



THE OLIVER WYMAN

# RISK JOURNAL

PERSPECTIVES ON THE RISKS THAT WILL  
DETERMINE YOUR COMPANY'S FUTURE

# INTRODUCTION

Our primary goal at Oliver Wyman is to help clients improve and grow their businesses, in part by preparing for both the negative consequences and the new opportunities that interconnected risks create. In our seventh edition of the *Oliver Wyman Risk Journal*, we share our perspectives on many of this year's greatest strategic challenges, including the impact of digitization on businesses and workforces, cyberattacks, and political upheaval.

I hope you find the *Oliver Wyman Risk Journal* informative and valuable.

Yours sincerely,

A handwritten signature in black ink that reads "Scott McDonald". The signature is written in a cursive, slightly slanted style.

**Scott McDonald**  
President & CEO  
Oliver Wyman Group

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**RISK JOURNAL**

VOLUME 7, 2017

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# EMERGING RISKS



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- The Public-Sector Banking Crisis In India
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Over the coming decades, artificial intelligence (AI) will eliminate something like half of the jobs that people in advanced economies now do. So say some experts, such as those from the Oxford Martin School. Others say the effect will be material but not so large. The OECD, for example, estimates that 10 percent of current jobs will be lost to AI.

The replacement of human labor by machines is neither new nor lamentable. The acceleration of this trend – that is, the Industrial Revolution that began 200 years ago – explains our current prosperity. The labor replaced by machines is applied elsewhere, and total output increases.

But this time might be different – at least, in two respects that create risks for employees and employers.

## DEVALUING HUMAN CAPITAL

The Industrial Revolution replaced much physical labor with machinery. The typically low-skilled workers displaced by machines suffered a loss of income. But often this was temporary, as they soon found jobs created by the new technology or the new wealth.

An AI revolution, by contrast, promises to replace skilled mental labor with machines. Given the cost of acquiring these skills, the pain for displaced workers is likely to be far greater.

An American medical student, for example, often leaves university \$300,000 in debt. That's a big investment in acquiring medical skills. What if AI massively devalues those skills? What if a listening and talking computer attached to blood-testing equipment and other sensors can do a better job of diagnosis than even the best-trained doctor? Try repaying a \$300,000 debt working as a yoga teacher! In other words, the prospect of rapid advances in AI dramatically increases the risk of investments in human capital.

Risks to those who consume training are also risks to those who supply it. Should universities shift resources from subjects where AI can take over much of the territory, such as medicine, law, and engineering, and into those where it is unlikely, such as literary criticism? Should companies abandon training programs they offer in skills that are likely to become redundant? The faster the progress of productive technology, and the more expensive the skills it replaces, the greater the risk to those affected.

## VOTERS DISLIKE REVOLUTIONS

Most modern Westerners can hardly imagine the upheaval caused by industrialization in the 19th century. Working and social arrangements that had been stable for centuries were transformed in just a few decades.

It occurred at a time of limited democracy, when government played a minimal role in the economy. Governments did not try to manage the ups and downs of the macroeconomy, and they did little to regulate economic arrangements, such as employment.

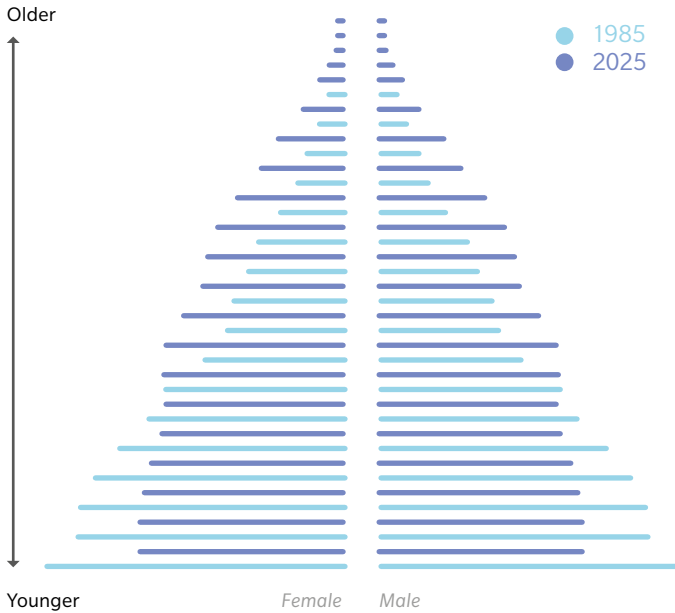
Since World War I and, more importantly, the Great Depression, this laissez-faire approach to the economy has been abandoned around the world. Voters expect governments to manage the economy and to protect workers from its vicissitudes. If the Industrial Revolution were playing out today, politicians would certainly play a greater role than their 19th century counterparts did.

In the early 19th century, gangs of unemployed English handloom weavers – the so-called Luddites – smashed mechanical looms. Today, politicians in many cities around the world ban Uber to protect the jobs of licensed taxi drivers, effectively doing the modern Luddites' work for them. As the



EXHIBIT 1: AI AND THE OLD

An aging global population...  
POPULATION IN AGE CATEGORIES

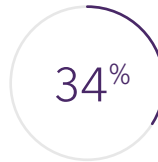


Source: OECD

...with limited possession of digital skills



**Of adults** have no information and communication technology (ICT) skills or only very basic skills



**Of workers** possess advanced cognitive skills enabling them to evaluate problems and find solutions using technology



**Of those** using software at work every day do not have the skills required to use digital technologies effectively

economic and employment implications of AI become more evident, governmental attempts to minimize disruption are likely to increase.

The nature and extent of these interventions is difficult to anticipate, adding another layer of uncertainty for businesses. They may involve attempts to impede the adoption of AI, along the lines of Bill Gates' suggestion that robots should be taxed. Or companies may be required to take greater responsibility for retraining staff made redundant by machines, or continue paying them long after making them redundant, or...

Many companies will try to manage this risk by getting ahead of the legislators and making the commitments to staff that governments would otherwise force on them. Like any legislation requiring such measures, however, this will put established firms with a large workforce replaceable by AI at a distinct

disadvantage to startups unencumbered by redundant staff. Ultimately, the new technology and the companies that use it most efficiently will not be stopped.

THE WORKFORCE OF THE FUTURE

A wide range of industries is likely to be transformed by AI, including medicine, law, accounting, banking, insurance, engineering and, yes, even management consulting. The most obvious challenge for the managers of firms in these industries will be to rearrange their workforces. They are likely to need not only fewer staff, but staff with different skills.

The kind of workforce companies require will depend not only on how AI develops in the relevant areas, but also on consumer preferences. For some services, people will continue to prefer dealing with another person,

even if a machine could do the job. It isn't always obvious which services. For example, it turns out that many people would rather have psychiatric problems diagnosed by a machine than by a human psychiatrist because they feel less embarrassed and are more inclined to be honest. Where such lines between AI and humans are drawn by consumers, and how they shift, will partly determine the kind of workforce companies need.

Wherever these lines are drawn, people who can build, maintain, and use AI applications will be in greater demand (unless, of course, AI can replace them!). Yet, the supply of them is unlikely to increase as rapidly as the need for them. The problem isn't only that such skills take time to develop; Western populations also are aging. AI and its applications isn't a game for the over-50s. (See Exhibit 1.) The populations of India and some other developing countries remain young. But the political mood in the United States and in Europe is increasingly hostile to immigration and outsourcing.

However uncertain the ramifications of AI, Western firms will almost certainly face a "skills gap." Indeed, they already do. Firms that have a considerable exposure to developments in AI will need to give themselves the greatest possible access to available talent. This means moving beyond the traditional in-house model, by which talent is employed, and also sourcing it from partner firms, freelancers, and "crowds." In an apparent irony, the rise of AI could make HR strategy more important than ever.

Then again...

If AI makes the progress many are suggesting it will, the consequences for business are

## However uncertain the ramifications of AI, Western firms will almost certainly face a "skills gap"

uncertain, but they are sure to be profound. Acting on a false expectation of dramatic change can be just as costly as failing to see it coming.

A degree of skepticism about dramatic change is always warranted, especially given the growing evidence that scientific and technological progress is becoming harder to achieve. For example, the number of researchers required to maintain Moore's Law – that the density of computer chips will double every two years – has increased 78-fold since the early 1970s.

Digital technology is already changing the workforces required by businesses, and these changes are sure to go further. But how much further, and at what pace, remains uncertain. It may be instructive to note that in the late 1960s, with several manufacturers building electric car prototypes, the public was told that "in the next few years, there is the prospect of seeing millions of them on the road".

Whatever ends up happening with AI, businesses that take a multi-faceted and flexible approach to their workforces should be able to see their way through.

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**Scott McDonald** is the president and chief executive officer of Oliver Wyman.

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*This article first appeared on the World Economic Forum Agenda blog.*





# GLOBAL TENSIONS AMPLIFY TECH RISKS

WEAPONIZED AI, DIGITAL ESPIONAGE,  
AND OTHER TECHNOLOGIES POSE  
NEW RISKS FOR GLOBAL PROSPERITY

John Drzik

Technology will continue to play a vital role in promoting global prosperity. New advances are poised to increase economic productivity, provide radical healthcare solutions, and combat climate change, among other benefits.

But the pace of innovation in areas such as artificial intelligence (AI), the internet of things (IoT), and biotechnology is also creating new risks – ones that will be amplified in a world where geopolitical tensions, nationalism, and social instability are on the rise. Businesses need to consider the threats stemming from technological change through the lens of the shifting global risk landscape. (See Exhibit 1.)

## NEW TECHNOLOGY, NEW RISK

A recent wave of high-profile cyberattacks – with objectives ranging from disrupting critical infrastructure, to influencing the United States presidential election – has heightened attention around the need for stronger

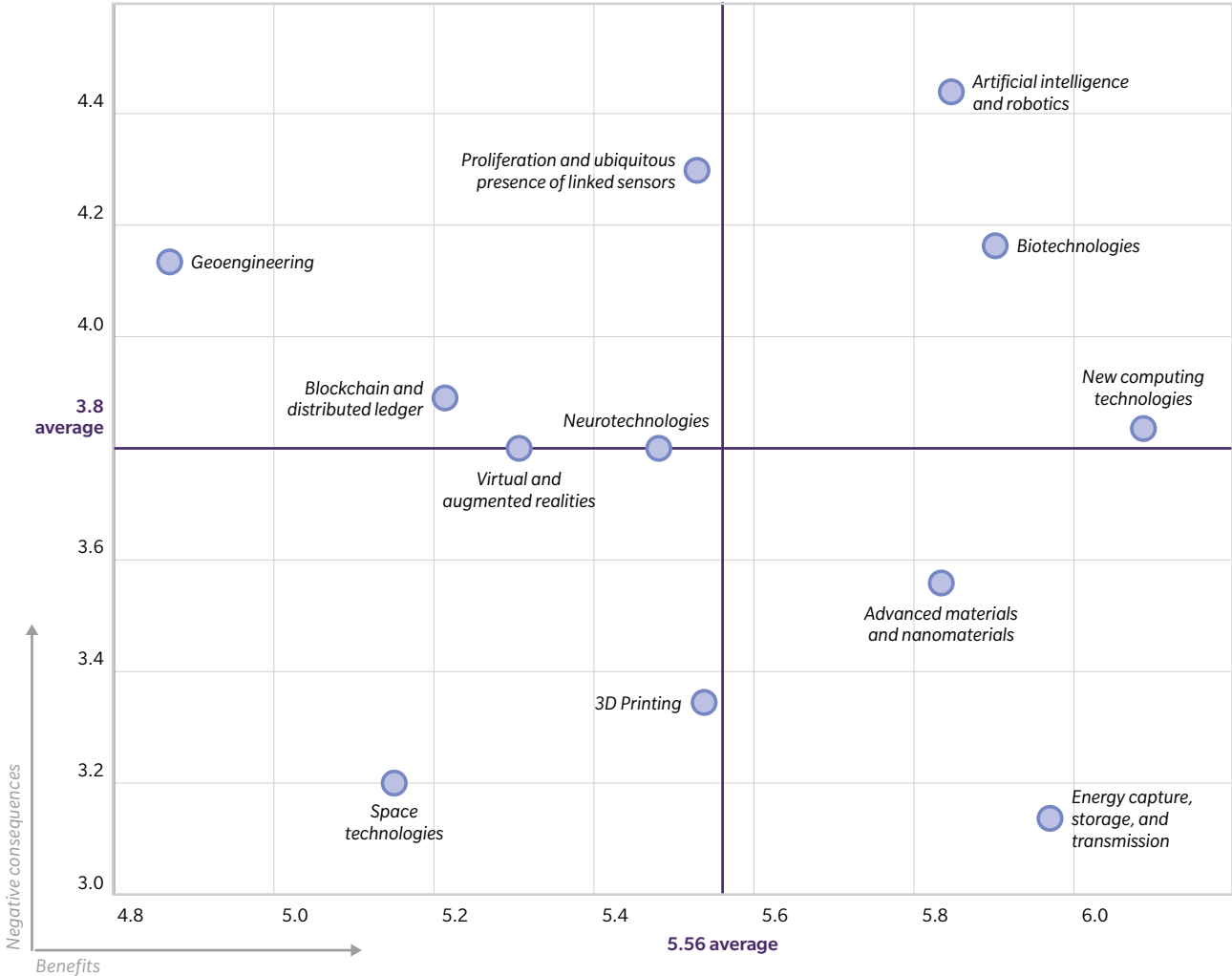
security and governance measures in the public domain. Technological advances have also facilitated a significant uplift in industrial espionage, which could grow further in an era of state-sponsored use of cyber technology. Meanwhile, the future weaponization of AI and robotics by rogue states or terrorists and the scope for hacking global satellite systems are also firmly on the radar of security specialists.

As businesses embrace innovation, they also take on new risks. Not only are companies buying and employing technology that creates new exposure, their IT systems are becoming increasingly connected to those of other companies in their value chain, such as suppliers, customers, and utilities. Additionally, more IoT devices are being deployed to improve productivity or increase safety.

This expanding interconnectedness, often facilitated by devices with limited security, creates additional points of vulnerability to cyberattack and makes assessing the risk permutations that much more difficult.

EXHIBIT 1: EMERGING TECHNOLOGIES

Businesses need to prepare for both the benefits and consequences of new technologies



Source: World Economic Forum, *Global Risks Report 2017*

Other innovations in the technology landscape, such as the migration of data and software to the cloud and the use of AI and robotics in commercial applications, are also shifting the nature of cyber risk. At the same time, companies implementing innovations may be assuming, through legacy contracts, new liabilities where legal precedent is embryonic at best, along with vulnerabilities they will find challenging to mitigate or transfer onto insurance markets.

DIGITAL RESTRICTIONS

Cross-border data flows are being slowed by a rise in government intervention. Some measures are aimed at consumer protection. For example, the European Union’s General Data Protection Regulation (GDPR) is driven primarily by privacy concerns on personal data. (See “The Coming Consumer Data Wars” on page 14.) Other initiatives are aimed at state protection, driven by heightened

## As businesses embrace innovation, they also take on new risks

security concerns. These measures enforce a range of protectionist policies, including prohibitive technical standards, censorship, surveillance, and data localization. China, for instance, has joined Russia in tightening the requirements placed on foreign companies to store information within national borders. Increasing regulation is complicating the space for business to work in and aggravating “splinternet” tendencies.

These trends may present significant challenges for businesses. Compliance with new regulation could be costly, and failure to comply could result in significant sanctions. Restricted access to digital supply chains and markets will create complexities for firms with global operating models. In an era of heightened nationalism, this direction could threaten open global competition.

### CONSIDERING THE FUTURE WORKFORCE

Businesses will also need to address the intrinsic changes to the nature of work itself and the future of employment. There is a general consensus that technological advances will accelerate productivity across a wide spectrum of job categories, ranging from assemblers in factories, to finance clerks and

analysts, to care providers. This shift will likely take place faster in advanced economies, even if the implications for emerging-market countries may ultimately be more profound.

The fact that these changes are happening at a time of significant unemployment concerns and increased social instability among lower-income groups suggests that companies may experience mounting pressure to align business and employment strategies with what is deemed politically and publicly acceptable. At the same time, companies are facing a fierce war for skilled talent with the technological know-how and leadership experience to shape and deliver on digital strategies. With discrepancies between the current supply and demand, companies will need to focus more extensively on retraining existing employees to build skills in critical growth areas.

Technology innovation is transforming the way businesses operate and compete. To capture the opportunities it presents, business leaders must better understand the depth and scope of the interrelated challenges ahead – and develop plans to address them.

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**John Drzik** is president of Global Risks and Specialties at Marsh. Marsh, like Oliver Wyman, is a division of Marsh & McLennan Companies.

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*This article first appeared on the World Economic Forum Agenda blog.*





# THE COMING CONSUMER DATA WARS

## NEW EUROPEAN DATA PROTECTION REGULATIONS WILL CHANGE MORE THAN MOST COMPANIES EXPECT

Thierry Mennesson

**W**hen companies come looking for permission to use their European customers' data after the General Data Protection Regulation (GDPR) takes effect on May 25, 2018, the answer may well be no. In a recent survey of 1,500 British consumers, our company discovered that as many as half said they were already leaning toward reclaiming their information.

That gives companies less than 12 months to figure out what it will take to get customers to say yes – as well as to figure out procedures and safeguards to assist consumers with accessing, editing, exporting, and deleting any or all of their personal data. And neither job will be easy.

The GDPR complicates business models for both European and US companies. While President Donald Trump removed

requirements in April for internet service providers to obtain permission from customers before sharing personal data, the GDPR will still force US companies to deal with the new data rules if they want to do business in the EU – a juggling act that could prove expensive.

But the greater challenge ahead may lie in the anticipated consumer data wars that will arise between the companies that customers trust enough to compile their personal data and the companies forced to let their data go. In this environment, the “haves” will be able to keep customizing and improving their offerings to EU citizens using more data than they ever dreamed accessible. At the other end of the spectrum, new products and services sold by the “have-nots” will likely emerge slowly – or worse, miss the mark entirely because of the lack of insight into evolving customer needs and tastes.

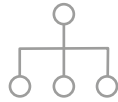
EXHIBIT 1: NEW EUROPEAN DATA PRIVACY REGULATIONS

Five steps that companies must take to achieve sustainable GDPR compliance



**1 MOBILIZATION**

- Appointment of Data Protection Officer
- Privacy impact assessments
- Assignment of accountability for data management
- Creation of program structures to implement change



**2 MAPPING**

- Creation of centralized data registry
- Centralization of consent handling
- Monitoring of usage against consent
- Review of subject access and breach reporting procedures



**3 INTEGRATION**

- Integration of existing systems with centralized data registry
- Redesign of customer interface to capture consent
- Creation of a factual audit trail



**4 CONNECTIVITY**

- Creation of customer portal to allow customer to amend the consent given and access their own data
- Integration with third-party data sources
- Integration with third-party service providers



**5 RELIANCE**

- Fostering of a market for “input” data services (such as collection, storage, classification, verification, and analysis) and “output” data services (such as credit rating, KYC, and AML)
- Outsourcing of data management to third parties

Source: Oliver Wyman analysis

**ENTICING CONSUMERS TO TRANSFER THEIR DATA**

With the GDPR, companies will be able to access data from both rivals and players outside their industry by enticing consumers to transfer their information. One way this could be accomplished is by offering better prices and services to customers who park their personal data with them. Traditional barriers to entry based on data collected over decades will be demolished, enabling small and nimble tech-based competitors that gain consumers’ trust to grow into giants. The good news is that companies can get ahead of this inevitable shake-up by thinking and acting more like consumer-data champions. To keep customers’ trust, most enterprises will strengthen safeguards against security breaches. Companies will likely add a chief data protection officer to their executive ranks and hire data protection managers, as stipulated in the new law, to oversee the huge

number of procedures and processes the law will spawn, including technologies to capture unambiguous consent for personal data use.

**GROWING MARKET SHARE AND ENHANCING PERSONALIZATION**

While there will be headaches in getting the technicalities right, GDPR gives companies the opportunity to grow their data-market share and enhance their customer experiences. By consolidating and using all the data at their disposal, including potentially from competitors and other industries, companies will be able to increase the level of personalization in existing product lines, as well as create new ones. For example, European banks’ retail fees have been under pressure, and some banks are exploring how GDPR could offer them the opportunity to charge fees for new types of advice and services.



Here's how this might work: Your bank currently has a limited view of your life through your bill payments. It knows you pay a certain amount to your electricity provider, for example, but that's it. With the new regulations, your bank will be able to tap into the data behind that bill when you agree to share your personal data with it – it will be able to see when you use electricity and for what purpose. As a result, your bank could begin to act as an electricity broker of sorts, potentially promoting a competitor utility's cheaper or better services. Banks could charge clients a small fee for this service and also collect a referral fee from the companies that they promote.

## PROVIDING A "DIGITAL SAFE" FOR GUARDING DATA

Some companies may even become the go-to store for managing individuals' data for them. GDPR empowers EU citizens to move all the data they have at their various providers (for instance, Amazon, Vodafone, and so on) to one place – say, a "data safe" provided by a bank – and ask the other providers to erase their data. By providing a digital passport of sorts, companies could help people securely store their personal data and limit its access to businesses they trust.

Companies managing people's data could dominate the marketplace by suggesting where and how customers might want to shop, what they might want to buy, and how they should pay. After reaching a critical scale, a company could even negotiate bulk deals

## The GDPR complicates business models for both European and US companies

on behalf of its customers for hotels or mobile phone services, for example.

Some may assume that these new-fangled data-management companies will be digital startups. But the new law could just as easily propel traditional companies with more solid customer relationships to the front of the pack.

Keeping consumers' data safe is about to become even more costly. But it is also going to become more critical. And companies caught unprepared by GDPR may lose the privilege of keeping consumers' data – period. The solution lies not in focusing on how to do the minimum required, but in devising ways to use the law to forge new business lines that will change the economics of consumer-data privacy protection. Those that embrace the future under the new law may find themselves with access to unclaimed digital territory.

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*This article first appeared in MIT Sloan Management Review.*



# THE HIGH PRICE OF HEALTHCARE

## THREE MISTAKES IN US HEALTHCARE THAT EMERGING ECONOMIES CAN'T AFFORD TO REPEAT

Sam Glick • Sven-Olaf Vathje

The healthcare system in the United States, with its technological prowess and massive infrastructure, often serves as a reference point for rapidly developing economies around the world while they build their own medical systems. With expanding middle classes demanding more comprehensive care, governments of these emerging markets are under pressure to invest as chronic disease rates – particularly those related to Western lifestyles – dramatically increase and the average age of their once-young populations begins to rise.

But replicating the facility- and labor-intensive American model – which is more costly than that of any other nation yet produces subpar results – will set these emerging economies on the same course of endless cost escalation that

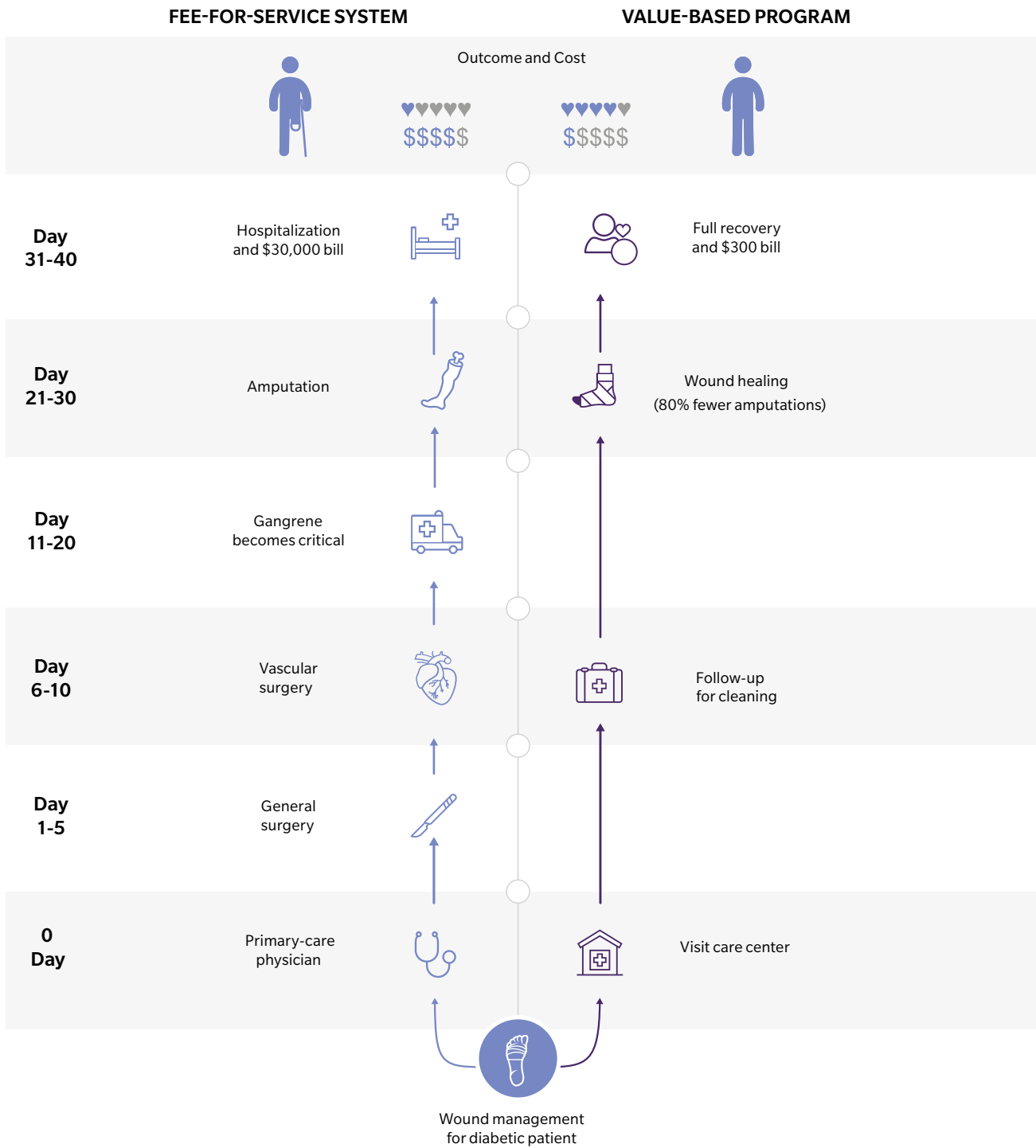
has plagued the United States. Still early in their healthcare-modernization programs, many nations in the Middle East and Asia are already struggling with double-digit annual increases in healthcare expenditures, well above the rate of expansion of their gross domestic products. Instead of copying the American model, these countries should leapfrog the United States by focusing more on keeping their populations healthy, tying care providers' pay to outcomes rather than the volume of services delivered, and using technologies such as telemedicine, in-home monitoring, and remote imaging to reduce the need for hospitals.

One major reason for the rapid cost inflation in healthcare is burgeoning hospital construction. As more countries try to provide American-style care, the number of hospital beds around



EXHIBIT 1: A LOOK AT HOW THE US GOT INTO TROUBLE WITH A FEE-FOR-SERVICE APPROACH TO HEALTHCARE

Patients with the same ailment end up with very different outcomes in a fee-for-service versus value-based world: One still has both legs and racks up \$300 in healthcare costs; the other lost a leg and spends \$30,000



Source: APRC analysis on CareMore Communications

the globe has begun to grow rapidly. China alone has set a target of having six hospital beds per 1,000 people by 2020 – more than twice the ratio maintained in the United States and the United Kingdom.

The rising flood of hardware, pharmaceuticals, and technical expertise from American manufacturers and hospital companies, which is connected to the needs of a growing number of hospitals, is also pushing many systems closer to the US model. Over the past five years, US healthcare exports to emerging economies have grown substantially. For example, shipments of medical, scientific, and hospital equipment to China have risen 69 percent since 2011. Over the same period, pharmaceutical exports have doubled. Comparing the five years between 2012 and 2016 to the period between 2007 and 2011, US exports to Saudi Arabia of hospital equipment alone increased 54 percent. There is a similar pattern across the Middle East, Latin America, and Eastern Europe, as well as in many nations in Asia.

To plot a sustainable course, emerging economies need to recognize the American practices that helped institutionalize high costs in the first place – and avoid them. Here are the three elements that our data and experience tell us have done the most damage in the United States:

## FOCUSING MAINLY ON TREATING THE SICK

This centuries-old approach to health still dominates worldwide. In countries from Singapore to Saudi Arabia, the focus is predominantly on medical care for the sick, not well care. Eventually, that will start getting expensive – primarily because spending to make sick people better is more expensive than keeping them well in the first place. Ultimately, it may begin to negatively impact

## In Qatar, fewer than 10 percent of physicians are primary-care doctors, compared with almost two-thirds in France

standard measures of health, such as life expectancy, infant mortality, and morbidity, as lifestyle choices increasingly expose populations to chronic illnesses such as diabetes and heart disease.

In Qatar, for example, fewer than 10 percent of physicians are primary-care doctors, compared with nearly one-third in the United States and almost two-thirds in France, where healthcare is considerably cheaper than in the United States and the results are substantially better. The vast majority of physician visits in Qatar end up costing much more because the appointments are with specialists, and the remedy proposed often involves hospital stays and procedures. They are fix-what's-broken visits.

Even if someone does manage to see a primary-care physician, it's doubtful there's much time for real discussion of lifestyle, wellness, or prevention: The average primary-care visit in Qatar lasts less than seven minutes. If nations want to control healthcare costs over the long run, professionals focused on health prevention (nutritionists, prenatal-care providers, and smoking-cessation experts, for example) should play important roles equal to traditional physicians, and primary-care doctors should be coordinating care.

## Inevitably, exporting US-style healthcare to other countries will end up producing US-style results

### BASING A SYSTEM ON FEE-FOR-SERVICE PAYMENT

Currently, fee-for-service payments dominate the healthcare space in places as diverse as China, South Africa, and Vietnam. In a fee-for-service world, medical care is overutilized – by up to 50 percent, according to our estimates. The reason is simple: To increase revenue, healthcare providers have to perform more procedures or see more patients, which in turn pushes up the cost of care. Even the best-intentioned providers can easily fall into a pattern of ordering too many tests or recommending surgery rather than a less invasive, less expensive therapy.

So why would emerging markets still adopt this practice? First, because it's an easy way to measure productivity: Measuring quality and health outcomes is notoriously complex even in the most highly developed healthcare systems. Second, given that many emerging economies depend on outside funds to help them build healthcare infrastructure, demonstrating the potential to grow and be profitable using familiar business models tends to attract private investment to the sector and people to the profession.

In Thailand, for example, 28 percent of healthcare facilities are privately owned, and there are no fewer than eight publicly traded hospital companies doing business in the country. The Thai government

encourages such investment to provide for its country's own healthcare needs, as well as to maintain Thailand's position as a medical-tourism destination.

Medical tourism – an enterprise focused exclusively on procedure-based sick care or elective surgery – is common in many developing nations. It helps create business for the local medical industry by offering less-expensive medical procedures to Americans and others living with high-cost healthcare.

Healthcare needs to define productivity differently. Pay physicians for health outcomes rather than the number of procedures or visits; systematically incentivize prevention and primary care; and turn hospitals into cost centers rather than revenue engines. All of this requires a better understanding of how health transactions work and how much they cost. Transparency on clinical data and financial flows is crucial for establishing a meaningful incentives system.

### PRIORITIZING PHYSICAL INFRASTRUCTURE

Each hospital bed carries a financial obligation – not only to fill it but also to maintain it. And to equip these modern hospitals and remain competitive, emerging economies must buy high-priced items, such as MRI machines and CT scanners, sometimes



costing nearly as much as the building itself. Even more costly in the long term, hospitals must be staffed with doctors, nurses, medical assistants, pharmacists, and lab technicians. The system becomes self-reinforcing: Patients who see a great hospital in a major city want one in their community, and to attract and retain the best physicians you have to build ever-more-expensive, well-equipped hospitals.

As developing countries set priorities for investment in healthcare, they should learn lessons from their own success in building a mobile-first infrastructure rather than a much more expensive landline system for communication. Today, because many countries in Africa built cellular towers even when they didn't have landline infrastructure, about 80 percent of adults have access to cell phone service, vastly more than the number who are or would have been served by landlines.

Growing healthcare systems have a similar opportunity to leapfrog older approaches by constructing a system with a substantial digital component. Technologies like telemedicine, in-home monitoring, and remote imaging can gain traction rapidly and make a meaningful difference in quality, convenience, and cost of care – especially if they represent fundamental services and not just nice-to-have extras. Public

health authorities can also take advantage of mobile-phone coverage to disseminate information on health issues, vaccinations, and even nutrition, and monitor the health of the population remotely.

The Dubai Health Authority, for example, recently announced that it would deploy so-called RoboDocs across all of its facilities to work alongside nurses, allowing immediate access to physicians, around the clock, regardless of location. We estimate that new models of care such as these can lower healthcare costs in rapidly developing economies by as much as 15 percent to 20 percent.

While the United States tries to reinvent its broken system, countries around the world have the opportunity to learn from American mistakes and create value-based, digital-first health systems that focus on preventing disease rather than simply treating it. The key is defining the priorities first and designing the system around them, rather than letting the system, with its appetite for scope and growth, define the kind of healthcare that takes shape.

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*This article first appeared in Harvard Business Review.*





# THE PUBLIC-SECTOR BANKING CRISIS IN INDIA

## THE GOVERNMENT NEEDS A CLEAR VISION FOR THE FUTURE OF INDIA'S BANKING SECTOR

David Bergeron • Amit Deshpande • Wolfram Hedrich

**T**he Chinese and Indian economies have grown rapidly over the past decade. In China, this growth has been fueled by a dramatic expansion of credit, up from 140 percent of GDP in 2008 to 260 percent today. Credit has also expanded in India during the past decade, but it started from such a low base that private-sector debt is now only 86 percent of GDP – less than half the average of advanced economies.

Given this difference, you might expect Chinese banks to be struggling with bad debt while Indian banks enjoy the stability that comes with slow credit expansion. In fact, things are the other way around. Many commentators suspect that the official non-performing loan ratio of 1.7 percent understates the true extent of bad debt in China. A serious credit crisis may be looming in China.

But a credit crisis has already emerged in India, where the official non-performing loan

ratio is 9.6 percent and the ratio of “stressed assets,” which also includes restructured loans, is 14 percent. Even at the height of the global financial crisis, non-performing loan ratios in Greece, Portugal, and Italy did not reach this level.

The relatively small size of the Indian banking sector may spare the country from the kind of pain experienced in Ireland and Iceland during the global financial crisis. Nevertheless, the Indian banking sector is in urgent need of stabilization and structural reform.

### A CONCENTRATION OF BAD DEBTS

India's bad debt problem is concentrated in the public-sector banks – though “concentrated” may be the wrong word, given that public-sector banks account for more than 70 percent of total lending in India.

# 9.6%

## India's official non-performing loan ratio

The impaired loans are primarily to the corporate sector rather than households, with defaults arising from factors such as overcapacity, falling commodity prices, and troubled infrastructure projects. The Reserve Bank of India is trying to bring problems into the open, having conducted an Asset Quality Review and enhancing the reporting of restructured assets. It has also asked banks to initiate forced-bankruptcy proceedings against 12 large defaulters that, between them, account for 25 percent of the banking system's non-performing loans; another 26 defaulters are scheduled to be forced into bankruptcy in December if their restructurings have not been resolved by then.

This high level of non-performing loans is eroding the ability of public-sector banks to retain earnings and is thereby damaging their capital positions. Under Basel III, banks must have capital ratios of at least 11.5 percent by March 2019. Various analyst reports have recently estimated that to meet this standard, the public-sector banks will need to raise between \$19 billion and \$21 billion (a finding in line with our own estimates from 2016).

### IMMEDIATE STABILIZATION

Given that the troubled banks are state-owned, a disorderly failure is extremely unlikely. Nevertheless, they must be recapitalized to the legally required level, and this means somehow coming up with the \$19 billion of capital. In October 2017, the government announced a recapitalization plan of \$31 billion for the

public-sector banks – primarily to shore up their capital and support future growth.

This capital will come from three sources: a direct infusion from the government; equity sales (including non-core assets) by the banks; and recapitalization bonds, which will account for 64 percent of the new capital. While this is a smart move on the part of the government – and will definitely help stabilize the banking sector in the near term – there should be stringent criteria attached to the capital-infusion plan (such as a business turnaround strategy, the upgrade of risk-management capabilities, and gradual privatization). This would help in building a healthy banking sector in the long term.

### PROVIDING REASSURANCE

If the government wishes to provide some reassurance to the sector and its customers, it should consider guaranteeing bank assets, along the lines of the Asset Protection Scheme that the UK government used to stabilize the Royal Bank of Scotland (RBS) during the global financial crisis. The scheme was ultimately cash-flow positive for the government because RBS paid a premium for the guarantee and never claimed on it.

Once stabilized, India's bank sector needs to be reformed to make sure that it contributes more effectively to economic development and at less cost to taxpayers. The best way to achieve this would be to drastically reduce the market share of state-owned banks. In many countries



and over many decades, state-owned banks have shown a tendency towards poor risk management and misdirected lending.

Sometimes the problem is that lending decisions are guided by a political agenda rather than commercial logic. But even in the absence of this distortion, state-owned banks have less reason than private sector banks to be prudent lenders. The creditors of a public-sector bank expect to be bailed out by the government if the bank fails. So they charge no risk premium when the bank's lending becomes riskier, and the bank has no short-term financial incentive to limit risk taking. It is no surprise that the non-performing loan ratio of India's private-sector banks is less than half the non-performing loan ratio of its public-sector banks.

There may be a role for state-owned banks to supply services that pure profit-seeking banks will not, such as, perhaps, micro-business lending or major infrastructure-project financing. And public-sector banks may also help to discipline the pricing of private-sector banks. But these roles cannot justify public-sector banks accounting for 70 percent of the market.

Privatizations would be the most direct way of reducing the dominance of state-owned banks, and they would have the secondary benefit of raising capital for the government to put to better uses. However, they are likely to meet with considerable political resistance, if only because public sector banks employ hundreds of thousands of unionized workers.

A more gradualist approach, which the government may already be following by design or default, is to stifle the growth of public-sector banks while encouraging private-sector development, as is happening with the liberal approach to granting new banking licenses in India. Given the likely growth of India's banking sector, this approach would not take long to reduce public-sector banks to less than half of the market.

But the approach taken is secondary to the goal. The government needs a clear vision for the future of India's banking sector, and one in which state-owned banks play a smaller role.

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*This article is based on an article that first appeared in India's Business Standard.*



# THE CUSTOMER OF THE FUTURE

COMPANIES NEED TO REIMAGINE THEIR BUSINESS MODELS TO KEEP UP WITH FAST-CHANGING CONSUMER PREFERENCES

Dan Clay • John Marshall

**M** eet Dawn. She's never been to the doctor's office, but she visits her doctor every week. She's constantly shopping, but she's never waited in line. Her apartment recognizes her face. She doesn't go into the office, she logs on to a platform. She doesn't have a resume, she has ratings. She doesn't have a boss, she has a robo-advisor that highlights upskilling opportunities, giving her the chance to expand her capabilities.

Dawn is an average 25-year-old in the not-so-distant future. She craves mobility, flexibility, and uniqueness; she demands speed, transparency, and control; and she has enough choice to avoid any company that doesn't give her what she wants. We're in the midst of remarkable change not seen since the Industrial Revolution, and a noticeable gap is growing between what Dawn wants and what traditional companies can provide.

Dawn strives for freedom, and technology allows her to untie many binds. She lives a life in flow, where multiple gigs have replaced a single career path and her house has been replaced by a co-living space. She lives a transparent existence where everything from her smart watch to her smart refrigerator collects data from her and applies it on behalf of customization and personalization. She expects everything on-demand, and in a world of predictive intelligence, "right now" might already be too late.

As a result, she's shifted who and what she trusts away from individual experts toward crowdsourced wisdom, intelligent devices, and personalized platforms. Since she's constantly getting support from the virtual world, immersive blended experiences become a new way of living.

This is not a dramatic description of the future. All of these shifts are grounded in business models and technologies that exist today, and all herald profound changes for companies and their leaders. (See Exhibit 1.)

## HOW TO WIN THE CUSTOMER OF THE FUTURE

To keep up with a life in flow, companies need to de-locate their experiences and fundamentally re-examine any interaction that interrupts a customer's day. To thrive in a transparent existence and customer omnipotence, companies need to be able to instantly apply customer knowledge on behalf of smart, personalized products and experiences. To excel in a world of on-demand everything and exponential intelligence, companies need to be fast and smart – keeping up with customers' lives, but in a way that reflects their preferences and values. And they need to do all this in a way that recognizes that in a world of blended reality, it won't be about our multi-channel web versus app versus in-person versus mobile world. There will be one channel: the customer channel.

In short, value shifts to the business that moves the fastest, knows the customer the best, transfers control and power to the customer, and adapts based on individual customer understanding. The winners will be the companies that innovate with these shifts in mind. Instead of "digitizing" a business, automating the supply chain, boosting CRM, improving app functionality, or adding more social to the marketing mix, these companies come up with "digital business designs" that fully embrace different assumptions, even about how money is made. In our experience, the companies that are best at nimbly revamping their business models to cater to the rapidly evolving preferences of future customers hold the following truths to be self-evident.

### **That the value you create doesn't need to be created by you:**

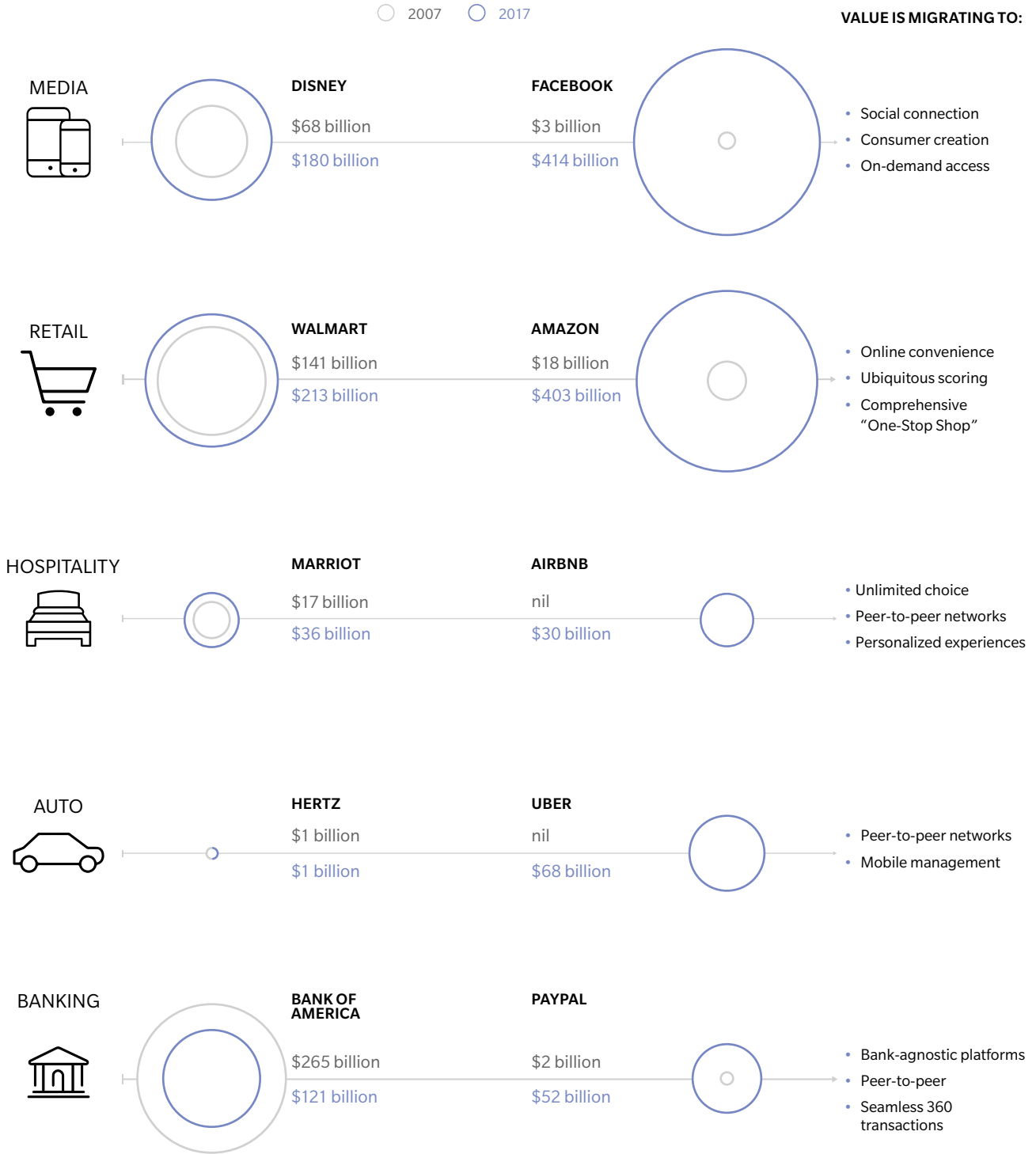
Because everyone is viewed as a producer in a connected system, exponentially more value is created. Platform models, which coordinate networks of participants, scale



EXHIBIT 1: DIGITAL'S WAVE OF DISRUPTION

No organization will be spared as customer expectations change

TOTAL MARKET CAPITALIZATION US \$ BILLION



Source: Lippincott

faster and deliver greater value. Digital models have incentives to collaborate built into their models and are exceptionally easy to snap into.

**That transparency is a great thing, not a threat:**

Data and more transparency are inevitable. The digital mindset is to grow value by adding data, not to hide value by bundling or trying to be too controlling about information that can help customers make better decisions.

**That share of customer attention is the only lasting source of advantage:**

Assume that winning attention means winning the flow of data, which creates the means to win even more attention. Scale economies come from the database size, not the factory size.

**That the value is in services, and everything will be a service:**

Service and subscription models are inherently smarter because they build in learning loops and feedback, capture better data, and keep iterating to improve quickly. People are Walmart “shoppers” but Amazon Prime “members” – the result is a highly different relationship and ability to grow. Uber learns you, the yellow cab forgets you.

In order for companies to get ahead of their customers’ future preferences, they need to reorient their business designs to take advantage of the orchestration as a whole, no longer the efficiency of any one player. Companies must pivot from producers to enablers. Their profit models should move from being producer-centric to becoming customer-centric. Then they

## Value shifts to the business that moves the fastest and knows the customer the best

can achieve unexpectedly new levels of creativity – like how the closed-loop business design of the Amazon Dash button trades loyalty and ongoing profit streams for the radical convenience of pressing a button for replenishment.

Living by these rules, which buck conventional wisdom, takes courage. Embrace complete transparency, even if my product scores poorly? The less you make, the better you do? Price for outcomes, not for products? To keep up and get ahead, embracing these assumptions has to become the new normal.

This new world poses great risks for traditional companies but also presents brand new opportunities for solving important problems. Waze solved the traffic problem through crowdsourcing real-time data from drivers. Tala is solving lending to the unbanked in Africa with location data and algorithms on cell phones that verify creditworthiness. It’s time for your company to turn risk into opportunity and delight Dawn – and the rest of your customers of the future.

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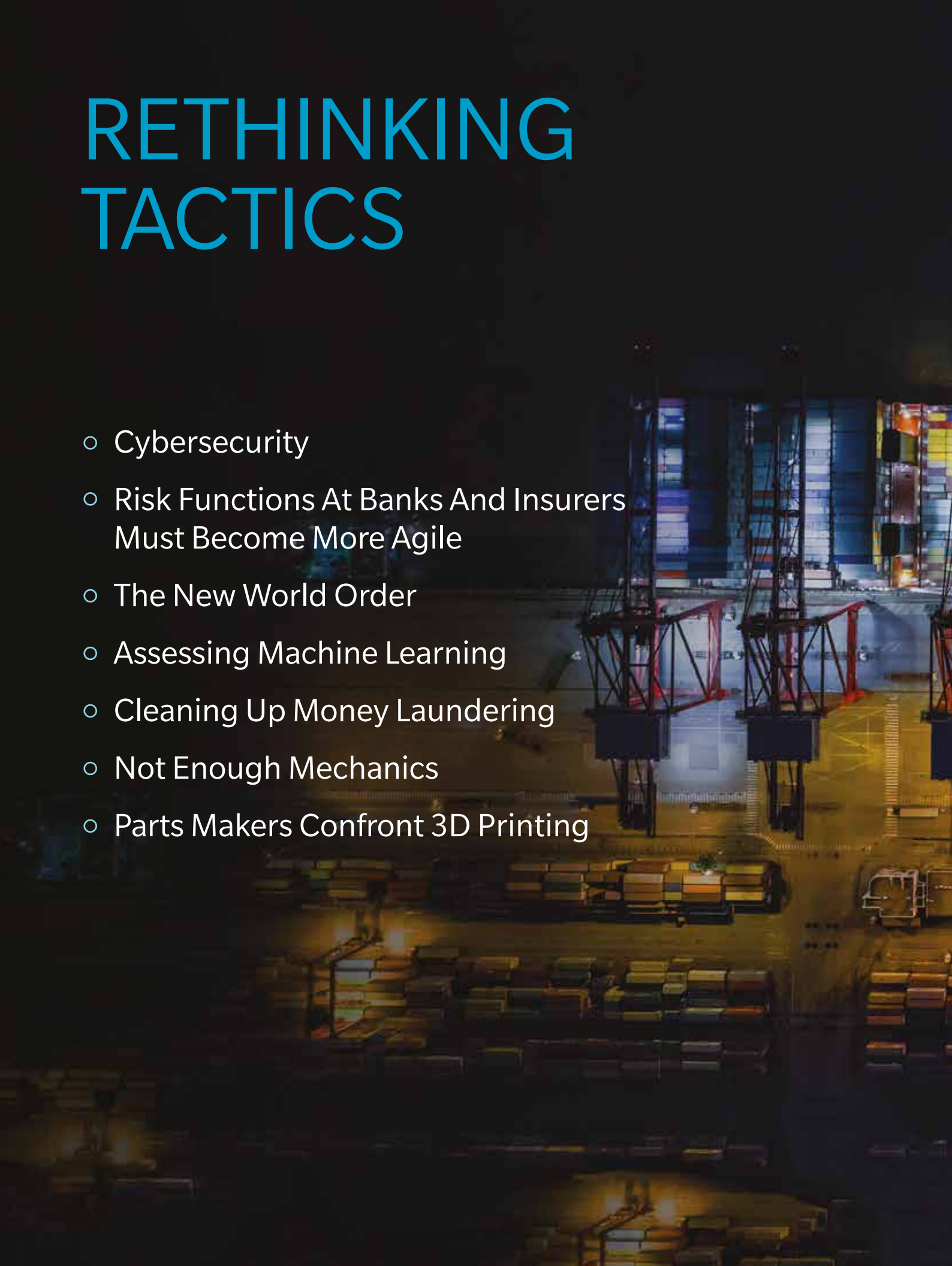
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*This article first appeared on BRINK.*

# RETHINKING TACTICS

- Cybersecurity
- Risk Functions At Banks And Insurers Must Become More Agile
- The New World Order
- Assessing Machine Learning
- Cleaning Up Money Laundering
- Not Enough Mechanics
- Parts Makers Confront 3D Printing













# CYBERSECURITY

## LIMIT CYBERATTACKS WITH A SYSTEM-WIDE SAFE MODE

Claus Herbolzheimer

Cyberattacks cost companies an estimated half a trillion dollars in damages every year. The main reason they can harm companies to such a staggering degree is that today's cybersecurity systems use centralized monitoring, with little beyond their main firewalls to protect the rest of an organization. As a result, when companies are hacked, it can take days for information technology teams to isolate infected systems, remove malicious code, and restore business continuity. By the time they identify, assess, and resolve the incident, the malicious code has usually proliferated, almost without limit, across any connected or even tangentially related systems, giving hackers even more time to access sensitive data and to cause malfunctions. (See Exhibit 1.)

To stay ahead of new intrusion techniques, companies need to adopt decentralized cybersecurity architectures, armed with intelligent mechanisms that will either automatically disconnect from a breached system or default to a "safe mode" that will enable them to operate at a reduced level until the effects of cyberattacks can be contained and corrected. Like the general security systems at high-risk sites such as nuclear power plants, companies require multiple layers of redundant safety mechanisms and cybernetic control systems. The goal should be to create "air pockets," with neither direct nor indirect internet connections, that can protect critical equipment and internet-connected devices.

Every company's cybersecurity program will have unique attributes, but there are several fundamentals to this decentralized architecture that can help companies shift the balance of power away from the attackers.

### DETECTION

Even the most expertly designed cyber architecture is useless if it can't detect and understand the threats it faces. Companies are experiencing more cyber viral outbreaks because they often can't even detect them until it is too late. Today's cybersecurity systems have been built to detect previously identified malicious codes and malware. But cyberattacks are morphing so fast that threat patterns are unpredictable.

To identify and mitigate evolving new attack scenarios, security systems need to search for anomalies, analyze the probability that they are hostile acts, and incorporate them into a continually expanding list of possibilities. This level of detection should be carried out by components on many different levels to cover the multitude of devices and system components connected to the internet and physical environments. Together, these form several layers of cybernetic systems that can identify unknown and new forms of attacks by comparing what they understand to be their normal, uncompromised state – both on their own and in combination with other systems.

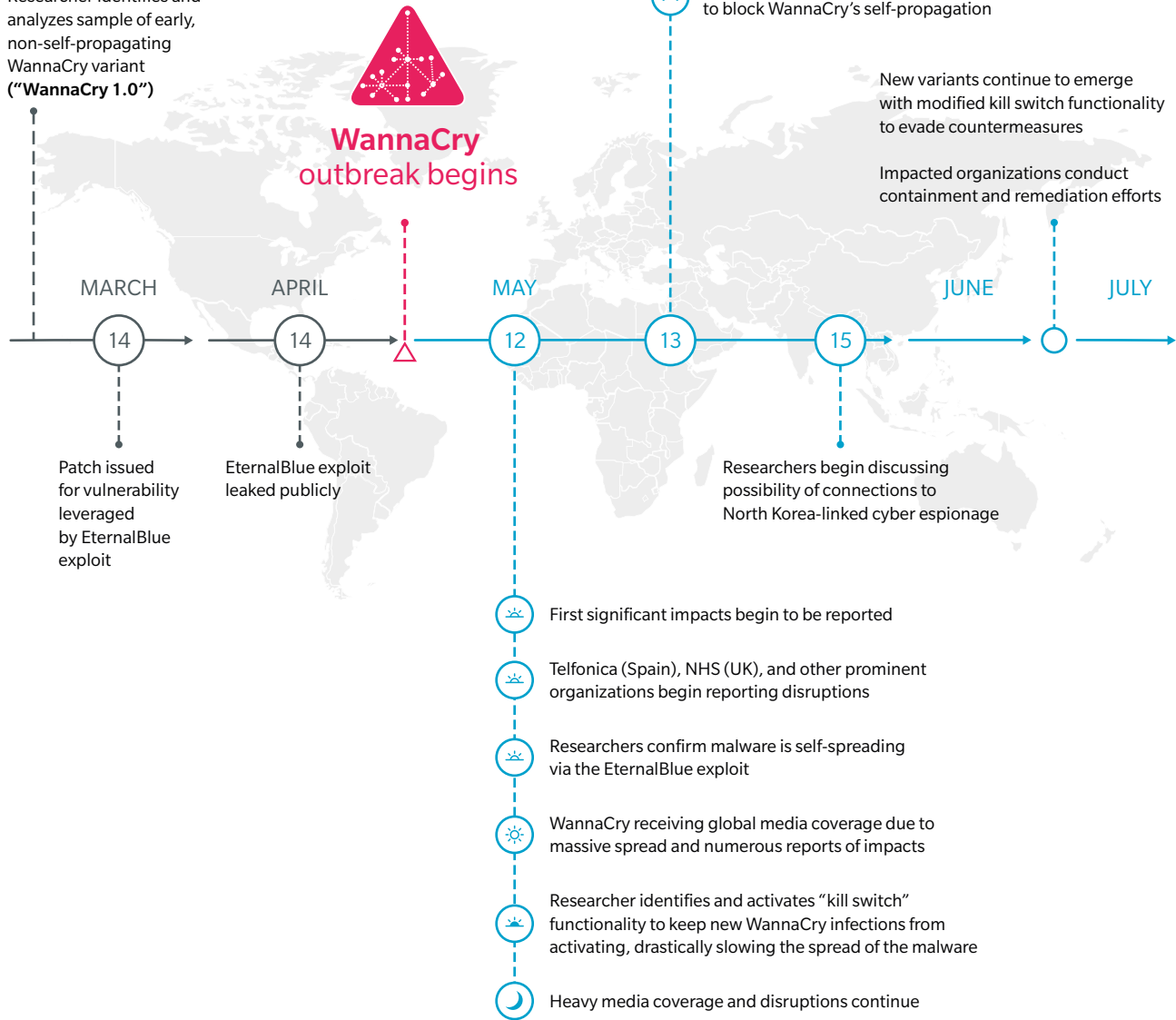
EXHIBIT 1: A MAJOR CYBERATTACK'S TIMELINE

Within three months, WannaCry infected systems in 150 countries

# WannaCry 1.0

The WannaCry ransomware is a self-propagating worm. This means, after it infects one computer, it searches for other computers in the network with the same vulnerability. If found, it can spread on its own without any user action.

Researcher identifies and analyzes sample of early, non-self-propagating WannaCry variant ("WannaCry 1.0")



Source: FireEye



Rather than reacting to a defined set of indicators, these systems detect and react to irregularities in data flows, involving anything from the amount, type, origination, or timing of data. For example, to determine whether someone should be locked out of an online bank account, some banks' cybersecurity systems are starting to use artificially intelligent technology to compare how a person normally types or uses their computer mouse.

## HARM REDUCTION

The next step is to make sure that decentralized, intelligent systems minimize the impact of attacks by independently starting a protocol that takes potentially compromised systems offline, disconnects them from other critical equipment, or locks them into a safe mode. Current cybersecurity systems usually trigger an alert if they have identified a specific attack. But they continue to operate and communicate with other systems until information technology teams shut them down and correct the malfunction.

## SECURE-BY-DESIGN

Finally, all companies' products will eventually have to become secure-by-design. So far, it seems that companies pay little heed to cybersecurity during product development. That needs to change. Hackers have remotely accessed and controlled everything from network-connected electricity "smart meters," to security cameras. In 2015, Chrysler announced a recall for 1.4 million vehicles after a pair of cybersecurity researchers demonstrated that they could remotely hijack a Jeep's digital systems over the internet. In

Germany, nearly one million homes suffered brief internet outages in 2016 after criminals gained access to and remotely shut down their internet routers. The US Food and Drug Administration warns that medical devices connected to hospital networks, other medical devices, and smartphones – such as implantable heart monitors – are now at risk of remote tampering that could deplete devices' batteries or result in inappropriate pacing or shocks.

Companies need to build kill switches, safe modes, and encryptions into their products during development. This will protect not only the companies' systems but also their customers'. Apple, for example, installs layers of data encryption into its products and will permit customers to run only Apple-approved software programs on their devices. Such practices need to become standard operating procedure across all industries.

Stopping cyberattacks will never be cheap or easy. Developing decentralized, intelligent cybersecurity systems will likely happen in fits and starts as devices learn through trial and error not to react to false positives or to go into safe mode more often than is necessary. Managers will have to show leadership, since most customers remain unaware of the extent that cyber risks now pose a threat to the products in their possession, and so are likely to be impatient with glitches and delays.

The good news is that the technology exists to make good cybersecurity a reality. Decentralized, intelligent systems can significantly decrease the risk of cyberattacks and minimize their damage. The savings will be enormous.

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*This article first appeared in Harvard Business Review.*



# RISK FUNCTIONS AT BANKS AND INSURERS MUST BECOME MORE AGILE

FINANCIAL FIRMS' RISK MANAGERS NEED TO MAKE AGILITY A KEY PART OF THEIR AGENDA

David Gillespie • Sean McGuire • Martin Lehmann

Large, long-established firms find it hard to change. That's okay in a stable business environment when you've got time on your side, but when things start to change quickly in the external market, it puts your organization at risk. Hence, the current fixation with "agility."

Rapid advances in digital technology, changing customer behavior, competitive forces, and new regulations threaten today's established business models and require companies to change at speed. Large-scale businesses need to find a way to change their processes, organizations, and people at pace on an ongoing basis. Nowhere is this need more pressing than in the financial-services industry, which must contend not only with the "digital revolution," but also with an unending stream of innovation and new regulations.

Financial-services firms are responding as one might expect: Many have started ambitious programs to become more agile. One critical area, however, remains a notable exception: the risk functions of banks and insurers. Most have changed over the past 10 years, driven primarily by regulatory demands. But a rise in regulation-based rules and controls has inadvertently reduced the agility of organizations. In some, the risk function has even become a "choke point" to agility.

## SCENARIOS FOR THE FUTURE OF RISK

For decades, the risk profile of a financial-services firm was relatively predictable. An economic downturn might push credit defaults to unusually high levels.

Market prices might move against an insurer's investment position. A rogue trader might defraud a bank of hundreds of millions of dollars. These are the kinds of risks that risk functions have been working on, guided in part by regulation and in part by experience. In banks, for example, if you wanted to get ahead in risk you worked in the credit division because that was the main risk the organization faced. It was just the way it was.

No longer.

For today's risk functions, their previously perceived "second-order risks" have become the primary concern; cyber risk, conduct risk, operational risks, and strategic and business model risks are occupying the agenda. Risk functions need to reassess which risks they will need to measure, how to manage them over the coming years, and the implications, both analytically and organizationally.

Consider the following two scenarios. In the first, life is made easy for incumbent financial firms: Economic growth is revived; technological progress is slower than expected; regulation continues to limit cross-border competition and becomes more onerous for new fintech entrants; customer attrition remains low; and substantial new risks do not materialize.

In the second scenario, established firms face fundamental challenges: Economic malaise persists; technology advances faster outside financial firms than inside them; a shift to regulatory harmonization reinvigorates globalization and new entrants; customers embrace digital far beyond projections; and the relative importance of various risks changes rapidly.

The risk functions suited to these two scenarios look completely different. In scenario one, risk functions largely retain their current structure and adopt new technologies where suitable. Risk management capabilities remain in-house, and there is only a limited reduction

of resources over time. In scenario two, risk functions will undergo a radical re-build. Risk management systems and analytics will be outsourced. Risk leaders will focus on governance tasks, methodology control, and third-party management. In this scenario, the headcount in the risk function may be reduced by as much as 60 percent to 75 percent, with a much heavier reliance on specialist third-party providers.

These are just two scenarios. Actual events are likely to unfold differently in various ways. But the simple fact that change as significant as this second scenario is in the cards means that risk functions must be able to cope with change that is rapid and meaningful in scale. This means that the risk function at financial-services firms needs to change how it performs its role and the framework by which risks are managed.

Risk managers know this. Our recent surveys of chief risk officers of leading European banks and insurance companies showed that most are concerned about their organization's ability to adapt quickly enough. They understand that good risk management can no longer rely on rigid methodologies and processes. They accept the notion that risk functions must be agile. But where should they start?

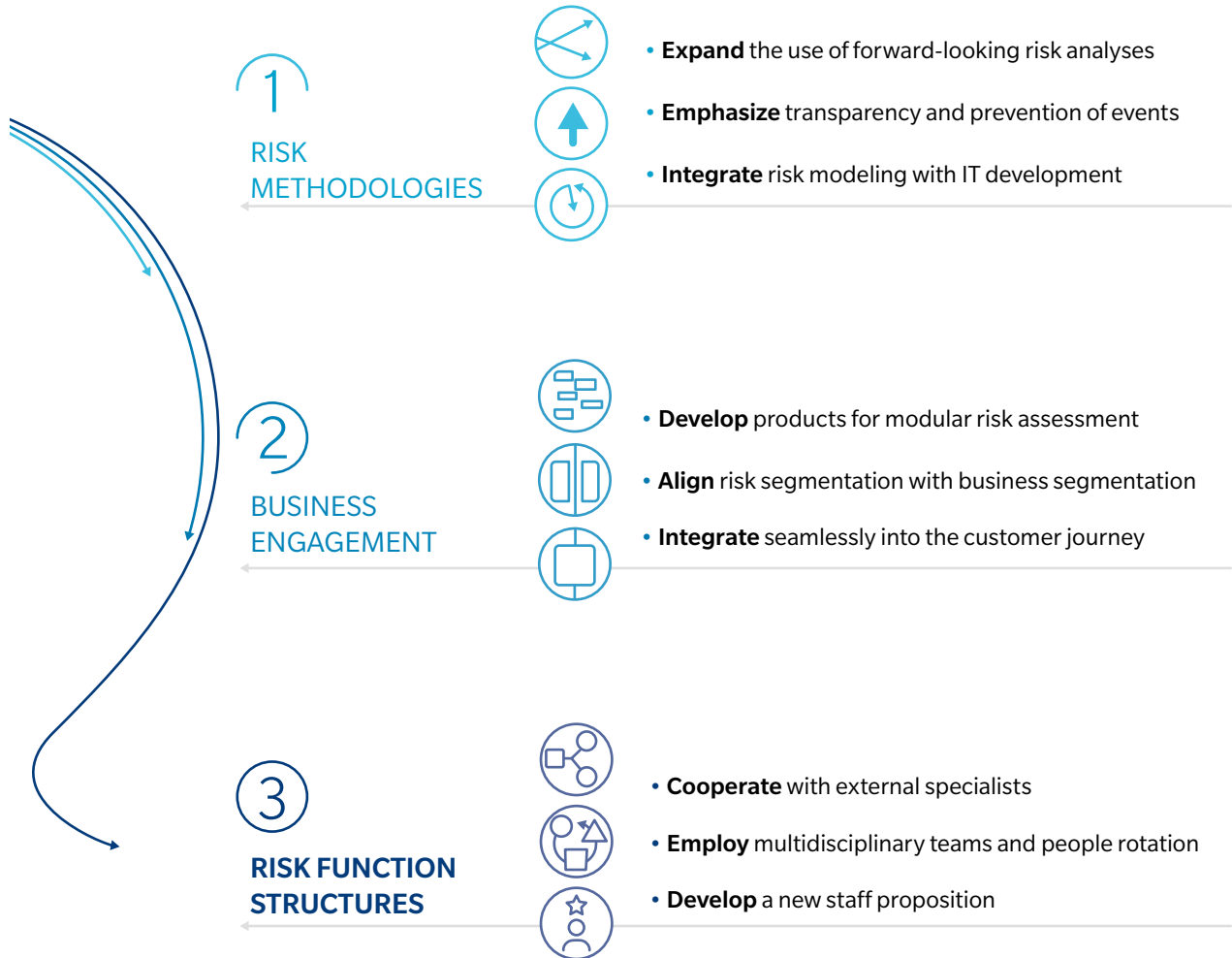
## "AGILITY" FOR THE RISK FUNCTION

The concept of being "agile" in business first emerged in IT, where people began to realize they needed an alternative development approach to a "waterfall" that allowed maximum flexibility and the ability to adjust quickly to customer feedback. This echoed other leadership concepts, for example, the "commander's intent" approach in the military is based on high levels of delegated authority and flexibility to what happens on the ground rather than traditional decision



EXHIBIT 1: RETHINKING WHAT IT MEANS TO BE "AGILE" AT FINANCIAL FIRMS

Risk functions need to shift their operating models across three fronts to increase flexibility



Source: Oliver Wyman analysis

making. The details differ in each area of application, but its essence remains the ability to create or react to change quickly and efficiently.

The risks faced by financial firms and their relative importance are not constant. Over recent years, for example, non-financial risks – cyber, conduct, and legal – have increased considerably. Yet relative to traditional credit, market, and insurance

risk management, the resources devoted to such non-financial risks have changed little.

Risk functions should take a more forward-looking approach to risk identification and measurement. (See Exhibit 1.) Rather than relying largely on historic data, agile risk functions place a greater emphasis on what is coming, prompting the need to change both their own risk models and the way they work as a function. Advanced scenario analysis is

## Chief risk officers of leading European banks and insurers worry their organizations aren't able to adapt quickly

currently the best way to incorporate variable and changing risk factors into loss forecasting. As part of our research into what we call “scaled agility,” we observe that most institutions now use stress testing in their internal planning processes, but few apply it to the full range of tasks where it has real value, such as risk identification and credit decisions.

Agile risk functions also help the organization act quickly to prevent or mitigate losses. They work with senior managers to set the firm’s risk appetite, and create early-warning triggers and escalation mechanisms to increase local decision-making authority while retaining transparency.

This requires the risk function to have timely access to as much relevant data as possible, from both internal and external sources. To this end, leading institutions are working to improve the interface between risk functions and their firms’ wider data systems. For example, they are more closely integrating risk model builders with IT developers and ensuring that they use the same coding language.

Risk functions must respond not only to a changing risk environment, but also to changing commercial imperatives. Customers’ expectations for the speed and ease of transactions keep rising, in financial services and elsewhere. Risk functions need to help reduce friction in the customer journey. Right now, this means minimizing the data demands on customers (for example, by using

publicly available data wherever possible) and making risk assessments as quick, transparent, and transferrable as possible. In the future, new demands are likely to arise. Meeting them quickly and efficiently will require agile working practices.

### RETHINKING OPERATING MODELS

In risk functions, as elsewhere, this means rethinking the operating model in several ways:

First, agile risk functions will have a best-of-breed network of specialist third-party providers who supply focused expert reviews or analyses. Traditional risk functions typically undertake all key elements of the risk management in-house. In an agile environment, this is both expensive and sub-optimal. In many areas, third-party providers are quicker, cheaper, and more effective providers.

Agile risk managers are trained in more than one thing. Especially at a senior level, risk professionals have consciously developed a broader skill set and avoid silo-thinking. Staff members are rotated through a wider range of roles and work closely with staff from other functions, such as IT, finance, and compliance. A leading European bank is experimenting with this concept by differentiating staff between “base camp” teams, who perform day-to-day credit assessments, and “mission” teams, who develop new models.

Agile risk functions need people who are adaptable. They must be able to think through the business implications of risk management and provide content based on challenges to the wider business. That means they must have a hunger to learn continuously and recognize the value of cognitive and skill diversity within the team. The days when 70 percent of a risk function's work came from a single risk type are fast disappearing. Agile risk functions will be changing their recruitment, development, and leadership models accordingly.

One key aspect of these changes that needs to be considered in parallel is the wider governance model of an organization and how decisions get made. The agile practice of making decisions fast, even with limited supporting evidence, and releasing new products as "beta versions" is hard to replicate in a risk function, given the requirements of regulators and shareholders. But that doesn't mean improvements are impossible. Risk functions need to get ahead of the agility imperative: Which decisions need the "full" governance process and which ones can be fast-tracked? Most organizations are still applying a one-size-fits-all approach to decision making. Local empowerment and more flexible escalation mechanisms are critical. If speed is of the essence in the new reality, then speed of decision making within a formal governance model needs to be reviewed and challenged.

## THE UPSIDE OF AGILITY

The scale of benefits from developing agile practices in risk functions is hard to predict with certainty. What we can say is that research in other areas reveals improvements of 50 percent to 75 percent across a range of performance drivers, such as the time required to respond to new operational requirements, the speed of strategic decisions, and the success in change management. There is no reason why such gains shouldn't be achieved in risk management as well. For example, we believe that an agile risk function could cut credit decision-making time by half or more, and that the agile organization of staff, external providers, and new technologies could result in a reduction of the size of risk teams by more than 50 percent.

Risk functions are rightly cautious in their estimates of risk and in the advice they provide business lines. That's their job: They're paid to be cautious. But rigid ways of working are not required to produce cautious output. On the contrary, an inability to adapt quickly will increase the chance of nasty surprises and of slipping behind competitors in customer targeting, product design, and risk pricing.

Rapid change in the business environment puts risk functions in the same position as other parts of financial firms. The agility imperative is upon us. Risk functions need to get agile.

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**David Gillespie** and **Sean McGuire** are London-based partners and **Martin Lehmann** is a Frankfurt-based principal in Oliver Wyman's Financial Services practice.

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Photo courtesy of Pippa Black, Oliver Wyman

# THE NEW WORLD ORDER

HOW MULTINATIONALS CAN ADAPT TO A POLITICAL  
MOOD THAT DOESN'T CARE FOR THEM AT ALL

Davide Taliente • Constanze Windorfer



The fall of the Berlin Wall, in 1989, ushered in a new era of globalization. People, capital, goods, and ideas moved around the world with a freedom not seen since the late-19th century.

The economic gains for developing countries have been extraordinary. The percentage of the world's population living in absolute poverty has fallen from 40 percent in 1980, to 10 percent today. China and India now have middle classes numbering in the hundreds of millions.

Multinational corporations have been instrumental in this process. To reduce costs, they have shifted production to countries with low-paid workers, thereby increasing demand for their labor and increasing their wages. This has spread advanced production techniques and management practices around the world, dramatically improving productivity. And they have sold their products in countries whose citizens were until recently shut off from goods and services of the quality and value familiar to Western consumers.

## GLOBALIZATION THREATENED

It wasn't for charity, of course. Shareholders have benefited greatly from bigger product markets, lower production costs, and the judicious use of head office domiciles to reduce tax bills. Since 1990, the market capitalization of multinational corporations has grown at more than three times the average rate of listed companies around the world, our research shows. (See Exhibit 1.)

But this ascendancy is under threat. Political sentiment has turned against globalization and the political and economic policies that promoted it.

The financial crisis of 2008 is often attributed to deregulation and unfettered capitalism.

Governments have since created new regulatory agencies and strengthened the powers of existing ones with a view to reducing "systemic risk" and protecting consumers, workers, and the environment.

At the same time, international trade and migration have come to be seen as harmful to low- and middle-skilled workers in advanced economies, suppressing wages and threatening their jobs and ways of life. Brexit, the election of Donald Trump, and the rise of nationalist parties across Europe are signs of this new political mood.

## A RETURN TO PROTECTIONIST WAYS

As the backlash against globalization is translated into policy, the structural advantages of multinational corporations are coming under threat from five main sources.

The first, and most obvious, is trade protectionism. Already, the World Trade Organization reports a rise in protectionist measures by the G20 countries, with 1,583 added since 2008 and only 387 removed. Tariffs not only restrict global corporations' access to consumers around the world, but also drive up production costs, as the price of imported components increases.

**3x**  
How much bigger  
multinational corporations'  
market capitalizations have  
grown compared to listed  
companies on average

Second is the return of “industrial policy,” as advocated, for example, by Theresa May, the British prime minister. Domestic champions receive favorable regulatory treatment that makes competing with them difficult for global corporations. Multinational banks are in retreat, and even digital businesses such as Uber and Airbnb have found their business models undermined in several countries by regulations introduced to protect the domestic suppliers they compete with.

## MORE ACCOUNTABLE, MORE RESPONSIBLE

A third threat comes from increased demands for accountability. Domestic regulators seeking to avoid environmental disasters, accounting scandals, or consumer detriment want responsible parties on the ground. Lean cost models that make use of globally centralized control functions (such as finance, compliance, legal, and risk) will no longer be deemed sufficient.

Fourth are the broader demands for corporations to be socially responsible. This can reduce revenues – for example, through demands for more-affordable products. It can increase costs, through calls for fair pay or environmentally friendly production. And it can push tax liabilities up, from what the letter of the law says, to what is deemed a company’s fair contribution. Some multinational corporations have already made voluntary tax contributions in response to public discontent.

Finally, the chance that an investment will go wrong because of unexpected political events is increasing. This heightened political risk entails higher hurdle rates for investment. Foreign direct investment from the European Union fell from 6.9 percent of GDP in 2007, to 3.3 percent in 2015, while foreign direct investment from the United States fell from 2.9 percent, to 1.8 percent.

## MOVING BEYOND A SHORT-TERM MINDSET

This new world order need not spell the end of multinational corporations. But they will need to change. In particular, we see two major adaptations that are needed – and one enduring advantage that will become even more important.

The first major adaptation is the adoption of corporate goals that go beyond short-term gain for shareholders and attend to the longer-term interests of all stakeholders. What this means in practice will vary with the multinational corporation’s line of business: An oil company will need to protect the environment; a bank will need to promote the financial security of its customers and contribute to macroeconomic stability; and a global fashion brand will need to be a good employer (or buyer). Social responsibility must be built into the business model, rather than being a philanthropic appendage.

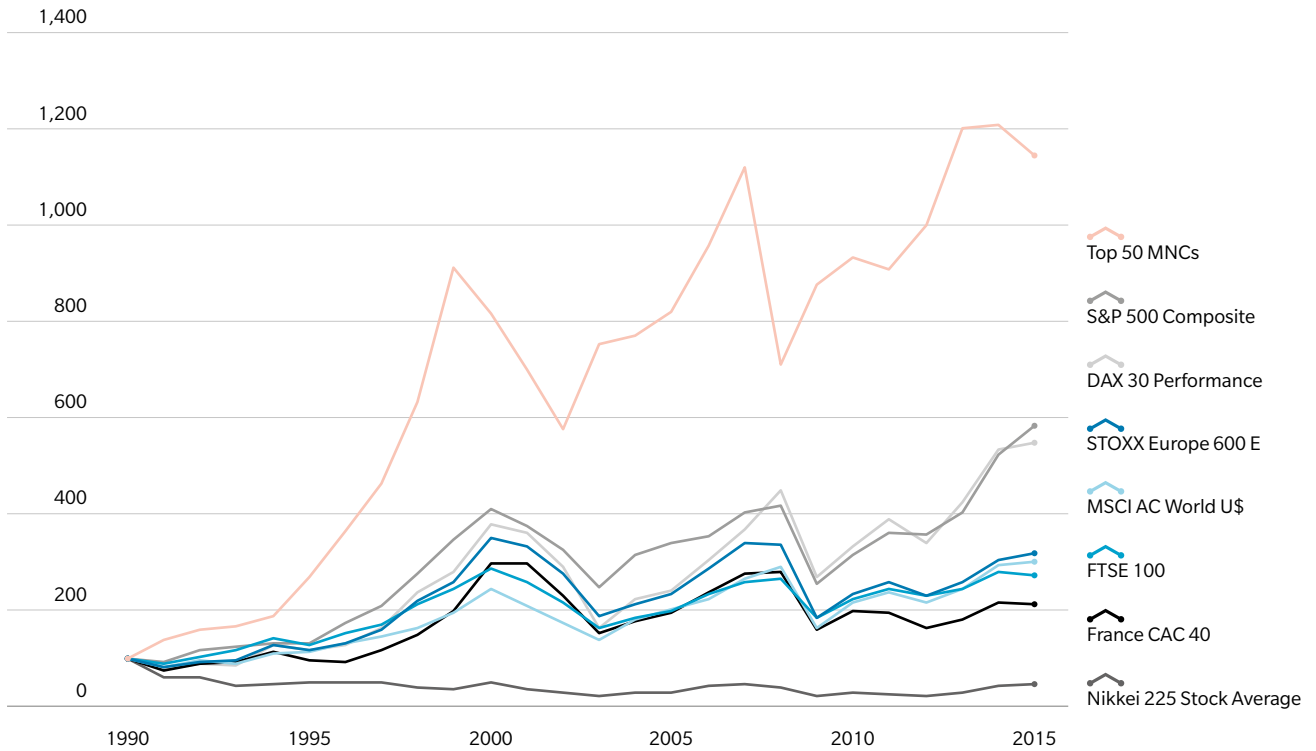
The second is a shift from global models to approaches based on a global-local hybrid approach. Centralized governance and “cut and paste” business models won’t work in the new world of economic nationalism. Multinational corporations may need to evolve from being globally integrated enterprises to federations of quasi-independent subsidiaries. This will mean being a little less multinational – making fewer, deeper strategic commitments to particular markets.

These changes will mean relinquishing some of the cost advantages of being a multinational corporation, and others may be removed by trade barriers. This is where their enduring advantage comes into play: Multinational corporations will continue to derive competitive advantage from intellectual property, the one corporate asset that cannot be stopped at the border.

**EXHIBIT 1: HOW MULTINATIONALS BENEFITED FROM GLOBALIZATION**

Multinational corporations’ market capitalizations have grown about three times more than the average rate of listed companies since 1990

**MARKET CAPITALIZATION**



Source: Oliver Wyman analysis

The business model in which intellectual property is used will need to be tailored to the regulations and political imperatives of the countries where it is deployed. But provided this can be achieved quickly and at a reasonable cost, as it usually can be where digital intellectual property is concerned, multinational corporations will still be able to derive outsize value from it. Hence, the continued success of Netflix, Skype, Zappos, and the like even as the tide has turned against globalization.

Under the economically liberal policy consensus of the past 30 years, senior leaders of multinational corporations concerned themselves with commercial matters – consumer demand, production efficiency, investor appetite, and so on. They must now pay far more attention to innovation and politics. If any are reluctant to do so, they should remember the wisdom of Pericles: “Just because you do not take an interest in politics doesn’t mean politics won’t take an interest in you.”

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*This article first appeared in Harvard Business Review.*



# ASSESSING MACHINE LEARNING

IF YOUR COMPANY IS NOT GOOD AT ANALYTICS,  
IT'S NOT READY FOR AI

Nick Harrison • Deborah O'Neill



**M**anagement teams often assume they can leapfrog best practices for basic data analytics by going directly to adopting artificial intelligence (AI) and other advanced technologies. But companies that rush into sophisticated AI before reaching a critical mass of automated processes and structured analytics can end up paralyzed. They can become saddled with expensive startup partnerships, impenetrable black-box systems, cumbersome cloud computational clusters, and open-source tool kits without programmers to write code for them.

By contrast, companies with strong basic analytics – such as sales data and market trends – make breakthroughs in complex and critical areas after layering in artificial intelligence. For example, one telecommunications company we worked with can now predict with 75 times more accuracy whether its customers are about to bolt by using machine learning. But the company could only achieve this because it had already automated the processes that made it possible to contact customers quickly and understood their preferences by using more standard analytical techniques. So how can companies tell if they are really ready for AI and other advanced technologies?

## AUTOMATING BASIC PROCESSES

First, managers should ask themselves if they have automated processes in problem areas that cost significant money and slow down operations. Companies need to automate repetitive processes involving substantial amounts of data – especially in areas where intelligence from analytics or speed would be an advantage. Without automating such data feeds first, companies will never discover their new AI systems are reaching the wrong conclusions because they are analyzing outdated data. For example, online retailers

## Companies must have sufficiently automated and structured data analytics to take advantage of new technologies

can adjust product prices daily because they have automated the collection of competitors' prices. But those that still manually check what rivals are charging can require as much as a week to gather the same information. As a result, as one retailer discovered, they can end up with price adjustments perpetually running behind the competition even if they introduce AI, because their data is obsolete.

Without basic automation, strategic visions of solving complex problems at the touch of a button remain elusive. Take fund managers. While the profession is a great candidate for artificial intelligence, many managers spend several weeks manually pulling together data and checking for human errors introduced through reams of Excel spreadsheets. (See Exhibit 1.) This makes them far from ready for artificial intelligence to predict the next risk to client investment portfolios or to model alternative scenarios in real time.

Meanwhile, companies that automate basic data manipulation processes can be proactive. With automated pricing engines, insurers and banks can roll out new offers as fast as online competitors. One traditional insurer, for instance, shifted from updating its quotes every several days to every 15 minutes by simply automating the processes that collect benchmark pricing data. A utility company made its service more competitive by offering customized, real-time pricing and special deals based on automated smart-meter readings, instead of semi-annual in-person visits to homes.

## STRUCTURED DATA ANALYTICS

Once processes critical to achieving an efficiency or goal are automated, managers need to develop structured analytics as well as centralize data processes, so that data collection is standardized and entered only once.

With more centralized information architectures, all systems refer back to the primary “source of truth,” updates propagate to the entire system, and decisions reflect a single view of a customer or issue. A set of structured analytics provides retail category managers, for instance, with a complete picture of historic customer data: It shows them which products were popular with which customers; what sold where; which products customers switched between; and which products they remained loyal to.

Armed with this information, managers can then allocate products better and see why choices are made. By understanding the drivers behind customer decisions, managers can also have much richer conversations about category management with their suppliers – such as explaining that very similar products will be removed to make space for more unique alternatives.

## TRYING OUT AI

After these standard structured analytics are integrated with artificial intelligence, it’s possible to comprehensively predict, explain, and prescribe customer behavior. In the earlier telecommunications company example, managers understood customer characteristics. But they needed artificial intelligence to analyze the wide set of data collected to predict if customers were at risk of leaving. After machine learning techniques identified the customers who presented a “churn risk,” managers then went back to their structured analytics to determine the best way to keep them – and used automated processes to get an appropriate retention offer out fast.

Artificial intelligence systems make a huge difference when unstructured data such as social media, call-center notes, images, or open-ended surveys are also needed to make a judgment. The reason Amazon, for instance, can recommend products to people before they even know they want them is because, using machine learning techniques, it can now layer unstructured data on top of its strong, centralized collection of structured analytics like customers’ payment details, addresses, and product histories.

AI also helps with decisions not based on historic performance. Retailers with strong structured analytics in place can figure out how best to distribute products based on how they are selling. But it takes machine learning techniques to predict how products not yet available for sale will do – partly because no structured data is available.

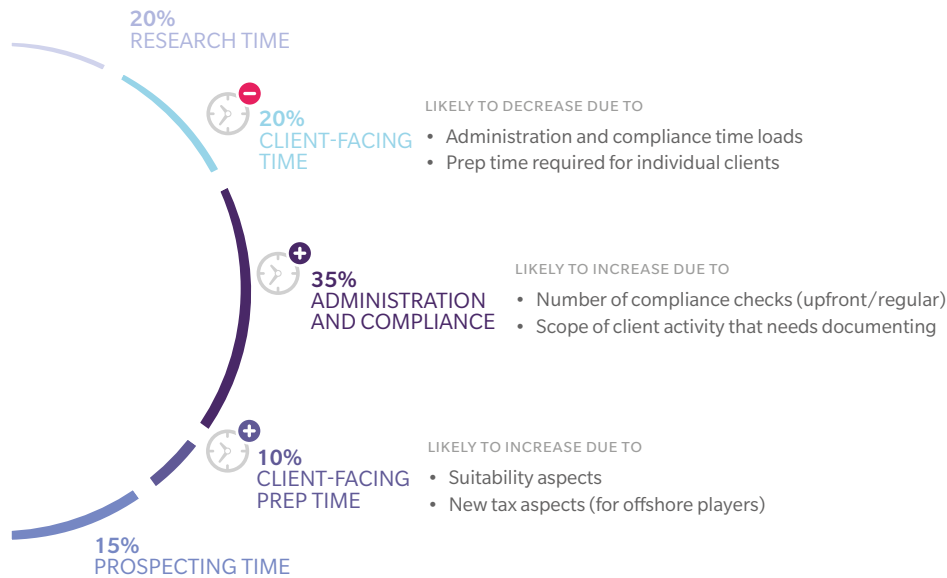
Finally, artificial intelligence systems can make more accurate forecasts based on disparate data sets. Fund managers with a strong base of automated and structured data analytics are predicting with greater accuracy how stocks will perform by applying AI to data sets involving everything from weather data to counting cars in different locations to analyzing supply chains. Some data pioneers are even starting to figure out if companies will gain or lose ground using artificial intelligence systems’ analyses of consumer sentiment data from unrelated social media feeds.

Companies are just beginning to discover the many different ways that AI technologies can potentially reinvent businesses. But one thing is already clear: They must invest time and money to be prepared with sufficiently automated and structured data analytics in order to take full advantage of the new technologies. Like it or not, you can’t afford to skip the basics.

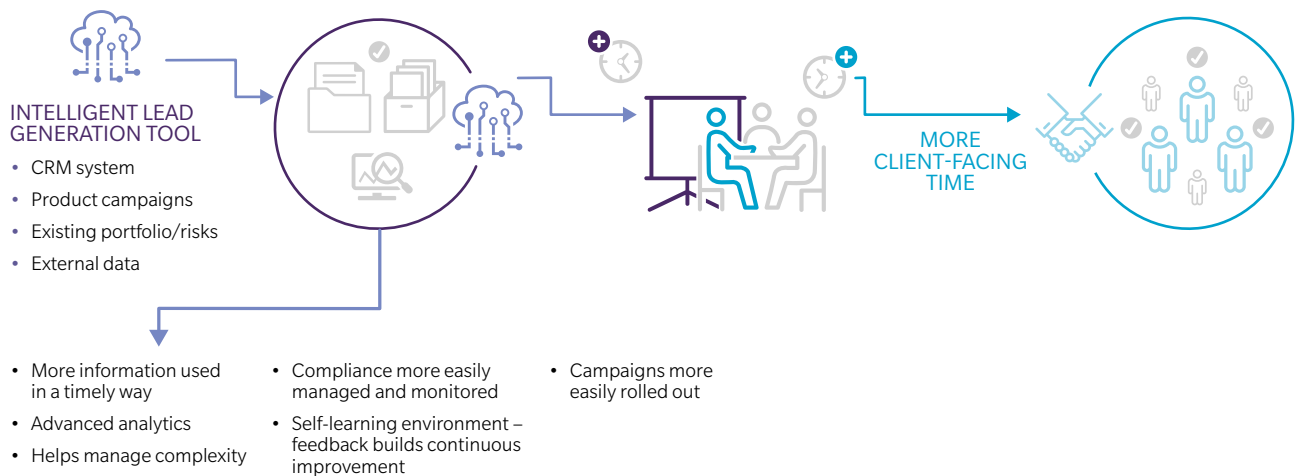
**EXHIBIT 1: THE POWER OF IMPROVED ANALYTICS**

WITHOUT STRONG BASIC ANALYTICS, THE BURDEN ON BANK RELATIONSHIP MANAGERS TO MEET CLIENT DEMAND FOR RESEARCH, ADMINISTRATION, AND COMPLIANCE CAN BE OVERWHELMING...

Typical allocation of a relationship manager's time



...BUT WITH PROPER DATA MANAGEMENT, MANAGERS HAVE GREATER CAPACITY – AND MORE ACTIONABLE INSIGHTS  
 Relationship manager's time is freed up to focus on client-facing activities



Source: Oliver Wyman analysis

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*This article first appeared in Harvard Business Review.*







# CLEANING UP MONEY LAUNDERING

BANKS NEED LESS EXPENSIVE AND MORE  
RELIABLE WAYS TO DETECT ILLICIT TRANSACTIONS

Adrian Murphy • Stefano Boezio • Allen Meyer

Last year, financial institutions in the United States filed almost 5 million “suspicious activity” reports (SARs), identifying transactions with potential links to fraud or money laundering. That figure, already alarming, represents a shocking increase of 2,000 percent in just five years, in part because banks have gotten better at ferreting out illicit transactions, but mostly because money laundering, despite the best efforts of governments and financial institutions, is one of the great growth industries of our times. (See Exhibit 1.)

It’s also a remarkably innovative industry. Where a few years ago, a money launderer might do little more than break large piles of cash into smaller piles to escape reporting requirements (“smurfing”) or funnel illicit funds through cash-based businesses like car washes and casinos, today’s far more sophisticated criminal enterprises conceal the way they move their money by using online instruments, digital payments, and dizzying numbers of global transactions. And when banks block one strategy, the launderers devise another, staying one frustrating step ahead.

For these reasons, financial institutions need to revamp their anti-money laundering methods. Most need to go much further than the first steps they’ve already taken. To stop money laundering, institutions need to adopt more strategic, end-to-end processes that take advantage of recent innovations in data analysis. Most important, they have to replace the familiar check-the-box compliance mindset in favor of full-on engagement.

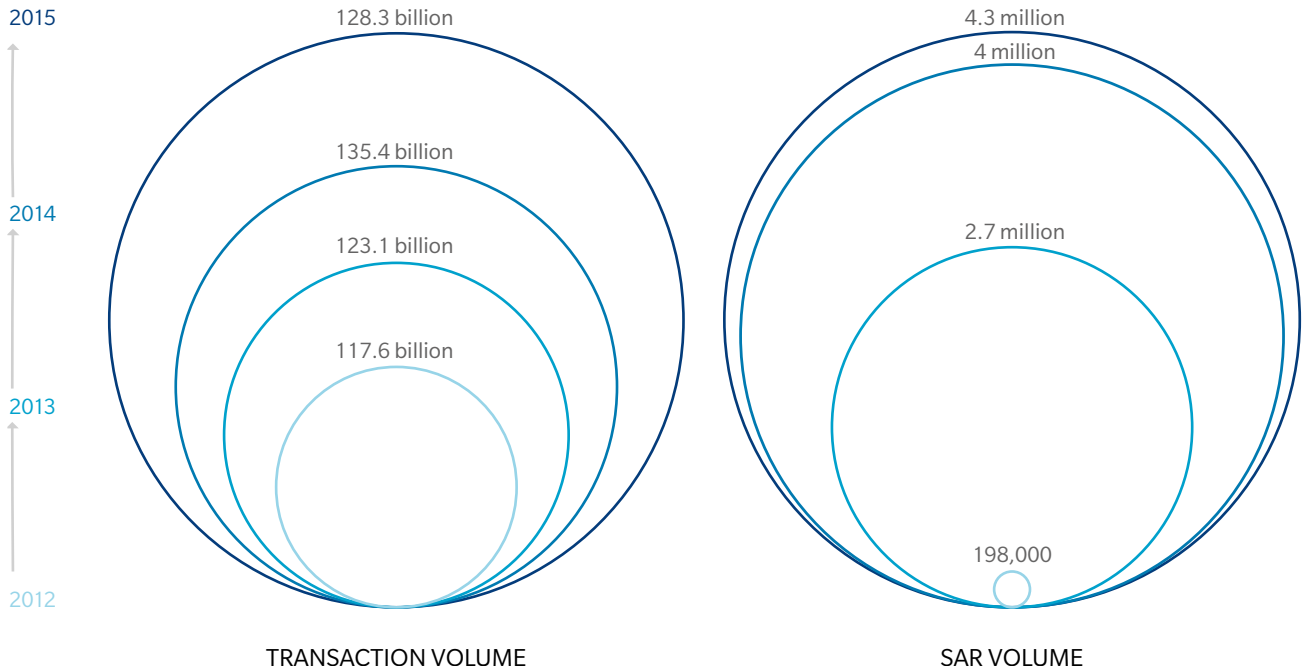
## SLIPPING THROUGH THE CRACKS

Until recently, incremental improvement ruled the day. The tools already at banks’ disposal were acceptable to regulators, if not ideally effective, and few institutions saw the point of undertaking the expense, labor, and regulatory risk of creating a new system that no one had asked for.

But now, it’s clear that banks need to undertake bigger changes. On average, less than one in 10 warnings currently generated by transaction monitoring systems lead to the filing of a

EXHIBIT 1: RECENT TRENDS IN TRANSACTION VOLUMES AND SUSPICIOUS ACTIVITY REPORT FILINGS

The US has seen a shocking increase of 2,000 percent in just five years



Sources: BIS Committee on Payments and Market Infrastructures. Statistics on payment, clearing and settlement systems in the CPMI countries. Figures for 2015. December 2016; FinCEN, FinCEN SAR Stats. Technical Bulletin. March 2017 – Data includes reports for Money Laundering, Fraud, Mortgage Fraud, Casinos, Identification Documentation, Insurance, Securities/Futures/Options, Structuring, Terrorist Financing, Other suspicious activities

suspicious activity report; an estimated 90 percent to 95 percent are false positives. That means in 2016 when the industry is estimated to have filed 4.7 million suspicious activity reports, banks first had to manually investigate 50 million to 90 million notifications, costing the banking industry billions of dollars.

Moreover, the current system virtually guarantees that some offenders, thanks to rudimentary modeling techniques, overloaded investigative operations, and lack of a holistic risk-management approach, will slip through the cracks. That is a risk that financial institutions cannot take. A bank discovered inadvertently aiding an illegal gambling operation 40 years ago would have been embarrassed. A bank found inadvertently supporting a terrorist attack

against the United States today might suffer irreparable damage to its reputation (especially considering the obvious moral duty that banks have in their role as the systemic first line of defense against such activities).

ADVANCED ANALYTICS

Advanced analytical tools are familiar in many areas of risk management, but financial institutions have only recently started using them to detect money laundering. These statistical techniques can reduce both false negatives and false positives (in some cases, false positives have fallen by 50 percent or more), and they can help institutions respond rapidly to emerging threats.

Quasi-autonomous machine learning can make analytics even more effective – but it won't achieve its full potential until banks learn how to solve the crucial challenge of explaining to regulators the logic behind what the machine has learned on its own.

**2,000%**  
How much the number of  
suspicious activity reports have  
soared in the past five years

## ROBUST CLIENT DATA

Analytics, of course, are only as good as the data they're applied to. And though financial institutions track transactions well, they need to raise the bar on generating high-quality and well-organized client data that is comprehensively sourced, consistently verified, standardized, and regularly updated. Without it, data analysis is forced to rely just on transaction data, which is important, but not enough. Obtaining customer data is not primarily an IT challenge – the trick is to get bank employees who interact directly with customers to understand the urgency of consistently asking for and recording a full range of information that will support the analytics program.

## DYNAMIC PROCESSES

Finally, banks need to use appropriate risk-management discipline and techniques. Analytics are a wonderful tool – but they aren't much help if they're employed without a strong understanding of what you're trying to catch and why. Banks need to deeply understand how criminal organizations are attempting to exploit them and what new trends are

emerging. Money laundering is a dynamic, constantly evolving form of criminal activity, and financial institutions need to create a dynamic, constantly evolving system for responding to it.

## PRACTICING SELF-DEFENSE

Money laundering is vital to the sort of enterprises society would be better off without: terrorist networks, drug cartels, and other disruptive criminal organizations. The penalties and reputational risk faced by banks that fail to identify laundering have never been greater, and the challenge of catching the launderers is escalating constantly. We're at a point in time, however, when new tools are available to help the financial industry detect illicit transactions, and regulators seem to be increasingly willing to let banks put them to use. It's time for banks to remove the shackles and defend the integrity of their industry – and the future of their institutions.

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**Adrian Murphy, Stefano Boezio, and Allen Meyer** are New York-based partners in Oliver Wyman's Financial Services practice.

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*This article first appeared on BRINK.*



JET FUEL PRESSURE 30 PSI. MAX. SUCTION 0.8 BAR  
JET FUEL PRESSURE 35 BAR



# NOT ENOUGH MECHANICS

BABY BOOMER RETIREMENTS LEAVE AVIATION SHORTHANDED JUST AS THE GLOBAL FLEET IS EXPANDING

Brian Prentice • Derek Costanza • John Smiley

A shortage of aviation mechanics within the next decade threatens the projected expansion and modernization of the global airline fleet. Based on Oliver Wyman projections, the gap between the supply of mechanics and demand for them should develop in the United States by 2022 and reach a peak of 9 percent by 2027.

The problem may emerge sooner in Asia where a bulk of the growth in the aircraft fleet is slated to take place. The increase in the number of planes, combined with a shortage of mechanics, may force them to maintain additional spare planes to avoid cancellations and late departures resulting from maintenance delays.

The shortage is, in part, a consequence of an aging global population. Between now and 2027, a record number of maintenance technicians will be eligible to retire as more

baby boomers reach their 60s. For example, in the US, the median age of aviation mechanics is 51 years old, nine years older than the median age of the broader US workforce as calculated by the US Bureau of Labor Statistics.

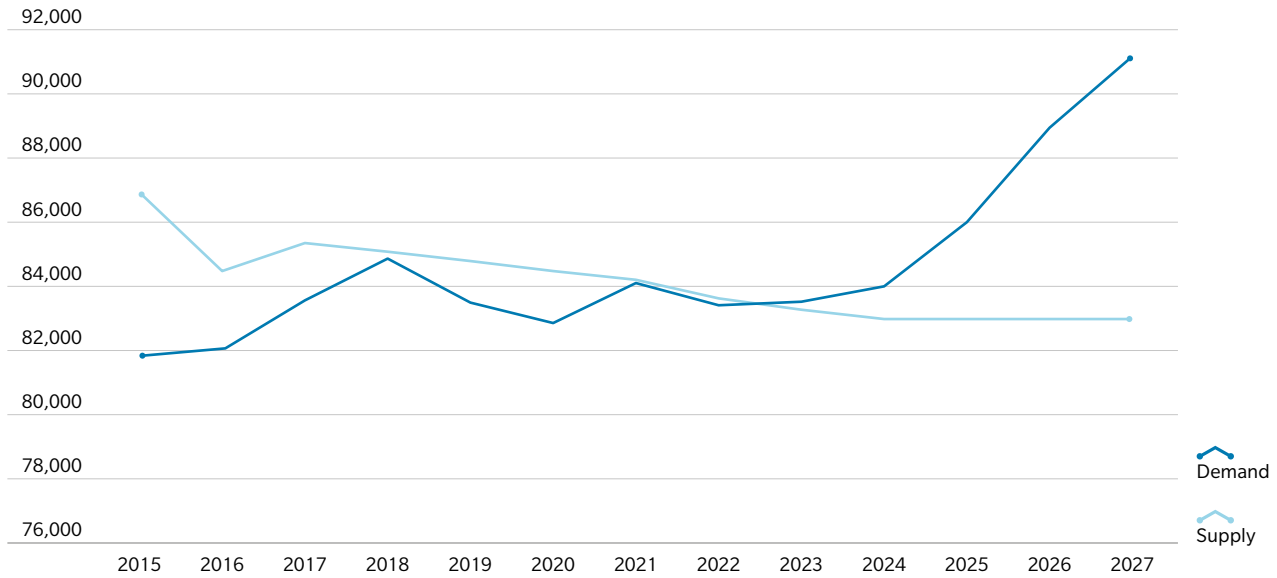
## WHERE ARE THE YOUNG MECHANICS?

And while there are plenty of millennials to step up and take their place, so far they have not done so. Oliver Wyman projections show that the number leaving the maintenance technician workforce will outpace the number preparing to enter it for most of the next decade.

To some degree, the problem stems from aviation mechanics' current wages, benefits, and perks. In an Oliver Wyman survey of

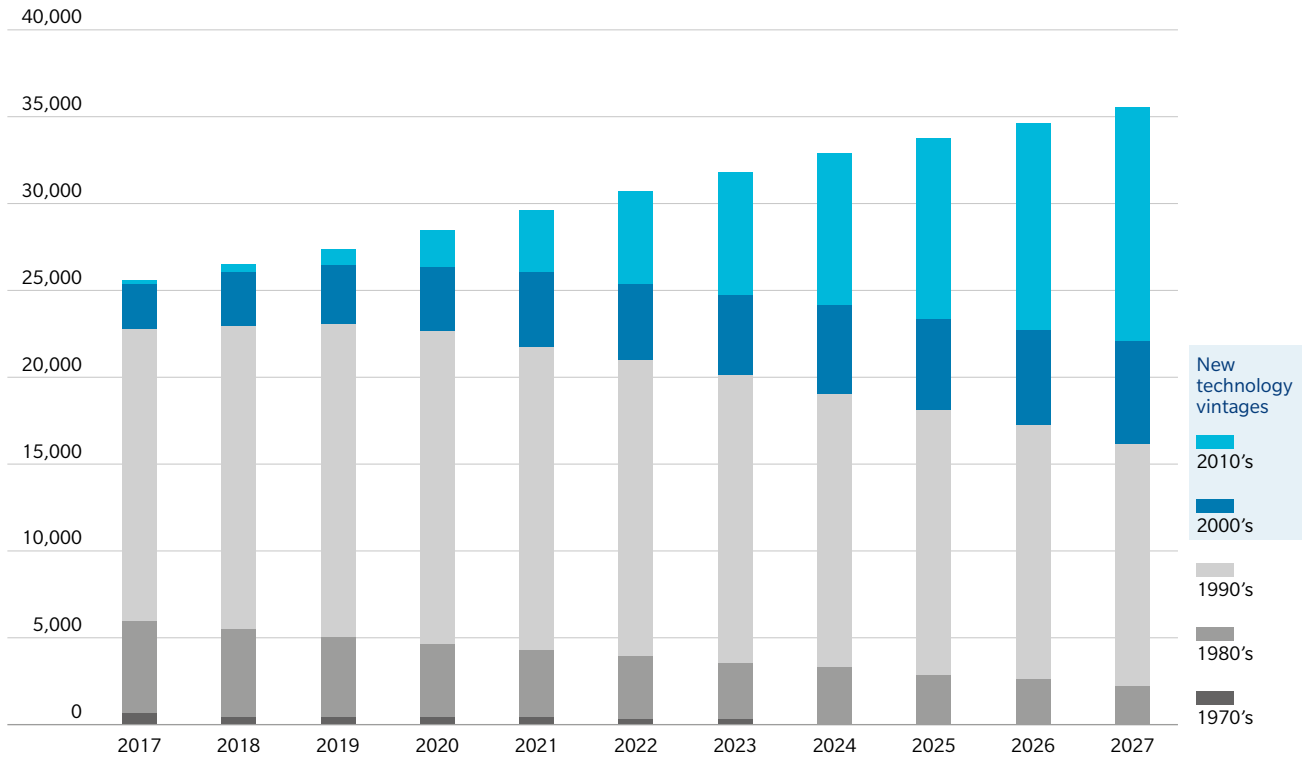
EXHIBIT 1: FEWER MECHANICS, MANY MORE PLANES

The supply of commercial aviation mechanics will dip in less than 10 years...<sup>1</sup>



...Just about the time when the global fleet will be 10,000 planes bigger and roughly half comprised of technologically advanced aircraft produced since 2000.<sup>2</sup>

NUMBER OF AIRCRAFT



1 Source: Oliver Wyman Commercial MRO Maintenance Technician Labor Model

2 Source: Oliver Wyman Global Commercial Air Transport Fleet Forecast

executives from the airlines and maintenance, repair, and overhaul (MRO) industry, 51 percent of respondents identified wages and benefits as an obstacle. The Aviation Technician Education Council (ATEC) estimates that 30 percent of those who finish an aviation maintenance training course end up accepting employment in another industry.

The aging of the mechanic workforce and rash of anticipated retirements could not come at a worse time for the industry, as it gears up to accommodate a larger, newer, and more technologically advanced fleet. The *Oliver Wyman Fleet Forecast* shows global airlines adding 10,133 planes by 2027, growing the fleet by 40 percent to 35,501. This reflects purchases of 20,444 next-generation aircraft in those 10 years and the retirement of 10,311 planes. The Asian fleet will double in size over the next decade and, beginning next year, will become the largest region.

## BIGGER, MORE MODERN FLEET

Within the next 10 years, 58 percent of the fleet will be comprised of planes designed and built after 2000. Mechanics moving forward will need the skill sets to work not only on the newest planes, but also on those that have been flying for 20 years – and the skills are not necessarily the same. This requirement further complicates the shortage; when supply and demand are tight, employers have to hope that the right mechanics with the right skill sets are in the right place at the right time when needed.

## While there are plenty of millennials to fill the void, so far they are choosing other careers

Tomorrow’s maintenance technicians need to be tech-savvy diagnosticians – something that was not imaginable a few decades ago. The MRO survey of executives identified three emerging technologies vital for the next generation of mechanics, including composite material repair and manufacture (62 percent); collection and reporting of data for advanced analytics, big data, and predictive maintenance (51 percent); and the newest avionics and electrical systems.

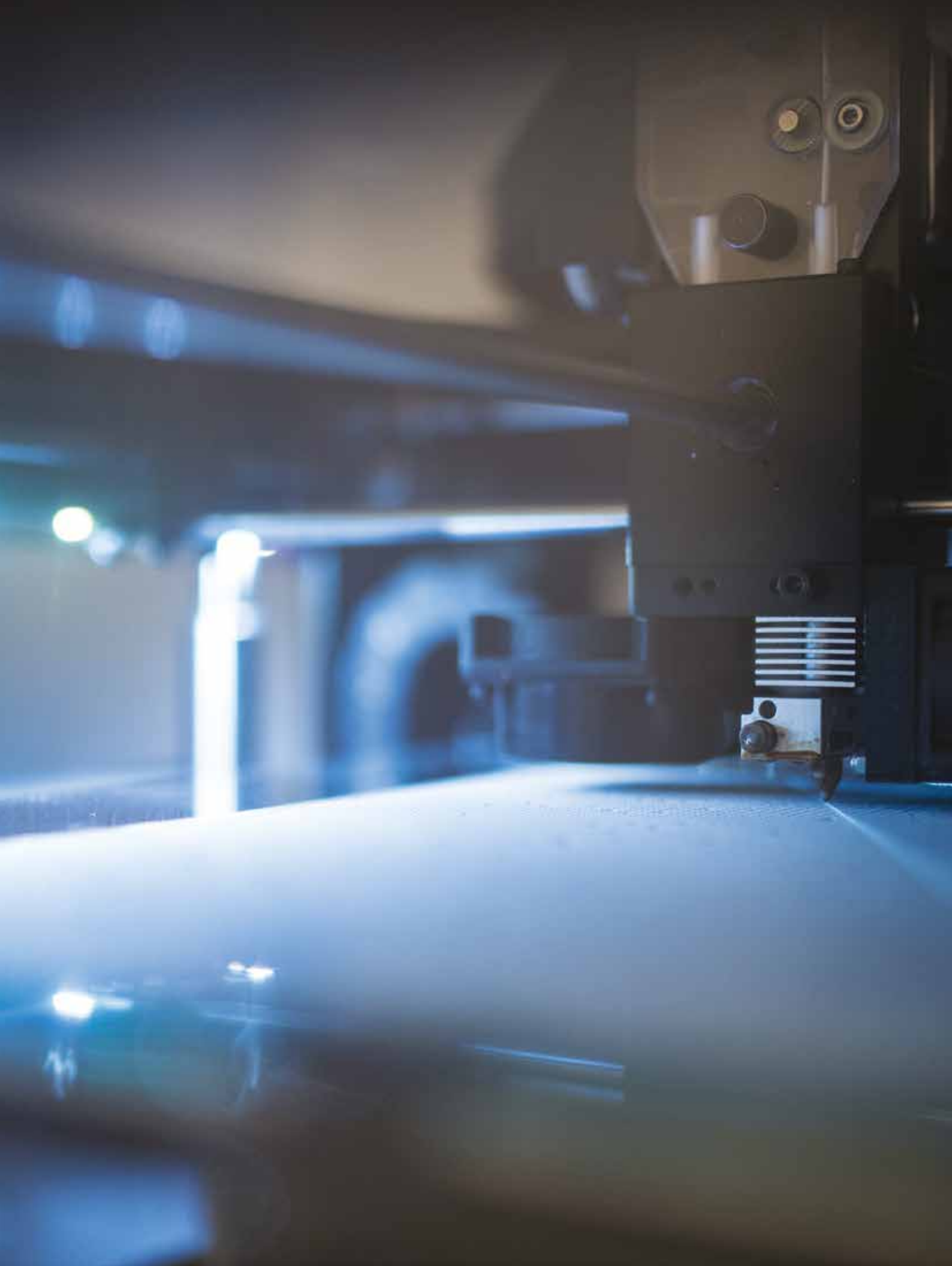
Sixty-four percent of the surveyed executives state their companies expect to hire mechanics over the next three years to expand the workforce; another 23 percent say they will hire simply to maintain their numbers. Thirteen percent are planning for their number of maintenance technicians to decline, either through attrition or layoffs. Seventy-two percent of those surveyed expect the search for qualified candidates to get much harder.

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**Brian Prentice** and **Derek Costanza** are Dallas-based partners and **John Smiley** is an Atlanta-based senior manager in Oliver Wyman's Transportation practice.

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*This article first appeared in Forbes and is based on information that also appeared on BRINK.*





# PARTS MAKERS CONFRONT 3D PRINTING

TRADITIONAL SPARE-PARTS SUPPLIERS  
IN AUTOMOTIVE AND AVIATION  
ARE ABOUT TO BE DISRUPTED

Gilles Roucolle • Marc Boilard

**T**he race is on to use 3D printing to produce small-series parts, on demand and on location, for industries ranging from aerospace to automotive. At stake is a \$400 billion market for spare-parts manufacturing and logistics. And those changes are not 20, or even 10, years out – they are happening now.

Using models built through computer-aided design (CAD), 3D printing can produce virtually any solid object, even those with complex architectures, and in a range of materials, including plastic, ceramic, and metal. Currently, about half of 3D printing – also known as additive manufacturing – is used for prototyping. This saves manufacturers time and money, because they can develop new components or products on demand, with less waste and without expensive tools and molds.

Industry analysts, however, project that within three years fully 80 percent of global 3D printing capacity will be dedicated to making finished products. GE, for example, expects to print 40,000 jet-fuel nozzles for aircraft by 2020.

This is not good news for spare-parts makers. Equipment that experiences constant wear and tear – such as planes, trains, trucks, and cars – requires a steady stream of spare parts specific to each make and model. These are often complex parts produced in small series and sometimes for decades, in cases where equipment has a long life span.

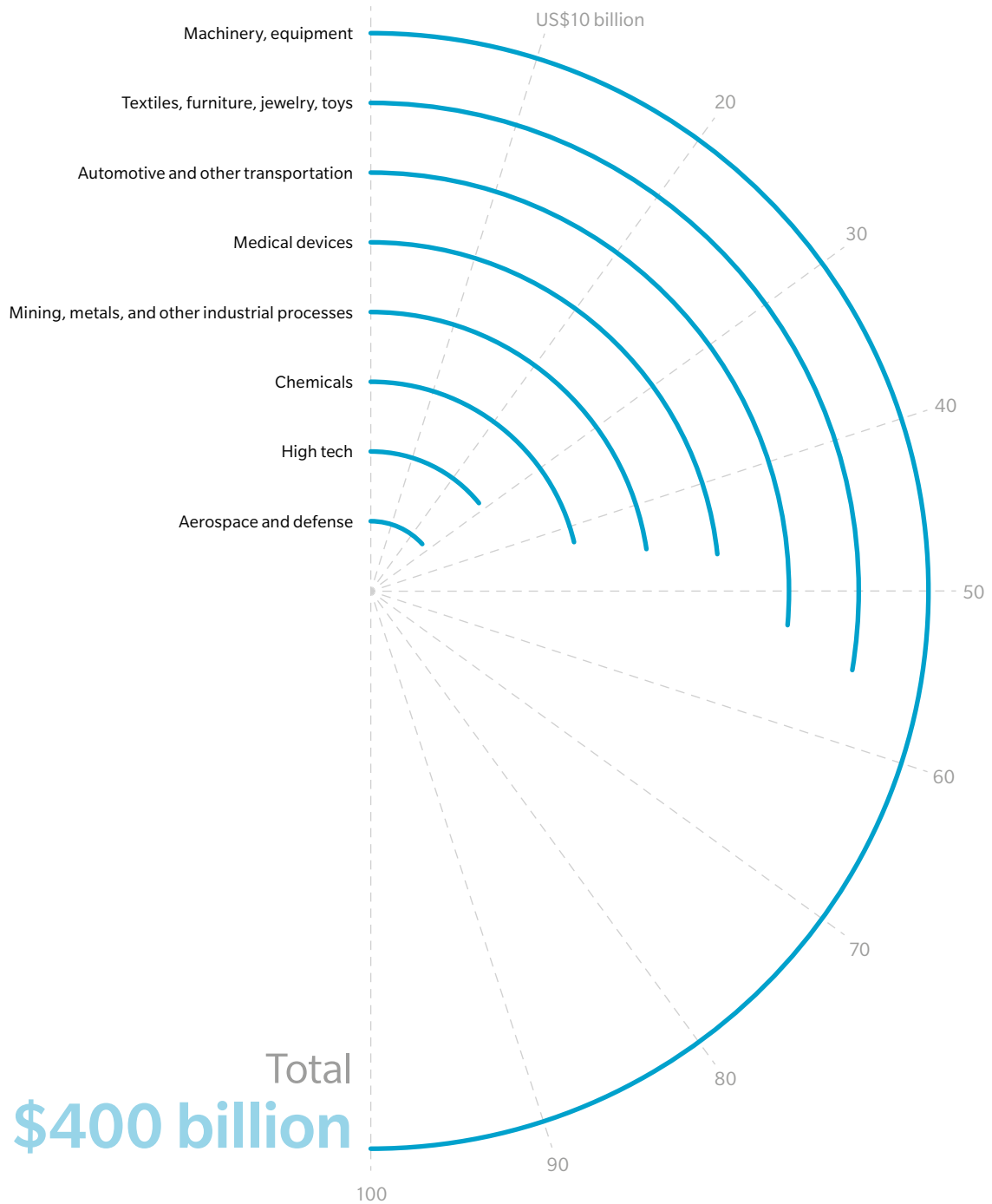
## HEAVY INVESTMENT IN 3D

The threat of 3D printing shuttering some parts manufacturers is only too real in the aviation industry, where aircraft and engine makers are

### EXHIBIT 1: THE FORECAST FOR 3D PRINTING

In 2030, 3D printing could represent a \$400 billion market

GLOBAL FORECAST 2030



Sources: Oliver Wyman modelization and analysis

investing heavily in 3D printing. In automotive manufacturing, Mercedes-Benz Trucks is allowing customers to 3D print a range of spare parts for freight trucks, while BMW has recently invested in a 3D metal printing startup. In rail, Deutsche Bahn, the German national railroad, announced last year that it will actively pursue 3D printing for train parts, while Siemens, a major rail equipment manufacturer, has begun 3D printing small-series custom train parts.

These are early adopters, but they are just the tip of the iceberg: As 3D printing speeds increase and the range of printable materials widens, the breakeven calculus is likely to become ever more persuasive.

And it's not just the manufacturing that is affected. To get those parts to the right place at the right time, logistics companies have built sophisticated long-distance networks. Many also manage spare-parts inventories for their customers. The expectation is that long-distance shipping volumes will drop, as many parts are replaced by a few base materials, while delivery distances overall will shorten as parts production moves closer to customers.

## LOOKING TO RIDE THE WAVE

The good news is that logistics companies might be ideally placed to ride this wave of change, if they are willing to embrace the disruption as an opportunity to develop market-leading B2B services. Turnkey spare-parts management, for example, could be expanded to include on-demand spare parts solutions. This might involve a "virtual warehouse" that securely stores CAD print files for clients together with "fabshops" that offer localized print-on-demand and delivery services.

# \$400 billion

## The expected size of the 3D printing market for spare parts by 2030

Logistics firms will have an advantage over their individual spare-parts customers in that they could quickly realize economies of scale from 3D printing, by virtue of their networks of distribution centers, warehouses, and sophisticated inventory management software. Leading-edge logistics companies like UPS clearly have gotten the message: UPS has launched 3D printing in some 60 customer-facing stores and is even experimenting with "end-of-runway" 3D printing for critical, time-sensitive parts.

Most manufacturing and logistics organizations, however, are taking a relaxed approach to 3D printing, thinking they still have time to adapt. That is becoming less true with each passing year. Our recent analysis suggests 3D printing could represent a \$400 billion manufacturing market by 2030. Organizations that face potential disruption from 3D printing must start piloting, partnering, and investing soon if they want to be well positioned to capture future value.

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**Marc Boilard** is a Paris-based partner in Oliver Wyman's Automotive practice

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*This article first appeared in Forbes.*

# REDEFINING BUSINESS MODELS

- The Rise of Business Risk in Banking
- Grocers' Biggest Threat
- Carving Out A New Place For Supermarkets
- The Gas Station's Digital Future Is Around The Corner
- The Challenge Of Insuring Vehicles With Autonomous Functions
- When Nations Need To Go Beyond Oil









# THE RISE OF BUSINESS RISK IN BANKING

BANKS NEED TO BE MORE MINDFUL THAT DEMAND FOR THEIR SERVICES COULD COLLAPSE

Barrie Wilkinson

Bank failures have historically been caused by risks that are specific to the industry – or, at least, that are of much greater consequence in banking. The savings-and-loan crisis of the 1980s in the United States was a case of risk arising from the maturity-mismatching characteristic of banks’ balance sheets. The collapse of Barings Bank in 1995, caused by Nick Leeson’s “rogue trading,” was a case of event risk, to which banks are also highly exposed. And the financial crisis of 2008 was a case of credit risk, of which banks carry more than any other kind of business.

The major risk that most businesses face – that demand for their services will collapse, perhaps because increased costs drive up their prices or because more efficient competitors steal their customers – has been of little concern to banks.

And rightly so. Banks have enjoyed advantages which minimize their business risk (as it is commonly called). The large fixed costs associated with banking have acted as a barrier to entry for potential competitors, as has the time and expense of creating a trusted brand. The cost of shopping around and switching has made bank customers sticky. And the vast quantity of customer data that banks naturally collect gives them an advantage in understanding the risks presented by customers, in designing products for them, and in marketing to them.

But new developments in technology and regulation are eroding these advantages and thereby increasing the business risk faced by banks. Failures arising from business risk unfold more slowly than those arising from the characteristic banking risks. But the risk is no less serious for that. The next bank failure in the US or Europe is as likely to come from a loss of customer business as from an explosion of bad debt or other financial shock.

The next bank failure in the US or Europe is as likely to come from a loss of customer business as from an explosion of bad debt or other financial shock

## THE THREAT OF EFFICIENCY

Building and running banking systems is expensive. This mainly fixed cost has been a barrier to entry and, hence, an advantage for established banks. Now, however, banks are disadvantaged by their systems. Decades of upgrades, bolt-ons, and integration have made the systems unwieldy and expensive to maintain and modify. New entrants with clean digital technology have a distinct cost advantage (in the areas where they now compete).

Banks have been trying to digitize their current infrastructure, but the job is proving complex and slow. “Re-platforming” a large bank is a three-to-five-year effort, which typically delivers a lot of pain and expense but little improvement in operating cost or performance.

Some have decided instead to “greenfield”: Rather than upgrade what they have, they start again from scratch. While keeping the old infrastructure running, they form a new digital bank with a management team that has the autonomy required to build something from scratch. Once the new bank is built, customer accounts are migrated to it and the old infrastructure is discarded.

These new banks are being built in the public cloud, using the same modern technology stack pioneered by the tech giants – scalable,

lean, and modular. A new launch costs around \$60 million, takes between nine and 18 months to complete, and delivers a cost-income ratio between 15 percent and 30 percent once the new bank is in run mode.

This poses a grave threat to banks that, for whatever reason, choose to stick with incrementalism and the cost-income ratios between 60 percent and 70 percent that it entails. They will be unable to compete on price with banks operating at half the cost, or to invest as much in providing better customer service.

Indeed, even greenfielding may underplay the potential for radical efficiency gains in banking. Banks need not build their own systems at all, relying instead on a third-party supplier of the machinery of banking – the IT platform, analytics, and other operational processes. The advanced technology and scale of these third-party suppliers could drive costs even lower, to the region of 10 percent to 20 percent of current cost-income ratios.

More importantly, these third-party “full stack” suppliers would eliminate a major barrier to entry. Any company that can build a brand and proposition adequate to attract customers and obtain a license can compete without any investment in the hardware or specialist skills required to run the machinery of banking. Even if incumbent banks achieve these cost savings, one of their competitive advantages will be gone.

## THE THREAT OF OPEN BANKING

As the collapsing cost of the machinery of banking undermines one advantage of incumbent banks, regulation is undermining another. The regulatory drive towards “open banking,” embodied in the EU’s revised Payment Services Directive (PSD2) and the General Data Protection Regulation (GDPR),

will loosen banks’ grip on their customer data. These regulations will force banks to share their previously proprietary data, not only with their customers, but also with competitor banks and third parties who have been given permission by the customer.

By making banks’ (formerly) proprietary data effectively open source, these regulations will greatly reduce their advantages in risk assessment, proposition design, and marketing. Competitors will be in a better position to understand a bank’s customers and to target the valuable ones. Combined with the reduced cost of shopping around created by online banking, open banking is likely to reduce customer stickiness. Customers won’t merely wander off; they will be pulled away. Though it will not be recognized on their balance sheets, open-banking regulations devalue one of banks’ most valuable assets.

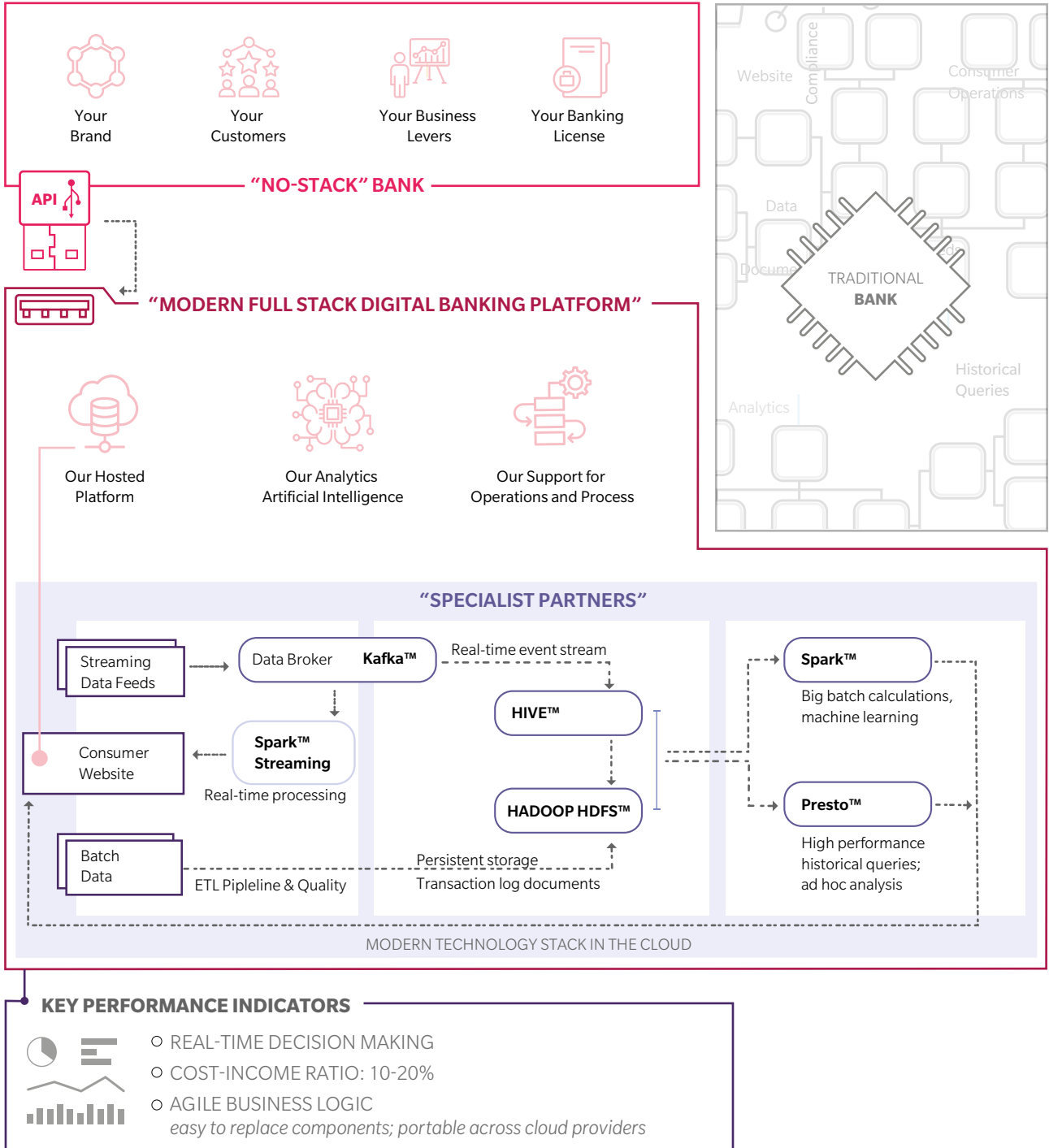
## BUSINESS RISK IS FOR BUSINESS LEADERS

Incumbent banks still have advantages. Depositors seem to prefer established banking brands. Compliance is becoming a larger and largely fixed cost, in which the incumbents have much more experience and expertise than potential competitors. And, perhaps most importantly, banks have vast balance sheets (capital) with which to perform the basic banking functions of risk intermediation and maturity transformation.

Yet there can be no doubt that the weight of risk facing banks in advanced economies is shifting from the traditional banking risks towards business risk. This means that the weight of risk management must shift from the chief risk officer and the risk function, to the chief executive officer and the C-suite. These threats cannot be handled by better risk modelling, risk limits, monitoring, and the other tools of standard risk management. They go to the heart of the banking business model and will require profound strategic responses.



EXHIBIT 1: NO-STACK BANKING



Source: Oliver Wyman analysis

Barrie Wilkinson is a London-based partner in Oliver Wyman’s Digital practice.

This article first appeared in Financial News.







# GROCERS' BIGGEST THREAT

## WHAT AMAZON'S PURCHASE OF WHOLE FOODS MEANS

Paul Beswick • Chris Baker

Amazon's acquisition of Whole Foods marks a major turning point for retailers. This is not just a real estate play to acquire hundreds of sites in high demographic areas. In one stroke, Amazon has purchased a nationwide cold chain, deep fresh-sourcing expertise, a global sourcing network, and complete credibility in private-label food. Amazon Fresh is no longer something to keep an eye on. It is now every traditional grocer's biggest strategic threat.

Whole Foods' retail proposition has room for improvement on its own. While Whole Foods has worked hard on its value proposition and price competitiveness over recent years, it still retains some perception of the "Whole Paycheck" legacy of expensive merchandise. A survey of thousands of North American customers that we conducted before the acquisition was announced revealed that Whole Foods' offering is considered one of the industry's strongest, but it scored poorly compared to competitors when customers

were asked if it delivered value – a weakness that the Amazon acquisition stands to improve. (See Exhibit 1.)

This is a strategic move for Amazon, not an equity investment looking for a return on a stand-alone basis. Amazon's interests are in expanding the appeal of the Whole Foods stores to more customer segments. Achieving that goal will require eliminating the price barrier.

Grocers should be looking hard at their pricing strategies and at their funding sources for building a war chest. Since the day that the Whole Foods' deal closed, Amazon has cut prices at the store multiple times and by as much as 43 percent, albeit on a very limited set of high-visibility items. Amazon has shown time and time again that it is willing to invest heavily in order to dominate the categories it competes in, and there is little doubt that it has the financial capacity to do so. (See "Carving out a New Place for Supermarkets" on page 74.)

EXHIBIT 1: CUSTOMER PERCEPTION MAP FOR MAJOR GROCERS

Before Amazon’s acquisition, customers considered Whole Foods’ offering one of the industry’s strongest. But also one of the priciest...



... At the other end of the spectrum, pure online grocers are considered convenient. But they score generally poorly in terms of the value and quality of their produce



Source: Oliver Wyman analysis



## PAIRING LOCAL INSIGHT WITH TECH

Much attention has already been paid to the technology that Amazon could bring to Whole Foods – for good reason.

But Whole Foods also brings valuable capabilities to Amazon. Whole Foods has always been a highly decentralized, local organization. Its connection into the markets it serves is amongst the best in the industry. If Amazon can pair its highly efficient, centralized, technology-driven approach to retail (something most retailers haven't learnt enough from) with that local insight in an effective, complementary way, it will be a tremendously powerful combination that can be leveraged both across the categories that Whole Foods currently competes in as well as many others that Amazon covers.

Consumer packaged-goods companies should also be on watch. If the emerging winning retail model is built up on top of the foundations of a retailer that has established a strong proposition without being heavily reliant on brands, it is fair to assume that the overall private-label share across the market as a whole is likely to grow.

As ever, the brand leaders in many categories are likely to continue to thrive, but the B and C brands are likely to see more pressure. Some will be squeezed out or forced into more and more extreme promotional strategies to retain the attention of consumers. At the same time, for the brand leaders, this offers an interesting option for the Amazon Dash program to ship to store, which will improve the poor home-delivery

## Grocers should look hard at their pricing strategies yet again

economics of bulky, low-value items, create the opportunity to drive in-store halo effects, and turn Whole Foods from a specialist into a full-service, multi-category retailer that will compete much better with traditional grocers.

### NO EASY OPTIONS

Most retailers are already in a position where it is hard to justify reinvesting in stores to keep them fresh and modern. That's not going to get any better now. Capital is going to become harder to access and more expensive. The attractiveness of investing in the brick-and-mortar business is going to look increasingly worse. Some companies that are on the ropes are going to find it very tough to pull through. Ultimately square footage will need to shrink, but that is never an even process.

The best-run retailers will end up bearing less of the pain as the weakest go to the wall. As with any new competitive threat in retail, you don't have to outrun the bear, but you do need to outrun your friend.

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# CARVING OUT A NEW PLACE FOR SUPERMARKETS

THEY CAN LEARN PLENTY BY STUDYING THE COMPETITION

George Faigen

The traditional supermarket is under assault. After a half-century as the go-to destination for shoppers throughout the industrialized world, new business models are making it less relevant. That's a danger because supermarkets' high overheads require correspondingly high sales volumes to maintain profitability. To be relevant going forward, supermarkets need to find new ways to appeal to increasingly diversified consumer demands while simultaneously reducing costs.

Amazon's purchase of Whole Foods Market is an example of the kind of threat presented by high-quality players able to provide consumers an integrated online and in-store experience. This threat is taking place throughout the world, with Hema stores in China similarly leveraging owner Alibaba's digital roots. Customers get product information by scanning with their smartphones, paying with Alipay, and receiving personalized recommendations

based on their overall purchase histories. This approach is proving effective in fostering loyalty with digitally oriented consumers, and it generates information for Hema to create interesting new products.

From another direction, hard discounters are moving beyond their traditional role of providing consumers low prices, and are adding a richer customer experience that includes a robust fresh-food offering. Longtime experience with producing private brands – one reason for their low prices – has honed their skills at running well-integrated supply chains where they can design, test, and ship trendy items in every category. This lets them keep pace with fast-shifting consumer preferences, such as gluten-free and non-genetically modified foods. Hard discounters, which operate in more than 20 countries, can also cross-pollinate the best of their internationally sourced products – Italian olive oil and pasta, German chocolate and sausage, and



French wines – packing their stores with a tightly curated and interesting array of products.

The discounters have also engineered an easy-to-shop store model with low operating costs, positioning them to thrive in an era in which consumers split their spend across several different stores.

Hard discounters are expanding their presence around the world. Lidl this year joined fellow German discounter Aldi in the United States, both having announced aggressive five-year expansion plans.

To fight back, supermarkets first need to find ways to lower costs so they can invest in remaining price-competitive and have the funds needed to finance new ways to connect to changing consumer demands. One such approach is to take a serious look at their private-label strategies. In the past,

private brands were seen – especially in the US – as cheap alternatives to superior national brands. But European supermarkets and hard discounters have demonstrated that private brands can be a powerful tool for differentiating a store and providing a unique connection with their customers. They can thus become a significant contributor to the bottom line through the sales and customer loyalty they generate – and they can also give a store negotiating leverage with national brand manufacturers.

Above all, supermarkets need to recognize that now is a time of momentous change. The first step to dealing with it is to ask: Who do we want to be? And how will we meet the needs of the fast-changing consumer?

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*This article first appeared on BRINK.*



# THE GAS STATION'S DIGITAL FUTURE IS AROUND THE CORNER

SELF-DRIVING AUTOS, MOBILE APPS, AND CONNECTED  
VEHICLES DISRUPT OIL AND GAS' RETAIL BUSINESS

Irfan Bidiwala • Eric Nelsen • Alex Kirov • Tom Shyr • Bryan Yamhure Sepúlveda



Can you picture a day when you never have to pump gasoline at the service station? You won't even have to get out of the car. It's not because they've hired more gas station attendants.

It's because the pump and the car can communicate with each other, work together to select your preferred fuel, and fill the tank without the driver being involved. Like gliding through E-ZPass, you'd be paying with a cloud-connected app that, by then, may be standard on most autos. If your vehicle is self-driving, you should be able to remain happily ensconced in your bed or at your computer while your car buys the gas without you even being there.

This is the future for service stations and gasoline consumers. Today, comparison apps may seem high-tech for your neighborhood favorite, but within the next decade or two, the gas station around the corner will likely be catering to everything from hybrids, to autonomous cars, to electric vehicles, to car shares – and selling them a lot more than just regular and premium. (See Exhibit 1.)

## A DIGITAL MAKEOVER

Like so many industries disrupted and transformed by technology, the iconic gas station will soon undergo what will be a pretty substantial digital makeover that connects it not just to the consumer but the car itself. It's not one single trend that is pushing the change; it's a multitude of disruptions that are overhauling our relationship with the auto and the way gasoline is sold. And with all these things in transition, the business model for the service station must ultimately begin to reflect the new reality.

Gasoline demand has begun to decline in more mature economies and will probably continue to shrink, given the growing number of people who no longer aspire to owning a car in the way that earlier generations once did.

According to the US Census, the number of no-car households increased slightly in 2015, perhaps in part because more people want to live in cities, and also because of the well-documented lack of interest in car ownership among millennials.

The gas station of, say, 2030 will not only have to do things differently; it will have to do different things to be profitable. For instance, one futuristic vision is to have short-distance drones deliver pre-ordered snacks or packages while the driver waits in the car.

## IT'S ABOUT SERVICE, NOT GASOLINE

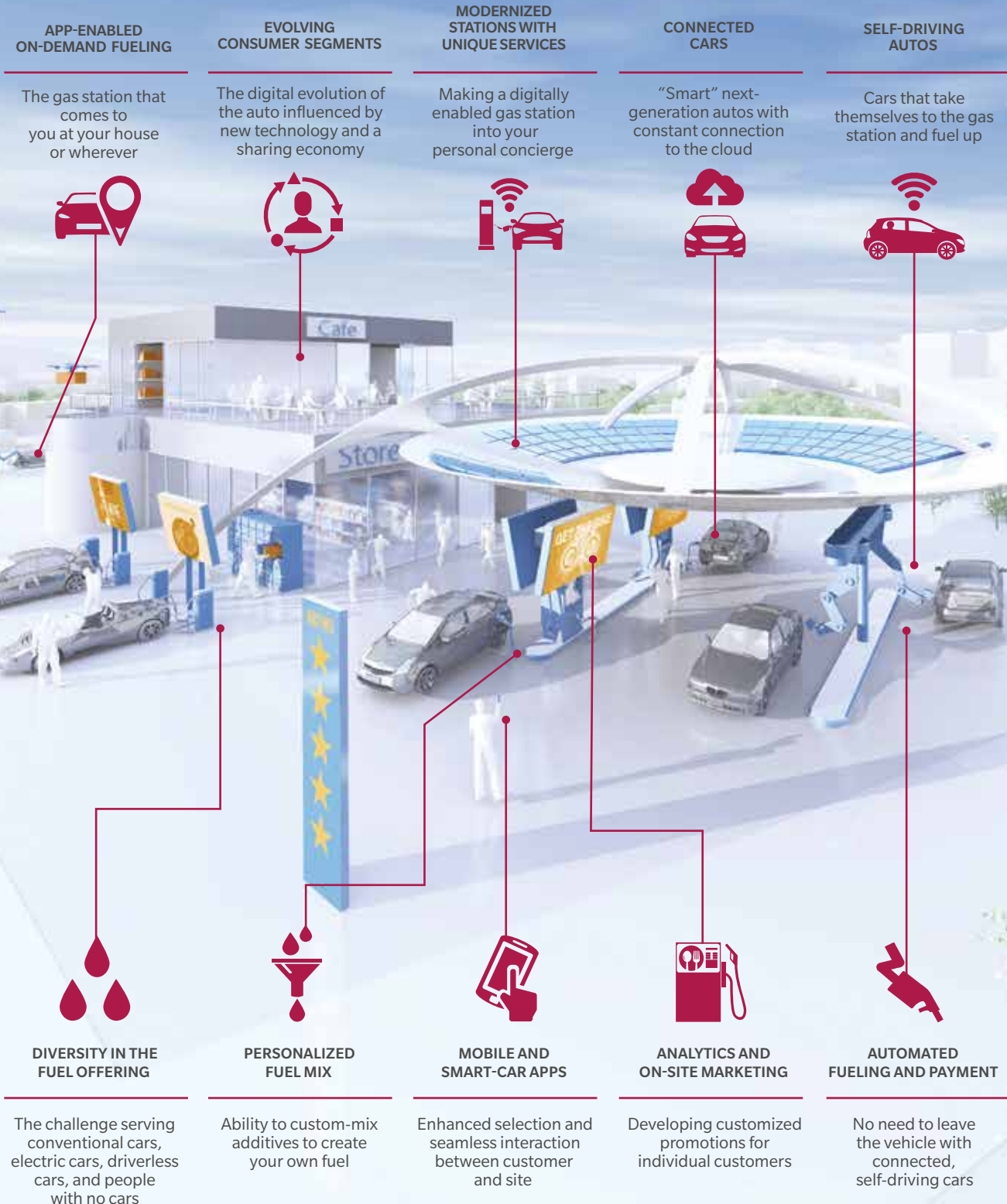
The gas station of the future is going to have to mirror the diversity of its clientele. Given the rising popularity of hybrids and electric cars like Tesla, perhaps the gas station will have to consider having charging stations, as some now do in Europe. Or perhaps the demand is for compressed natural gas or liquefied petroleum gas. Already, gasoline and diesel generate less than 30 percent of the profits at the average gas station, and that figure may continue to decline, not necessarily from low demand but because the gas station is selling so many other services and products.

Of course, we're used to the convenience store aspect of gas stations, changing them into personal fueling stations – and that service is expected to become more ubiquitous and more sophisticated over time. But the gas station also will likely be a place where you can pick up your order from Amazon after it was delivered to the station by drone. Or maybe you pick up groceries that you ordered or your dry cleaning. In essence, your gas station becomes a giant post office box or a personal concierge – a convenient one-stop shop for the sharing economy as it blossoms.

The change may go beyond the services the station offers; it may involve when it offers them.

**EXHIBIT 1: VISION FOR 2030 AND BEYOND**

The gas station of the future may be more about providing service than selling traditional fuels



The busiest time for the gas station of 2035 may be at 2 a.m. when autonomous driving cars are programmed to take themselves to the station to fill up for the next morning's drive to the office.

The transactions may not even take place at the service station as on-demand fuel services begin to pop up. With an app, consumers can type in their order and have it delivered to their office parking lot or their driveway.

## A NEW BUSINESS MODEL

Stations also will deal with more wholesale purchasers, as car-sharing services like Lyft and Uber grow. Rather than sell to individual drivers, service-station franchises may only maintain long-term contracts with the companies that employ drivers. Manufacturers of autonomous autos also may decide to develop long-term fuel programs for their buyers.

While the potentially painful disruption is not entirely welcome news for the legions of independent gas stations and their owners, it represents an opportunity for early adopters, ready to embrace and anticipate change. Already, we're seeing service stations experiment with predictive analytics and other technology-driven innovation like mobile payment. For instance, one US convenience store-gas station chain is cutting gas prices by up to 10 cents per gallon for customers paying via app-enabled direct debit.

One futuristic vision is to have short-distance drones deliver pre-ordered snacks or packages while the driver waits in the car

By 2022, cars are expected to have enough internet connectivity to allow drivers to simply ask their cars for recommendations on where to go for gas and then rely on the car to seamlessly pay for it. In the United Kingdom, Jaguar and Shell are piloting advanced capabilities for site interaction with such web-enabled vehicles.

The digital revolution has already compressed product cycles and brought disruptive innovation to a range of industries. Like it or not, the traditionally conservative gasoline industry appears to be among its next targets. What's not clear is which enterprises will be early movers and which will go the way of the drive-in movie.

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*This article is adapted from one that first appeared in Forbes.*







# THE CHALLENGE OF INSURING VEHICLES WITH AUTONOMOUS FUNCTIONS

INSURERS ARE STRUGGLING WITH PRICING AND COVERAGE AS SELF-DRIVING FEATURES COME ONLINE

Fady Khayatt • Marc Boilard • Rouget Pletziger

Autonomous cars offer the promise that 20 years from now we'll live in a world where cars take themselves to the gas station while we're sleeping to fill up or charge up for the next morning's drive, where we can enjoy texting on the ride to work without totaling our car, and where getting a learner's permit will no longer be a teenage rite of passage. The day of the autonomous car is approaching, and while not every vehicle on the road will be without a driver once that day arrives, it's expected that by around 2035, up to one-third are likely not to have one.

While it's a scenario that every auto insurer has heard about and dreads, it's not the scenario auto insurers should really be focused on today. Instead, they need to concentrate on the artificial intelligence already making its way onto the roads. Long before self-driving cars make a significant impact, advanced driver assistance systems (ADAS) are about to upend accidents and claims experience in the industry's pricing and underwriting models.

Insurers are starting to get their first glimpse of the dramatically different world of driving they will be confronting for the next 15 to 20 years. It's a landscape populated by the full spectrum of vehicles – from traditional car and driver, to those that are partially self-piloted, with even a small set of experimental self-drivers. While the number of cars with such innovations as autonomous braking and automatic steering correction functions is still small, that won't be the case for long.

## ANTICIPATING RAPID CHANGE

Through 2025, the percentage of cars on the road with advanced driver assistance systems is expected to jump from a little more than 10 percent in 2015, to close to 40 percent, according to a report by Oliver Wyman research division Celent. By 2030, half of the cars on the road will have multiple advanced driver-assistance systems.

Thanks to the projected exponential growth in artificial intelligence systems, our roads will be filled with cars, trucks, and buses partially driving themselves. Our skies will see various degrees of self-piloting cargo planes and delivery drones, while our seas will be traversed by versions of self-navigating freighters. By the middle of this century, the world of transportation will no longer resemble what it looked like at the turn of the millennium.

As in other industries grappling with such disruption spawned by artificial intelligence, auto insurers need to get out in front of the change, rethink strategies and tactics before that drip, drip, drip of innovation becomes a torrent. This once staid industry must initiate

a reformulation of its pricing, underwriting, claims processes, and most importantly, its culture.

## BECOMING DATA-DRIVEN

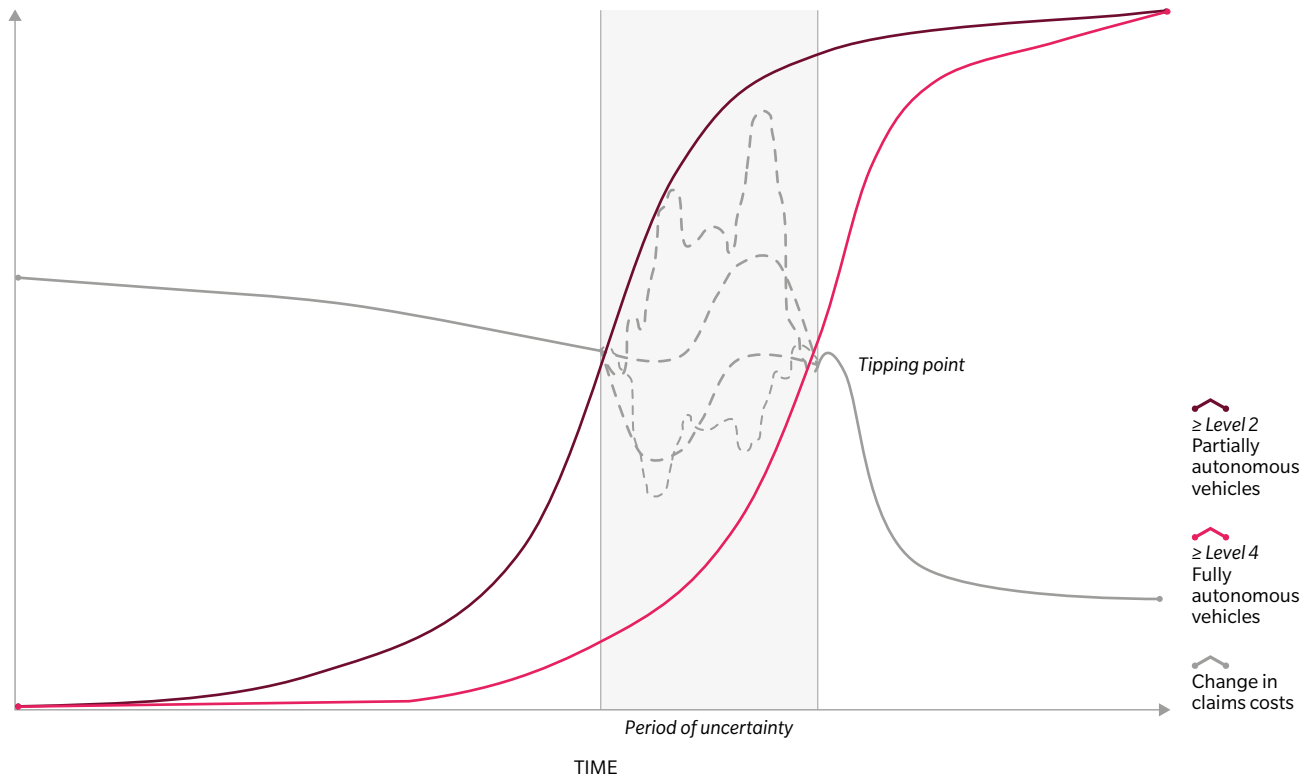
Insurers will have to begin to think more like technology companies, putting processes in place that not only accommodate new facts and scenarios, but actually have the presumption of change in their DNA. The keys to their success will be flexibility and creativity.

Moving forward, the emphasis will be on expanding data collection and analytical capabilities, forcing insurers to reach across

### EXHIBIT 1: CLAIMS UNCERTAINTY RELATING TO THE ADOPTION OF AUTONOMOUS VEHICLES

Technology is redefining the way we own and use cars – also how we insure them. As the proportion of partial and fully autonomous vehicles sharing the road with traditional vehicles increases, there will be a period of uncertainty over how insurance claims costs are likely to develop

PROPORTION OF ALL VEHICLES ON THE ROAD WITH AUTONOMOUS FEATURES



Source: Oliver Wyman analysis

and out of the industry to work with other affected parties to reimagine how things get done. While these changes will prove fundamental to accommodating self-driving cars, the makeover necessary is too extensive to wait for their arrival – and is needed now to accommodate the autonomous capabilities of cars already showing up on the road.

While self-driving cars hold out the prospect of eventually eliminating the vast majority of traffic accidents caused by human error – which account for the vast majority of collisions – that improvement will not be seen overnight. Self-driving cars will have to attain a certain threshold presence on the road before the exponential improvement will be realized, but insurance giant Swiss Re projects that advanced driver assistance could cut up to 45 percent of accidents by 2020.

## THE CHALLENGE OF ELIMINATING HUMAN ERROR

It just won't be a one-way street to fewer crashes. Studies indicate that these innovations are also apt to create accidents because they respond to situations on the road differently than human drivers. Consider the experience of test vehicles in operation today. Almost all of the various models have been involved in crashes, and almost all of these accidents seemed to occur because the self-driving cars didn't anticipate the fact that humans do not always respond logically when driving or follow the rules of the road. Human drivers, on the other hand, do not accurately gauge what to expect from autonomous vehicles.

In a crash involving a test vehicle last year, the self-driving car had a slow-motion collision with a bus because its software was programmed to expect the bus to acknowledge that the self-driving car had the right of way. There have been a few more serious accidents – even one fatality, although in almost every instance, it

has not been the self-driving car's action that caused the collision.

This insight into autonomy suggests that the gradual introduction of autonomous features will affect pricing, underwriting, and claims processing differently at different stages of their development and adoption. To adjust to this new reality, insurers need processes and analytical capabilities that are flexible enough to accommodate the various scenarios.

## DISRUPTED BUSINESS MODEL

Let's start with premiums. There are predictions for a decline of as much as 60 percent once self-driving cars become plentiful. But that's not until after 2035, and the real question is, what happens in between? Just as with projections for a decline in accidents, we expect it to come gradually over time, with the potential for significant volatility even if the overall trend is downward, reflecting the accumulation of experience with self-driving cars and autonomous functions and the changing mix of cars with varying degrees of autonomy. Celent projects a decline of as much as 22 percent in auto losses by 2030. Can premiums be far behind?

The speed and frequency with which pricing models will need to change will require the development of different methodologies that will enable updates over a much shorter cycle. Although the insurance industry has been built on being able to look backwards at the lessons of history about risk, insurers inevitably will have to get used to more agile and experimental processes moving forward, injecting some volatility into pricing.

Another pivotal necessity for insurers as they enter this new world will be developing the ability to analyze and act on real-time data. Since there will be little to no history to inform risk models, insurers will have to become

## By around 2035, up to one-third of cars are likely not to have a driver

vacuum cleaners for relevant stats and develop rapid-fire analytics to decipher them. Their goal is to put a value on what it means to have half of the cars on the road with lane departure warnings systems and another third with automatic-braking systems and how that information impacts their pricing calculation. This is even further complicated by the fact that systems are being produced by different manufacturers, with some more effective than others.

### THE NEED FOR GRANULARITY

That is a huge shift. While data has always been a high priority for the industry, it has been almost exclusively backward looking, until recently. Since the 1990s, insurers have been seeking more granularity in their risk assessments and segmentation of the market, increasingly asking more questions of potential policyholders. In Germany, for instance, insurers had five risk criteria in the mid-1990s about which they inquired. That number today has increased to as high as 50 risk criteria. Because each insurer uses a subset, plus their own algorithms, many pricing models have become true black-box calculations, which are no longer easy to back-calculate from the outside.

To collect more detailed data, major car insurance carriers – for example, Geico and Progressive in the US – offer customers an option that lets them pay as they drive, monitoring either how well they drive or how much. It involves installation of a telematics device, probably connected to the driver's GPS.

Telematics forces insurers to tackle one of the biggest obstacles they confront – developing the IT capability, either internally or through outside service providers, to cope with frequent, real-time unstructured data. In that scenario, adopting a telematics system becomes the catalyst for IT modernization.

The same may be true for carmakers, when it comes to both data collection and IT upgrades. Like insurers, they will need to constantly refine their products based on feedback from the road. Car manufacturers like Tesla already swear by data collection, which in Tesla's case goes far beyond the typical telematics system. The electric carmaker literally upgrades its models through software downloads and considers itself as much a technology company as a carmaker.

### REDEFINING FAULT

Determining who owns this new real-time data – auto insurers, automakers, or individuals – will be critical for insurers as they struggle to redefine the concept of fault in the age of autonomous control functions and self-driving cars. Since the turn of the 20th century when car insurance was first offered, insurers have worked to optimize the claims process for all sorts of accidents, creating an efficient system that attempts to limit the expense of accidents for themselves and consumers. Autonomous cars and autonomous control functions are changing the equation.

With the transition to self-driving vehicles, the insurance industry is already envisioning the prospect of gradually moving from



individual coverage to insuring car and software manufacturer risk. Even if some of the manufacturers of self-driving features accept responsibility in the front end for malfunctions of their systems, as Volvo in 2015 committed to doing, that acknowledgement does not necessarily eliminate the risk once plaintiff lawyers get involved. The newness of the situation is likely to lead to an increase in litigation, especially given the complication of assigning blame once the technology is a factor. While the autonomous car manufacturer and software maker offer new potential customers for insurance companies, it also is an area for which only limited data exists.

In these early years of autonomy, insurers and carmakers will need to work together. Establishing ties early in the game will be useful for information sharing. The two industries may also find it handy to cooperate when legislatures begin to reshape the claims process and redefine the concept of fault to reflect the new landscape. Finally, developing a connection to carmakers at a time when the industry expects a shift to fleet coverage and coverage of autonomous car manufacturers also may provide a competitive advantage.

## DEALING WITH SUCCESSIVE CHANGE

The challenge for the insurance industry is to understand how to go about their business when the environment holds the potential to change quickly. Where in the past there might be a huge safety breakthrough to evaluate every decade or so, today car manufacturers are introducing new autonomous functions on autos almost monthly, with no clear timetable for how swiftly any of them will be adopted on a large-scale basis or generate sufficient data for models.

While autonomy offers an exciting new future for cars, it's one that is apt to make the present unpredictable. Even governmental authorities face challenges to develop laws that sufficiently reflect the new reality on the roads, and the size of that task may end up slowing down the adoption as officials attempt to balance the need to protect both citizens and industry – particularly if there is an increase in accidents initially that are difficult and costly to resolve. Insurers can – and should – play a pivotal role in the new reality. To do so, they first must grapple with their own challenges today.

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*This article first appeared in Forbes.*



# WHEN NATIONS NEED TO GO BEYOND OIL

## GULF STATES PUT NEW EMPHASIS ON GROWING LOCAL INDUSTRIES

Bruno Sousa • Volker Weber • Saji Sam

There's a certain symbolism in the role South Korea has taken on in helping the United Arab Emirates launch its nuclear power industry. South Korea – a relative newcomer to nuclear power compared to bigger rivals like the United States, Japan, or France – grew its own industry from the ground up in order to cut energy costs, create new jobs at home, and boost domestic growth.

Today, a Korean consortium led by state-owned electric utility Korea Electric Power Company (KEPCO), is working with the UAE and its Emirates Nuclear Energy Corporation (ENEC) to do the same thing. The joint Korean and ENEC team is building four facilities in western Abu Dhabi with the help of local labor and companies, part of the Emirates' own efforts to increase its industrial base and employment and generate more electricity to power the nation's economic growth moving forward. The first reactor in Barakah is scheduled to be completed in 2017; the other three are slated for 2020.

### THE PRESSING NECESSITY TO LOCALIZE

The need has never been greater for Gulf region nations like the UAE to decrease their dependence on oil and gas production and broaden the industrial base of their economies. With the decline in crude oil prices over the past two years, some of the richest Gulf nations are experiencing budget deficits and unemployment for the first time in decades. In fact, almost all major oil producing nations – from Venezuela, to Indonesia – are under pressure from their constituents to expand their manufacturing sectors, create more good-paying jobs, and increase local content across their oil and gas value chain.

But, it's not easy. In the past, well-intentioned efforts to increase local production often have been fraught with problems and disappointments, as economies overreach to score big results over a short period or fail to take into consideration the skill level and



## Norway developed local companies in fields that supported the oil and gas industry

readiness of their workforce and local supply chain. In the Middle East, governments have built massive state-of-the-art manufacturing facilities, only to find they had to import workers to staff them – undermining both their security and the goal of providing jobs to their own citizens.

Even localization projects considered success stories, such as the one undertaken by the Norwegians after the discovery of offshore oil deposits in 1969, can and do take decades to achieve their goals. Norway’s effort, which took more than 15 years, is not even typical, as that nation’s economy was already relatively prosperous before it started developing its oil and gas resources. Most oil-producing economies are more dependent on oil and gas revenue than Norway ever has been. (See Exhibit 1.)

### THE PROCUREMENT LEVER

Still, Norway serves as a model for helping nations ensure that the development of oil and gas leads to an expansion of local industry and employment. In Norway’s case, the focus was on working with international oil companies (IOCs) to develop the oil and gas value chain and guarantee the transfer of knowledge and technology through agreements. The Norwegians achieved import substitution by requiring IOCs to use 50 percent local content to supply their operations, and the nation mandated that research and development should be conducted in Norwegian facilities.

Norway’s approach also was based on developing local companies in fields that supported the oil and gas industry. For instance, the Norwegians focused on their upstream oil and gas sector by developing enterprises that made offshore oilfield drilling equipment and other related equipment. Eventually, the nation became a major export center for these upstream capabilities.

Saudi Aramco, Saudi Arabia’s national oil company, is following the Norwegian example to a certain degree by using its massive clout as a purchaser of oil and gas equipment and support services. Aramco is incentivizing its suppliers to increase the amount of local content by making it one of the procurement criteria by which it assesses bids. The company provides a 10 percent premium for local content.

### MEETING LOCAL-CONTENT GOALS

Aramco has set clear objectives and targets for major projects. It even provided its planned spend per category for the next five years to help suppliers justify the investment necessary to localize production and services. The Norwegian initiative eventually was able to increase local content in the oil and gas industry to 80 percent – a goal the Saudis hope to replicate.

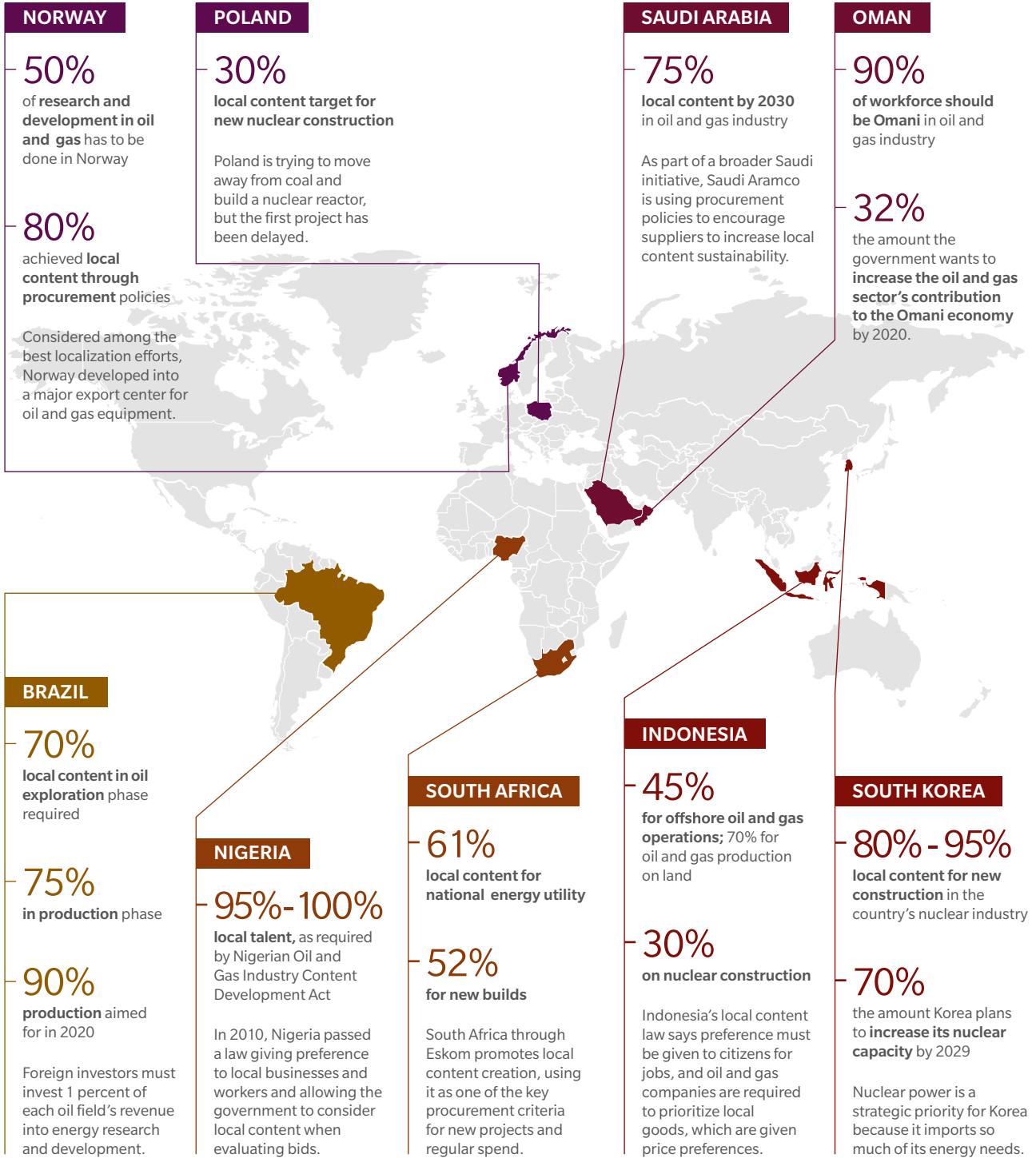
Over the next several years, the goal of the Saudi Aramco program is to double the percentage of local content to 70 percent. It also hopes to create 500,000 jobs and raise the export contribution from the initiative to 30 percent.

Saudi Arabia is working to tighten connections between training and job creation and develop key performance indicators to measure success through a program called the In-Kingdom Total Value Add program (IKTVA). The IKTVA program is designed to measure and monitor the “added-value” to the Kingdom from a



EXHIBIT 1: TRYING FOR A BIGGER ECONOMIC PAYBACK FROM ENERGY

Nations globally are pushing producers for more local content and jobs



Source: Oliver Wyman analysis, Saudi Vision 2030, ANP, PROMINP, Eskom, IPIECA, Global Local Content Council, World Nuclear Association, and published reports

# 500,000

## The number of jobs that Saudi Aramco hopes to create

supplier, reviewing such items as the value of local goods and services used, salaries paid to local citizens, and the amount spent on training and development.

### PRODUCING SUSTAINABLE GAINS

As in the case of Norway, the use of procurement as a lever is producing immediate and sustainable results for Saudi Arabia. Siemens recently completed the first “Made in the KSA” gas turbine at the company’s Dammam Energy Hub, the first gas turbine plant in the Kingdom and the largest in the Gulf Cooperation Council (GCC). Additionally, Siemens committed to help develop a vocational education and training program, working with the Saudi Colleges of Excellence. The program may prove particularly useful, given the results of a recent survey of oil-and-gas country and project managers that identified the lack of competent labor as a key barrier to effective localization programs.

Currently, the agreement with Siemens focuses on the development of technicians and business administration graduates. These types of positions are likely to be attractive to locals and were identified by the industry survey as critical needs.

Eventually, the government may want to consider extending this agreement or establishing another with a different supplier

to develop the kind of blue-collar skills, such as welding, needed in manufacturing and construction. This would further align talent development initiatives with creating sufficient, sustainable jobs, as these skilled blue-collar jobs tend to be more plentiful in most projects than managerial positions.

### INVESTING IN MODERNIZATION

Saudi Arabia and Siemens also negotiated research and development agreements to collaborate on the expansion of renewable energy and the digitization of the oil and gas industry. The investment here helps Saudi Arabia diversify beyond fossil fuels and will allow its dominant industry to compete more effectively, by bringing in cloud technology and advanced analytics.

The Saudi Aramco effort is backed by a larger KSA localization campaign detailed in the Kingdom’s ambitious Vision 2030 economic initiative. Among its broader goals: to create a \$2 trillion investment fund to finance economic diversification; transform Aramco into a global industrial conglomerate; and establish the Kingdom as a trade hub connecting Asia, Europe, and Africa.

Another pledge is to expand the country’s military industrial complex, so that half of its future defense industry purchases will be fulfilled with Saudi domestic production.

Similar to the more targeted Aramco project, Saudi Arabia's goal in Vision 2030 is to increase the localization of oil and gas sectors from 40 percent, to 75 percent by 2030.

## ATTRIBUTES OF A SUCCESSFUL INITIATIVE

So what are the characteristics of a successful localization campaign? While every country has its own spin on localization initiatives, there are a few attributes that distinguish the ones most likely to produce results. First, it's important that localization plans are centralized and coordinated on both the country level and the operator level. They also must be staged over time to ensure successful technology transfer and adequate preparedness of the workforce and local supply chain.

Localization efforts must be sustainable and reflective of the current state of the national industry and the economy. Initiatives are not free, usually requiring a large investment by the government or foreign investors in such items as the purchase of technology rights.

Embedding localization mandates into procurement and human resources provides mechanisms for implementation. To be successful, they also require strong government commitment, and they must be standardized and able to be replicated.

Finally, everything must be measurable. To ensure sustainability, governments and companies must be able to demonstrate progress to its citizens and customers.

At the end of the day, economic development is never easy, particularly when it involves reducing an addiction to a resource once considered to be a limitless source of wealth and growth. But gradually, various countries are developing the best practices that will eventually allow the Gulf region nations and others to realize localization goals.

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*This article is adapted from one that first appeared in Middle East Economic Survey.*

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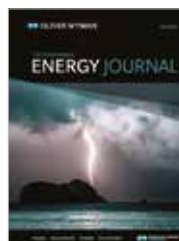
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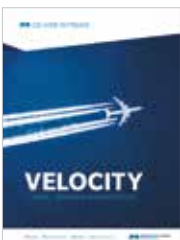
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