutch lithography company, ASML Holding NV, to develop an etching technique called extreme ultraviolet lithography. EUV promised to help squeeze the size of the features on a cutting-edge chip down from 14 nanometers to 10nm and eventually to even smaller sizes. (In chips, of course, smaller is better.) But the technique was unproven and expensive, and then-CEO Brian Krzanich attempted a workaround with less advanced machines. Gelsinger now calls this "one of the stupidest decisions that Intel made." He blames it for delays that left the company a full two generations of chips and several years behind TSMC by 2020. (Krzanich didn't respond to requests for comment.) These technical setbacks would have lasting damage, as AMD's Taiwan-made server chips gained market share and as companies like Apple, Google and Amazon cut their purchases of Intel's chips and designed their own instead, paying TSMC to manufacture them. In 2020, Krzanich's successor, Bob Swan, suggested Intel might have to give up manufacturing, too.

Gelsinger watched this with a mix of pain and frustration. Intel, he believed, was perhaps six months from a total collapse where "nobody could have saved it," he says. "We would've been exiting technology development, and we would've been selling the manufacturing assets at dimes on the dollar."

At the time, he was running another company, VMware, but he wrote a memo to Intel's board, urging a radically different strategy. Gelsinger would bet it all on manufacturing, investing billions of dollars on fabs while frantically trying to catch up to TSMC's most sophisticated manufacturing processes. Intel would enter TSMC's main business of making chips for other companies—known as the "foundry" model—which would lead to higher volumes and allow it to continue to pursue next-generation research. In February 2021, ▶



■ An overhead view of the Ohio site in early 2024



■ Gelsinger and Biden breaking ground in Ohio in 2022

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◀ Intel's board announced the CEO job was his. "The old Intel is the new Intel," Gelsinger told a group of Wall Street analysts the following month. "The world needs more semiconductors, and we're going to step into that gap."

The comments were meant to evoke nostalgia for the Intel of yore and speak to a new political reality. The supply chain disruptions of the Covid-19 era had crystallized the risks of outsourcing. Prominent Republicans and some Democrats were loudly warning about China's influence on the tech industry and threat to Taiwan. And Biden had just won the White House promising massive government spending to help rebuild the US industrial base. Gelsinger, adopting a pose that was part patriotic technologist and part cold-hearted capitalist, suggested to lawmakers that the US would need to step up its subsidies or lose a national champion. "We either get the Chips Act done," he recalls saying, "or I should build all my factories in Asia."

There was a logic to this, but it sidestepped the role Intel itself had played in the decline of US chipmaking capacity when it ceded technological leadership to TSMC. It arguably understated the challenges of mounting a comeback. Intel's share price has plummeted because investors worry the company can no longer sell enough chips on its own to build lots of new state-of-the-art factories, and its ability as a foundry is unproven. Gelsinger has disputed this, but the fear is that big foundry customers might wait years before giving Intel a substantial contract, says Matthew Ramsay, a semiconductor analyst at TD Cowen. "Intel is still one of the most, if not the most, strategically important manufacturing companies in the United States," he says. "But when you look at their track record over the last seven or eight years juxtaposed against the amount of wood-chopping they need to do, it's going to be hard."

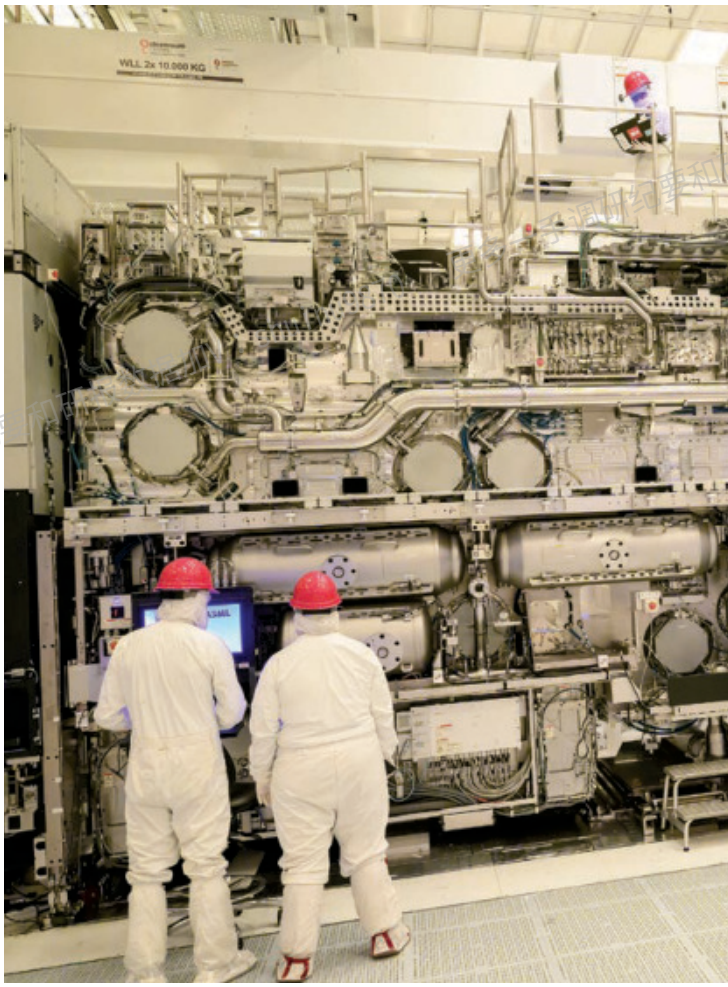
THE FIRST THING YOU NOTICE WHEN you drive onto the grounds of any fab is the infrastructure: power stations, water treatment plants, storage tanks and a vast thicket of pipes used to bring in the enormous quantities of purified air and water the chipmaking process needs.

Each Intel fab starts with the same basic design, a flat-roofed structure with the main factory on the third floor. This is the clean room, the heart of the operation. It sits above two floors of utilities, ducts and equipment, and one floor below what's got to be the world's most powerful HVAC system, an array of fans and filters blowing in ultra-pure air. The floor tiles are perforated, and a huge vacuum system underneath them ensures that the air turns over six times per minute. The air filtration is expensive but necessary. A single particle—a tiny flake of dead skin, a droplet of water from a sneeze—can destroy a $10,000 chip. Bright light applied at the wrong time is bad, too, which is why the rooms are lit a dull yellow.

Intel executives like to boast that their clean rooms are a thousand times cleaner than a hospital operating room. The low light and all the talk of purity can make a visit feel a little cultish, as can the secrecy. Until recently, Intel almost never let outsiders in, and even executives would need special permission. But the promise of almost $20 billion in taxpayer money, and the need to persuade other chipmakers to trust it with their designs, has changed the equation.

"We either get the C should build all my

In mid-April, a gang of Intel executives and their publicists led two *Bloomberg Businessweek* reporters through what one guide called a "hierarchy of cleanliness" at D1X, the company's research and development fab just outside Portland, Oregon. We put on glove liners, hairnets and protective shoe covers. We sanitized our phones with wipes, then turned them off because radio signals can disrupt the machines. That got us into an inner room where we put on hoods with face masks, followed by Gore-Tex coveralls, a second pair of shoe covers, a second pair of gloves and, finally, safety glasses. We were given latex notepads (regular paper sheds particles when written on) and were warned that bumping into anything could risk shutting down production. Then we proceeded, very carefully, through a heavy set of glass doors.



WALDEN KIRSCH/INTEL (2)

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Chips Act done, or I factories in Asia”

Inside was a space that stretched a dizzying quarter mile long and several hundred feet across. Machines in sizes ranging from large to humongous were laid out on either side of a sort of thoroughfare, a reinforced metal floor known as the Silver Highway. A typical fab has 1,200 of these “tools,” which look like distant cousins of the copy machine you’d find in a normal office, but way bigger. A small tool, like a metrology instrument for making sure the layers being deposited on a wafer are properly applied, was the size of a minivan. A medium-size one approximated a school bus.

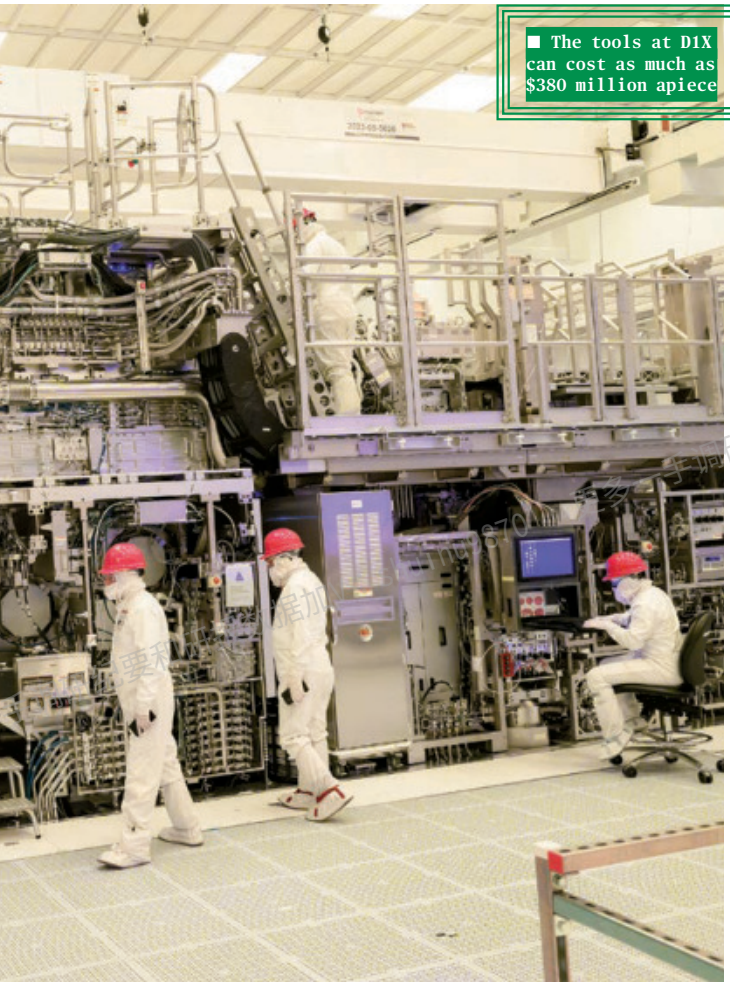
The largest tool was also the newest: ASML’s latest EUV machine, which is the size of a tennis court and costs $380 million. This “high numerical aperture”—or high NA—EUV machine was positioned in a section of the fab some engineers had taken to calling “the billion-dollar bay,” because of the wildly expensive tools involved. It arrived in Oregon from the Netherlands last year in 43 specially constructed shipping containers. Assembly took months and was only just finished.

Gelsinger says that not long after getting the CEO job he began furiously lobbying ASML for early access to the tool. “It was, you know, ‘We’re not going to debate it, we’re not going to leave this meeting, I’m not going to let you get up from your chair,’ ” he recalls saying. For now, he has it: The machine is so new, the only other one that’s fully assembled is at ASML’s own headquarters.

High NA machines are as big as they are because they use light, if you can even call it “light,” that doesn’t occur naturally on Earth, and because they employ an enormous array of mirrors and lenses to shrink the lithography down to a scale that you’d need an electron microscope to see. The light starts just below the fab floor in a huge laser drive—the kind normally used to cut heavy-duty steel. Then it’s shot into three similar laser drives that amplify it further. The laser beam then comes up through a hole in the floor and into the main tool itself. From there, it hits a drop of liquid tin and instantly vaporizes the metal. The tin is heated to 220,000C, about 40 times the surface temperature of the sun, producing a burst of radiation that occurs nowhere in nature.

That extreme ultraviolet light bounces off a series of mirrors before it hits the wafer. The entire operation—the lasers, the tin hotter than the surface of the sun, the mirrors, the wafer—is a single step in a process that takes three to six months to yield a finished product. During that time, each wafer will go through thousands of steps of layering, etching, measuring and washing until there’s an intricate pattern of hundreds of billions of transistors. Some of these layers will be as thin as a single atom. “We build it layer by layer,” says Jeff Birdsall, a vice president who runs manufacturing in Oregon. “Think of it like building a city from the bottom up.” When the wafer is finished, it’s cut into several hundred individual chips.

The obscene cost, complexity and time involved in this microscopic ballet makes sense only if you can do it at high volume, which means having tens of thousands of wafers in production at any given time. But if volume falls, either



■ The tools at D1X can cost as much as $380 million apiece



■ Suiting up to enter the clean room

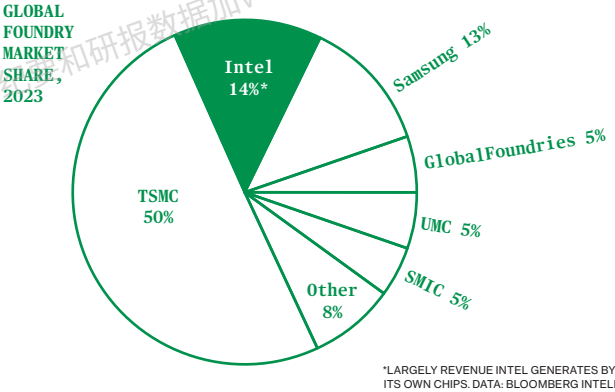
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◀ because customers stop buying or because the process doesn't work the way it's supposed to, a chip company can find itself in a sort of death spiral, making less money and then having less to invest in innovations. That's arguably what's happening to Intel. As its chipmaking skills declined, it was forced to do what every other chipmaker was doing at the time: outsource its high-end chips to TSMC.

Even today, even with all of Gelsinger's swagger, roughly 30% of the top-of-the-line chips Intel sells are made by TSMC. Those chips cost Intel extra money to make and they also reduce volumes, making its aging factories even less profitable than they would be. The hope is that by investing in new fabs and by touting state-of-the-art machines, Intel can reverse the death spiral—"bringing more of those wafers home," as Gelsinger put it in a recent call with analysts. Of course, TSMC and Samsung are also building new fabs and will get their own high NA EUV machines. In fact, just days after Gelsinger talked up his early access to the high NA machine, ASML announced it had shipped one to a second customer. Intel's head start will last for only a few months.

BUILDING A NEW FAB, ON THE OTHER hand, takes three to five years, from groundbreaking to full production, and requires some basic elements: "You're looking at land, power, water," says Maureen Duhig, an Intel vice president in charge of developing new chipmaking processes. "You need a lot of water." (Intel's Ohio site plan called for as much as 6 million gallons a day—roughly twice the volume used by Ohio State University, which has 100,000 students and staff. The company says that it will actually use less and that most of its water will be recycled.) Then there are the roads, which need to be wide enough to carry all the superloads, not to mention construction equipment and the tools that will eventually be shipped in. Finally, you need people. Fabs are mostly run by robots, but Intel's project will need thousands of technicians and even more construction workers.

Those potential jobs caught the attention of state governors in early 2021 and led to what Gelsinger describes as an "intense negotiation." Intel considered bids from four states, including Ohio and Wisconsin, which offered the company a site outside Racine that it had originally set aside for Foxconn, the Taiwan-based contract manufacturer. Gelsinger wouldn't discuss the failed bids. "You're negotiating like a thousand line items," he says. "Are we going to upgrade the sewer? Are you going to upgrade the electrical grid? Are you going to get the transportation systems in? What environmental support are you going to get? It goes on and on."



*LARGELY REVENUE INTEL GENERATES BY MAKING ITS OWN CHIPS. DATA: BLOOMBERG INTELLIGENCE

Intel accepted Ohio's bid with a theatrical flourish. "We got this nice white box with a big red ribbon on it," Gelsinger says. He asked Lieutenant Governor Jon Husted to deliver the package to Governor Mike DeWine that Christmas Day. Intel committed to spending at least $20 billion, employing 7,000 unionized construction workers and eventually hiring 3,000 of its own employees. In return, it got plenty: $600 million in grants for the building, $500 million for roads and other infrastructure, $300 million for a water recycling plant, $650 million in tax breaks and $150 million for employee training. Intel also wouldn't pay local property taxes on its buildings for 30 years. The project was code-named Cardinal, after the state bird.

In Ohio, Intel promised to hire 7,000 construction workers and 3,000 employees and spend at least $20b

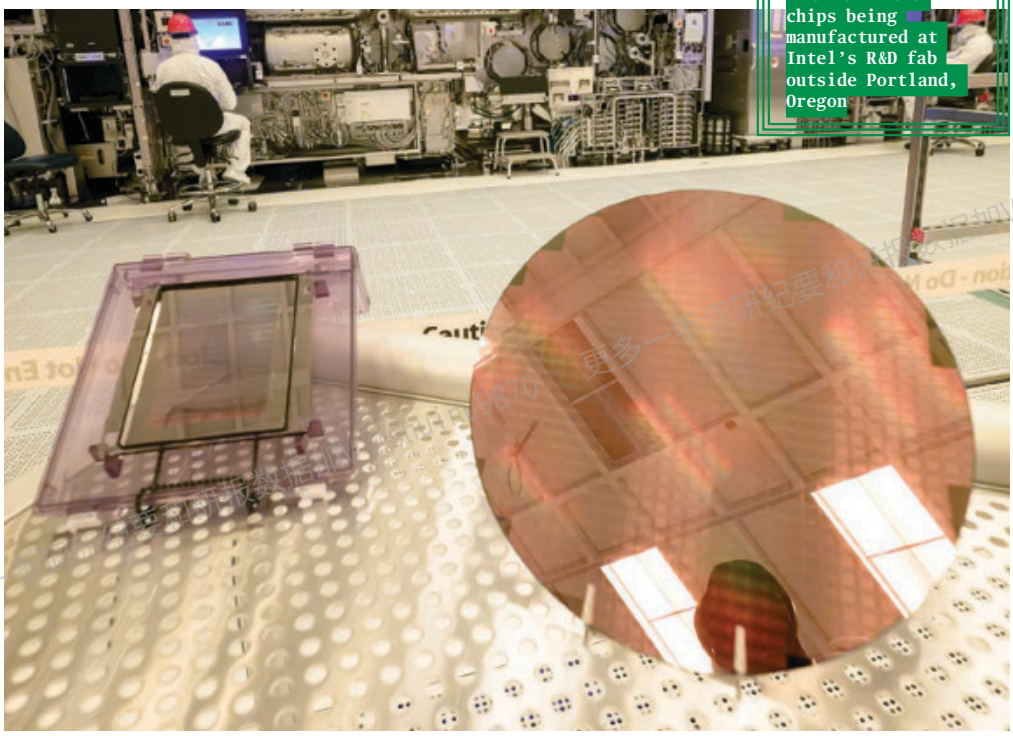
In other political environments, more than $2 billion in subsidies for an enormous union-backed construction project might have generated suggestions that this was a waste of public funds, especially from Republicans. But DeWine and Husted won reelection the following November by 15 points, an increase of more than 10 points over their margin in the previous cycle. Meanwhile, instead of mounting opposition, state Democrats mostly tried to claim credit for their part in the agreement, portraying the deal as a vindication of their efforts to bring industrial jobs back to the state. "We are burying the term 'Rust Belt,'" Senator Sherrod Brown said at the groundbreaking, calling the factory part of "a new pro-American, pro-union industrial policy."

Intel has other fabs in the works as part of Gelsinger's expansion, including two new ones in Chandler, Arizona, and a renovation at D1X that will include an additional fab. But the Ohio project is in some ways the most audacious. It will be the first semiconductor plant in the Midwest and the first time in more than 40 years that Intel has built one of these from scratch, without any existing infrastructure or pools of potential workers nearby. "In Arizona, you already have base facilities, stuff you can work from," says Jim Evers, the Ohio general manager. "Here, everything's coming from the ground up. In the first year we had to, like, lay out dirt."

Last fall, Evers, who wore an Intel work shirt embroidered

WALDEN KIRSCH/INTEL

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■ Some of the chips being manufactured at Intel's R&D fab outside Portland, Oregon

with "Jimbo," drove to the site with a *Businessweek* reporter. As we set out from the company's offices, we passed farmhouses, cornfields and a collection of electric transmission towers. "Lots of big lines," Evers said with admiration, before noting the luxurious width of the country highway we were on. Then he rattled off a litany of recent improvements provided by Intel's generous hosts: new curbs, new water lines, new storm pipes, new manholes. The site itself was muddy and flat, and, at 1,000 acres, seemed almost endless. We passed a concrete plant, followed by a line of maybe 20 cement mixers, an enormous group of dump trucks and a collection of trailers serving as offices. Farther on, we could see the silos owned by the neighboring pig farm and 10 or so large cranes that hung over a hole where the first fab would be.

Workers had dug a sort of basement level, from which a large collection of columns and pipes had already sprouted. A concrete slab would go over that, followed by two levels of subfab, followed by the clean room itself. Evers noted that the cranes overhead, which had a capacity of 30,000 pounds each, might look big but they were actually sort of puny by Intel standards. "These are not the big crane," he said. "In fact, they're not even big enough to put the big crane together." The big crane—a Liebherr LR 12500-1.0 crawler crane (capacity: 5 million-plus pounds)—will arrive this summer. Intel will use it to mount a collection of enormous steel trusses that will form the ceiling of the clean room.

The trusses are necessary because Intel wants its clean room to be a giant unbroken space for the giant and extremely delicate tools. ("Columns just get in the way," says Mark Phillips, Intel's director of lithography.) The trusses, which weigh more than 300,000 pounds each and look like the product of the world's largest erector set, must be strong enough to support a new ASML machine because it will have to be lifted into place from yet another crane attached to the ceiling. After the ceiling is constructed, the clean room will be sealed and filled with filtered air, and then the equipment will start to arrive. In Arizona, that's happening now. It's unclear when it'll happen in Ohio, in part because when you're building a fab the tools are the most expensive part. "About 25% of the investment is the building, 75% is the equipment," Gelsinger says. "So I'm going to be pretty confident that the market is there."

It's far from guaranteed that the market is waiting on Intel. In February the company announced a deal to manufacture custom chips for Microsoft Corp., but it wouldn't say how many. Intel says it has a "strong pipeline" of customers, but has yet to announce a deal with a major chipmaker, such as Nvidia, Qualcomm or AMD. This latter task is a particular challenge because all the other chip companies have long considered Intel their archrival.

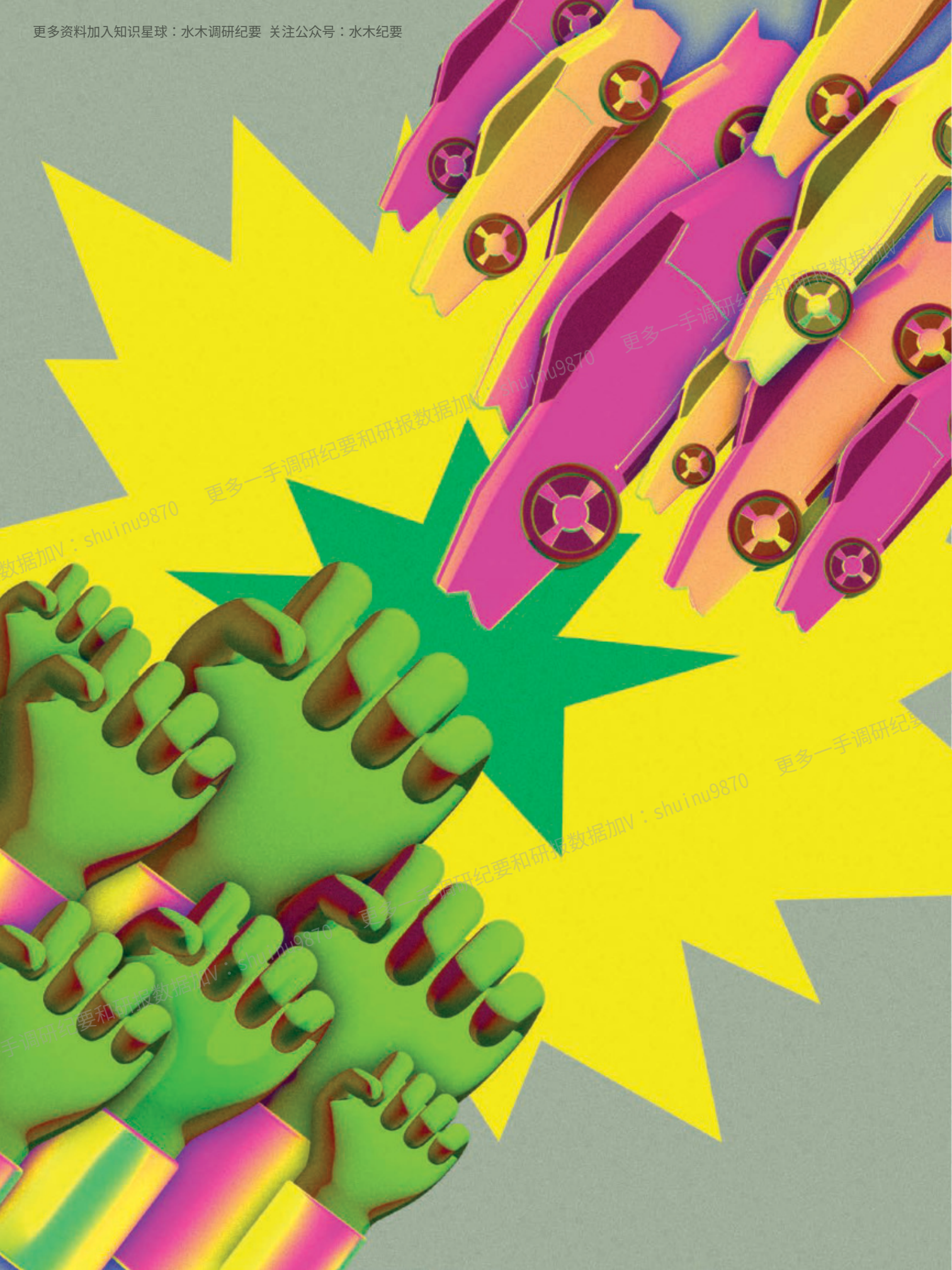
Gelsinger is sensitive to the suggestion that the Ohio project might go the way of previous Silicon Valley boondoggles in the Midwest, such as that planned Foxconn campus in Wisconsin, which remains largely undeveloped many years after then-President Donald Trump touted it as "the eighth wonder of the world." Gelsinger insists he isn't going anywhere. "These aren't blarney projects," he says. "I wouldn't put, you know, thousands of workers at a construction site if I didn't believe we were going to get remuneration."

But belief isn't the same thing as execution. Intel's most recently opened plant, Fab 42 in Arizona, broke ground in 2011. The following year, President Barack Obama showed up at the site and called it "an example of an America that is within our reach." Construction was completed in 2013, and then the fab sat empty for seven years, as Intel struggled.

For the Ohio plant to avoid such a fate, nearly everything will have to go right, and even then it seems almost certain Gelsinger will again find himself in the position of lobbying for more money from the US government. During an Intel event in February, Secretary of Commerce Gina Raimondo suggested that Congress would need to provide "continued investment" by way of "Chips 2 or something else."

Gelsinger says his company will do its part. "In semiconductors, every new wafer is a new experiment," he says with a combination of weariness and excitement. "We're going to push the very edge of the human understanding of physics." B

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TESLA'S NORDIC REBELLION

As unions take on Elon Musk, a small Swedish strike has big stakes

■ By ANDERS MELIN and JONAS EKBLOM
■ Illustration by SHIRA INBAR

IT WAS STILL DARK IN MALMÖ, A coastal city in southern Sweden, when the union men arrived early one winter morning. They filed into a trailer parked on the roadside, donned yellow vests and stepped back out into the cold. A short distance away, a few people hurried across the icy street, wearing parkas imprinted with a familiar name: TESLA. The groups exchanged awkward glances, like neighbors passing in a stairwell. Then the second set shuffled into a low-slung auto repair shop, while the unionists huddled together and sipped coffee as the sun rose. Another day in the first-ever strike targeting Tesla Inc. and its chief executive officer, Elon Musk, was underway.

Tesla technicians with IF Metall, one of Scandinavia's biggest blue-collar labor unions, have been off the job in the automaker's 10 Swedish workshops since October. The central issue is Tesla's refusal to sign a collective agreement—a written accord common in Scandinavia that sets out wages, working hours, leave policies and the like. Seen in isolation, it's a small fight. Fewer than 50 employees are on strike, in a country that makes up just 1% of Tesla's worldwide sales. But as Tesla embarks on its largest-ever round of global layoffs and US unions seek inspiration for their own organizing campaigns, both sides are acting as though what happens in Sweden could have global implications.

Tesla, the most valuable producer of electric vehicles, has shown no interest in negotiation. After union members walked out, it became the first company in decades to bring in strikebreakers to keep Swedish operations running. In response, other unions in Sweden and neighboring countries sided with IF Metall and began blocking deliveries of shipborne Teslas, as well as the company's mail and license plates for new cars. They also halted trash collection and maintenance for Tesla's properties. In March, unions extended the blockade to cover the construction and servicing of Tesla charging stations.

Globally, Tesla has fought off any attempts by unions to organize its workplaces and establish collective bargaining. Signing up its employees is a priority for the United Auto Workers, the industry's largest American union, and for its counterpart in Germany, where Tesla operates a big factory outside Berlin. UAW President Shawn Fain, who won extensive wage concessions from Detroit's three major automakers with a strike last year, has cheered on the Swedes and called their effort "a blueprint for future leveraging campaigns." Encouraged by this support—and armed with enough funds to pay the idle Tesla workers for around ▶

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◀ 500 years—IF Metall has stuck to its guns. The strike has now lasted four times as long as the UAW's in 2023.

If Tesla had reached a collective agreement when it arrived in Sweden a decade ago, it's likely nobody would have cared. For IF Metall, which signs hundreds of such accords each year, it hardly would have warranted a public declaration of victory. And Tesla could have rationalized it as an obligatory acceptance of local customs—comparable to removing one's shoes when entering a Swedish home.

Now the company's approach risks tarnishing its image in a region at the vanguard of the green transition. Scandinavians are among the world's fastest adopters of electric vehicles: EVs and hybrids accounted for 60% of new cars sold in Sweden last year. Norwegians, Danes and Finns also buy electric cars at rates far above those in the US. Global automakers are fighting for the business of these affluent customers, who also happen to be broadly supportive of organized labor.

In a statement to *Bloomberg Businessweek*, Tesla said "it is unfortunate that IF Metall has taken these measures. Tesla adheres to Swedish labor market regulations, but like many other corporates, has chosen not to enter into collective agreements. We already offer equivalent or better agreements than those covered by collective bargaining and see no reasons to enter into any agreement." (Unsurprisingly, the union disputes this.)

As the day got started in Malmö, union officials watched as Tesla technicians who'd declined to join the strike darted through doors, moved cars and chatted with customers. They were mostly young and male—a cohort that IF Metall representatives say can be difficult to recruit, because life hasn't hit them hard yet.

"Sure, your terms might be good right now," said union official Mikael Andersson, glancing at the workshop. "But what happens if the company starts doing poorly, or if your boss decides he doesn't like you anymore?" His colleague Patric Nelson chimed in. Some young Swedes today "have no idea what a union is," he said. Andersson nodded: "Everyone's immortal when they're young," he said. "Never been unemployed. Never had a hard time landing a job."

A little later, the service center's bay door was pulled up. From the ceiling hung a flag featuring a plump chipmunk wearing the same yellow vest as the union officials, and a four-word phrase: *Tack, det är bra*. It expressed a sentiment similar to the sneering "go f--- yourself" that Musk lobbed at advertisers who'd pulled business from his social media platform, X. But reflecting the Swedish habit of understatement, it was more polite: "Thanks, we're good."

IT WASN'T ALWAYS THIS WAY. FIFTEEN years ago, when Tesla had built and delivered only about 500 cars, Musk said that tolerating unions wasn't out of the question as long as they understood "that they're on the same side as the company."

"I'm against having a two-class system where you've got the workers and then the managers, sort of like nobles and peasants," he told a 2009 conference hosted by *Wired*. He noted that Tesla employees who'd previously worked at unionized companies had pointed out one benefit: "If their boss was an asshole, they had recourse," Musk recounted. "I said, 'Let's make a rule: There will be no assholes.'"

He's stuck to this argument ever since. And while Musk has sometimes said that Tesla workers are at liberty to unionize, it hasn't gone well for those who've tried.

In 2021 the National Labor Relations Board, which enforces American workers' right to organize, ruled that Tesla broke the law by "coercively" interrogating union supporters at its Fremont, California, factory and firing one. In 2023 an agency judge decided Tesla had unlawfully barred Florida employees from discussing workplace issues. That same year workers at Tesla's plant in Buffalo announced a union campaign to improve pay and job security. Within days, Tesla fired dozens, including one member of the organizing committee and others involved in labor discussions. (The NLRB later dismissed a claim that the terminations were retaliatory.)

But in much of Europe, and particularly in Sweden, unions are more deeply embedded. A century or so ago, Sweden was an epicenter for strikes, which sometimes spiraled into violence. In 1908 political activists planted a bomb on a ship housing British men hired to replace striking dock workers, killing one and injuring 23. During a lumber mill strike in 1931, soldiers shot and killed five people.

Seven years later, as lawmakers considered stricter labor market legislation to curb the conflicts, a federation of unions and the national association of employers convened. They emerged with a written resolution that set ground rules for how the two sides would negotiate, resolve disputes and handle strikes. Collective agreements sat at the center of this entente. Swedish law doesn't require companies to reach such deals with unions, but over time it became customary.

In the decades since, the accords have underpinned the economy, helping make Sweden one of the world's wealthiest countries while keeping income inequality in check. They've created closer and friendlier relations between unions and corporate leaders than in the US, and they've also encouraged politicians to stay out of most labor market matters. For example, Sweden is one of just a handful of European countries without a legislated minimum wage; since pay levels are set through collective agreements, mandating one is unnecessary. Strikes are rare.

"Before 1938 the notion was: We want to defeat the other side," says Mattias Dahl, deputy CEO of Svenskt Näringsliv, the employers association. "But over time we saw it led to harder and longer conflicts, and a desire for revenge. And how should you devote your energy? On winning, or on finding a solution?"

Once companies in Sweden start to grow, unions tend to come knocking. Tesla opened its first Swedish dealership in 2013 and gradually expanded. IF Metall officials and Tesla representatives met multiple times over the years, but they didn't find common ground for a collective agreement. To

ANDERS MELIN/BLOOMBERG (2); ERIK FLYG/BLOOMBERG

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■ A Tesla repair shop in Malmö, with a sign that translates as "Thanks, we're good"



■ Campaign pins at IF Metall's office in Gothenburg



■ A banner outside a Tesla service station demands a collective agreement

boost its leverage, the union started recruiting. By 2023 it had signed up more than half of the roughly 130 workshop staff–enough to put Tesla on notice that a walkout was imminent without a deal. "We see no other option," Marie Nilsson, the union's chairperson, said on Oct. 17.

Nilsson's threat didn't bring Tesla to the table. A minute past midnight on Oct. 27, the strike began.

THE NEXT FEW WEEKS WERE A STUDY in the power of Swedish organized labor. As dozens of service technicians walked out, IF Metall said union members at independent workshops around the country would also stop servicing Teslas. Many other unions in Sweden joined in and began so-called solidarity strikes. The dispute also spread regionally, with unions in Denmark, Finland and Norway beginning selective work stoppages.

As the situation intensified, a group of Nordic institutional investors with $1 trillion under management sent a letter to Tesla's chairperson, Robyn Denholm, urging the company to reconsider its approach. Norway's $1.6 trillion sovereign wealth fund, which rarely takes public positions on sensitive matters, issued a statement saying Tesla should respect "fundamental human rights, including labor rights."

IF Metall says workers' welfare and the stability of the Swedish labor market rely on collective agreements. Today, roughly 90% of working Swedes are covered by one. As a result, companies can't undercut each other on wages and benefits. Both unions and the employers association say that structure could unravel if companies such as Tesla refuse to fall in line. Still, some think the dispute has been blown out of proportion. "Labor unions are going berserk," says Albin Zettervall, a labor market expert at Timbro, a free-market think tank in Stockholm.

The goal of the multiplying blockades was to quickly push Tesla into signing an accord. Faced with a similar campaign in 1995, Toys "R" Us Inc. capitulated after three months. But Tesla isn't Toys "R" Us. It has deep pockets and has traditionally taken a bare-knuckle approach to anything standing in its way.

When IF Metall officials showed up outside service centers on the first day of the strike, they found black-clad security guards lining the perimeters. (The union sends only its own staff members to picket. Strikers mostly stay home.) After mail workers stopped delivering license plates, Tesla sued both the postal service and the government agency that issues the plates. (The cases are pending.) Tesla later figured out it could circumvent the blockade by compelling both organizations to send plates directly to new owners and then to a recently created subsidiary in Stockholm. It began to ship cars from Germany by truck, to bypass Swedish ports. It publicly advertised for a lobbyist with "a proven track record of getting regulatory changes made in the Nordics."

IF Metall also says Tesla broke one of Sweden's most sacred business taboos: It began replacing the workers on strike with new hires and personnel brought from abroad. ▶

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◀ Union officials were taken aback. They acknowledge that the solidarity actions were wide-ranging. But labor culture in Sweden is different from that in the US. Unlike the UAW's Fain, union leaders there don't wear "EAT THE RICH" T-shirts or berate colleagues for seeing companies as partners instead of adversaries. Strikes, however contentious, tend to follow agreed-upon rules. One of them is an understanding that companies won't bring in strikebreakers.

Musk and his companies have long followed an us-against-the-world philosophy, which has only intensified with his recent swing toward hard-right politics. IF Metall's offensive—and the wider support it attracted—likely hardened Tesla's resolve. While union representatives say many workshops are handling fewer cars than before the strike, none has shut down. The lawsuits, hiring of new workers and other measures to circumvent the sympathy strikes have probably cost Tesla some money. But local vehicle sales have stayed strong: Tesla was the top electric car brand in Sweden in 2023, with a 17% market share.

Still, Musk no longer dominates the EV world as he used to. Amid flagging sales and a dearth of new models, Tesla's stock has declined dramatically since the beginning of the year, and Musk recently said the company would cut over 10% of its global workforce. More broadly, consumers aren't ditching gasoline vehicles as quickly as the industry hoped, leaving automakers to contend for a smaller-than-anticipated pool of customers. These headwinds all make antagonizing potential buyers riskier than before.

At the *New York Times* DealBook Summit in November, an hour after he'd cursed at advertisers, Musk was asked whether he worried that unions, emboldened by wins in 2023, would be coming for him. He gave a familiar answer. "Unions naturally try to create negativity in a company, and create a sort of a lords-and-peasants situation," the centibillionaire said. Fiddling with the armrest of his chair, Musk noted his appreciation for the employees who build Tesla cars. His eyes darted back and forth and appeared to briefly tear up. "I don't know," he said. "Maybe there will be unionize—." He paused for a split second. Then he continued: "If Tesla gets unionized, it will be because we deserve it and we failed in some way."

AT IF METALL OFFICES IN MALMÖ, Gothenburg and Uppsala, seven striking technicians told *Businessweek* that Tesla was mostly a good employer, a company where they found camaraderie, excitement working with cutting-edge cars and opportunities for development. The wages and benefits are broadly fine, they said, and the equity awards a nice perk.

But they also described increasing pressure to fix more cars in less time, which they said forced them to take shortcuts, skip breaks and stay late. They'd seen colleagues get fired for reasons that they said seemed arbitrary. Two said they'd spoken up about these issues and were deprived of raises as a result. In the technicians' view, the absence of unions had left them vulnerable to the fickle demands of financial markets and faraway executives. (Tesla declined to comment on their statements.)

"There is no force to counter the power of our bosses," said one technician, who asked to remain anonymous for fear of repercussions. "You try to complain," he said, and managers might "tell you to go away. What are you gonna do?"

Jānis Kuzma, a Malmö employee, spoke of his fears of Tesla's approach. "If you choose only the young ones, only the fast ones, only the ones who can reach the goals, where will the rest work?" he asked. "How will society end up?"

What Kuzma described sounds a lot like how many companies operate in America, the homeland of his colleague Jason Dorrance De Lawyer, a technician from upstate New York. IF Metall had helped him when he first moved to Sweden in 2001, De Lawyer said. To him, joining the strike was a matter of solidarity. "They've been there for me," he said. "Now it's my turn to be there for them."

As they spoke, the workers kept returning to one word: *trygghet*, a Swedish term for a sense of emotional security and safety. That, they said, is the core of a collective agreement. Having one would ensure everyone was paid what they deserved and that nobody would lose their job without a valid reason. They wondered: Is that what failure looks like to a billionaire?

The bigger question for Tesla, and the world's auto unions, is about the broader impact of the Swedish dispute. Outside China, most of Tesla's manufacturing employees are in the US and Germany, and carmakers in both countries have long been anchors of union membership. But as the EV transition slowly progresses and nonunionized newcomers challenge incumbents, unions need to recruit and organize to stay relevant.

The UAW's Fain has applauded the Swedish

"If you choose only the young ones, only the fast ones, only the ones who can reach the goals, where will the rest work?"

ANDERS MELIN/BLOOMBERG

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sympathy strikes, which somewhat resemble his strategy for confronting Ford, General Motors and Stellantis last year. It was the first time the UAW had shut down production lines at all three companies simultaneously. In the weeks after the strikes concluded, with workers securing a 25% raise over four-plus years, cost-of-living adjustments and further concessions, several other automakers, including Tesla, raised wages for their US workforces.

To the UAW, the results proved that aggressive bargaining pays off. It's now running public organizing campaigns at Tesla and 13 other carmakers in the US. But victories won't come easy. A large proportion of American auto manufacturing has shifted to Southern states where labor unions have a much smaller foothold and organizing efforts are hindered by so-called right-to-work laws and political hostility. The UAW has made an early breakthrough: Volkswagen AG employees at a plant in Tennessee voted to unionize in April.

In Germany, Tesla has been at loggerheads with Europe's largest industrial workers' union, IG Metall, over its EV factory near Berlin since it started building the facility in 2020. As in Sweden, the discord centers on Tesla's refusal to sign a collective wage agreement. IG Metall's Dirk Schulze, who oversees the district where the Tesla plant sits, says he supports the Swedish action. But IG Metall has ruled out a sympathy strike; any potential walkout will come only as a result of its own negotiations with Tesla. For now, it's focused on recruiting members. In October, according to the union, more than 1,000 of the plant's roughly 12,000 staff came in wearing stickers calling for "safe and fair work."

The challenges of organizing even a few dozen service technicians hint at what's ahead for the UAW and IG Metall. Only about one-third of Tesla's workshop employees in Sweden—about 40 people—are actively striking, government figures suggest. A handful of others who were union members kept working after the walkout began; IF Metall expelled them. On the whole, Tesla says that more than 90% of its Swedish employees have remained on the job. (That count includes sales staff and managers who don't fall under IF Metall's purview.)

"We have been open and will remain open to dialogue with IF Metall," Tesla said in an email. "However, our primary focus is ensuring we continue to provide an excellent experience to our employees." In one of his only public comments on the matter, during an April conversation on X with a Norwegian sovereign wealth fund official, Musk seemed to shrug off the conflict. "Things are in reasonably good shape in Sweden," he said. "The storm has passed."

Tesla declined to make workers available for interviews, and service center staff in five cities turned away *Businessweek* reporters. "As you can see, there are people working away in there," a workshop manager said outside one service station. "That should tell you everything you need to know." Asked if employees had been barred from talking to the press, he shook his head. "Nobody's prohibited me from talking," he said. He then asked to remain anonymous, to not cause trouble with Tesla.

One Tesla salesman who did speak with *Businessweek*, but declined to give his name, said a LinkedIn post by Andy Rietschel, who was Tesla's first employee in Sweden and who left the company in 2021, captured the views of some of his colleagues. In Rietschel's telling, IF Metall provoked an unwarranted conflict and tried, and failed, to beat Tesla into submission. Yes, a Tesla job can be hard, he wrote, but those with grit will succeed and be rewarded.

The UAW strikes at Detroit's Big Three automakers lasted 46 days. IF Metall's conflict is heading toward 200 days. Tibor Blomhäll, president of Tesla Club Sweden, a community of Tesla owners, sees two possible solutions for the impasse. Tesla could copy Amazon.com Inc., which operates in Sweden through an independent staffing company that's covered by a collective agreement. But that would mean bowing to IF Metall's demands, at least indirectly. Or Tesla could simply close its service centers and rely on independent workshops. (These may or may not be covered by collective agreements, but the company itself wouldn't have to sign one.) Given Tesla's tendency to do things in-house, Blomhäll says the second option is also improbable. More likely, he says, the stalemate will continue: "Now they've dug their trenches."



■ Kuzma, a striking Tesla technician in Malmö

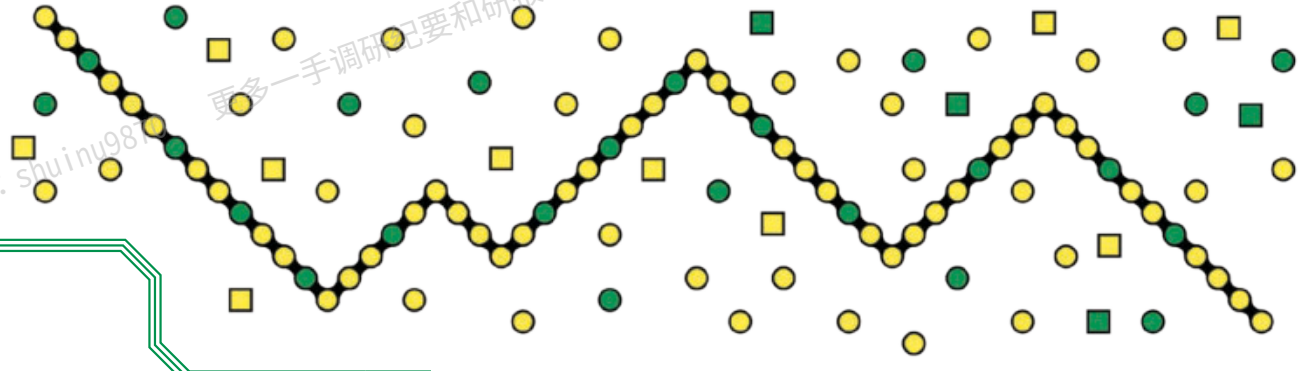
At IF Metall's office in Malmö, Adis Heldic chuckled as he poured a cup of coffee. In his two decades as a union representative, he said, he'd never seen a company behave as combatively as Tesla. "I don't think they understand we're not here to chase them," he said. Based on his own conversations with local Tesla managers, Heldic said that some view unions more benignly than their superiors abroad, "but they're afraid of Elon."

On the eve of the strike, Heldic recalled, Tesla managers told the technicians they were free to walk out. But those who did were asked to return key cards and computers and clear out their lockers. "Like getting canned," he said. "So they thought, 'That was my last day,' because that's how it felt." Heldic said the strikers he's in touch with tell him, "We want to come back, to an employer who takes care of us." It'll be interesting, he said, "when that day comes—if it comes—what will happen to them." ❸ —*With Josh Eidelson, Dana Hull, Monica Raymunt and Stefan Nicola*

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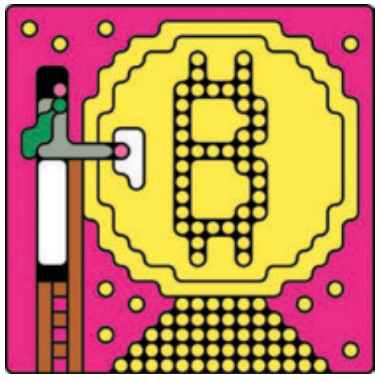
By MOLLY WHITE
Illustrations by MATHIEU LABRECQUE

THE STATE



AFTER MORE THAN A YEAR, the freeze of a deep crypto winter has thawed. Bitcoin prices have surged to new heights, venture capital firms are raising funds to invest in cryptocurrency startups, and gloating crypto bros are back to mocking skeptics with the words "have fun staying poor." Once again, the people pouring millions of dollars into memecoins that depict dogs in knit hats or drooling cartoon sloths are being described as the smart money. When the developer of the sloth coin, Slerf, accidentally destroyed $10 million of the funds he'd raised from early buyers, the attention only fueled a massive spike in trading volume—$2.7 billion worth in 24 hours.

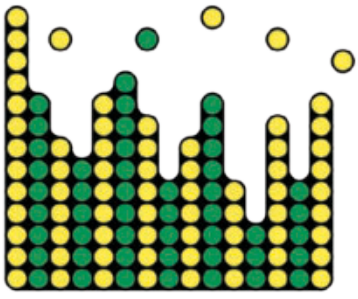
This speculative mania is familiar to veterans of the last crypto boom, from 2021 to 2022. Instead of "the metaverse," everyone now just says "AI." What's new is a veneer of normalcy, a reputational makeover. While the average crypto fan of the last boom talked in terms of Lamborghinis and get-rich-quick schemes, the industry's new spokespeople are CEOs in suits who focus on regulatory compliance, politicians whose favorite word is "innovation," and traditional financial institutions pitching cryptocurrencies as a sound way to diversify your portfolio. The problem for the rest of us is that the crypto markets remain fraught with manipulation and scams.



Throughout the years I've been watching the cryptocurrency sector, the grifts have been the constant. Even when prices crashed, there remained plenty of opportunities for crooks to exploit. Now, with new money being drawn in by rising prices and new financial instruments, it's important to look closely at the state of crypto.

In January, the US Securities and Exchange Commission begrudgingly approved spot Bitcoin exchange-traded products, a financial instrument targeted to mainstream investors and investment funds more comfortable with brokerage accounts than crypto trading apps. (The ETPs function like exchange-traded funds, so the finance world just calls them Bitcoin ETFs.) Crypto advocates saw this as a watershed moment, a more traditional investment vehicle that could draw billions of dollars into Bitcoin from more respectable sources who had previously been worried about it being lost, stolen or outlawed. As he announced the ETF approval, Gary Gensler, the SEC chair and longtime crypto detractor, reiterated that "Bitcoin is primarily a speculative, volatile asset that's also used for illicit activity including ransomware, money laundering, sanction evasion and terrorist financing." Still, these ETFs are now being offered by staid firms including BlackRock and Fidelity,

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Industry boosters say they've learned their lessons from the last crash, but regulators need to move faster to protect a new wave of mainstream investors from the same old story

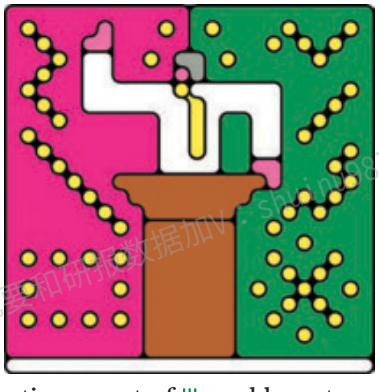
OF CRYPTO

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which emphasize their due diligence in their prospectuses even as they stress Bitcoin's volatility.

Gensler is far from the only one with reservations. During the last hype cycle, the Department of Labor expressed "serious concerns" about the inclusion of crypto in employer-sponsored retirement plans and warned fiduciaries to take "extreme care."

They were right to worry. Market manipulation is rampant on the hundreds of exchanges where crypto trades hands. Many in the sector seem to have accepted wash trading—self-dealing that makes the market look busier than it is—as a built-in. The same professor who reported heavy market manipulation driving the 2017 crypto boom has noted similar suspicious patterns more recently, suggesting that a relatively small number of large holders continue to artificially prop up prices. The SEC, Department of Justice and Commodity Futures Trading Commission are weighed down with more evidence of these crimes than they seem to know what to do with. Slow to act on an industry that shifts quickly, these agencies often stepped in only after businesses collapsed.



Despite all this, the industry has continued to push the narrative that crypto has outgrown its wild teenage years, with the ETFs representing a sort of coming-of-age moment. "This approval establishes crypto as a legitimate new asset class and underscores that it's here to stay," tweeted Emin Gün Sirer, chief executive officer of blockchain company Ava Labs. Boosters are loudly promoting ETFs as well as the underlying assets to lay investors and institutional funds alike. All the more reason, then, for greater reforms and more stringent enforcement.

The saving grace of the 2023 crypto winter was that average folks who opted to stay away suffered little or no fallout. It was nothing like the global financial collapse of 2008, which had ramifications far beyond the market for mortgage-backed securities. During the crypto downturn, as some speculators saw their life savings collapse along with token prices, the rest of the world went on relatively unscathed. If traditional finance becomes more entangled with crypto, the rest of us won't be so lucky next time.

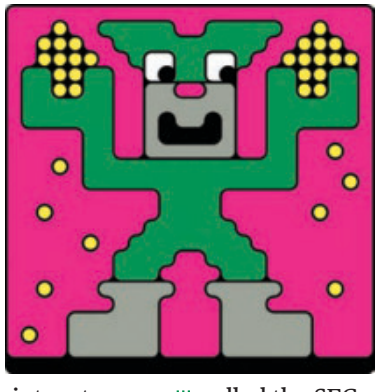
PERHAPS MORE THAN ANY other part of the tech industry, crypto relies on storytelling. This is because the underlying technology, as it exists today, doesn't have much to offer the average person in their day-to-day life. Instead, entrepreneurs conjure visions of what the tech might look like tomorrow, usually blockchain products powered by artificial intelligence or AI ▶

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◀ products powered by the blockchain. They pitch AI bots meant to automate crypto trading strategies, or the software to make those bots.

The moral of the story is subject to change. After the 2008 financial crisis, early Bitcoin advocates pitched the currency as a true alternative to the traditional banking system, one with greater stability for everyday savings and more privacy for all kinds of transactions. When the opposite turned out to be true—Bitcoin is far more volatile than the US dollar and all too easy to track—advocates flipped their scripts to focus on Bitcoin as a winning lottery ticket and to sell sophisticated blockchain analysis tools to law enforcement.

The dominant narrative during the last crypto boom was "web3," a buzzword that skyrocketed in popularity during 2021. Building on distrust for Big Tech, crypto companies and their backers promoted the idea that blockchains' decentralization could redemocratize the internet and reverse its profit-minded decay. Unfortunately, their solution was to turn every online interaction into a transaction. Anyone who used the internet to post to social networks or play online games or do their jobs would soon be doing so "on the blockchain." Certain identical copies of digital files were more valuable than the rest. If you weren't paying attention to this stuff at the time, suffice it to say it was even sillier than it sounds. As crypto has resurged, web3 has not.



Crypto advocates now point to the fallout from this period, along with the rise of Bitcoin ETFs, as evidence that the industry has grown up. FTX founder Sam Bankman-Fried, who controlled the second-largest cryptocurrency exchange until it imploded in late 2022, is beginning his first of 25 years in federal prison. Do Kwon, the man behind the massive, now-collapsed Terra/Luna stablecoin, was just found liable for fraud. Avi Eisenberg, a trader who boasted of his "highly profitable trading strategy" that siphoned more than $100 million from a cryptocurrency exchange, was just convicted of criminal market manipulation. This, the boosters say, means it's time to pile into crypto—now that the biggest sharks are gone and before everyone else shows up.

To the SEC's credit, it began cracking down on the industry after SBF became a household name. This has drawn it, however, into conflict with some of the same companies that claim to desire stronger oversight. In 2022, crypto exchange Coinbase Global Inc. petitioned the agency for a bespoke set of rules to govern the sector. Last year the SEC sued Coinbase for alleged violations of existing securities laws, including promotion of unregulated securities. Coinbase has vehemently denied the allegations and called the SEC suit "unfair."

Although there's a deterrent effect to legal actions against high-profile figures and firms, investors would be much better served by strong regulatory oversight that takes place before all their money is gone. Most crypto firms still don't undergo anything resembling financial audits. Some say they have obviated the need for a traditional audit by producing a public report called a proof of reserves, a system of self-reporting. This, however, is a far lower standard than securities regulators accept. The disclosures and protections afforded to buyers of publicly listed stocks are nowhere to be seen for cryptocurrencies, and the same companies that say they want strong rules also say this standard would destroy their businesses. They may be right, but if an industry can't coexist with basic consumer protection laws, that's a condemnation of the industry, not the laws.

Outside of the appeals to authority, the industry is hard at work coming up with new problems their technology might solve. If all you have is a blockchain, everything looks like a use case. This time, it's AI. Some are adapting old crypto projects to catch up with the trend. Every trading bot that promises to predict coin price movements or give speculators an inside scoop on the next big token is "AI-powered." Blockchain security companies boast that they're using AI to audit smart contracts or detect attacks. Crypto markets have emerged for people to buy and sell AI models, training data and computing power. Trading platforms offer chatbots that they claim can analyze market signals to help customers place the best bets.

But blockchain systems are inherently slow and inefficient, a bad match for resource-hungry AI models. More important, if you've tried ChatGPT, you know that AI models are prone to getting things wrong or just making them up. That isn't a risk factor most people want to combine with their finances.

Nevertheless, a great many startups promise to use blockchains alongside their AI models for one reason or another. Much as web3 boosters saw an opportunity in the techlash, those in the blockchain-AI space have taken note that the secrecy built into the AI models of OpenAI and Google can freak people out. Although the hows aren't exactly convincing, it's an attractive idea that the decentralized computing of the blockchain might magically decentralize AI and return some power to the people.

Other startups say their blockchain applications will address the problems of AI bias or factual accuracy, or figure out how to compensate people whose data has been used to train AI models. Some even say their blockchain tools will, given enough funding, protect the world from

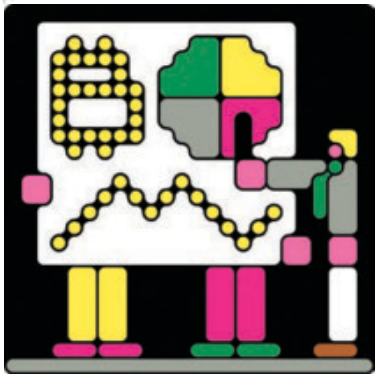
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some theoretical humanity-threatening AI superintelligence, by making AI development more inherently reviewable and therefore safe.

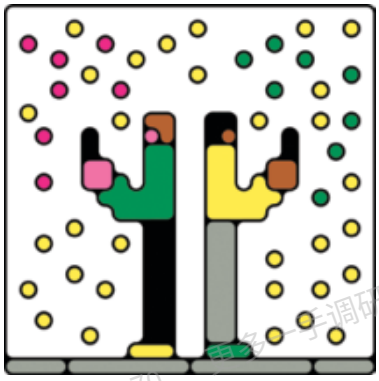
The problem with all of these sales pitches is that decentralized computing isn't the same as decentralized control. Even if people willingly outsource their computing power to larger AI ambitions, there's little to suggest the collective will get a say in how these models are designed or used. And it just so happens that some of the people creating the scary AI models are the same people selling the blockchain solutions.

OpenAI Inc. CEO Sam Altman also founded Tools for Humanity Corp., a benevolent-sounding company that manufactures a malevolent-looking chrome sphere about the size of a basketball. The sphere scans people's eyeballs to issue them an account on the World App and some crypto tokens, called Worldcoins. Altman says these tokens will amount to a universal basic income to offset the job losses from the AI models he and OpenAI are developing. The token's price, however, has fluctuated wildly over the past year, within a range of roughly $1 to $11, and most users receive about 75 of them a year, not much of an income. The enterprise has served mostly to draw the ire of data privacy agencies in multiple countries. The nonprofit Worldcoin Foundation has said it's moving deliberately to ensure regulatory compliance.

The world of AI-blockchain hybrids remains light on products. Speculators can buy related tokens, but few of the underlying projects have developed much beyond glitzy websites and low-effort clones of existing AI models. That hasn't stopped them from luring cash from retail investors and ostensibly savvy VC funds, just as some of web3's worst offenders did.



As history repeats itself and the specter looms of a new crypto mania that could even overshadow the last, it's far past time to consider new solutions to the familiar downside. Blockchains have been around for 15 years. The industry's scammers must no longer be allowed to bleed dry the everyday people who are drawn in, year after year, by promises of revolutionary technology that's always just around the corner.



CRYPTO FIRMS AND THEIR lobbyists love to threaten that a crackdown on the industry would stifle innovation. But what innovation has the sector produced, besides new avenues for ransomware payments and new types of pump-and-dump schemes? People get scammed so often by crypto founders running off with the money raised for some project or other that there's now a term for it: the rug pull. Perhaps it's time we realize that not all innovation is inherently good and that preventative measures are needed before more people are swindled.

Even some crypto skeptics, however, are worried about the potential consequences of oversight. Any attempts at regulation, they argue, will probably leave open loopholes for exploitation while assuring more investors that crypto has gone legit. It's true, as the past year has shown, that the industry will use any new rules as evidence that all of its problems are solved. But regulators spent more than a decade mostly ignoring crypto in the apparent hope that it would go away, and the results are in: That didn't work.

Now that key financial firms have bought into crypto, it's all the more essential that thoughtful, carefully crafted regulation be put in place. To protect investors, yes, but also to install a firewall limiting the contagion any future crypto disasters can transmit to the rest of the financial world. Careful limits on what assets can be sold, who they can be sold to and what disclosures are needed to go with them could help limit the damage to those who choose to engage with the sector, and help them make more informed decisions.

Stronger attention to the promises being made by crypto companies and those hired to promote them could make a huge difference in avoiding the types of disasters that came to define the sector in 2022, after swaths of customers were drawn in by crypto firms comparing themselves to banks. Many of those companies promised a new level of transparency and inclusivity to groups often ignored by traditional finance, and one consequence was that some of the pain in the crash that followed spread to people with few ways to absorb it.

Those within the industry have a role to play, too. Self-regulation will never be the sole solution, but crypto's reputation as a fraud factory might be improved somewhat if leaders started holding one another to account. They should push those arguing against strong consumer protections to find another line of work, or at least pursue a business model that doesn't require fleecing the customer. They will also need to support models of government regulation that require rigorous outside scrutiny, and even burdensome changes to their business models, rather than continuing to seek carve-outs that would essentially lock in the chaotic status quo.

For now, although crypto is hot once again and the number is back to going up, another crash seems inevitable, part of a vicious cycle that no one has had the strength to break. Although promises of mainstream safety and security unite the latest crypto boosters in a way that web3 did not, the current crop of ETF hawkers and AI startups weren't the first to the idea. Before its collapse ruined many of its customers, "safe and easy" was a tagline of FTX, too. B

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Drivers love Apple CarPlay. Carmakers are starting to revolt

GENERAL MOTORS IS DONE PLAYING NICE WITH APPLE

■ By AUSTIN CARR and DAVID WELCH

■ Illustration by ARIEL DAVIS

THE 2024 CHEVROLET Blazer EV was the nicest ride Michael Waldron had ever owned. When he purchased the $62,000 electric SUV last November, he was enamored with its "radiant red" paint, buttery acceleration and deluxe interior with slick displays stretched across the dash. There was just one big thing missing: Apple CarPlay.

General Motors Co., Chevy's parent, had revealed the prior spring that it was ditching support for Apple Inc.'s infotainment hub in its new EVs so it could bolster GM's in-house Ultifi platform. It was a buckle-your-seatbelt move. For tens if not hundreds of millions of drivers, CarPlay has become the default home screen of the center console, an iPhone-enabled grid of apps available in vehicles ranging from Fords to Ferraris. According to Apple, as of 2022, 79% of US car buyers would only consider purchasing cars that were CarPlay compatible.

At first, Waldron, an iPhone user, kind of liked Ultifi's software, which came with decent services for navigation and media. But little annoyances crept in. Unlike CarPlay, which allows drivers to listen to recent texts by clicking on Apple's touchscreen app, Ultifi is only able to access new messages over Bluetooth if the driver has previously granted permissions. Waldron, who lives in Iowa, could no longer ask Siri for directions to a friend's house by name; instead, he entered addresses into Google Maps. His wife, another iPhone owner, hated its lack of Apple's music and podcast apps.

Larger problems reared up on a family road trip to Ohio for Thanksgiving. After a warning light randomly popped up on the main screen, apps kept crashing before the display blacked out altogether. With the system bricked, no settings could be changed for the 600-mile drive back to Des Moines, not even the SiriusXM channel, which was stuck on 1990s radio. "My 4-year-old is now very well-versed in my music taste," says Waldron, who depended on his iPhone planted in the cup holder for the rest of the journey.

Once home, Waldron's Blazer went to the dealership where it stayed for a month as technicians tried to diagnose ▶



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◀ the glitches. He wasn't alone: Press reviewers and numerous customers ran into major software failures and vehicle faults, forcing GM to ground the vehicle and halt all sales starting in December. As the weeks dragged on at the shop, a service rep asked Waldron if there was anything he could do to make the situation right. "I said, 'Well, you could put CarPlay back in it,'" Waldron recalls. "The guy was laughing and said, 'I have a feeling I'm going to be hearing a lot of that.'"

But GM had ensured that wasn't possible. The new Blazer was the first test of GM Chief Executive Officer Mary Barra's risky bet to replace CarPlay with an alternative it had built itself. GM is gambling that its own software group, led by recruits from Apple, Amazon.com and Google, can create a better dashboard experience, supplant CarPlay, and eventually reap massive digital sales. Carmakers so far have tolerated CarPlay as a way to please customers, but GM's move is a sign that they're starting to sour on the arrangement.

A traditional car company attempting to take on Silicon Valley in tech only to subject its customers to subpar functionality and embarrassing bugs is almost too on the nose. The poor quality of MyFord Touch, Toyota Entune and other infotainment products seeded the desire for a real tech company to provide a modern replacement such as CarPlay in the first place. But as CarPlay grows wildly popular and seeks more data and instrument controls, Apple threatens to become the "iOS of the vehicle," says Alan Wexler, GM's senior vice president for strategy and innovation, referring to Apple's ubiquitous mobile operating system. "It's a physical vehicle, but it's an iPhone you're driving."

Apple attempted to make a car itself, and it was ultimately a humbling exercise. It invested years and billions of dollars in the effort, an open secret known as Project Titan, before abandoning it in February. But the phonemaker had certainly learned enough during the process to burrow Apple software deeper into Jeeps, Mazdas and Volvos. Indeed, Apple's latest version of CarPlay syncs with onboard sensors to manage vehicle settings, climate control and even oil and gas gauges.

Letting Apple show fun and convenient infotainment apps inside cars was one thing; letting it control how cars feel and drive is not something GM could stomach. If Apple completely captures car software, it could govern how GM connects with its own customers and earns digital revenue, relegating it to being a 115-year-old metal bender.

Hence Ultifi. GM says it hopes the software platform can spark a boom in service add-ons and paid subscriptions for services such as assisted-driving systems and premium safety features. The software team has been busy crafting iOS-quality features to convert the iPhone faithful: polished layouts for viewing maps and songs alongside speed and mileage data, clever tools for monitoring EV battery life, adjustable ambient lighting with a Skittles bag of colors. What was the point if drivers could reflexively tap over to CarPlay? "The minute you decide to Balkanize and outsource those pieces, you cannot create those kinds of experiences," says Baris Cetinok, who runs GM's software and services group and who previously spent years at Apple developing its iCloud and Wallet services. "This is not just about receiving a couple of voice messages and playing podcasts."

Despite the Blazer's bumpy introduction, GM remains committed to escaping Apple's gravitational pull. (It will do so without the Ultifi branding, which it's phasing out.) But the more its customers rely on iMessage or subscribe to Apple Music or use a bundle of iHardware, the more they'll resist switching. "Detroit has discovered Apple's lock-in," tweeted Epic Games Inc. founder Tim Sweeney in April 2023 when GM faced a public backlash over its Ultifi-first announcement. Even the US Department of Justice targeted CarPlay in its recent antitrust lawsuit against Apple, warning that it's increasingly "forcing users to experience driving as an iPhone-centric experience."

Apple says CarPlay provides a smarter and safer way to use an iPhone in vehicles, and that it's inaccurate to suggest it's somehow blocking the development of other technologies simply by offering CarPlay as an option for automakers and iPhone users.

GM is now racing to refine its software and convince customers that it's worth breaking old habits for. If the company can smash through the gates of Apple's walled garden, GM projects that digital services will bring in as much as $25 billion annually by 2030. Then again, it might end up simply alienating droves of Apple loyalists like Waldron, who bought an iPhone mount for his Blazer once the GM software was fixed. "If my nav screen bricks again," he says, "I can at least make it useful by suction-cupping my iPhone to it."

"One of the Apple engineers said, 'Look, Our system is better. Why can't you just do what we say to do?'"

GM ONCE HAD A SOLID chance of ruling the future of vehicle software. It pioneered the first

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in-car touchscreen for its 1986 Buick Riviera, which sported a small tube television that could digitally adjust the temperature and radio via a pixelated set of black-and-green menus. A decade later, GM introduced OnStar, the safety subscription that offered roadside assistance with a built-in button and eventually expanded to GPS and internet packages.

But OnStar's service, which costs as much as $50 monthly, never developed into the type of business GM's leadership had hoped for, and the company failed to keep pace with customer expectations. GM's "state-of-the-art" CUE infotainment hub was so plagued with problems that it sent Cadillac satisfaction scores plummeting. Plaintiffs in a class action suit said the screen had serious defects that resulted in the laminate coating bubbling or cracking, which could render it unresponsive. Other Detroit manufacturers didn't fare any better. According to a 2013 class action filed against Ford Motor Co., a company engineer called its software "a polished turd."

So when Apple reached out to automakers including GM and Ford a little more than a decade ago about what was to become CarPlay, many considered it a way to enhance their brands, not lose a direct connection to their customers. Google was likewise seeking partnerships around 2013 for its equivalent Android Auto product. The hope was that adding both would sell buyers on plug-and-play access to iMessage or Google Maps.

Google's aims seemed clear: It was blatantly requesting reams of vehicle data, such as for oil life and windshield wiper activity, which GM executives assumed the search giant wanted to sell ads for Pennzoil or for hyperlocal insights on weather. (GM said no to such data demands.) Apple, on the other hand, was a more perplexing partner. It refused to sign a contract with GM, as Google had, and mostly kept its product road map secret.

CarPlay was free and was essentially just mirroring what was on your iPhone in a slightly modified interface. But was it a Trojan horse? GM leaders traveled to Apple's offices in Cupertino, California, to suss out the company's ambitions. In a meeting with Greg Joswiak, now Apple's senior vice president for worldwide marketing, one exec tried to impress upon him GM's deep automotive expertise as if to suggest Apple was out of its depth, emphasizing



■ The infotainment touchscreen and center console on a 2024 Chevrolet Blazer EV SS

the complexity of cars and how they can require four years to develop, according to a person familiar with the interaction, who spoke on the condition of anonymity because they weren't authorized to discuss the private meeting. Joswiak replied, "How long do you think it takes us to build an iPhone?"

Honda Motor, Mercedes-Benz and Volkswagen, among other automakers, announced support for CarPlay, and GM integrated it into almost three-dozen 2016 models. Then everyone zoomed to get Apple into their cars. Ford and Chrysler soon revealed their own integrations, followed by Subaru, Nissan Motor and Toyota Motor, diminishing the feature to table stakes. BMW AG once began charging $80 a year for CarPlay access, only to drop the fee when drivers revolted.

Although some GM employees were pleased to learn that a top Apple engineer had purchased a Chevrolet Corvette Stingray with the vanity plate CARPLAY, it was evident that GM's cars were merely another way to distribute iOS. "Some people care about 'win-win.' Apple just cares about 'win.' If you win, too, cool. If you don't win, cool. It's not even malicious. They just don't care," says Phil Abram, GM's chief infotainment officer until mid-2017.

This experience was new for GM, which was used to dictating to suppliers, not the other way around. Apple didn't even seem especially open to feedback on areas CarPlay could improve. A former top GM exec remembers teammates recommending a tweak based on their insights about how screens could be interruptive. "One of the Apple engineers said, 'Look, our system is better. Why can't you just do what we say to do?'" this exec recalls, requesting anonymity to avoid professional retaliation. "There wasn't even any consideration of our decades of experience with driver distraction." (Apple says it's continually enhanced safety features and cites a 2018 study that found CarPlay was less distracting than a handful of automaker platforms.)

Meanwhile, GM's embedded software felt dated and fragmented across its brands. Cadillac's 2021 owner's manuals devoted seven pages to instructions for how to interact with CUE's voice assistant. The company made an e-commerce portal within the infotainment software for buying gas, ordering a cup of coffee from Dunkin' or making dinner reservations at TGI Friday's. It ended up killing the service, which never attracted much engagement. Those kinds of things, it turned out, were easier to do straight from a smartphone.

AT APPLE'S ANNUAL developer conference in June 2022, Emily Schubert, a senior engineering manager, spent four minutes of an almost two-hour presentation about iOS and Mac features explaining Apple's plans for the next generation of CarPlay. The new system, she said, would expand from infotainment displays to the entire dashboard, enabling Apple's software to access everything from heating to the speedometer. "It's the very best of your car and your iPhone," she said. ▶

GENERAL MOTORS

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◀ The new CarPlay set off OnStar alarms around Detroit. Apple no longer merely wanted to project a copy of iOS onto the infotainment screen; it wanted the iPhone to oversee the mission-critical cluster behind the steering wheel. This stuff was sacrosanct in Detroit. GM's Wexler says the next-gen CarPlay, which GM learned of before the announcement, was a "major factor" in its ensuing decision to divorce Apple. "We can see where they were going with it," says Wexler, who nevertheless insists GM and Apple maintain a good relationship and have discussed sharing Apple Music and other apps on Ultifi.

The previous October, Barra had delivered an audacious address to investors at GM's sprawling Tech Center in Warren, Michigan, pledging to double annual revenue, to $280 billion, by the end of the decade. A significant part of that growth would come from subscriptions developed for its homegrown Ultifi ecosystem, introduced days before the shareholder gathering. Barra took to saying that GM was transitioning from an automaker to a "platform innovator."

A big challenge was that GM didn't really have the organization to pull off the vision. Barra had hired thousands of developers for its push into electric vehicles, whose software is changing more rapidly than the systems for gas-powered vehicles. But it was still juggling systems from legacy suppliers and mixing electronics that required tons of code to get them to communicate with each other. Even its cluster and console displays historically used different processors. A goal of Ultifi is to simplify the programming and chipsets necessary to facilitate easier over-the-air internet updates, which were difficult or even impossible with disparate hardware systems.

GM aspired to be seen as a tech company such as Tesla Inc. and Rivian Automotive Inc., which controlled almost every aspect of their customers' experiences. If they didn't allow CarPlay in their EVs, why should GM?

Of course, Tesla and Rivian radiate a certain sheen that eluded the maker of gas-guzzling Chevy pickups. In March 2023, when the company announced its plans to phase out Apple's service, social media lit up with trash-talkers claiming they would never purchase a GM model without CarPlay. Some wondered why GM simply didn't keep the old CarPlay (the screens are wide enough where they could populate just a small section of one Blazer display), but Barra wanted to own the entire system. Ford CEO Jim Farley reaffirmed his loyalty to CarPlay—and the need to keep iPhone owners happy—in an interview with the *Wall Street Journal*. "Why would I go to an Apple customer and say, 'Good luck!' " he said.

Rivian conducted research and found that 70% of its customers initially wanted CarPlay access in its electric trucks

GM software executive Cetinok, who joined GM later that year along with a batch of ex-Apple colleagues, says it just wouldn't make sense to rotate back and forth from CarPlay to Ultifi to alter various settings. He notes that the company is also getting rid of support for Android Auto. "Having two or three jarring UIs—nobody can actually say that's ideal," he says.

The Blazer EV rollout blew up that strategy. Abdul Bazzi, who'd recently taken over the team responsible for software quality at GM, was surprised to see trade reviews ripping into the technical malfunctions of the Blazer, a vehicle that *MotorTrend* had just named its SUV of the Year. GM grounded Blazer sales on Dec. 22 while it rooted out the cause.

GM execs held weeks of what-the-hell-happened video conferences. Barra led every one even through the holidays, Bazzi recalls: "She was the most hands-on I've ever seen her."

One huge contributor to the problem was that GM had five separate groups overseeing different parts of the vehicle's technology. (Bazzi says he's now centralized software quality reviews under his division.) Apple can push updates to CarPlay wirelessly during regular iOS updates, but GM wasn't able to release a full Ultifi fix and resume Blazer sales until early March. Some existing customers reported that installations at dealerships involved a maintenance worker downloading the software on an office computer, transferring it to a thumb drive and then walking over to plug it into the SUV's USB port. The process could take eight hours or longer.

ON A RECENT TUESDAY afternoon at the Milford Proving Ground, GM's rural test track an hour outside Detroit, concept Corvettes and Hummers are zipping through 150 miles of private roads. Here, GM tests the durability of its vehicles on the same cobblestone tracks where World War II tanks were put through their paces. Chevy product marketing director Darin Gesse stands near a set of garage doors at one facility, where a Tesla Cybertruck is cruising to the test tracks for competitive analysis and Chevy's newest Equinox and Silverado EVs sparkle in the April sun.

Like the Blazer, both come equipped with a 17.7-inch horizontal console display and another high-resolution screen behind the steering wheel, which are, naturally, CarPlay-free. Although Android Auto isn't supported either, GM's infotainment software is still developed atop a custom version of Google's open-source operating system, giving the trio of EVs built-in access to Google Maps and additional Android apps.

Gesse confesses that Ultifi will be tough to sell to a "hardcore Apple user," but says he believes component-integrated features will win over iPhone customers. He points to how maps

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■ GM CEO Barra on the floor of GM Design West in Warren, Michigan, in February

EMILY ELCONIN/BLOOMBERG

automatically incorporate EV info: If he asks for directions from here to GM's Silicon Valley lab, the navigation system will automatically predict battery capacity and plot charging stations along the route.

How this all will turn into $25 billion of annual revenue isn't totally clear. There's promise with Super Cruise, a service that enables hands-free driving on freeways. The feature comes with an initial $2,500 price tag, and after three years it costs $25 per month. The company also offers subscriptions for extra safety features, internet connectivity and remote car access, and it envisions premium bespoke apps for specific models, such as trail services for 4x4 off-roaders.

Other possibilities include vehicle and home-security apps integrating with the cameras on its newest models or enterprise tools for corporate fleet management. Wexler also suggests EV data could be leveraged for an advertising business. Barra wanted to strike before Apple expanded into these larger experiences and dominated the space.

Tellingly, only Aston Martin and Porsche have committed to supporting the more immersive CarPlay in coming models. Mercedes-Benz CEO Ola Källenius has explicitly said it won't adopt the next-generation software, and not even Ford has announced a single product that will integrate the new CarPlay, Farley's enthusiasm for Apple notwithstanding.

If Cupertino needs automakers to help fulfill its vision for CarPlay, though, those automakers may also need some help from Apple to make their software run smoothly. Apple's limits on how its devices interact with other systems—which the company says are needed for privacy and security reasons—make it less than straightforward to get an iPhone working with the Blazer EV software. Depending on your tech savvy and patience level, this could be a five-minute process or a headache for which you'll need a YouTube tutorial. So whereas CarPlay requires only one tap to use, GM's equivalent setup takes at least eight clicks for basic iPhone functionality.

Critics claim Apple intentionally makes these things needlessly complicated to push people toward its products at the expense of its rivals. Garmin Ltd. wearables can't interact with iOS as smoothly as an Apple Watch; Epic Games isn't allowed to have its own version of the App Store in the US; and so on. The issues have drawn the attention of US regulators who've lately looked at anticompetitive practices in the tech industry. "By applying the same playbook of restrictions to CarPlay, Apple further locks-in the power of the iPhone," the Justice Department said in its March antitrust complaint.

Apple CEO Tim Cook has said that his company's rules are key to fostering its safe and seamless ecosystem and that it would be crazy to permit a third-party store on its flagship mobile device, just as Walmart Inc. would never be expected to let Target Corp. set up a shop inside one of its supercenters. Yet, in a way, that's effectively what carmakers have let Apple do with CarPlay. Today, more than 98% of new US cars—another form of mobile device—empower Apple to insert its software into their user experiences.

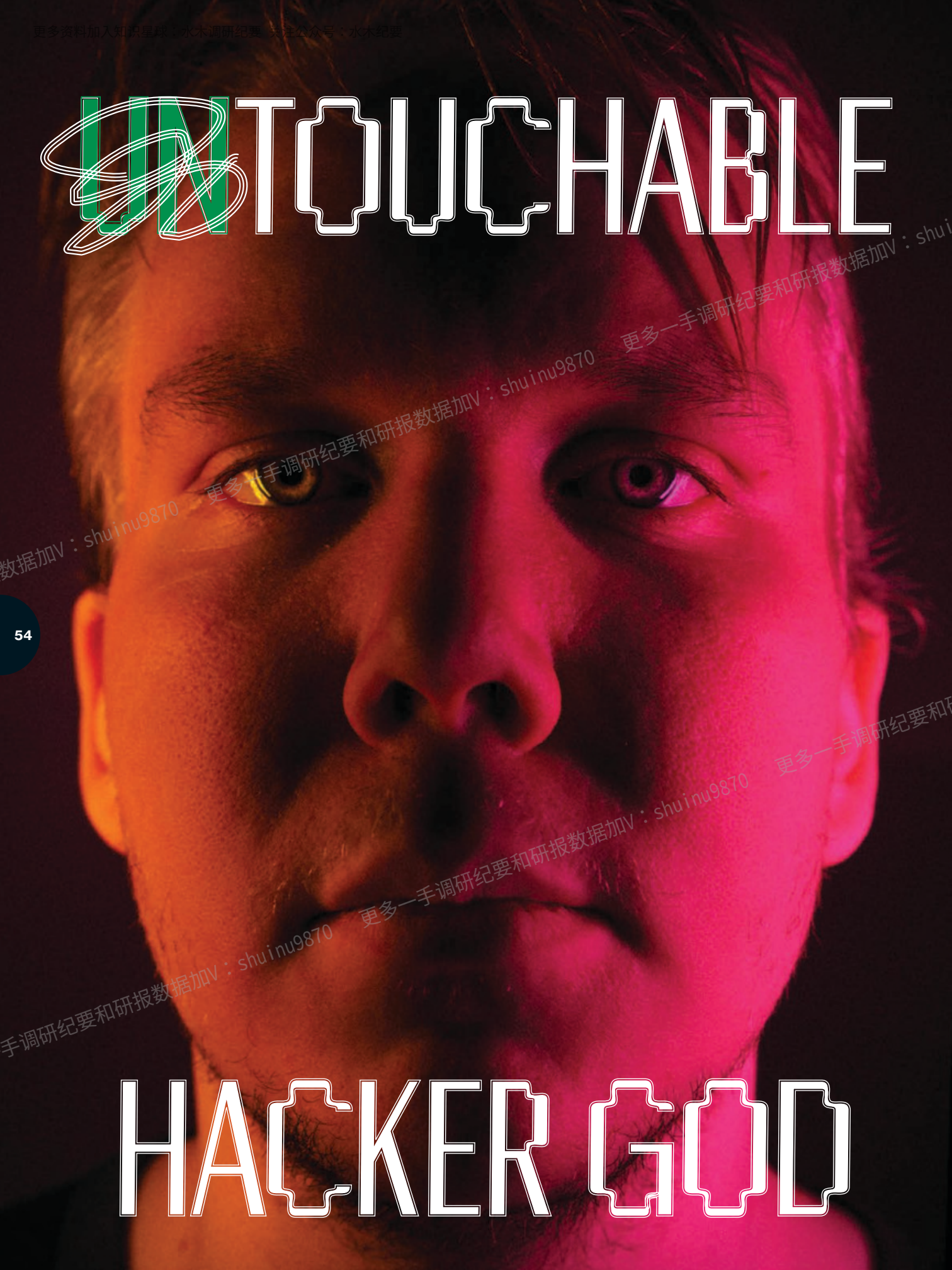
Some carmakers say customers might be open to differentiated experiences once they're broken from the habit of the generic Apple default. "We don't want a world where the experience in our vehicles is the same as every rental car," says Wassym Bensaid, Rivian's software vice president. His company conducted research and found that 70% of its customers wanted CarPlay access when its electric trucks were introduced two years ago without it. But the startup has found ways to add value, such as rating EV charging stations with letter grades to tell drivers where the best place is to top up batteries. After getting familiar with Rivian's platform, the proportion of customers who still want CarPlay has dropped to 30%.

GM customers appear to have the same Band-Aid-ripping experience. David Marcus was the first Blazer EV buyer in Canada, and he kicked himself when he realized it didn't have CarPlay on the drive home from the dealership. But the more he used GM's software, the more he fell in love with how its "brains" are embedded in the SUV itself. He found he no longer needed to bother with his iPhone.

He says he thinks every automaker will follow suit. "It's just inevitable that you're going to have an integrated system in your car," says Marcus, who shares this advice for consumers stuck in the confines of Apple's walled garden: "Get over it." B

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Aleksanteri Kivimäki was a cyber wunderkind. Now he's on trial for a historically vicious crime

■ By DRAKE BENNETT
■ Photographs by JUUSO WESTERLUND

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THE SUBURB OF COURBEVOIE SITS JUST west of Paris on the left bank of the Seine. It's home to La Défense, a thicket of skyscrapers visible from the city that forms a distant, unlovely terminus to the grand axis extending from the Louvre up the Avenue des Champs-Élysées and through the Arc de Triomphe. Just a short walk from Courbevoie's office towers, at 7:20 a.m. on Feb. 3, 2023, local police arrived at a short-term rental in a modern beige apartment block. They were responding to a domestic violence call.

Outside the apartment, the officers met the young woman who'd phoned. She told them her friend and her friend's husband were inside. The night before, the three had been out late at a nightclub and the husband had been drinking. There had been a dispute, the woman said. Now she worried her friend was in danger. The officers knocked on the door, no one answered, and they broke it open with a battering ram.

The man and woman the police found inside did seem to be recovering from a late night—especially the man, who was awakened by their entrance—but there were no signs of violence. The couple produced Romanian passports. The man, however, didn't sound or look particularly Romanian. Asan Amet, as his passport identified him, was blond, with green eyes, fleshy cheeks and a button nose. When he got out of bed, he stood almost 6 feet 4 inches. Checking a list of Europol's most wanted fugitives, the police got a hit. Asan Amet was a known alias for a Finnish cybercriminal named Aleksanteri Kivimäki. The officers arrested him.

Kivimäki, only in his mid-20s, had been a celebrity in world hacking circles for a decade. He had a reputation for flair, focus and inventive cruelty. Years earlier he'd been convicted for a series of high-profile data breaches and harassment campaigns dating to his early teens. His latest alleged cyberattack, though, dwarfed those. Measured by the number of victims, it was the largest crime in Finnish history. Kivimäki was accused of hacking and attempting to extort a nationwide chain of psychotherapy clinics, and in the process publishing a trove of patient data to the internet. Along with typical identity fraud material—social security numbers, phone numbers, residential and email addresses—the dump had included the innermost secrets of tens of thousands of people, desires and deeds and memories that in many cases they'd only ever confessed to their therapists. The result was a national trauma that one prominent Finnish politician likened to a terrorist attack.

Throughout his trial, from this past November through early March, Kivimäki maintained his innocence. He argued that investigators and prosecutors singled him out from other potential suspects because of his reputation, not the evidence. "They're saying, 'Well, we know one of these guys,'" he told me. "'We've investigated him before, he's from Finland—OK, this guy did it.'"

Whoever committed the attack, however, was working from a playbook Kivimäki helped create. Cybercrime is a business, practiced at the highest level by anonymous gangs who cultivate an air of professionalism—they need you to believe that if you pay the blackmail, they'll hold up their end. And the vast majority of them are never caught. But that model exists in tension with a more juvenile, ▶

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◀ performative strain that measures success in terms of shock and notoriety. Combining the two, as Kivimäki at various points in his career tried to do, offers the prospect of both fame and riches. But it also makes for a combustible mix.

KIVIMÄKI GREW UP IN ESPOO, Helsinki's western neighbor, a sprawling municipality of office parks and detached housing. Nokia is headquartered there, and in Kivimäki's earliest years the company was covering the world in its candy-bar cellphones. Today, thanks to the iPhone, Nokia is a shadow of that behemoth, but its rise and fall left Finland with an incongruously large constellation of tech companies and entrepreneurs for a nation of 5.5 million.

As a child and into adolescence, Kivimäki was known by his middle name, Julius. He started playing around with the family computer at age 3. By his teen years he had already made a reputation for himself, under handles such as "zeekill," in the Internet Relay Chat forums that functioned as proto-social media for hackers and the young men who emulated them. Finding out much about his family is difficult, and Kivimäki himself won't discuss them, but there is evidence that his parents worried about his direction and tried unsuccessfully to push him toward a more orthodox technology career. Kivimäki did not graduate from secondary school or attend college.

One of the IRC forums Kivimäki frequented was for a group called Hack the Planet. The name was a quote from *Hackers*, a 1995 camp classic about a rebel band of cyberpunk prodigies. (A young Angelina Jolie plays "Acid Burn.") The forum's members broke into corporate networks, preferably those of tech giants or cybersecurity firms, and posted whatever they could find. Companies such as Symantec and the image-hosting service ImageShack found themselves in Hack the Planet's crosshairs, as did rival hackers, whose personal details were published in HTP's digital zines. "It was just kids playing around," Kivimäki says today. But as these groups were quick to point out, there was a social benefit to exposing the security weaknesses in trusted digital systems and shaming their custodians into doing better. Tech companies began paying "bug bounties" running into the tens of thousands of dollars to hackers who alerted them to such vulnerabilities.

Around 2011, when Kivimäki turned 14, he and an American teen named Blair Strater got into a heated disagreement over whose site should host the next installment of Hack the Planet's zine. Things escalated, various threats were made, and both of them were kicked out of the group.

Strater, in his own recollection, was often getting in fights online. "At the end of the day, I was an autistic child being obnoxious on the internet," he says now. He wasn't prepared for Kivimäki. First, pizza and Chinese food deliveries showed up at the house in Oswego, Illinois, where Strater lived with his parents and younger sister. The orders, when they came in, had instructions to "Ask for Julius Kivimäki." Then a truck arrived with three tons of gravel to dump in the family driveway. The household internet and the electricity got shut off by someone posing as a family member. At one point, hackers took over Tesla Inc.'s official Twitter account, posted the Straters' phone numbers and address, and said anyone who called or showed up at their place would get a free car.

The harassment continued for years, and it darkened. Strater started receiving regular phone threats. The local police were crank-called to the house more than 20 times—"swatting" was just getting popular enough to have a name. In one call from 2013, the robotic voice of an automatic text-to-speech program claiming to be Strater said he had murdered his girlfriend and planned to kill his parents and "blow the whole block up." Strater spent three weeks in juvenile detention after an email address incorporating one of his online usernames sent a bomb threat to a local police detective. His mother, a biostatistician, lost her job after her social media accounts were hacked, then filled with racist, antisemitic ranting.

Torturing the Straters was only one of Kivimäki's projects at the time. He'd found a new set of associates, many of whom congregated on Darkode, an online marketplace for malware, stolen data and hacking services. One was Vinnie Omari, a Brit in his early 20s who matched postings with people who could do the work. The jobs ranged from patching server security vulnerabilities to snooping for suspicious spouses to stealing data from websites at scale, and the middleman's cut, Omari says, could be tens of thousands of dollars each time.

Kivimäki and Omari hung out a couple of times, including once in Amsterdam, getting stoned and going out to eat. Most of their relationship, however, was online, where they spent hours playing *World of Warcraft* and *League of Legends* together. Kivimäki had an obsessive side, Omari says. Usually,

Asked why the group had done it, he said it was "to raise awareness" about poor cybersecurity and "to amuse ourselves"

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Kivimäki and his online friends picked targets of convenience. "If they don't retaliate, then Julius gets bored," Omari says. "And then we move onto a new person." But if someone put up a fight, Kivimäki could get fixated and come after them again and again.

At this point, multiple law enforcement agencies were learning of Kivimäki. In the late summer of 2013, he flew to Las Vegas to attend the Black Hat cybersecurity conference. A fellow Hack the Planet member was there, too, staying at the Bellagio Hotel, and the two were chatting in his room when half a dozen FBI agents knocked at the door. The agents briefly interviewed Kivimäki, "just some broad, basic questions," as he recalls, and confiscated his cellphone. When Kivimäki got back to his own hotel room, agents were waiting there, too. They took away his laptop and told him, he says, "to never come back to this country." He became convinced that someone in HTP was working with the bureau.

A few weeks later, on Sept. 23, 2013, Kivimäki was home in Espoo on his computer, his parents out, when Helsinki police officers arrived with a search warrant. His name had come up in an ongoing cybercrime case. Kivimäki was taken into custody, along with his computer, an Acer Aspire desktop. What the police found on it proved to have no connection to the other case they were investigating. It did, however, strongly suggest multiple other crimes. Convinced that Kivimäki might destroy evidence or even continue his criminal activity if allowed to go free, a judge put him in jail.

Antti Kurittu was one of the police investigators on the case. "We would spend the first half of the day combing through his computer," he says, "then we'd talk to him for the rest of the day." The conversations were not fruitful, but on Kivimäki's hard drive, in files whose names were gleefully racist and crude, the police found evidence that he and fellow Hack the Planet members had installed backdoors on 50,700 computer servers, taking advantage of a vulnerability in an Adobe software platform called ColdFusion. In one such attack, Kivimäki and possibly others had infiltrated the computer systems of Educause, an American nonprofit responsible for managing the ".edu" domain. Using this access, Kivimäki routed traffic from a server belonging to the Massachusetts Institute of Technology to a server at Harvard University, crashing both. Then, Kivimäki redirected all of the email traffic passing through MIT's server to a server in his control.

In other attacks, passwords, credit card information and other personal data had been scraped from compromised servers. Then the servers had been synchronized into a botnet, a kind of zombie computer army that can be deployed in DDoS (for distributed denial-of-service) attacks, bringing down other servers and websites by inundating them with traffic. To Kurittu, however, the hard drive's contents also suggested the limits of the young hacker's abilities. Kivimäki most likely hadn't created any of the malware he'd used. He had various viruses stored on his computer, but none of their source code.

Over the following year, Kivimäki was in and out of police detention. He spent weeks at a time in jail. Between stints, he carried on as before. In the summer of 2014, he and some Darkode acquaintances initiated a series of attacks to shut down the *League of Legends* servers, then targeted Microsoft's Xbox, Sony's PlayStation and Twitch, a livestreaming site popular with gamers. As ransom, the attackers would demand on Twitter that popular streamers tweet photos of themselves with "Lizard Squad"–the name of their loosely affiliated gang–written on their forehead. Gaming and social media had merged to create a new kind of public spectacle. Kivimäki and his friends decided hacking should be one, too.



■ Cybercrime investigator Kurittu

ATTACKS ON INDIVIDUALS CONTINUED, as well. Kivimäki led swatting campaigns against a fellow hacker, against the family members of an FBI agent who'd investigated him and against a girl in Norwalk, Connecticut, who'd broken off communication with him. In that call, Kivimäki posed as the girl's father, claimed to be heavily armed and suicidal, and could be heard making gunshot noises as he hung up. John Smedley, the president of Sony Online Entertainment, became a favorite target. In August 2014, after the outspoken video game executive tweeted that he was about to fly home to San Diego, Kivimäki figured out Smedley's American Airlines flight information by calling the airline pretending to be him. Then Kivimäki called back, again posing as Smedley, and said he had reason to believe an impostor had boarded the flight with his passport and ticket. He alerted the customer service agent to a tweet, from @lizardsquad, saying there was a bomb on the plane. Once again, the maximalist tendencies of the American security apparatus played into the gang's hands. Two fighter jets met the plane midflight, and it was rerouted to Phoenix, where FBI agents ▶

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In Finland, "everyone knows someone who knows someone" whose therapy records were leaked

◀ questioned Smedley. He declined to comment for this story.

Publicly, Lizard Squad paid lip service to white-hat hacker ideals, but the group seemed more interested in putting on an anarchic show. On Christmas in 2014, Lizard Squad shut down the servers for both Xbox Live and the PlayStation Network with DDoS attacks, temporarily preventing anyone who'd just unwrapped a console from doing much with it. Kivimäki, identifying himself as "Ryan," gave a television interview to Great Britain's Sky News. "I can't really say I feel bad," he said, suppressing a smile. "I might have forced some kids to spend time with their families instead of playing games." Asked why the group had done it, he said it was "to raise awareness" about poor cybersecurity and "to amuse ourselves."

In July 2015, a Finnish district court convicted Kivimäki of money laundering, multiple counts of fraud, cyberbullying and 50,700 aggravated data breaches. In addition to the Harvard and MIT hacks, he was found to have stockpiled and used stolen credit card information. But because he'd committed the crimes as a minor, the sentence was lenient, even by Finnish standards. The state kept his Acer computer and forced him to forfeit €6,588.88 (about $7,000). He was given a suspended prison sentence and was free to go. "That was the piece of garbage that brought my plane down, leaked my information and did all kinds of other crap to me," an outraged Smedley tweeted the next day. Shortly after, his new company, Daybreak Games, experienced a DDoS attack.

Kivimäki changed his Twitter bio to "Untouchable hacker god." He left Finland to live in Barcelona, then London, where he rented a pair of luxury apartments for his girlfriend and for himself—one in Westminster just around the corner from the headquarters of the spy agency MI5. He traveled to Dubai, Hong Kong, the Czech Republic and Romania. He visited Nepal and the French Alps. At some point, he got married.

A little less than five years after his first conviction, Kivimäki went on trial again, this time for the harassment campaigns. The evidence, most of which the FBI had gathered and handed over to Finland's National Bureau of Investigation (NBI), included call recordings and logs of IRC chats between Lizard Squad members. It showed the alarming ease with which Kivimäki extracted sensitive information. At one point, in response to Lizard Squad's attacks, Smedley had announced online that he'd gotten identity theft protection from the company Lifelock Inc. Kivimäki responded by calling Lifelock, saying he was Smedley. In audio of the call submitted at trial, the customer service representative asks Kivimäki a series of security questions, all of which he gets wrong. Nonetheless, by the end of the conversation, he has been allowed to create a new password for the account, enabling him to log in and find, among other things, Smedley's banking details.

In June 2020, Kivimäki once again was found guilty, received another suspended prison sentence and was required to make restitution payments totaling several thousand dollars. Then he dropped from public view. But someone very similar to him left a voluminous record of his thoughts in the comments section of Hacker News. There, a poster going by ryanlol frequently held forth about digital currencies, Covid-19 policy and criminal ethics and tactics. "You are seriously overestimating the capabilities of blockchain analysis tools," he responded when an interlocutor warned about the ability of law enforcement to trace crypto payments. "If swatting deserves more than a fine," he'd written back in 2017, "then you're living in a deeply f---ed up society and should probably focus on fixing that first." Institutions whose data was ransomed by hackers had a duty to pay, he wrote in October 2020. Refusing to do so was "unconscionable."

Asked about it today, Kivimäki denies posting as ryanlol, though that contradicts his admission in a police interrogation submitted at his trial—and is hard to square with a 2017 post in which ryanlol detailed a personal rap sheet including "50,700 counts of aggravated unauthorized access to computer systems." Ryanlol presented himself as an amalgam of anarchist pundit and luxury lifestyle influencer. He described how he programmed his computer to shut down, erasing evidence the authorities might want, the moment he yanked a "kill cord" he made from headphones plugged into the 3.5-millimeter jack. He offered tips for travelers flying Emirates first class ("Book the shower right before landing and step off the plane feeling nice and fresh") and mentioned "having spent time in some

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of the nicest prisons in the world." He detailed his ambition to start a high-end travel agency. One post from November 2021 combined a few of his interests into one outside-the-box plan: "A terror group could just have one of their operatives blow a million dollars on first class flights," he mused. Once the plotters achieved ultra-VIP airline status, "it becomes really easy to ask for things like seeing the cockpit during takeoff."

"Money killed hacker groups," ryanlol wrote in the spring of 2021. "I suppose the rise of cryptocurrency is to blame for dealing the final blow." The founders of Hack the Planet "were children" and, he claimed, "few of us cared about money." Not anymore. Bitcoin, with its promise of untraceable payment, had made it so simple to cash in on data breaches. "It's obvious why nobody is making zines anymore."

Kivimäki became a celebrity in a particular young male corner of the internet. Allison Nixon, chief research officer at the cybersecurity company Unit 221B, calls him a kind of cultural innovator. "The amount of bad influence that this guy has had on kids online," she says, "is very significant." In the message boards and chatrooms she monitors, there's still a mystique around Lizard Squad, and in recent years newer gangs have taken up the hacker troll mantle. One of them, Lapsus$, was responsible for a series of attacks from 2021 to 2023. Like Lizard Squad, it targeted popular gaming brands and publicly mocked its victims, maximizing attention while also giving investigators a trail to follow.

THE EVENING OF SEPT. 28, 2020, A

Monday, Ville Tapio was home catching up on the day's accumulation of emails. Tapio is a sloe-eyed former management consultant who dresses like a semiotics professor and speaks, at least in English, with great care. He lives on one of the hundreds of islands that form Helsinki's eastern archipelago. At the time he was the chief executive officer of Finland's largest provider of psychotherapy services, a company called Vastaamo.

Finland has topped the rankings of the World Happiness Report, a global survey, for several years running, but Finns suffer from the same psychological maladies as everyone else. Tapio's mother is a psychotherapist, and when he co-founded Vastaamo in 2008, he wanted to make what she did more widely available and less stigmatized in his country. Vastaamo marketed itself aggressively, opening clinics in shopping malls and helping produce a reality series called *Kummalliset kammot* ("Weird Phobias") for national television. For the therapists it recruited, it offered relief from the administrative headaches of private practice and an intuitive web application where, among other things, they could write detailed notes on each session. True to his mission, Tapio made a point of putting locations in some of Finland's remoter reaches. Vastaamo grew fast, and in 2019 the private equity firm Intera Partners bought a majority stake for about $11 million.

Going through his emails that Monday night, Tapio was alarmed to see that one of them was a ransom note. The sender introduced themselves, in Finnish, as a hacker, and claimed to have stolen Vastaamo's patient database. The rest of the email was in English. "Any price you'll pay us will be small compared to the damage that would be inflicted to your business if we release this information on the internet," it read, then closed with a more solicitous, first-person singular voice: "If you have any questions or difficulty understanding what's happening, I'm here to help."

Reading the email, Tapio noticed something about its Finnish. It was grammatically incorrect, but not the way it would be if a nonnative speaker used Google Translate. The clumsiness struck him as intentional, a phony lack of fluency. "It was like something out of a comedy," Tapio says.

The ransom email had also been sent to two other Vastaamo employees: Sami Keskinen, the company's data protection officer, and Ilari Lind, a software developer. Over pizza at Tapio's house, the three of them quickly determined that the sample batch of patient records attached to the ransom email was authentic. Tapio reached out to a Finnish cybersecurity company called Nixu. One of the lead investigators there, as it happened, was Antti Kurittu, who'd left the Helsinki police a few years earlier. His team began working to determine how the breach had happened. He also connected the company with the Finnish NBI, which took over the ransom negotiations.

At first the conversations continued to run through Tapio. "We do not negotiate with criminals," he responded to the ransom note, as instructed. "If you publish the data, prosecution will follow." The extortionist's response, also in English, came within a couple of hours: "I understand where you are coming from, but this is not a negotiation." Vastaamo, they continued, had failed to protect the private information its patients and therapists had entrusted to it. "Failing to prevent the publication of these extremely sensitive details will be an even greater failure." The ransom was 40 Bitcoin, around $430,000 at the time.

As Nixu's investigation made clear, Vastaamo had been extraordinarily careless. Its database had essentially been left wide open to the internet for more than 15 months. The company network's firewall had been disabled, as had another firewall around the server that held the patient information. Most egregiously, there had been no password on the system's administrator account. Anyone using one of the specialized search engines that help hackers spot internet-connected devices could easily log onto Vastaamo's system and copy everything they found.

There had, in fact, been at least two breaches at Vastaamo, most likely unrelated. One of them occurred in 2019 while Tapio was negotiating with Intera Partners over its stake in the company. (No data was stolen in that attack.) When this came to light during the Nixu investigation, Tapio was quickly fired, and the private equity firm sued to annul the deal. According to Tapio, though, the security vulnerabilities had been hidden from him, as well. Their egregiousness, when he learned about them, made him wonder if the breach was an inside job.

Years before, Keskinen and Lind, the other two recipients of the ransom note, had been criminally investigated in connection with a different incident, something they told Tapio ▶

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◀ as Vastaamo struggled to respond to its own crisis. The two men weren't charged in the earlier incident, however, and according to prosecutors on the Vastaamo case, there is no evidence either was complicit in the extortion attempt. (Neither responded to requests for comment.) That leaves, as an explanation for the company's security practices, some combination of complacency and laziness—having no admin password or firewalls would have made it much easier for Vastaamo's IT personnel to work remotely. Intera's lawsuit would be settled two and a half years later, with undisclosed terms.

In the weeks after the ransom demand, NBI investigators continued to negotiate with the extortionist. They sent emotional emails posing as Tapio, begging that the company be spared. As a gesture, they sent 0.1 Bitcoin to the wallet address linked to the ransom note.

Early the morning of Oct. 21, the hacker took a new tack, and gave himself a name. A post appeared on a Finnish language dark web forum called Torilauta from the username ransom_man. Vastaamo had stopped responding to emails, ransom_man wrote, and to move things along he had published 100 patient records to a special leak site. As is standard practice in data extortion operations, the site was on the dark web, where it was invisible to regular web browsers and search engines, but anyone with a special anonymizing Tor browser could peruse them. Ransom_man promised to upload 100 more records to the site each day until the ransom was paid. "Enjoy!" the post ended. Below that was an email address labeled "press contact."

A few hours later, similar posts appeared on Ylilauta, a Finnish message board with an alt-right reputation, as well as on Reddit. Other posts appeared with patient records copied directly into them. Unlike the ones on the leak site, these were visible to anyone with an internet connection. They seem to have been a kind of teaser, chosen for maximum impact. Digital forensics on ransom_man's devices would later reveal the search terms he used to find those records in the database. Some of the terms, like the Finnish words for "CEO," "famous," and "police," suggested the sorts of patients he was looking for. Others, like "rape," "pedophilia," and "rape fantasy" suggested the content he sought. The teaser posts, complete with patient names, were the results of those searches.

Twenty hours later, when the second batch of records appeared on the leak site, cybersecurity professionals in Finland and elsewhere were monitoring it. The Nixu team set up a software script to check the site hourly and scrape any new data. On the third day, Oct. 23, ransom_man uploaded an additional 100 patient records right after midnight Helsinki time. But then, just a few hours later, another file appeared on the leak site. It was more than 30,000 records—all the data taken from Vastaamo.

If the goal had been to shock and horrify the nation, ransom_man had succeeded. News of the massive leak exploded in the Finnish media. "Everyone knows someone who knows someone" whose information was in there, says Mikko Hyppönen, a leading Finnish cybersecurity researcher. Prime Minister Sanna Marin called a meeting of key ministers to discuss a government response. The Finnish president described the attack and leak as "mercilessly cruel." Hanna Sarkkinen, a member of Parliament who was soon to become the country's minister for health and social affairs, compared it to "an act of terrorism."

If the goal had been to get paid, however, what ransom_man had done made no sense. Exposing a few hundred patients as proof of one's deadly seriousness had a clear if sociopathic logic. But publishing the entire dataset removed any incentive for Vastaamo to pay. Kurittu found himself wondering if it was some kind of ruse to throw investigators off the trail. Then he began to suspect it had been a critical mistake.

A few hours after the 10.9-gigabyte file appeared, it disappeared with a cheeky message, "whoopsie :D." By then, however, multiple investigators had downloaded at least part of it, and by painstakingly reviewing the command history, the NBI team developed a clearer picture of what had happened. The extortionist, after uploading the first three batches of patient information manually, had set out to automate the process. But he'd written the script sloppily and hadn't bothered with a trial run. Swinging into action at the appointed time, his program uploaded the entire home folder of the server on which it was running onto the leak site. "You have to be ignorant and arrogant to make this kind of mistake," Hyppönen says.

There were other clues. Poring through the inadvertently leaked home folder, Kurittu noticed that many of the file names were obscene or slurs, and one of them referenced ColdFusion. He was reminded of the Acer desktop he'd examined seven years earlier. "I only know one guy who names files like that," he remembers thinking.

Two days after the mistaken upload, ransom_man started emailing individual Vastaamo patients. In Finnish, he offered to delete their patient record from his servers in return for €200 worth of Bitcoin. (The price would jump to €500 after 24 hours.) The emails appeared to be an attempt to salvage something from the trove. They were also, in their way, an innovation. Hackers typically extort companies, not their clients. It's far less efficient to contact and negotiate with tens of thousands of individuals. If a gang of professional cybercriminals had made such an error, it would most likely just have moved on. Whoever this was, they were more stubborn or more desperate.

And, it turns out, untrustworthy. Some Vastaamo patients did pay ransoms, but their data was never purged. Even if ransom_man had meant to, it quickly become impossible. Investigators had already begun confiscating his servers. An IP address found in ransom_man's home folder had immediately led the NBI to a server farm not far from Helsinki. Investigators took possession of a server there, then two others they connected to the breach, and began poring through the machines' communication logs.

Despite that early breakthrough, months went by without an arrest. Meanwhile, the Finnish government tried to reassure its citizens. It closed a loophole that had left Vastaamo largely

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■ Raiskio, a lawyer whose firm is representing thousands affected by the Vastaamo breach



■ Marttiini, one of the victims

exempt from the country's health data protection laws and, in December 2021, fined the company €608,000. By that point, though, Vastaamo had filed for bankruptcy and sold its clinics to an occupational therapy chain. Tapio, the ex-CEO, was later convicted for violations of the European Union's General Data Protection Regulation, receiving a three-month suspended prison sentence. He appealed the decision, and an appellate court trial is scheduled for next year.

None of this will give any of the victims their secrets back. Since the breach, copies of the patient database have surfaced on file-sharing sites. In the summer of 2021 an anonymous coder even created a search engine that made the trove searchable by name. For people already prone to depression or anxiety or grappling with past trauma, the exposure, and sense that it will never truly end, has only compounded the symptoms that brought them to Vastaamo in the first place. "For all of us, we have this life sentence," says Mia Marttiini, a 59-year-old designer. Jenni Raiskio is a lawyer at a Finnish firm representing 2,600 victims. Some of them, now frightened and mistrustful of therapy, have stopped going. Others have lost jobs. Some, Raiskio says, were driven to suicide.

ON OCT. 29, 2022, TWO YEARS AFTER the botched extortion attempt, a Finnish prosecutor named Pasi Vainio signed an arrest warrant for Kivimäki. Suspecting that he was still abroad, Finnish police had him placed on Europol's list of most wanted fugitives, making his name public. The Finnish press, which normally does not publish suspects' names, in this case loudly made an exception. Nonetheless, Kivimäki continued to travel around Europe. At some point, according to an Instagram video submitted at his trial, he and some friends spent time in St-Tropez.

There is a certain irony to how the authorities finally found Kivimäki outside Paris. In Kivimäki's account, the friend of his wife's who tipped off the police in Courbevoie did it to get back at him. After their night out clubbing, he says, the friend had been out of control and increasingly loud, and he'd finally kicked her out of the apartment. Then she called the police and accused him of physically assaulting his wife. If Kivimäki's account is true, and details in French court documents at least partially match it, he was finally found and taken into custody because someone tricked the police into showing up at his door. In other words, he was swatted.

In late February 2023, Kivimäki was extradited to Finland and placed in Vantaa Prison, a half-hour north of Helsinki. The great challenge in prosecuting cybercrimes, aside from their technical opacity, lies in proving who was at the keyboard when a specific command was executed. The Vastaamo investigation was no exception, according to Marko Leponen, the NBI detective chief superintendent who led it. "The path from the crime to the suspect was not a straight line," he says. But there were many connections. "It is a spider web, and in the middle of this web is Mr. Kivimäki."

The first thread had emerged out of communications logs on the confiscated servers. Right after the accidental data dump, whoever controlled those servers had copied the ▶

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■ Vainio and a fellow prosecutor put up a timeline at Kivimäki's latest trial

◀ contents somewhere else, then wiped as much of the memory as they could. But while previously that person had been careful to disguise their IP address by using a virtual private network, that time, perhaps out of haste or panic, they logged in without the VPN. The unmasked IP address that one of the servers had recorded was registered to one of Kivimäki's two London apartments. Kivimäki had used that same IP address to make online payments, including one for a hotel stay and another to an OnlyFans creator.

Another IP address in the communication logs was traced to an apartment in Barcelona rented to a Daniel Fulgescu. That seems to have been another of Kivimäki's Romanian aliases. According to prosecutors, it was the name on the registration of a BMW 7 Series that Kivimäki drove. A picture of the car, complete with license plate, had been posted by "Aleksanteri K" in a glowing five-star review for a high-end Barcelona auto detailing shop. (Kivimäki denies that the car was his.)

The server logs had also led the NBI to a different set of servers rented by a consulting company. Scanifi, as it was called, offered cybersecurity services to the owners of badly protected databases that it found online. The company co-founder was Kivimäki, who'd paid to rent the servers in question. One of the Scanifi servers had been configured into multiple smaller virtual servers, including one whose contents were encrypted. When investigators managed to break the encryption, they discovered a copy of ransom_man's home folder. "It is an exact replica," says Vainio, "of the server that was used to commit these crimes."

In perhaps the biggest coup, investigators determined the ultimate destination of the 0.1 Bitcoin payment that negotiators made to the wallet address in the original ransom demand. Whoever controlled that wallet had first converted the Bitcoin into Monero, a cryptocurrency thought to be untraceable because of special obfuscating measures built into its blockchain. According to the NBI, the Monero was then transferred to an account at the crypto exchange Binance and converted back into Bitcoin. And a portion of that money ended up in a bank account belonging to Kivimäki.

While the investigative report redacts key details, the NBI's Leponen says both the Monero tracking and the decryption of the Scanifi server relied heavily on other evidence available in the case. The accidental upload had been a rare gift to investigators. On ransom_man's home folder, alongside the records of the tens of thousands of patients whose reputations he'd taken hostage, his own information was stored. Some of his login credentials were there, as well as hints about others.

This past Nov. 13, in the brand-new district courthouse in his onetime hometown of Espoo, Kivimäki's third trial began. The charges included "aggravated computer break-in," the dissemination of private information, 20 counts of extortion (for the few patients who did futilely pay ransoms) and 21,316 counts of attempted extortion. Finnish criminal defendants are, for the most part, tried by a panel of judges rather than a jury. Kivimäki's judges, a woman and two men in business attire, sat on a dais in the front of the courtroom. One of the judges first assigned to the case had recused themselves because of a personal connection to a Vastaamo victim.

The room was small and paneled in blond wood, like a sauna, and journalists and other spectators were at three rows of desks equipped with monitors to display digital exhibits, or in chairs arranged along the back wall. Hundreds of victims watched remotely—by law, they had a right to witness the proceedings, and their massive numbers had presented a logistical challenge. One of the two remote viewing sites was a movie theater. To try to protect what was left of the patients' privacy, the exact locations weren't disclosed to the public, and access to them was tightly controlled.

Kivimäki took the stand for two days in mid-January, as Helsinki dug itself out from a blizzard followed by a bitter cold snap. The first day, he answered questions from his own lawyer; the second day, from prosecutors. The chief judge chimed in courteously to ask occasional questions of his own. Shown spreadsheets of various time-stamped logins and bank transactions, Kivimäki mostly said he couldn't recall making them. He pointed out repeatedly that others had access to the IP addresses and credentials and servers that supposedly linked him to the breach—at various points, friends and colleagues had used them, too. And he maintained that he had no motive to

The charges against Kivimäki included 21,316 counts of attempted extortion

TAPIO; EMMI KORHONEN/LEHTIKUVA

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resort to crime. Timely cryptocurrency investments, he said, were to thank for the lifestyle he flaunted online.

In an interview with *Bloomberg Businessweek* the following day, Kivimäki expanded on those arguments. Vantaa Prison, to American eyes, has the distinctly unforbidding air of a public high school. Kivimäki was provided a room to use as an office, complete with a desktop computer: It wasn't connected to the internet, and its processing unit was locked in an aluminum crate so nothing could be plugged in. The government also provided him with an encrypted laptop to use at trial. For two hours on a Tuesday morning, Kivimäki was left alone in a visiting room with a journalist and photographer. Afterward, he and his fellow inmates made lunch together in the kitchen they shared. It was pizza day.

Kivimäki introduced himself as Alex, not Julius. He'd dropped his middle name years ago "just to keep the banks happy," he said. His English was fluid and only lightly accented, the idiomatic American dialect of the internet. When he was named a suspect in the Vastaamo breach, he said, he didn't believe he would be given a fair trial. That's why he didn't turn himself in. "I wasn't super eager to come here. It was obvious that they're not really going to respect my very basic rights."

That fear, he said, had been borne out. "They never searched my home in London, where they claim I was living and they claim I performed these crimes from," he said. Vainio, the prosecutor, concedes this is true, and that, because of a "misunderstanding regarding the investigation order," police in London failed to seize any of Kivimäki's devices. As for the cryptocurrency payment tracking evidence, it was introduced late in the trial, and Kivimäki and his lawyer weren't able to properly examine it. Peter Jaari, Kivimäki's lawyer, is at pains to point out that the seven-year sentence prosecutors sought is a heavy one by Finnish standards.

During the prison interview, Kivimäki was also happy to correct what he said were misperceptions about his earlier career. He described himself as a mere spokesman for Lizard Squad. "My involvement was quite small. It was sort of exaggerated in court," he said. "There were much more talented people there who actually did the things." As for the campaign against Blair Strater and his family, that, too, was a team effort. "I might have called him once or twice and sent him pizza," he said. Strater himself, Kivimäki said, was known for issuing threats of his own: "He was very good at making enemies." ("The only thing I ever threatened anyone with was to snitch on them," Strater insists. "That's not cool, but there's a big disconnect between threatening to snitch on someone and threatening to kill them.")

"I know next to nothing about programming," Kivimäki maintained. What he does know about is "systems architecture," he said. "Any company will be a collection of different systems used for different things," he said. His specialty, in his own description, was understanding institutions and the people who make them do things. The technical details, less so.

A few weeks after that conversation, Kivimäki briefly went missing. He'd appealed his detention, and his judges decided he no longer was a flight risk and could be released. An appellate court quickly reversed the decision. But at that point, no one seemed to know where Kivimäki was. He was, of course, online. For a week, he posted furiously on message boards while his lawyer, Jaari, promised that he was still planning to show up at his next scheduled hearing. Police eventually took Kivimäki into custody at a downtown Helsinki penthouse apartment rented in his sister's name. They tracked him down in part thanks to background details in a photo he'd posted to Ylilauta, the chat forum, of a bottle of Krug Champagne.



■ Former Vastaamo CEO Tapio at the trial

The trial closed on March 8. One of the victims, an elementary school teacher and young mother, came to court a week before the trial's end to read a statement she'd written. "Many of the victims were at the darkest point in their lives at the time," she said. "The data breach made it even worse." Seven years, she argued, was far too short a sentence for what Kivimäki was accused of.

Describing it afterward, she said she wasn't afraid of Kivimäki when she saw him, as she thought she'd be. Still, she didn't want her real name in this story. As an alias, she suggested Mira, a common Finnish name. Finland has a tradition of "name days," she noted, and on your name day, as on your birthday, you receive presents. Mira's day is April 30, the date Kivimäki's judges had promised a verdict. For her present, she wanted it to be guilty.

Mira got her wish: At 2 p.m. on the appointed day, Kivimäki was convicted on all counts. Ultimately, the judges had not found him credible. "Kivimäki's denial has been undermined by the fact that the grounds for his denial and his story have changed during the trial as the evidence has progressed," they wrote in their verdict.

They did extend him a measure of leniency. Noting that he's in settlement talks that would entitle the victims to compensation, most likely from the government, the judges trimmed Kivimäki's sentence to six years and three months. Finnish law extends a further indulgence: Because it's his first actual prison sentence and because of time served since his arrest in France, Kivimäki won't spend anywhere near six more years behind bars. He'll walk free in two. He's informed the court of his intention to appeal the decision. Ⓑ —*With Leo Laikola*

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Ignore the algorithm.
Forget what your friends told you.
Block out the in-laws' advice.
Instead, prioritize the only preferences
that really matter: yours.
(It may save you money, too)

DETOUR TO SERENDIPITY

By Nikki Ekstein
Photographs by Emli Bendixen
Illustrations by Pete Gamlen

EUROPE FOR LESS

This year, our summer travel special comes with 27 trip ideas to make your vacation budget go further—without sacrificing luxury

A road near Batcombe in Somerset, UK, where the author learned to let someone else take the wheel

May 6, 2024

Edited by
Nikki Ekstein
and James Gaddy
Businessweek.com

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"So, where are you going?" my mother-in-law asked a few weeks before my husband, Charles, and I were scheduled to leave for several days of child-free bliss. Almost two years overdue on celebrating our 10th wedding anniversary, I was still drawing a vacation blank. My mother-in-law was shocked. "You're normally so on top of it!"

She was right. I've been a travel editor for more than a decade; knowing where to go is literally my job. But I'd been trapped in a paradox: The thing I needed most—rest—was incompatible with my dreams of parental freedom. After all, relaxing places like beach resorts are the default when "vacation" means 24-7 child-minding.

A solution slowly came into focus. It would be a countryside escape far enough away to incur jet lag but near restaurants that are worth staying up late for. Boring for kids, impractical for tiny bad sleepers and gloriously indulgent for us.

That's how I arrived at the Newt, a 2,000-acre estate in Somerset, a roughly two-hour drive west of London in an area known for two things my husband and I hold dear: apple cider and cheese. It was perfect—until we realized it was also sold out for half of our dates.

Luckily the staff at the Newt had recommendations for how to fill out our itinerary with the places they themselves love to frequent. So instead of staying in one place (relaxing!), we'd bounce among several (an adventure!). When a local friend offered to make a few reservations for us, I happily surrendered control.



And yet we still hadn't figured out our first stop until after our plane landed at Heathrow. It felt thrilling to let go and give in to serendipity.

Looking back now, I feel confident no amount of planning could have yielded a better itinerary. I wouldn't have changed a single turn.







An upstairs room (above) and back patio (left) at the Three Horseshoes in Batcombe; a dish of golden beetroot with preserved lemon at Osip (right) in Bruton



Windsor to Batcombe

It's around 10 a.m. when we climb into our Mercedes A-Class rental, zonked after a sleepless overnight flight. Our first stop is Batcombe, 100 miles away, but I decide we won't get there at all without caffeine, so I navigate us to Windsor, 10 miles down the M4.

In the king's ancestral seat, I spot a sign for a "cakery" down a brick-walled alleyway. That's how we find ourselves at Cup of Rosie in a Tudor house splitting an indulgent vanilla custard cake and pots of Earl Grey before touring Windsor Castle.

We're two-thirds of the way to our destination when traffic slows. But drivers aren't rubbernecking at an accident: It's Stonehenge, right off the A303, standing in a grassy field as it has for some 4,500 years.

Batcombe is a speck of a village that consists primarily of a 15th century church and a 17th century pub called the Three Horseshoes, which is where we're staying. There's no lobby or reception desk, just a worn wooden bar that sits under beamed ceilings. This is the favorite local pub of the Newt staff, and, like thousands of these establishments across the UK, it has a handful of rooms on the second floor. The inn opened in April 2023 after a restoration by star chef Margot Henderson. Her mince toasties and deviled pig skins are staple bar snacks; for dinner she makes a rotating array of refined British comforts such as ox cheek pie with pickled walnuts and roast goose with apple jelly.

Before arriving, I'd had visions of sloshing pints, hoppy aromas and sticky floors. In reality, it hums with what feels like the entire population of the town (scampering children included), and it's full of warm conviviality. We're the only non-Brits. Upstairs, we settle into an antique-filled room (from £220, or $275) with a soaking tub and views of St. Mary's church.

It's Pie Week, seemingly a nod to the *Great British Bake Off*. We order the savory duck option with buttery crisped potatoes, and it's deserving of a "Hollywood handshake."



Batcombe to Bruton

At breakfast we get our first taste of Somerset apple juice, famed for its tart complexity, then we borrow wellies and stroll to the region's most awarded cheesemaker, Westcombe Dairy, for nibbles of smoked and aged cheddars. We leave with two shopping bags full of cider and cheese and head to Bruton, 3 miles down the road.

Compared with Batcombe, it may as well be Manhattan. The town's charms are

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The spa pool (above left) at the Newt; a Sunday lunch (left) at Beckford Canteen in Bath; At the Chapel (above), a bakery and restaurant in Bruton; sheep (right) on the grounds at the Newt

concentrated on the pastel-hued High Street: At one end is Bo Lee & Workman, a modern gallery in a tiny old church, where we pop in for the opening of an exhibit by British sculptor Olivia Bax. At the other end is our hotel, the colorful No.1 Bruton (from £180).

Bruton is the hub of Somerset's recent creative influx. The center of town has two dozen or so shops, and each is outstanding. Cabbages & Roses sells floral brocade blouses and grandmacore dresses; it's not to be confused with Rose & Lyons, a store with a curated collection of under-the-radar (read: midprice) European labels. Vegan beauty brand Commune looks poised to be the next Aesop: "We're already stocked by private clubs in London and New York," the shopkeeper tells me.

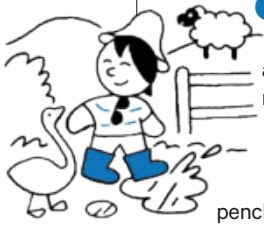
The town is also home to an outpost of the gallery Hauser & Wirth, which has beautiful grounds for strolling. But Bruton's most masterful creations are those from chef Merlin Labron-Johnson, who cooks out of a shoebox-size kitchen at Osip. Our dinner there is a slow-roasted beet with kefir cream, hazelnuts and preserved lemon and a celeriac puree loaded up with truffles, honey and preserved egg yolk. Paired with funky wines and (more) cider, this meal alone is worth the transatlantic travel.

Bruton to Bath

The next morning, we drive the 27 miles to Bath, which has lovely Georgian architecture that survived World War II unscathed. We skip the abbey and thermal springs and beeline to Beckford Canteen for Sunday lunch. The restaurant feels like a greenhouse, with sun pouring through walls of windows. After a delectable parade of roast beef and Yorkshire puddings and cauliflower smothered in cheese sauce, we let our server twist our arm for a "cheeky teaspoon" of rhubarb sorbet.

Bath to Castle Cary

All this has been the prelude for the hotel stay we'd originally angled for: two nights at the Newt. The 17th century estate is a hive of activity; all the rooms are booked, and there are plenty of day visitors, too. We stroll through a sprawling deer park where several species roam free. We take in tastings at a cider barn and skip the beekeeping master classes. At the heart of it all is an egg-shaped garden filled with hundreds of gnarled vines trained into spirals and crosshatches. It includes one tree for every known heirloom apple variety grown in England.



My room to the spa

The Newt is a place to indulge a bit and slow down a lot. (The rooms start at around £625—not terribly extravagant for a hotel on the World's 50 Best list.) You have to embrace the British penchant for walking, so I meander some 20 minutes through apple orchards before I reach the spa. True to its name, the "relaxing" massage delivers; the therapist released a knot in my neck I'd settled on living with. Charles also takes a long walk but to a painstakingly restored Roman villa-turned-museum—he's still talking about it.

We retreat at night to a room in the Farmyard section of the hotel, a mix of old and new structures. Ours, built on the site of a dairy, is called the Cheese Barn. Modern in style, it has a bathroom larger than the East Village one-bedroom I once considered palatial. It even has its own steam room.

Castle Cary to Heathrow

As we check out of the Newt, I can't quite bear the notion of airport dining. So for one last impromptu hurrah, we set the GPS not to Heathrow but to Heckfield Place. The luxe hotel is located conveniently on the outskirts of London, about 80 miles from the Newt and 35 miles short of the airport, and its main restaurant, Marle, has last-minute availability. We roll in for veal tortellini en brodo and braised beef cheeks with wild garlic—all technically precise and delicate.

As the GPS points us east to Heathrow, I feel a certain satisfaction knowing I don't have any more decisions to wing and gratitude for how miraculously it all fell into place. It's odd, but I realize I have my kids to thank. I was never much good at ceding control until they came along, anyway.

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Dare to Compare

Want to save money on your hotel? Or splurge? Or ... both? Here's a side-by-side look at what you get in five European hot spots. *By Jackie Caradonio*

French Riviera



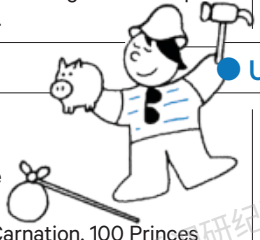
A suite at Château de Théoule

For $385 a night ...
You can book a room at Château de Théoule, a 17th century seaside estate with a private beach, a Mediterranean restaurant and 44 rooms largely inspired by the castle's abundant herbal gardens. It's off the beaten path, in Théoule-sur-Mer, 30 minutes—or more, in summer traffic—from Cannes and more than an hour from the tony scene of St-Tropez, but the view of Cannes Bay is among the most beautiful in the region. Plus, the hotel can arrange boat trips to explore the coastline, from the isolated beaches of Le Trayas to the famous red rocks of Pointe de l'Aiguille. The spa and pool are small but serviceable bonuses.



The dining terrace at Arev St. Tropez

But for $1,500 ...
You can find yourself in the middle of it all at Arev St. Tropez. Its 43 rooms are just a 10-minute stroll from the chic Plages de St-Tropez and a quick taxi hop from Michelin-starred restaurants La Vague d'Or and Colette. If you simply want to hole up, French perfumer Maison ST stocks the elegant spa, and the Strand Restaurant & Champagne Lounge—a St-Tropez institution—has been reborn in-house with live music and a trolley for the fizz. Most of the resort is covered in chic stripes. That includes the glamorous loungers surrounding the pool, which is tiled with the words "A Rêve in the Sun," to remind guests that this *rêve*, or "dream," is in fact real life.



UK

For $560 ...
There's a new spot in Edinburgh set in the historic Victorian-era former clubhouse of the Royal Over-Seas League. Fresh off a top-to-bottom renovation by boutique hotelier Red Carnation, 100 Princes Street is a mere 12-minute walk to Edinburgh Castle and the National Gallery. Instead of a spa, there's a wealth of bespoke details, including hand-painted murals by London art studio Croxford & Saunders. Also on-site: serious whisky tastings and the finest cuts of Aberdeen Angus beef at the leather-and-velvet-lined restaurant, Wallace.

But for $2,500 ...
The Emory, an all-suite Knightsbridge hotel—and sister property to Claridge's and the Connaught—is easily among the glitziest openings in London this year. Even the entry-level rooms start at 592 square feet and are outfitted with marble details, floor-to-ceiling windows and custom millwork. This splurge also comes with instant clout: Every stay includes airport transfers and unpacking services from an "assistant," a guest membership at posh wellness club Surrenne (with an underground 72-foot-long pool) and access to a private rooftop lounge overlooking Hyde Park.

Portugal

For $350 ...
Melides, a 90-minute drive from Lisbon, is home to Christian Louboutin's most affordable bauble. The fashion designer's boutique hotel Vermelho opened last year in the same village as his own longtime vacation compound. Although it looks like a historic *palácio*, the 13-room property is freshly built to his exacting standards, down to its antique textiles, hand-painted frescoes and custom slippers embroidered with his signature red. His glamorous jewel box is rounded out with a Portuguese restaurant where the bacalhau arrives on artisan tableware. There's also a garden pool and a spa featuring Anne Semonin skin care. Sometimes you can have it all on a budget.

But for $750 ...
You can stay in one of the four new finca-style suites at Octant Vila Monte. Opened in 2022, this Algarve gem from nascent luxury brand Octant Hotels feels like your own private inland estate, tucked among citrus groves and pink bougainvillea and just out of earshot of the beach crowds. There are 55 rooms in all, but splurge on a lavish suite, and you'll get a private heated plunge pool, a garden terrace and local design details such as azulejo tiles, woven basketry and rattan furnishings. The À Terra restaurant shows off the best of traditional Algarvian cuisine—think just-caught calamari, savory chorizo and rustic breads cooked in the wood oven.

COURTESY COMPANIES

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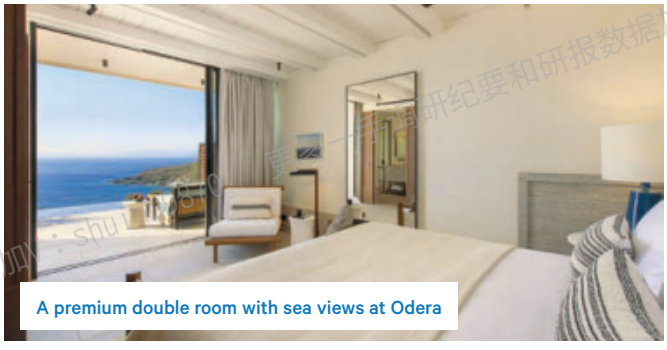
Balearic Islands

For $500 ...
You can have a little bit of Formentera to yourself. The Balearics' less crowded (and more affordable) island doesn't have the ultra-luxury hotels of nearby Mallorca, instead drawing a bohemian crowd. Soak it in at Dunas de Formentera, a 44-room escape set among the powdery dunes of Migjorn Beach—just as gorgeous as Mallorca's Cala Santanyí but far less jammed with tourists. Balearics architect of choice Antonio Obrador has combined earthy stone and ceramic with beachy stripes and minimalist wood furnishings for a stylishly understated aesthetic. Luxury here isn't butler service and spa rituals: It's wood-fired pizza, a breezy pool and an unpretentious vibe.

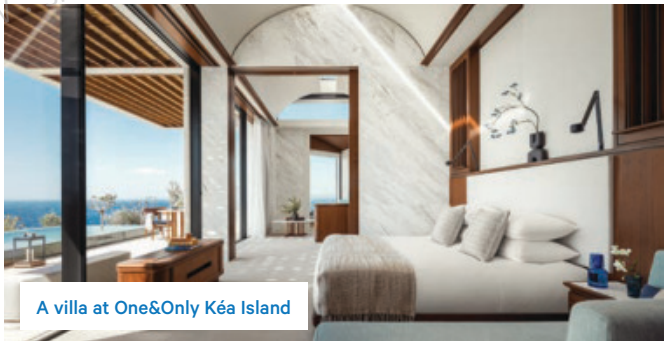
But for $1,000 ...
You can see all of Mallorca's natural wonders converge at Ikos Porto Petro. This 319-room resort is set between rugged mountains and idyllic coves, near both the pristine beaches of Mondragó National Park and sceney Porto Petro Marina. Its suites and family bungalows open up to private gardens, some with infinity pools. The half-dozen on-site restaurants were concocted by Michelin-awarded chefs including Italy's Ettore Botrini and Basque master David Ibarboure, each bringing their culture's cuisines to this stunning Spanish island.



Greek Islands



A premium double room with sea views at Odera



A villa at One&Only Kéa Island

For $375 ...
Skip Santorini and check out Tinos. The sleepy Cycladic island has long been ignored by tourists, but Odera is providing its first dose of luxury with 77 villas and guest rooms. Designed in deference to local architecture, the hotel is constructed of Tinian stonework, with traditional pigeonholes framing the Aegean Sea views. The island itself remains refreshingly sedate, while Odera cultivates a lively atmosphere with a breezy beach lounge and organic spa. There are also two Mediterranean restaurants that focus on local ingredients, including several cheeses as well as wines from Mavrotragano and Assyrtiko grapes.

But for $2,700 ...
Spend the night at the newly arrived One&Only hotel on Kéa, Athens' nearest inhabited Cycladic isle, where just 2,500 people live year-round. The resort's 63 cliffside villas maximize views and privacy, perched dramatically over the Aegean Sea with floor-to-ceiling windows, private infinity pools and sleek white interiors. The 160-acre resort comes with a built-in social scene, by way of the Bond Beach Club and several themed bars, including a Cuban cigar lounge and speakeasy. But guests are encouraged to go forth and explore the still-pristine nature of this charming island via experiences such as scuba diving, beekeeping and gold-jewelry making.

Come Sail Away

Make your money go further and take to the water. *By Fran Golden*



Hotel rates in Europe have jumped 50% since 2019, according to market researcher CoStar Group, but one place where pricing is relatively stable—even if your footing isn't—is on a boat. The cost of a cruise can be a steal when you consider it also includes meals and entertainment.

Ironically, the more luxurious the cruise, the more value you can extract. **Seabourn**'s 600-passenger *Encore* (seven-night sailings from $3,999 per person) includes unlimited caviar and Champagne on trips to small ports such as the ancient Greek town of Monemvasia, typically accessible only to yachts. **Regent Seven Seas Cruises** redefines the meaning of "all-inclusive" by covering round-trip business-class airfare from 29 US and Canadian cities to the port. That alone could make a seven-night sailing between Athens and Istanbul on the 698-passenger *Seven Seas Voyager* (from $8,999 per person) worth every penny.

For a more intimate experience, motor over from Malta to Sicily, Capri and Rome on **SeaDream Yacht Club**'s 112-passenger *SeaDream I* (from $5,999 per person for seven nights), newly outfitted with a waterslide that plummets from the top deck into the sea. Other bells and whistles include kayaks, Jet Skis and paddleboards.

You can even find deals on private yacht rentals. **The Moorings**, a charter company, offers springtime sales of up to 20% off, bringing down the cost of a four-cabin monohull to $6,389 per week. (Add a skipper for an additional $1,925.) The Dutch company **Sailing-Classics** sells individual accommodations on the eight-cabin schooner *Kairós* (about €3,300, or roughly $3,500, per person for a week), which explores the glorious coves of the Croatian coast.

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Clockwise from top left: Hereu, Stella McCartney, Bembien, Tyler Ellis, MZ Wallace

Pack a Pièce D'Assistance

Handy straw bags are a dime a dozen. But chic versions are one in a million

Photograph by Adrianna Favero

On a recent spring break trip to Mexico's Riviera Maya, the thin strap on my beloved, supersoft raffia bag finally gave way after years of loyal service. For the rest of our vacation, I was forced to sheepishly scoot past the bronzed shoulders at the St. Regis Kanai pool, schlepping my 5-year-old's rainbow backpack. In it, my bought-in-Japan sunglasses and the latest Ann Patchett novel hopelessly jumbled together with glitter crayons and my baby's diaper cream.

As I enviously surveyed everyone else's fully functioning totes, I noted the array of enticing replacement options–some with top handles, others with a low-slung boho vibe–as well as basketlike carryalls with decorative embroidery.

No sooner had I arrived home than my email dinged with a solution. **MZ Wallace** was releasing the raffia tote (from $255), a straw bag for summer. The New York-based brand is a personal favorite, in part because its designs don't feel huge but somehow seem able to contain all my earthly belongings.

But I won't lie to you: The window shopping was tempting. The Forna raffia bag from **Hereu Studio** (€590, or $630), made in Spain, is more structured, with a wider, less deep profile. Plus, its braided shoulder strap is the perfect length. **Stella McCartney**'s new Logo raffia crossbody bag ($550) is as understated as you'd expect and comes with a genius inner drawstring pouch to keep sandy toys and phones in separate compartments. The Solana bag ($295) from **Bembien** is delicate but functional–the flat bottom means it won't topple over when you put it down. In a wild fantasy, I imagined bringing the chic, almost severe $3,550 Stella handbag by **Tyler Ellis** to a fancy seaside dinner.

What eventually sold me on the MZ Wallace was a subtle pièce de résistance. Its sturdy straps, made in the brand's signature hand-woven nylon, would ensure I wouldn't be left stranded wearing my kids' accessories around a five-star resort ever again. B —*N.E.*

SET DESIGN: DENA WINTER

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Bet on the Cold Coast

As temperatures in the Med heat up, Denmark's beaches play it cool

By Brandon Presser

If someone invited you to a place they called "Cold Hawaii," would you be tempted to go? What if they told you the soft-sand beaches seemed never to end? Or that the evening ritual was fried fish and pale ale beneath purple-pink skies? Or that the water was a parade of surfable waves? Never mind the best part: You'd have it pretty much to yourself.

That's what it's like on the shores of Jutland, in northwestern Denmark, where the mainland literally juts into the North Sea. The beach paradise is about a five-hour drive from Copenhagen and an hour away from Aalborg's well-connected international airport.

But word is getting out. In 2023 the region saw a 119% increase in visitors from a year earlier, VisitDenmark reports, setting local records. There's a thriving beach culture in the summer, which (for better or worse) is getting warm enough to enjoy swimming without wetsuits. European sunseekers, too, are newly discovering the area after being turned off by the Mediterranean's ever-rising swelter.

They join the regular mix of Danes and Germans in Winnebagos looking for their own slice of a beachfront that goes almost uninterrupted for more than 150 miles. At its north end is the impressionist-influenced artist colony of Skagen—home to P.S. Krøyer and other painters of the late 19th century; at the south end are the breezy shores of Thy, where kiteboarders and windsurfers tack their neon sails. In between are working fishing villages such as Hanstholm, with restaurants like Det Gamle Røgeri lining the harbor and serving heaping, unfinishable platters of prawns and fried fish.

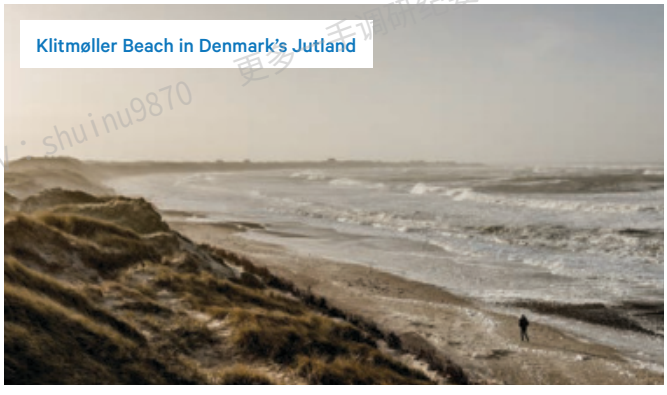
New hotels are meeting the moment, mostly with rates less than $300 a night and coastal locations near the pine-forested thickets of Thy National Park. **Vorupør Badehotel** has a handful of simple, modernist rooms in a repurposed municipal building whose beach-facing walls have been replaced with floor-to-ceiling glass. The tent-covered grounds of **Vorupør Camping** have cabins with blond wood slatting and turf roofs. In the next village over, **Guesthouse Klitmøller** has a dozen accommodations arranged around a hidden interior garden filled with tropical fronds and bamboo details.



METTE JOHNSEN/VISITDENMARK

Vahineura Itchner and Mor Meluka, who founded **Cold Hawaii Surf Camp** in Klitmøller 15 years ago, say they've watched the area change over the past decade into a preferred summer spot for a wide range of northern Europeans. "Others around the world are catching on, too," Itchner says.

Jutland is unlikely to get spoiled by crowds, even as it finds a place in the spotlight; tight government restrictions curb foreign investment and construction. Just in case you get booked out, though, here are other key seaside spots in Denmark.



Klitmøller Beach in Denmark's Jutland

The Danish Riviera

Copenhagen's old-money suburbs—best known for housing the Louisiana Museum of Modern Art—are like New York's Hamptons or Montecito north of Los Angeles, with modern mansions and baroque brick estates. Stay at **Helenekilde Badehotel** (rooms from $278), a century-old summer home in the village of Tisvildeleje that's been lovingly expanded into an inn with about two dozen rooms. Ogle local architecture with weekending Copenhageners, who bounce between beach walks, quaint restaurants and seaside saunas.

Fanø

Put on your wellies and head out onto the mud flats of Denmark's westerly island of Fanø for an oyster safari. Then check into the 300-year-old **Sønderho Kro** (room and board from $408), easily the country's most romantic hotel. The vibe is decidedly "captain's shanty chic," with timber walls, thatch roofing and cozy beds under deep eaves.

South Funen Archipelago

Copenhagen is on one of the islands strung between mainland Denmark, Germany and Sweden. West of the capital, the South Funen Archipelago is equally worth a visit for its fairy-tale landscapes of rolling dales and turreted castles. Fittingly, Hans Christian Andersen was raised here. Stay at **Stella Maris** (rooms from $209) for old-school hospitality with languid water views, nautically themed rooms and buttoned-up French cuisine. While you're there, ferry over to the tiny island of Ærø, where timbered bathing huts along the beach are painted in lively colored stripes.

Bornholm

A new high-speed ferry—the world's largest catamaran—has made it exponentially more comfortable to get to Bornholm, home to the original location of globally renowned New Nordic restaurant Kadeau. The gastronomic paradise is now a zippy 80-minute ride from the Ystad terminal in southern Sweden. (Confusing geography notwithstanding, it's all seamlessly accessible from Copenhagen.) Stay at **Allinge Badehotel** (rooms from $165), a Tudor-esque structure from the 1770s that was transformed in 2020—its 24 rooms are airy and sea-facing and retain plenty of throwback splendor.

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Break the Pastry Rules in Paris





In France the "Crookie," a croissant-meets-cookie mashup, has taken over social media. Here are the other delightful twists on cherished classics being dreamed up by local bakers

By Kate Krader Photograph by Mary Devinat

● Tarte au Sirop d'Erable at Tapisserie

Once upon a time, you never would have seen maple-syrup-flavored desserts in Paris; it's the kind of intensely sweet, very North American ingredient that would make French chefs hold their noses. But at the modernist shop Tapisserie, chefs Bertrand Grébaut and Théophile Pourrait, owners of the popular nearby restaurant Septime, make it the filling for their now-signature tarte au sirop d'erable. The maple syrup custard is contained within a high-sided, crisp tart shell and topped with generous mounds of softly whipped cream that spill over the side. The cream, sprinkled with powdered vanilla bean, provides a contrast to the intense, indulgent filling and gives the tart a casual, welcoming appearance when considered against the precise construction of classic Parisian pastries. *65 Rue de Charonne, 11th arrondissement*

● Tarte Citron at Jeffrey Cagnes

Cagnes got famous baking at Paris' oldest pastry shop, Stohrer, which opened in 1730. He started his own bakery in September 2021 and now has three chic boutiques and hundreds of thousands of followers on Instagram. His specialty is tweaking classics in fun new ways. A fanciful twist on a Paris-Brest, the praline-filled choux pastry confection, is piled up with swirls of mousse and chunks of cake with crushed nuts pressed into the base. His tarte citron highlights the often overlooked crust by adorning it with toasted hazelnuts—an ingenious move that catches your attention with its extra-crunchy texture. Basil and olive oil accent a double dose of lime both in the pillowy filling and the intense creamy ganache layer underneath. *73 Rue Montorgueil, 2nd arrondissement*

● Croissant Tout Chocolat at Frappe Boulangerie Urbaine

At this bright corner shop, owner Solenn le Squer was one of the first bakers in Paris to sell the round, glazed Supréme croissants that went viral in New York, but the item to order is the seasonally changing viennoiserie, or yeasted dough pastry. This winter she served a knockout one filled with rice pudding that was so creamy, it pooled out of the sides when the shell was cut. The current selection is a "croissant tout chocolat." But unlike its close relative, pain au chocolat, with its plain pastry and rigid sticks of filling, the base here is a cocoa-infused dough with a voluptuous chocolate pastry cream in the center. A sprinkling of praline and sea salt chocolate crumbs gives it a final savory note. *7 Rue Sedaine, 11th arrondissement*

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The Man of the Meuse by SozyOne

See Why the Best Things in Liège Are Free

The Belgian city is an underrated open-air museum. *By Paul Tullis*

A tiny square in Outremeuse, on an island in the middle of Liège, Belgium, offers a view worthy of a postcard. But it's not the cafe tables, blooming flowers or single Catholic icon in a glass-fronted box you're going to be snapping. It's the four-story-tall mural of a cartoonish thundering herd—an ostrich, a beaver, a hammerhead shark, even a tiny crawfish—that will get your phone out.

The 35-foot-long artwork by Belgian illustrator Psoman, 42, is just one of hundreds of large-scale paintings that dot Liège. It adorns the backside of a modern apartment block wedged awkwardly between narrow, medieval-era buildings—a juxtaposition that perfectly encapsulates this city of 200,000 that sits an hour east of Brussels.

Liège is a strangely compelling mix of the old, the new and the under construction. The city fell on hard times in the 1960s and '70s, when its coal-mining and steel industries faltered. Now biotech, finance and electronics production are helping it leverage its position at the crossroads of French-, German- and Dutch-speaking regions.

I arrived here by accident, accompanying my daughter for an audition at the Mosa Ballet School. Wandering its streets while she pliéed and jetéed, I was reminded of living in San Francisco in the early 1990s, before the first internet IPO. There are hardly any chain stores, much less an entire street lined with them, like Amsterdam's Kalverstraat. "Luxury" is a foreign word: no Louis Vuitton, no Hermès, no Dior—not even an Armani Exchange.



What Liège does have is a publicly sponsored program of street art begun in 2002 that's led to the creation of more than 90 pieces. The success of the early commissions drew private partners; together they're now spending about €60,000 ($64,000) annually on open-air works. The collaboration seems to have since inspired at least a hundred more such pieces, unofficially—and sometimes illegally—placed.

On my trip, it didn't take long to find significant examples. Outside the manta-ray-like train station, designed by Spanish architect Santiago Calatrava, is a depiction of a sword chasing a dragon chasing six fleeing knights. Another piece nearby has just been whitewashed over, a reminder of the medium's ephemeral nature.

The artworks can be small—a ceramic tile mosaic of a stork carrying a child swaddled in the Belgian flag is glued to a corner of the provincial palace—or monumental. *The Man of the Meuse*, for example, is a 10-story-tall diptych by SozyOne, a Belgian artist born in 1973, that depicts the top half of a reclining man on the side of one building while his legs occupy another a few doors down. When viewed at the right spot from across the Meuse River, which runs through the city, the work looks like one seamless piece.

I'm not alone in thinking Liège is one of Europe's most underrated urban museums. Paul Gough, vice chancellor at Arts University of Bournemouth in the UK, says SozyOne and Psoman are like DJs but for visual arts—nomadic and transgressive. Works like theirs are rare in, say, London or Melbourne, so it's uncommon for a city of Liège's size to have so many. Search for "Liège street art" walking tours on the Wikiloc app, and you'll find several 5-mile loops around town.

Peppered throughout the city is a hodgepodge of architectural styles: Postwar Brutalism, 19th century villas and wacky contemporary stuff—the local ice rink looks like a whale surfacing from beneath the asphalt—are all jumbled together with more typical European fare, such as the Gothic St. Paul's Cathedral and gorgeous works of art nouveau.

Those who end up here, be it for business or ballet, will find that Liège's murals are one of the most compelling manifestations of its culture. And I found the ones in the Outremeuse neighborhood to be the city's most charming. Getting lost in its warren of narrow pedestrian streets among sidewalk cafes, basement bars and 16th century houses with their characteristic corbeled second floors, I felt I'd stumbled into a concealed, unexplored corner of urban Europe. Ⓑ

Where to Stay

The **Van Der Valk Sélys**, perched on a steep hillside between the Royal Opera of Wallonia and the switchback streets of the quiet Pierreuse neighborhood, has comfortable rooms (from around $100) and an excellent brasserie. A 15-minute drive south near the spa town of Chaudfontaine is **Le Château des Thermes** (from around $200), where even basic rooms have king-size beds, and there's an outdoor pool fed by hot springs. It's an excellent base for hiking the nearby forests—and exploring Liège itself.

ALLARD SCHAGER/ALAMY

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Plan a Romanian Holiday



The country has fascinated for centuries. Luxury travelers are finally finding out why

By Lebawit Lily Girma

In March, 34 years after the fall of communism, Romania joined the Schengen Area, which means European Union citizens traveling there by air or sea won't need a passport. The reasons to visit extend beyond picturesque Saxon villages, beautiful mountains and the fabled home of Dracula. (Bran Castle has erroneously been linked to the fictional vampire.) Romania is now emerging as an offbeat luxury gem.

To see the highlights you'll need five to seven days, says Raluca Spiac, founder of bespoke travel agency Beyond Dracula and the country's unofficial tourism ambassador. Add a week if you want to get to the northeastern region of Maramureș, famous for its wooden churches, or Bucovina, home to painted 16th and 17th century monasteries.

The point, Spiac says, is to take your time: Romania is a place for those who understand luxury as being able to slow down. Here's an itinerary we collaborated on to jump-start your planning.

Begin in Bucharest

Young Romanians used to yearn for Europe's other urban hubs, but many now want to live in Bucharest, a city that's benefiting from infrastructural investments. A tech community is likewise blossoming, with companies such as Oracle, Google and Romanian-founded Bitdefender planting flags here.

Where to stay: Set up in the heart of Centru Vechi, or Old Town, where Autograph Collection's Marmorosch Bucharest hotel fills a 19th century bank—the bar is in a former vault. Its 217 rooms (from €163, or $174) include art deco-style suites with balconies. By September, the Corinthia Bucharest will arrive, with 30 palatial, gold-trimmed suites and an outpost of Monaco's swish nighttime spot Sass' Café.



The medieval fortress town of Sighișora in Transylvania

Where to eat: For the best introduction to Romanian fare, Spiac recommends Caru' cu bere. It draws as many tourists as locals for hearty roasted polenta, topped with matured cheese and smoked sausage.

Don't miss: The Museum of Recent Art (MARe) has a collection of postwar Romanian work that ranges from religious to satirical. The 462-acre Herastrau Park, where locals gather to picnic and go boating, is just a 10-minute walk away. Be sure to end up at Noua, which puts a creative spin on regional Romanian dishes; the seven-course tasting menu clocks in at around $70.

Take a hike: Decamp with a guide on Day 2 to Văcărești Natural Reserve, three miles outside the capital. A thriving urban park and wetland, it's home to more than 90 protected species of birds, including the whiskered tern, Eurasian coot and great crested grebe.

Trek to Transylvania

Three hours north, red-roofed medieval towns contain Gothic churches, castles and views of the Carpathian Mountains.

Where to stay: In the village of Criș, Bethlen Estates (rooms from €350) is a collection of five restored, centuries-old villas served by a small restaurant—all owned by a local family.

Don't miss: From the hotel, it's a two-hour e-bike journey to Sighișoara, a Saxon village known for its Unesco-protected, pastel-colored buildings. The highly rated Casa Joseph Haydn there is open for breakfast, lunch or dinner. The town of Saschiz, an additional 45-minute ride from Sighișoara, has a celebrated woodworking and painting tradition and is surrounded by wildflower fields where Buckingham Palace sources its honey. (Britain's King Charles III has a vacation home in the area.) Spiac can arrange tastings with the beekeepers in charge of production.

Don't Bother With Dracula

A five-hour trip east sees western Transylvania's green valleys and forests shift to dramatic granite peaks.

Where to stay: Matca recently opened with 26 rooms and villas (from €445) on the outer edges of a rewilded forest. Take in the sprawling mountain views from the spa's heated pool before sitting down for lunch with Romanian rosé at Stup, the on-site restaurant.

Don't miss: Bike along the Bucegi Mountains, or join Romanian Orthodox monks to play the semantron—a percussion instrument used in the centuries-old "toaca" prayer call.

Skip: Bran Castle may be Romania's one and only tourist trap, so forgo the tour. Instead, break up the three-hour trip back to Bucharest with lunch in the Saxon city of Brașov, for panoramic views of surrounding villages from the 14th century fortress. Sure, the castle is touristy, but it does offer a beautiful parting glance of Romania.

ADRIAN CATALIN LAZAR/GETTY IMAGES

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The beach club at La Roqqa in Monte Argentario

Escape To a Quiet Corner Of Italy

Leave Como to the Clooney cosplayers and Taormina to the *White Lotus* wannabes. This summer, a lesser-known locale is where you'll want to be

By Adam Erace

COURTESY COMPANIES



The Amalfi Alternative

Ogle nature, not other tourists, in the Costiera Cilentana. The swath of wild hills and turquoise water unspools an hour south of the Amalfi Coast, and spiritually it's even further away. The land, encompassing trail-laced Vallo di Diano National Park and the Greek ruins of Paestum, is protected. So is much of the sea, with two marine biospheres guarded by cliff-hugging villages like Agropoli and Castellabate. Even the languid pace of life feels safeguarded from the overtourism that's wracked Cilento's northern neighbors—though it'll be easier to get here once the Salerno Costa d'Amalfi airport, which has been closed since 2016, reopens this summer.

Nights here are best spent lingering at unpretentious osterias—no first-class concierges or weeks of planning required to sample the region's lemons, figs and tomatoes. Shaggy buffalo herds provide the milk for tangy mozzarella di bufala, yogurt and gelato at Tenuta Vannulo, a pastoral farm and dairy. Also try the buffalo salumi and mixed grill at Agriturismo Porta Sirena, an events venue where stumbling upon a garden party is one of the charms. Both are in Capaccio, close to the archaeological temples of Poseidon, Hera and Ceres in Paestum.

Stay at Il Cannito (from €300, or $321, per night) a four-suite forest redoubt with garden-driven cooking—traditional ravioli with just-picked tomatoes and basil, stuffed and fried squash blossoms—and a pool cut into the hills. Sustainable clothing designer Antonella Gorga runs it with her mother, sister and brother Nicola, who zips guests up and down the coast in his speedboat. He'll get you right up close to Isola Licosa, a little green apostrophe of an island where, according to myth, the siren Leucosia threw herself off a cliff after being resisted by Odysseus. Today it's marked by an abandoned sun-bleached lighthouse; linger a moment and you might even hear singing.

The Reborn Tuscan Escape

Only 90 minutes from Rome's Fiumicino airport, the peninsula of Monte Argentario has long hosted jet-setters: Jackie Kennedy and Sophia Loren in the 1960s and '70s, Harry Styles and Charlize Theron today. The pool at Il Pellicano was captured in Slim Aarons' photography. But despite the VIPs, "it was never open to mass tourism or big construction," says Stefano Cuoco, head of Erqole, the Swedish-held hospitality group behind the hottest new hotel in the area, La Roqqa (from €300 per night).

The hotel soft-opened last summer overlooking the marina in Porto Ercole, one of the island's two main villages; now it's in full swing. Sunbathe at Isolotto, the only sandy beach club in town, then have a glass from the 120-label all-Tuscan wine cellar. By request, the hotel's 40-foot yacht can take you to offshore islands such as Giglio and Giannutri, where you can swim in empty coves and scale the ruins of Villa Domizia.

Being on the ultramarine sea, it's easy to forget this is Tuscany, with its undulating, cypress-pinned countryside and legendary vineyards an hour away, but that's what makes the Argentario special. "It's the proximity and the feel of Tuscany that everybody knows," says Cuoco, "infused with all the Mediterranean DNA."

The Holy Hideout

It takes 30 minutes to drive the entire Tyrrhenian coastline of Basilicata, but what a half-hour it is. Midway you'll find the town of Maratea, a hypnotic cocktail of rugged mountains honeycombed with stalactite-spiked caves and cerulean coves. That's where Santavenere was built as a textile factory and hotel by the Piedmontese wool magnate Conte Stefano Rivetti in the 1950s.

Maratea still falls under the radar, says Aldo Melpignano, who renovated Santavenere and reopened it this spring as a follow-up to his successful Borgo Egnazia resort in Puglia (from €219 per night). "It represents an authenticity that in many of these more developed destinations, you can no longer find," he says. The alabaster villa, nestled in a garden of ancient olive trees and cascading bougainvillea, has 34 rooms, many with sea-view terraces and textured tiled floors as pink and green as watermelons. There's a gracious pool, three restaurants and the pomegranate-colored spa, whose sea-salt-and-olive-oil body scrubs will leave you feeling like focaccia.

Taking the road 10 minutes uphill leads to Maratea's historic village, put together like an Escher drawing. The 5,000-person town counts 44 churches, including the main cathedral, said to be built over a temple to Minerva. As the Roman goddess of wisdom, she'd tell you to visit Maratea before everyone else finds out about it.

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Tech

Ones to Watch

These aren't the biggest names in tech, but they're doing big things. They're running Amazon's logistics operations (Udit Madan) and building consumer-product conglomerates for the e-commerce age (Tushar Ahluwalia) and artificial intelligence startups (Demi Guo). It's impossible to predict what the next big thing will be, but chances are that people on this list will be involved.



Tushar Ahluwalia

Co-founder and CEO, Razor Group GmbH

Ahluwalia has emerged as a key player among Amazon aggregators, companies that aim to create consumer-product conglomerates by rolling up e-commerce brands. The online shopping spree of the Covid-19 era made this strategy seem intriguing enough that about 100 companies were able to draw $16 billion in investment. But the boom has fizzled, and Ahluwalia's company is scooping up competitors just when aggregators and their investors are looking to recoup what they can. —*Spencer Soper*



Brendan Carr

Commissioner, Federal Communications Commission

Carr is the senior Republican on the Democrat-led Federal Communications Commission, an obscure post that he's animated through a combination of showmanship, hustle and firecracker rhetoric. It would be much easier for Carr to attract attention in a second Trump administration. He's raised his profile as a relentless critic of TikTok and is a possible choice to become chairman of the agency just when conservatives regard reining in Big Tech as a top policy priority. —*Todd Shields*



Dave Fontenot & Emily Liu

Co-founders, HF0

Fontenot and Liu's startup residency, HF0, promises to give entrepreneurs "the most productive 12 weeks of their life" by having them live together for three months in a historic-mansion hotel in San Francisco, gathering for communal meals and thinking about nothing but building a company. HF0, or Hacker Fellowship Zero, started in 2020. The fellowship and its alumni network already have an in-crowd feel in SF's clubby AI scene, and its demo day pulls investors from top companies. —*Ellen Huet*



Demi Guo

Co-founder and CEO, Pika

At a time when new AI startups seem to be everywhere, Guo is making her company, Pika, stand out with software that lets anyone type a few words and get a vivid video clip in response. Pika, which she started in April 2023, grew out of her work as a graduate student at Stanford University. It's raised $55 million and, for now, is one of only a handful of companies that offer text-to-video software. Perhaps the most high-profile would-be competitor, OpenAI Inc.'s Sora software, doesn't yet have a release date. —*Rachel Metz*



Luciana Lixandru

Partner, Sequoia Capital

Lixandru is in charge of bolstering Sequoia Capital in Europe and has led investments in eight startups since joining the storied firm. Three have come from the Munich area. Berlin is generally considered Germany's top startup town, but Lixandru says the top-tier AI and robotics programs at Technical University of Munich have seeded a thriving ecosystem. "In Munich there are less companies, but they're higher quality," she says. —*Sarah McBride*



Udit Madan

Vice president for worldwide operations, Amazon.com Inc.

Madan, the 37-year-old who took over Amazon's sprawling logistics division in January, is exactly the kind of hardworking, detail-obsessed engineering type who thrives in the company's pressure cooker. He oversees 1.1 million people—the vast majority of whom work in warehouses that store and ship the items for sale on Amazon—making him one of the most important executives at the company and in the broader logistics industry. —*Matt Day*



Li-Chen Miller

Vice president for product management, Meta Platforms Inc.

Miller discovered Meta's first pair of smart glasses, the Ray-Ban Stories, in late 2021. She found the concept exciting but the glasses underwhelming. So she sent a cold email to Meta's head of augmented reality with a list of 10 ways to improve them. The company soon hired her to fix the product herself. Miller now leads a team that works on many of Meta's augmented reality devices and is convinced her team is closing in on the formula for the next major computing platform. —*Aisha Counts and Kurt Wagner*



Evan Reiser

Co-founder and CEO, Abnormal Security Corp.

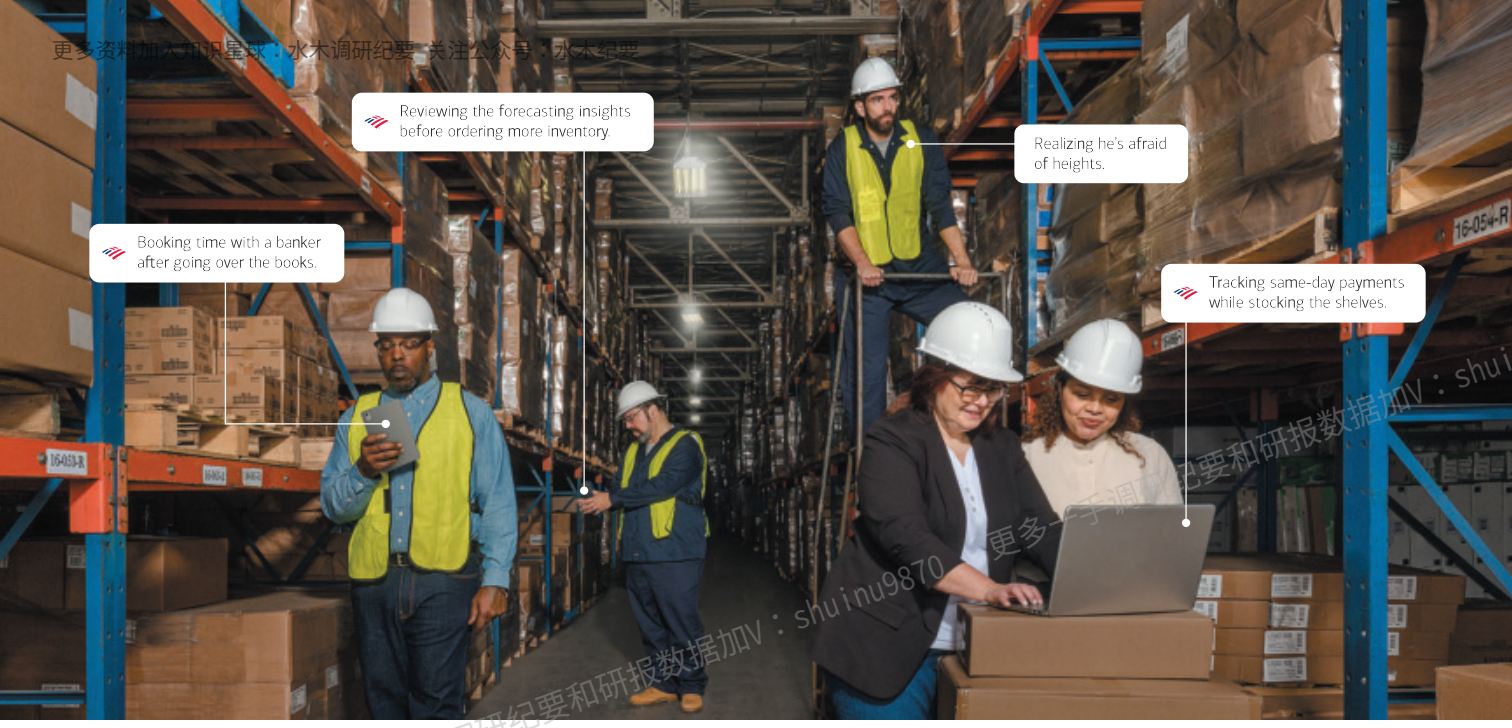
Reiser's $4 billion startup, Abnormal Security, uses algorithms to spot oddities in workplace emails, to detect which ones are intended to trick people into clicking on a malicious link or sending money to the wrong account. When it comes to hacking, Reiser says, "email's the big open front door." Abnormal counts 15% of the Fortune 500 companies among its 2,000-plus customers and has raised about $300 million from investors. —*Katrina Manson*

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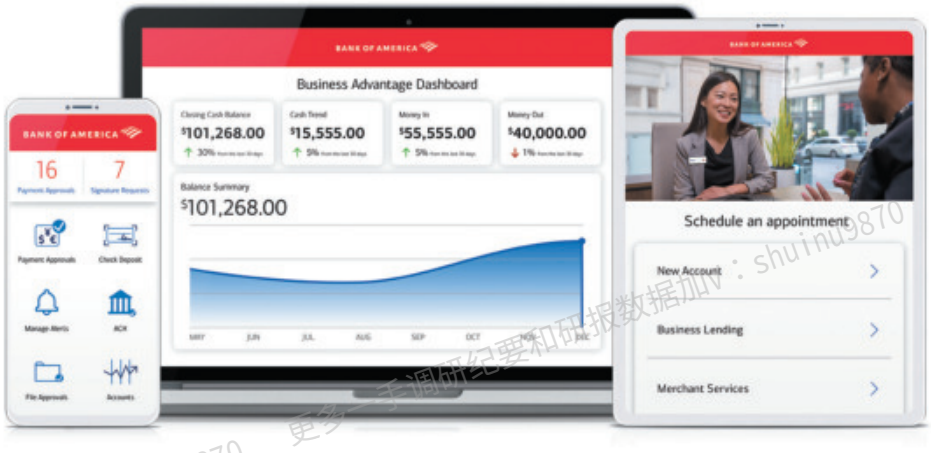
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