

# TOMORROWLAND

PERIODICAL #18

In this issue:

**Annet Aris** INSEAD

**Tim Clark** Emirates Airline

**John Defterios** CNN

**Charles Dumas** TS Lombard

**Hans-Ulrich Engel** BASF

**Gerhard Lohmann** Swiss Re

**Simone Schürle** ETH Zurich

**Andreas Wiele** Axel Springer

**Oliver Zipse** BMW





# TOMORROWLAND

Of course we are not scared about the future! Thinking about the future, that is also our children. But when it comes to our children, I feel many of us are more than scared. Have we given up on the idea that our children have a better life?

**There are so many challenges ahead.**

Climate change, geopolitics, technology, or just some crazy person. We individually cannot solve the macro questions. Now, of course, we are trying to have an impact. But more than that, we have to be prepared. Be prepared for us and our children.

**Down the road in five, ten, twenty years.**

200 key leaders will participate in the Institute's 2018 summit. They had to prioritize the topics. The winner is a big surprise to me:

**The next generation – What are the essential skills we need to teach our children?**

Computer science rather than Latin might buy them some time. Creativity rather than pure knowledge could do a trick. Leadership and social skills might set us apart from machines. Flexibility, resilience, and happiness might all be learned. But is it really just about essential skills?

**To me, it's more about essential values and some character!**

But that's the challenge. We can delegate skill training to others. Kindergarten, school, and university. But when it comes to values and character?

**Let's not rely on the state or just society.**

The trend, however, is going the other way. Parents have less time, not more. And the gravity of social media is a force. So, yes, I am scared. Not about technology or a crazy guy. I am scared that our generation is letting the next one down. We have to take more time and make an effort.

**Let's give our children values and some character!**

This is the moment to say thank you!

It is the 20th anniversary of our Institute.

20 years of taking the challenges of our time head on. Sharing fears, controversial opinions and solutions openly. And with your support we have taken on our share of responsibility for society at large.

We have constructed many schools. 4,000 women will learn to read and write in 2018. And in October we will open the Burkina Institute of Technology ([www.BIT.bf](http://www.BIT.bf)).

**A university educating a new generation of African leaders.**

Enjoy the read!

Yours,

A handwritten signature in black ink, appearing to read "M L P II".

Markus Pertl  
Chairman of The Stern Stewart Institute

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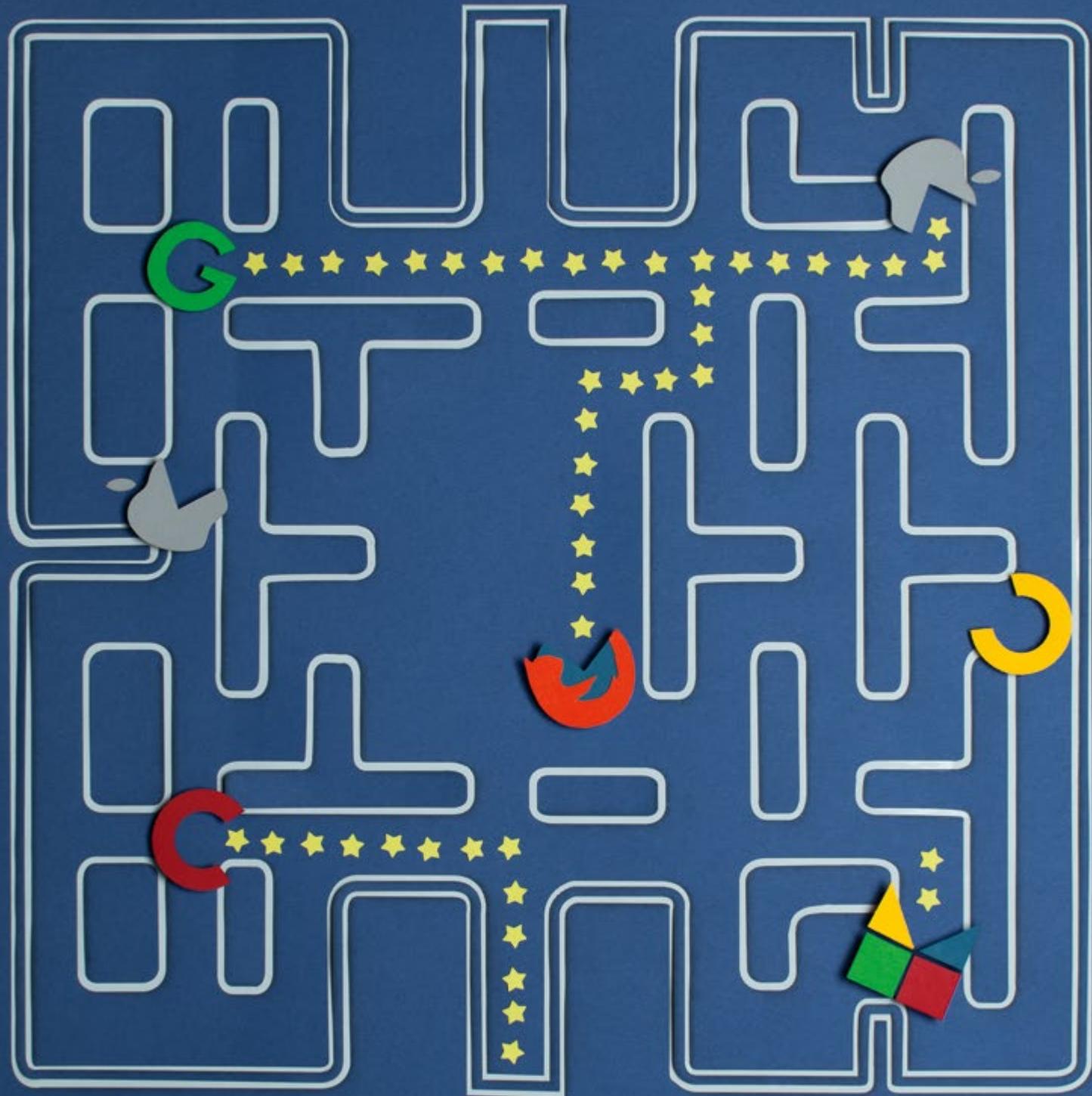
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Imprint





**Andreas Wiele**

Member of the Executive Board  
Axel Springer SE

# Navigating the Jungle of Browsers, Cookies, and User Consent – How Europe's GDPR is Boosting US Companies

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It would appear that Brussels has adopted a mantra that is similar to Donald Trump's election slogan of "Make America great again". If you're having trouble believing that, you're not alone. But it is true, unfortunately.

**S**ince May 25, 2018, everyone can grasp the difference between well-meant and well done. This is the day the new General Data Protection Regulation (GDPR) came into effect. And if that weren't enough, the draft for a directive on Privacy and Electronic Communications is also up for debate which is supposed to take effect in addition to the General Data Protection Regulation. Believe it or not, European consumers are actually supposed to be protected. At any rate, surfing is going to become more difficult for them. By contrast, in Silicon Valley and Washington, champagne corks are going to be

popping because the supremacy of US companies is being boosted, while the level playing field is becoming more unbalanced. Brussels is building its own walls, and the European internet sector is going to be paying for them.

Trump with his "We will build this wall" slogan would truly rejoice.

Is this strong stuff? No, unfortunately this is an alarming reality which is partly hidden in the small print of a complex regulatory text. European internet companies can only avert this impending doom if they work together to have a few glaring errors removed on the home stretch.



## THE EU IS PUTTING THE AMERICAN FOX IN CHARGE OF THE EUROPEAN HENHOUSE.



### First Error

Browsers are going to become the main gateway to the sovereign area of customer privacy settings. Eighty-five percent of the browsers used in Germany belong to the four American operators Google, Apple, Microsoft, and Firefox.

According to Article 10 of the Commission's draft, these browsers are obliged to ask every user individually which privacy setting they would like.

As stated in the Parliamentary draft, a restrictive standard setting is to be included, which will be basically known as the basic default setting of 'use of cookies not permitted'. One might think this is reasonable consumer protection.

With that, however, the browser becomes the gatekeeper of the most important tracking and data settings of the European internet. If upon visiting a particular website the user would like to reconsider, it is almost technically impossible today to change the (declining) browser setting without hopelessly overwhelming the user. According to credible estimates, only five percent of internet users are at all able to change their browser settings. Although the Parliamentary draft

stipulates that even a whitelisting at the level of the website should be possible, it is nonetheless unclear just how this is to be technically implemented.

And with that, the keys to a personalized internet and data-driven marketing will be placed squarely in the hands of the US browsers. And by the way, it is these very browser companies which are currently undergoing deregulation by the Trump administration and, in future, may sell user data in the USA with no holds barred. The result is that the EU is putting the American fox in charge of the European henhouse.



## Second Error

It is common knowledge that every website has to measure its users in order to capitalize on ad sales. In future, the Parliamentary draft stipulates that everything beyond mere reach measurement with aggregated statistical data will no longer be possible without express consent from the user. And the Commission's draft even requires consent for reach measurement if the content provider requires a service provider for this.

Operators of large platforms like Facebook and Google may nonetheless continue to market as before on the basis of their own existing data material. All other market participants have to rely on a functioning ecosystem with independent providers for services like ad serving, data management platforms, demand and sales side platforms without which a competitive advertising marketing is impossible today.

Once the directive on Privacy and Electronic Communications takes effect, it is basically business as usual for Facebook, Google, and the like while every European advertising marketer has to first obtain approval from each individual user in order to continue to vie for advertising funds. With a few exceptions, the same consent also has to be obtained for all external advertising partners who assist the website operator with advertising marketing because they are the only ones with the necessary technology and do not need to involve third-party providers who are subject to extra approval.

According to the Parliamentary draft, cookies are exempt for pure statistical reach measurement in a limited scope; as per the Commission's draft, only web measurements will be permitted that can be done on their own without using service providers.

This means that in future ad server operators, retargeting companies, and all other advertising marketing service providers – so all companies which to date have no direct contact whatsoever with internet users – have to ask these very users for approval to continue performing their business dealings.

That's difficult if not impossible, especially in conjunction with the third error below.



## Third Error

A well-meaning observer might argue that it's not all that bad because, after all, users should be able to decide on their own how much information they would like to disclose about themselves. This individual freedom correlates to entrepreneurial freedom, so subjecting the use of the company's digital offers to certain rules. For instance, a news website can require every visitor to consent to cookies before enjoying predominantly free contents provided by journalists.

That is fair but unfortunately illegal once the directive on Privacy and Electronic Communications comes into effect.

The reason being is that the Brussels-based sidekicks of the American internet giants have now eagerly hatched the related ban to target cookies. Accordingly, it is forbidden to make access to a website dependent upon whether or not the visitor has consented to cookies or not. While it is up to the websites to show advertising extensively without data support, this will be hardly possible or only at low prices. Brussels has taken a liking to the free-for-all policy.

In many European countries, publishers are plucking up the courage and are increasingly successful when it comes to requiring their users to pay to access particularly valuable contents. Regrettably, Brussels has for the most part so far been unable to manage to offer European publishers corresponding property rights.

Paying with money, perhaps. How about at least with data? Once the directive on Privacy and Electronic Communications comes into effect this will be a thing of the past.

*BRUSSELS  
HAS TAKEN A  
LIKING TO THE  
FREE-FOR-ALL  
POLICY.*

## One-size-fits-all gains momentum

These regulations are going to hit large publishers and strong internet companies as well as medium-sized companies and start-ups. Everyone can imagine the harm to the digital future industry which is so vital for Europe. But these regulations are also going to harm consumers, not only because they are removing the economic basis from companies for high quality offers, but also because cookies – or every other comparable technology – are the useful and invisible gnomes of the internet without which individualized offers that satisfy the needs of the user much better than the ‘one-size-fits-all’ are now no longer possible.

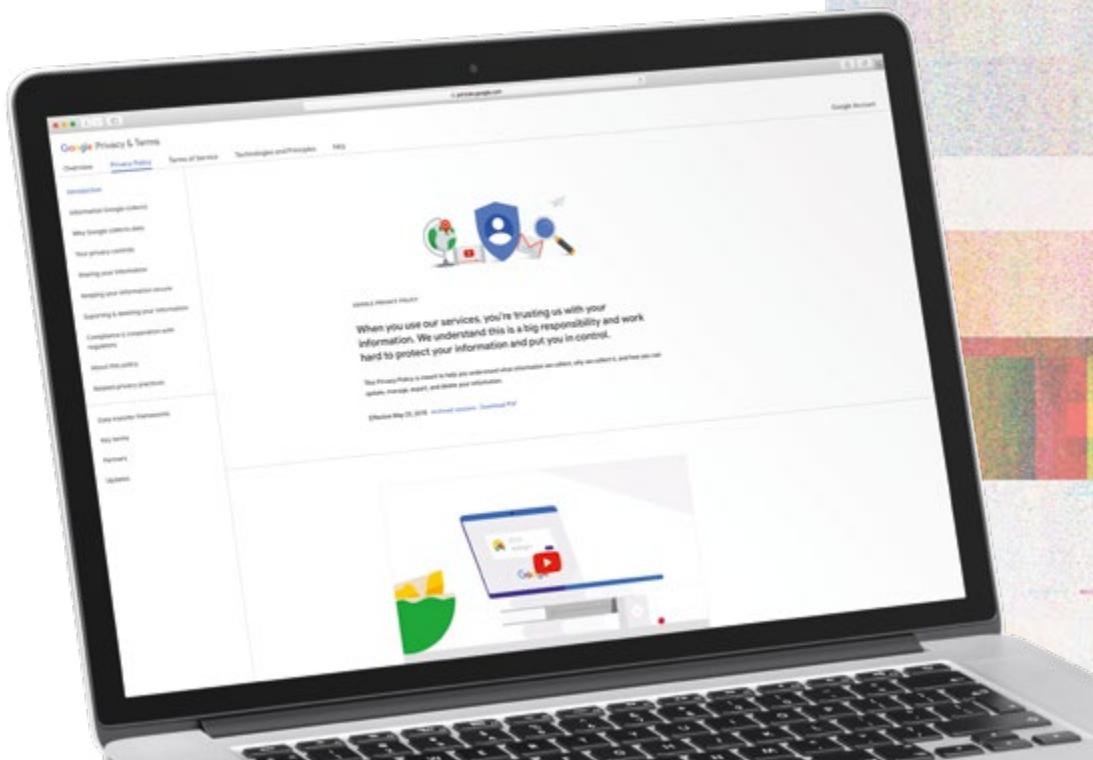
But the guiding notion one might argue is that enlightened consumers can decide this for themselves and grant consent based on sound reason and judgement for their information to be used even though they are not obliged to do so.

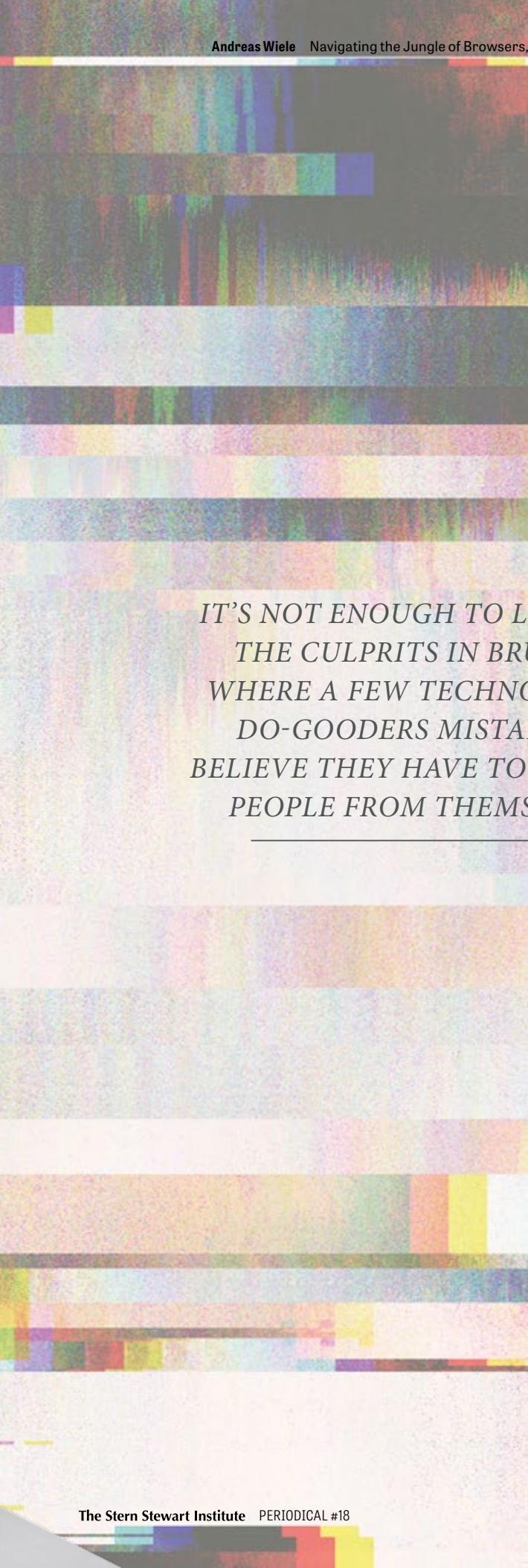
*COOKIES ARE THE  
USEFUL AND INVISIBLE  
GNOMES OF THE  
INTERNET WITHOUT  
WHICH INDIVIDUALIZED  
OFFERS ARE NOW NO  
LONGER POSSIBLE.*

However, even if they wanted to, they would wind up just as ensnared in the web of ‘browser primacy’ and ‘cookie consents’ as the companies that have to apply these regulations.

And is there any proof for this? We have already done trials on several of our websites to obtain consent in keeping with the draft regulation. In the process, not once did we require the users to take a detour and use the browser setting.

The results are subduing. At best, half of the users consented, and at worst only ten percent did. That means that our and your digital offerings are losing at least half and at most up to 90% of marketable inventory. That would be a fatal blow to digital journalism and to the European digital industry.





*IT'S NOT ENOUGH TO LOOK FOR  
THE CULPRITS IN BRUSSELS  
WHERE A FEW TECHNOPHOBIC  
DO-GOODERS MISTAKENLY  
BELIEVE THEY HAVE TO PROTECT  
PEOPLE FROM THEMSELVES.*

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## Look no further than Berlin

How can our politicians want such a thing? It's not enough to look for the culprits in Brussels where a few technophobic do-gooders mistakenly believe they have to protect people from themselves.

It is crazy indeed that every politician is talking about how the American internet giants have to be tamed and then at the same time a policy is tabled which Silicon Valley couldn't have worded better.

But those responsible are also sitting in Berlin – in the German federal government – and in almost all political parties. To date, not one German politician has taken a firm stand against this regulation.

A majority of member states have rejected the browsers' role of gatekeeper and appear to be taking the concerns of the European internet economy seriously.

And even the Council's most recent draft dated May 8, 2018 is worded a bit softer in a few places but is far from being adequate.

France is not the only one waiting to learn how the new German government is going to position itself. Now there is an even more important role for the latter to play in the Council. Germany has to abandon its reluctance and start advocating strongly for a regulation which gives due consideration to data privacy and legitimate business models of open web offers.

The very good balance between protecting user privacy and the justified interest of the European economy as outlined in the General Data Protection Regulation should not be limited as a result of the planned directive on Privacy and Electronic Communications. In particular, permission surrounding the notion of "justified interest" has to be given full consideration in the directive on Privacy and Electronic Communications. Here, the directive on Privacy and Electronic Communications should not fall short of the achievements of the General Data Protection Regulation. The federal government should adequately establish its position on this key point both in the discussions in the European Council as well as in the pending dialogue involving the European Commission, the European Council, and the European Parliament.▪





Annet Aris

Adjunct professor of strategy  
INSEAD  
and supervisory board member

# The Topsy-turvy World of Digital Curves

Curves in the digital world differ fundamentally from the traditional ones. And that is especially important for boards and management, since using the “wrong” curve can lead to wrong decisions...

Last week I finally started to clean out my archives. Like many tasks you tend to postpone, when you actually get around to them, the experience is more enjoyable than expected. Sorting through old memories and forgotten feats, I stumbled on the notes I took during the first semester of my engineering studies and started scanning through them. I was especially impressed by my transcripts of the introductory math course: I did recognize my handwriting, however did not understand anything anymore of what I had written down.

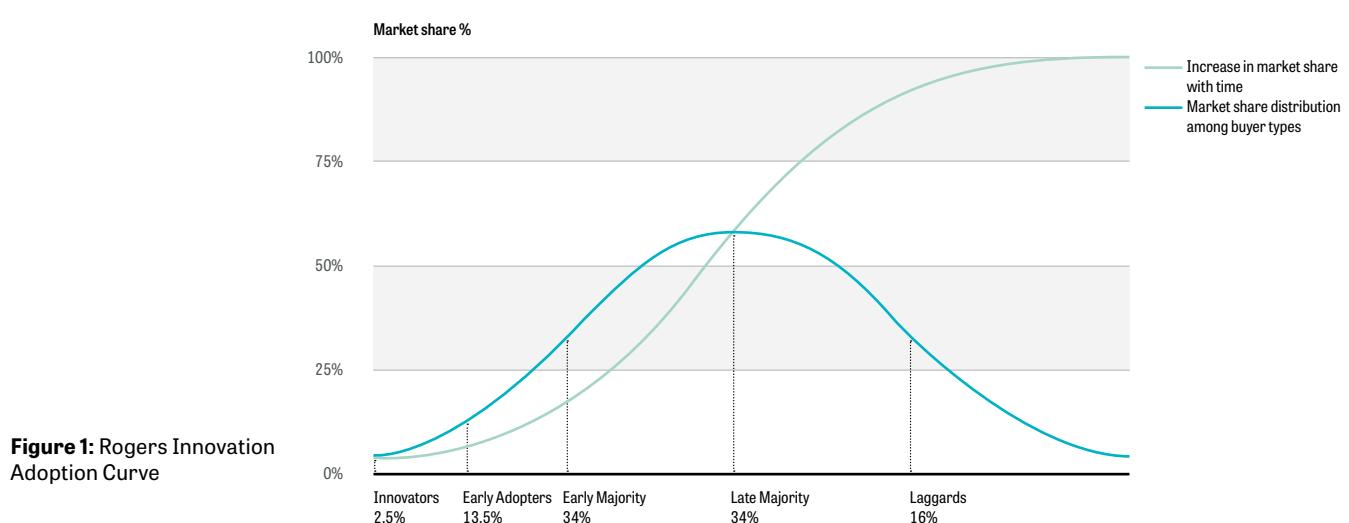
This was quite a confrontational experience, but I guess it is like this for most of us: once we leave our chosen profession and turn into business people and managers, day to day firefighting becomes all-encompassing and we tend to forget the technical details of what we learned at high school and university.

The page contains several handwritten mathematical problems and their solutions:

- A graph of a function  $f(x)$  showing a shaded area under the curve between two points, labeled "D".
- Integration formulas:
  - $\int_a^b (x-y) dx = \frac{1}{2} (y_1^2 - y_2^2)$
  - $\int_a^b (x^2-y^2) dx = \frac{1}{3} (y_1^3 - y_2^3)$
  - $\int_a^b (x^3-y^3) dx = \frac{1}{4} (y_1^4 - y_2^4)$
- Volume of revolution:
  - Diagram of a solid of revolution.
  - Equation:  $V = \pi \int_a^b (r(x))^2 dx$
  - Another equation:  $V = \pi \int_a^b (R^2 - r^2) dx$
- Surface area of revolution:
  - Diagram of a surface of revolution.
  - Equation:  $S = 2\pi \int_a^b r(x) \sqrt{1 + (f'(x))^2} dx$
- Other calculations:
  - $D = \frac{x^2}{2x-y^2} + \frac{y^2}{2x-y^2} = \frac{1}{2x-y^2}$
  - $\int_0^1 (x^2-y^2) D dy = \int_0^1 (x^2-y^2) \frac{1}{2x-y^2} dy = \frac{1}{2x} \int_0^1 (x^2-y^2)^{-1} dy$
  - $\text{approx. methodik: } (\ln x) = \frac{1}{x} (1-\frac{1}{x})$
  - $(\int_0^1 (x^2-y^2)^{-1} dy = 1 - \frac{1}{2} \int_0^1 (1-\frac{1}{x}) dx = (1-\frac{1}{2})(1-x))$

## From trendlines to tipping points

As a supervisory board member I always get very nervous when I see “hockey stick plans”, plans where the results in the first years are very modest in order to take off big time a few years out. Also our brain is programmed to automatically extend the past into the future. Therefore we feel much more comfortable when we see gradual business plans, where the market grows a few percent per year in a gradual but continuous way. In many mature industries this is indeed the best way to predict the future, however in the digital world these assumptions about market growth do not apply. After an initial buzz around a digital innovation, very often little happens and most incumbent players assume it was “much ado about nothing”, however, more often than not the dam bursts suddenly and the new digital service takes off in a steep curve. A striking example of this is the fast adoption of mobile internet after languishing many years. There are 2 reasons why the digital world is especially prone to this tipping point effect. Firstly, there is the well-known technology life cycle, as described by Everett Rogers and Geoffrey Moore: a small group of innovators and early adopters are followed by the large masses of the early and late majority. As the graph below shows, this cumulatively results in an S-curve with a tipping point at the transition of early adopters and early majority. In a digital world this S-curve is even steeper as new innovations can spread much quicker, and the normal curve is shorter.



## In a digital world, other rules and relationships apply...

Luckily, however, a few basic concepts tend to stick around and give us context in our daily decision making. Most popular evergreens are simple, intuitive relationships such as trendlines, the normal distribution curve and the law of diminishing return. Over time they have proven their worth and are used frequently in our daily decision making. However, the stickiness of these curves is exactly the reason why they are dangerous, especially in a world which is becoming digital at an increasing speed. These concepts became popular in an analogue, physical world where goods were scarce and the cost of doing transactions was significant. In a digital world, however, other rules and relationships apply, often counterintuitive to the ones we assume. When we are not aware of this, we run the risk that we automatically refer to our default concepts and take radically wrong decisions.

### ...often counterintuitive to the ones we assume

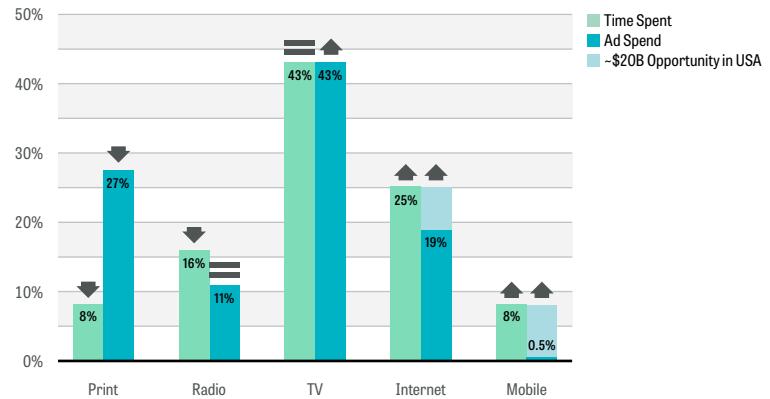
What are then the biggest pitfalls when applying commonly used curves to the digital world? Three stand out: the use of gradual trendlines instead of tipping point curves, the assumption of a normal distribution curve instead of a power curve and finally assuming on (concave) scale effects instead of (convex) network effects. These choices might seem at first sight relatively abstract, however, they have major implications for strategic and operational decisions.

## The role of ecosystems

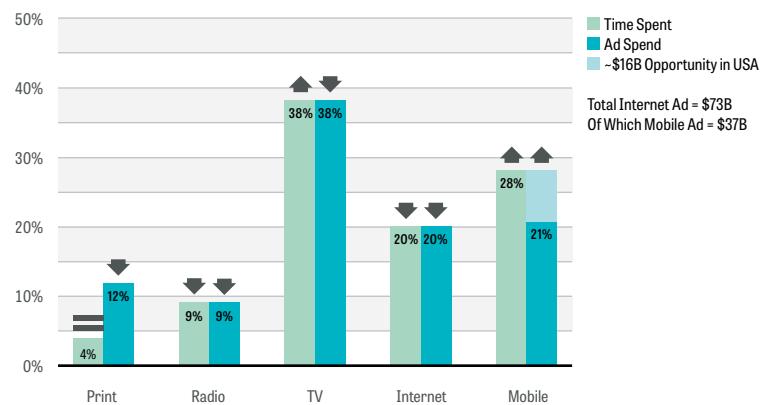
A second, less discussed effect which causes a tipping point are the ecosystem barriers. As professor Ron Adner from the Tuck School of Management describes in his book "The Wide Lens" industries are often much slower in adopting innovations than individuals. An example of this is the advertising industry: for many years major advertisers still spent the bulk of their marketing money with traditional media, such as print, in spite of the fact that consumers were already spending a significant amount of their time on digital media. The reason for this was not that advertisers did not see this shift, but that the value chain was not geared up for digital advertising: advertising- and media agencies lacked the skills, there was no financial incentive for media agencies to shift away from traditional media, price setting was opaque and effect measurement was faulty and fragmented. Only recently the tech giants have found ways to greatly simplify the design, targeting, pricing and effect measurement of digital advertising, which resulted in a tipping point shift of marketing investments towards digital.

Tipping points are thus a fact of life in the rollout of digital products and services. They are however unfortunately very tricky for companies. On the one hand, many incumbent companies are often fooled by the slow start of the curve and are then taken completely by surprise as the curve takes off. On the other hand, it is almost as bad to be too early because investments are made with no direct return and own products are cannibalized prematurely.

As an industry moves from analogue to digital, management and boards should therefore be very focused on potential tipping points and understand which signals they have to monitor which indicate a high likelihood of the tipping point nearing. From a consumer adoption point of view the questions to ask deal with the true new benefits of an innovation, its ease of use and the affordability. From an industry point of view it is important to understand the ecosystem barriers to change and the extent to which these are being chipped away.



**Figure 2:** % of Time Spent in Media vs. % of Time Spent in Advertising Spending, USA 2010



**Figure 3:** % of Time Spent in Media vs. % of Time Spent in Advertising Spending, USA 2016

Note: Print includes newspapers and magazines. \$20B opportunity calculated assuming Internet and Mobile ad spend share equal their respective time spent share.

Source: eMarketer, 3/11.

Source: Mary Meeker KPCB  
Internet Trends Presentation Code Conference 2011 and 2017

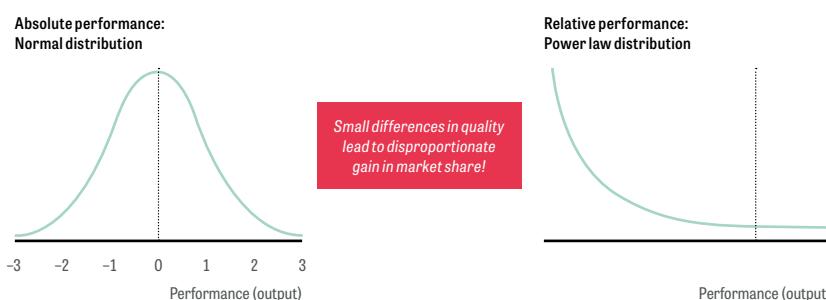
**THE BIG DIFFERENCE IS THAT DIGITAL GOODS ARE NOT SCARCE: DIGITAL GOODS DON'T DETERIORATE, THEY CAN BE COPIED ENDLESSLY AND CAN BE DISTRIBUTED AROUND THE GLOBE AT ALMOST NO COST.**

### From normal curve to power curve

In a physical world we are used to scarce goods and high transactions costs. Transaction costs are the costs incurred when searching for a product, selecting the best alternative, negotiating the price and ensuring correct fulfillment. Due to these two limitations demand curves often take the shape of a normal distribution curve. For example, when an airplane ticket at the most popular time and at the best price is not for sale anymore we look for a second best alternative. Either we buy a more expensive ticket at the right time or a cheaper ticket at a less attractive time. Research done by Erik Brynjolfsson and Andrew McAfee from MIT, which is summarized in their book "The Second Machine Age", shows that these simple rules do not apply in the digital world. The big difference is that digital goods are not scarce, digital goods don't deteriorate, they can be copied endlessly and can be distributed around the globe at almost no cost. The consequence of this is that whenever a digital good or service is slightly better than its competitor, consumers flock to this product, also helped by the greater transparency the internet offers. Because there is no scarcity there is no normal curve. Instead, we end up in the world of power curves where the best performer gets the lion's share of the revenues.

In addition, research by Harvard professor Anita Elbers shows that due to search behavior of consumers, digital power curves are even steeper than power curves in the analogue world. For instance, in the analogue world 20 percent of music titles generate 80 percent of the revenue, the ratio in the digital world would be closer to 10 and 90 percent.

The implications of this phenomenon are far reaching. In an analogue world a company can still gain a respectable market share with a slightly worse product, in the digital world this is much more difficult. For boards and executive management this means a relentless focus on quality of the digital offerings. Beautiful power point presentations of digital plans are not enough. What really matters are the nuts and bolts of the digital offerings, including continuous product improvements and testing. An in-depth understanding of the individual customer and his or her needs and of the individual customer journey are crucial. This in turn requires a smart strategy for data gathering and analytics, balancing the need for information with respect for privacy.



**Figure 4:** Fundamental different shape of revenue distribution in the digital world

Source: The second machine age, Eric Brynjolfsson and Andrew McAfee, W. W. Norton & Company, Inc, 2014

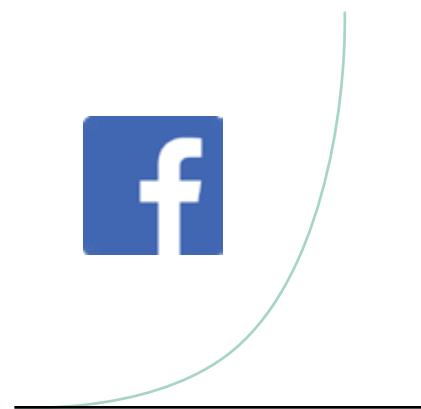
**Figure 5:** Scale effects: supply driven

### From “concave” scale effects to “convex” network effects

In the digital world, and especially in the world of digital platforms, scale effects play a role but far more important are the external network effects, i.e. the mutual reinforcing effect of increasing supply (for example more car drivers, apartments for rent or products for sale) and increasing demand (people ordering rides, guests or buyers). Other than scale effects, network effects tend to start at a slow pace and then pick up an increasing speed once a critical mass is reached. This leads to a “convex” curve where the slope gets steeper instead of shallower.

Of course in due time also network externalities taper off, for example when the market gets saturated.

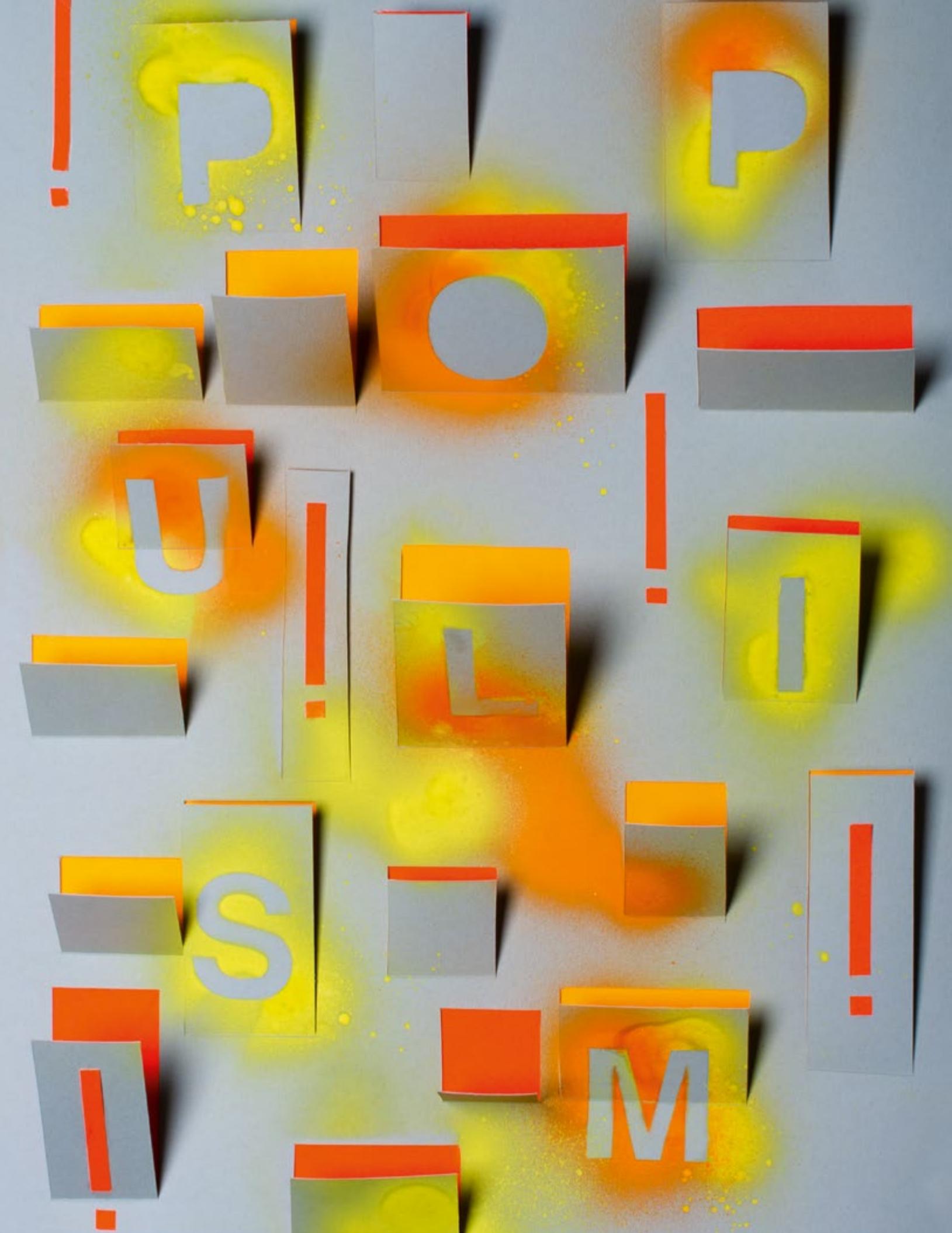
The managerial implications of these different curves affect above all timing. Whilst scale effects have their largest impact in the short-term, network effects only show later on. Also it is important to realize that scale effects work for all companies which increase their size, whilst network effects very often only apply to the winner. Like the power curve the winner is likely to take all. The tech giants are the best illustration of the combined effect of the power curve and external network effects. The implication thus is that when you decide to go for the network effect, it is an all or nothing game. Both management and the board should in this case be willing to take the risk and accept the consequences of failure.

**Figure 6:** Network Externalities: demand driven

### Reality check – retrain your brain

In the previous paragraphs we covered three instances where curves in the digital world differ fundamentally from the ones we have been accustomed to use in daily life. Boards and management should be actively aware as using the “wrong” curve can lead to fundamentally wrong decisions. As described, each of the three digital curves has its own management challenges and together they will require a clear shift in focus from management and boards. First, the companies’ focus will have to be much more on the long term as in the “convex” digital world the short-term effects will be smaller and long-term effects bigger. Second, deeply understanding the needs of individual customers and being able to measure one’s own performance will become make or break as the digital curves are unforgiving for the runner up. And lastly management and boards should have enough risk appetite to aim for the winning position in the face of aversities, as not taking the risk will most likely lead to a certain demise.

All in all the new curves are a lot more exciting and challenging than the old ones, so it might be worthwhile to dive into your archives, dust off your old notebooks and retrain your brain for the new world!▪



# Populism and Germany

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First Brexit Britain, next Trump in America, now Italy.

Where to next? How does it affect Germany?



**Charles Dumas**

Chief Economist  
TS Lombard

The kneejerk reaction of centrist politicians has been to deplore populism. But the word itself is rooted in the word ‘people’ and the quality of ‘popularity’. Surely any democrat should pause. If the current state of the world is unpopular with people, politicians despise populism at their peril. Recognising discontent expressed by populism does not mean approving of demagogues. And so far centrist politicians have been slow to steal their policies – notably concerning immigration.

Populism as we have seen it recently in the West is a mixture of identity politics – resistance to cultural dilution and multi-culturalism – and anger at slow income growth. In Germany, the large inflow of foreign labour arouses populist feelings on both accounts, as real wages have been eroded by the immigrant inflow, partially accounting for weak after-tax income growth. The source of populism in Italy is similarly only too easy to understand, with even greater emphasis on falling real income: Italian output is still more than 5% below its pre-crisis peak in early 2008.

## The failure of the euro

The chart below shows the growth, per head of population, of total real output (GDP) and after-tax personal income (PDI) over the first 19 years of the euro, 2017 compared with 1998. Only in France has growth of personal income matched, in fact slightly exceeded, that of output. With this chart, rising populism in Italy is only too easy to understand. The euro has helped crush Italy. Its pre-euro habit of devaluation to secure cost-competitiveness bequeathed it (by the late-1990s) focus on industries that compete on price – ‘commodity’ industries, like textiles, iron and steel, tiles, and so forth. These are the natural start-up industries of a developing country. Italy gave up the ability to devalue by joining the euro just as China exploded onto the world trade scene, starting in just these industries. As a result, Italy’s real output per head has hardly increased in 19 years. Real after-tax income of Italians is actually down 6–7%. Small wonder anti-establishment parties have won elections and are now in charge!

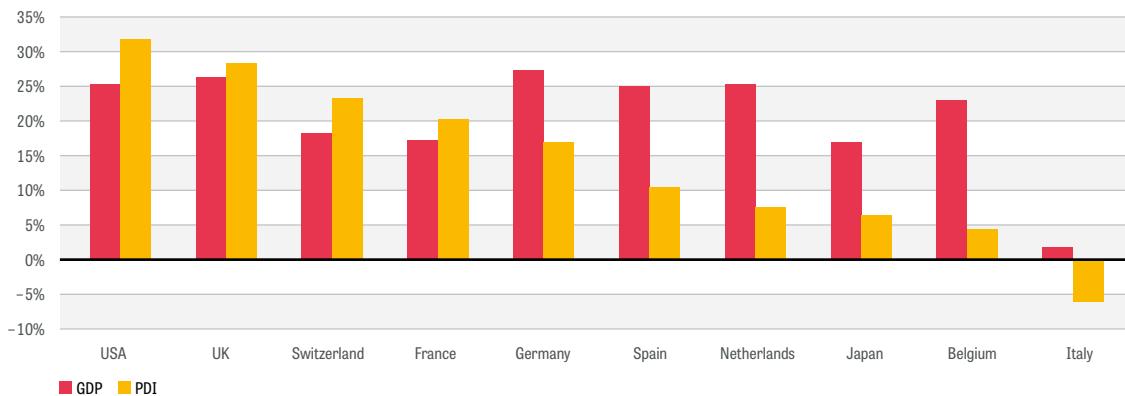
What about Germany? Its real output per head has risen about the same as Britain and the US – total output is behind, but Germany has had no increase of population. Income gains of German people, however, have been more than ten percent-points less than their product. This is the common experience of Eurozone (EA) countries. Mostly, this reflects diversion of real growth into net exports – export volume growing faster than import volume. To some extent this has been offset by worse terms of trade – import prices up by more

than export prices – as the real exchange rate of the euro has fallen. But mostly it shows up in the huge EA trade surplus, about \$500 billion (€450bn) in 2017’s current account. Nowhere is this truer than in Germany, with a 2017 current account surplus of \$300bn (8% of output) forecast by the OECD to rise to \$340bn in 2018. Germany became ultra-competitive in 2002–05, with massive austerity imposed by Hans Eichel, which not only lowered Germany’s relative costs and real exchange rate (see below) but also repressed imports owing to feeble domestic demand.

After Germany’s bout of austerity in 2002–05, the 2007–09 financial crisis and the 2010–13 euro crisis saw violent austerity imposed on most of the rest of the EA. The ‘EA-plus’

data in the chart below include the surpluses of Switzerland, Sweden and Denmark, totalling more than \$100bn. Though not in the euro, they are part of the German-centred economic core of Western Europe. The chart also shows the chief counterpart deficits – the world cannot have a surplus with itself! China is weaning itself off dependence on exports to the US as a growth model. But neither German-centred Europe nor Japan have been able to do so. Japan’s surplus (\$200bn) is smaller in amount, but was 4% of output in 2017, compared with 3.8% for the EA.

**POPULISM AS WE HAVE SEEN IT RECENTLY IN THE WEST IS A MIXTURE OF IDENTITY POLITICS AND ANGER AT SLOW INCOME GROWTH.**



**Figure 1:** Real growth per capita, 2017/1998 (life of the euro)



Figure 2: EA current account balances, \$ billion

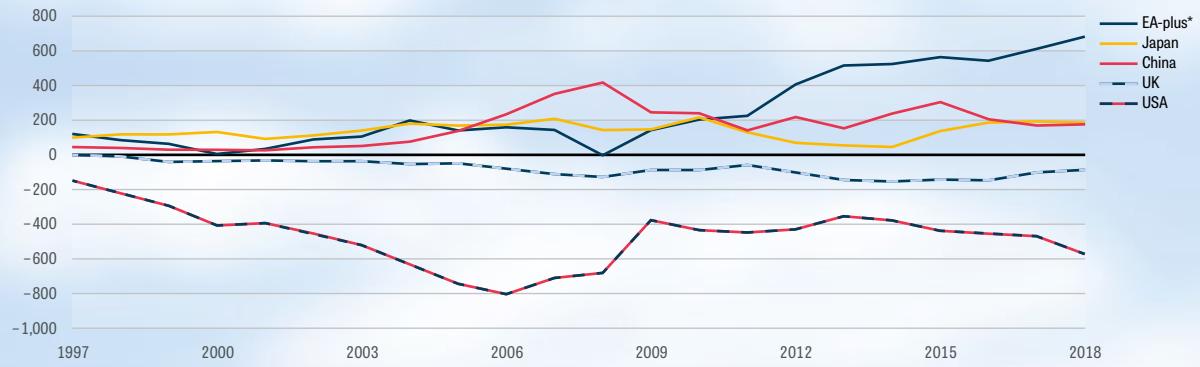
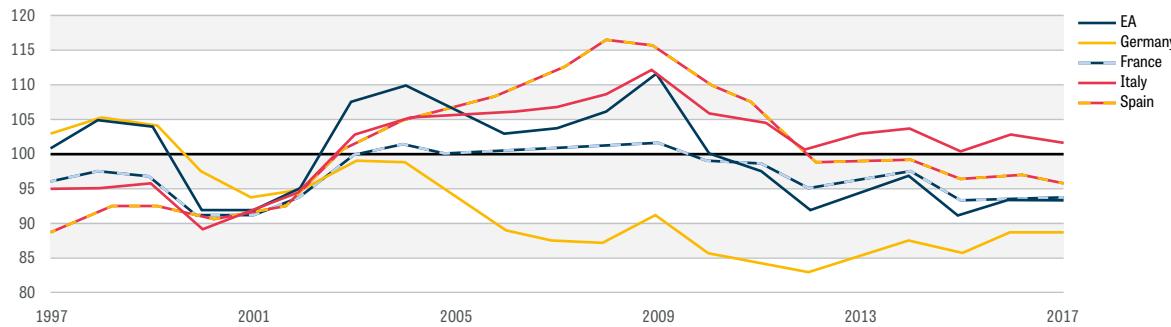


Figure 3: Current account balances, \$ billion



**Figure 4:** Real FX rates (relative unit labour costs), long-run average = 100

### German undervaluation persists

Germany's 2002–05 austerity period caused a huge downward divergence of its real exchange rate. The chart above, showing relative labour costs of various countries, tracks each relative to its own long-run average, in Germany's case since 1973, when the Bretton Woods fixed exchange rate system broke down. By its own standards, Germany has been more than 10% undervalued for a dozen years now. This persistent undervaluation has caused the huge trade surplus, and the diversion of income from ordinary people into supporting net exports. As the chart shows, the EA generally is now about 5–6% undervalued, thanks to the ECB's ultra-stimulative monetary policies, and this is the chief reason for the growing EA surplus.

*BY ITS OWN STANDARDS,  
GERMANY HAS BEEN MORE  
THAN 10% UNDVALUED  
FOR A DOZEN YEARS NOW.*

### EA and global imbalances a major cause of populism

A few years ago it seemed possible that relatively strong German growth would lead to faster inflation than elsewhere in the EA, gradually reducing the internal EA imbalances. But as the chart above shows, the divergence between Germany and Italy in real exchange rate, having reached 16 percent points in 2006, remained as high as 13 percent points in 2017. Only the lowering of the aggregate EA real exchange rate permits any growth at all in Italy. The idea of solving EA imbalances by means of German inflation was always unlikely. What actually happened was that German growth was underpinned by a major influx of immigrants.

The Brexit vote was 52-48 for Brexit. It could have been the other way round but for the euro's failure. Exports to the EA account for 13% of British output. As well as being hurt by poor EA growth, they were disadvantaged by the pound's appreciation, given a major inflow of EA flight capital to London. This was a double whammy for Britain's industrial regions, where the pro-Brexit vote was heaviest. Youth unemployment averaging 50% in Mediterranean Europe meant large migrant flows as well, adding to anti-immigrant feelings behind the vote.

In America, identity politics directs Trump's ire at China, and the huge bilateral trade deficit adds fuel to the fire. And the income argument is different. A major domestic point is that inequality is both greater than in Europe, and has been increasing rapidly, both of income and of wealth. But the loss of jobs in middle-income America is also a function of the overvaluation of the

**THERE ARE TWO CLEAR SOLUTIONS  
TO THE EA'S INTERNAL IMBALANCES:  
ITALIAN EXIT FROM THE EURO,  
OR FISCAL UNION WITHIN THE EA.**

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dollar that is the counterpart of EA undervaluation. The US current account deficit (about \$500bn) has its chief global counterpart largely with the EA. The US populist surge is more readily harnessed to anti-Chinese rhetoric. Loss of US hegemony is a huge grievance, even though unjustified. But the US trade ‘hawks’ could soon shift their focus onto the EA, particularly Germany’s trade surplus and undervaluation.

### **What next?**

Not all is gloom. It is perfectly possible to envisage Germany’s surplus declining naturally. It is, after all, the difference between the national savings rate and capital spending (capex). The immigrant and refugee influx will probably cause a big boost to capex. The increase of labour input to the economy has not yet been matched by capital, housing and infrastructure. Baby boomers will retire and take a very large generation out of high late-career saving into low or no saving in old age. The rising euro in response to huge surpluses would be an immedi-

ate source of lesser EA surpluses, and could also cut business savings out of profit. But the rising euro also presages economic and financial crisis in Italy.

There are two clear solutions to the EA’s internal imbalances: Italian exit from the euro, or fiscal union within the EA. Anything else is just the usual ‘kicking the can down the road’. But Italians do not want euro exit (even though the euro has brought them nothing but grief) and Germans do not want fiscal union – and neither do the Dutch, nor the Spaniards who went through intense pain to be competitive without devaluation or fiscal relief.

Europe and the world has a major dilemma:

- ▶ A major euro appreciation very soon is needed to stave off potential US trade wars
  - ▶ But a major euro appreciation is hampered by internal EA imbalances that slash confidence in the currency – and, should it happen, it will make those imbalances more acute by ensuring serious overvaluation of Italy
- Meanwhile the identity politics that is fundamental to populism works against cooperative solutions to the almost inevitable worsening of tensions, both globally and within the EA. ▪





# Human Enhancement – Boon or Bane?

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A recent study on the attitudes of Americans towards human enhancement technologies provides interesting results



**Simone Schürle**

Professor at the Institute of  
Translational Medicine  
ETH Zurich

**H**uman Enhancement – is it just another buzzword or a trend with real effects that could soon be felt by everyone? The term Human Enhancement refers to the use of technology to extend and increase particular aspects of people's performance beyond their natural limit, which may ultimately transform the experience of being human. Although restoring function has long been a common and generally accepted part of medicine, the emerging possibility to go beyond restoration demands thoughtful reflection on the consequences and side effects, both at the individual level, as well as at the level of society as a whole.

A few illustrative examples may help make this more concrete. Eye surgery with laser technology can completely restore a person's vision, but what if a similar surgery could instead allow her to see for miles? In medical technology, joint replacement to restore mobility is nothing new, but what if replaced joints or bionic implants could allow us to move at a speed that exceeds normal human capabilities? What if genetic engineering could not only help us to treat disease, but also make us smarter?

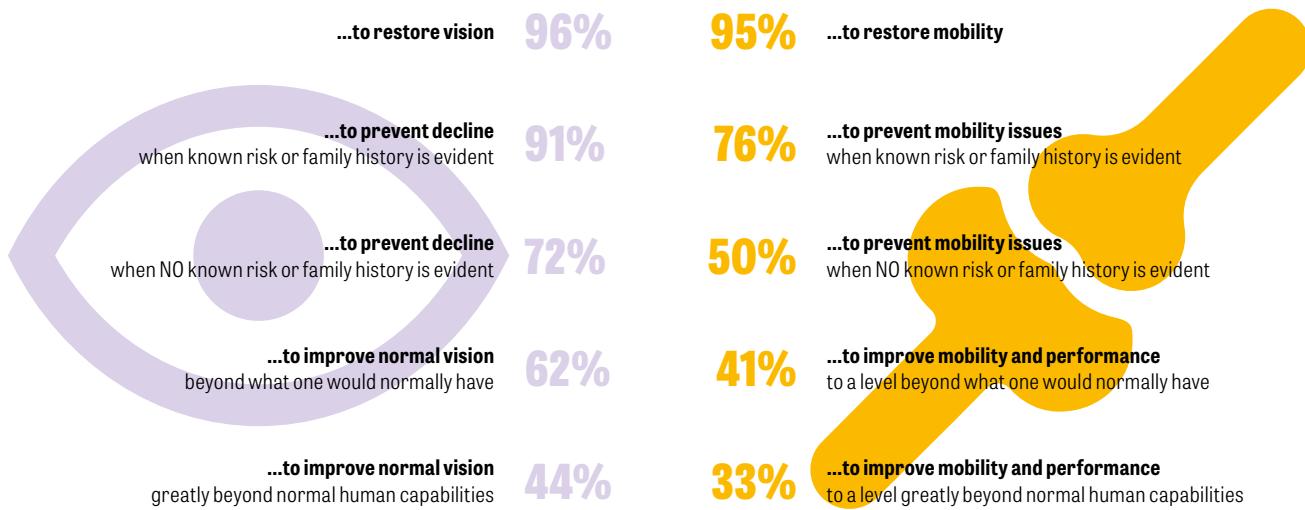
The impact on human development requires open discussion, and the first step in this direction is to raise awareness. How do people feel about these possibilities and what do they want for themselves, their families and society? Do

they see the potential for enhancement as an opportunity or a threat? Answering these questions requires input from scientists, which is why I feel a sense of responsibility for engagement. My research is actually not focused on human enhancement technologies, but rather on the development of responsive nanosystems for diagnostics and therapy. However, the line between technologies that contribute to regenerative medicine and technologies that improve abilities beyond the healthy state is blurrier than one might imagine. Nanotechnology and other methods we use in our lab will ultimately play a role in the development of human enhancement technologies. This is why I was asked to join the World Economic Forum Global Future Council on Human Enhancement (GFC-HE), where experts from various spheres come together to develop frameworks, guiding questions, and recommendations for the effective, value-based governance of emerging HE technologies.

One activity furthering the mission of the GFC-HE was to help develop a survey probing public perception of human enhancement. Conducted together with and led by AARP, the world's largest membership organization representing 37 million Americans age 50 and over, the results of the survey offer useful insight into public attitudes toward this topic.

It is appropriate to use...

# VISION ENHANCEMENTS AND JOINT REPLACEMENTS



Source: AARP®

## Lack of awareness

Over 2,000 American adults were surveyed by AARP Research. To be representative of the U.S. population, the data were weighted by age, gender, race, ethnicity, employment status and income. The study examined different types of human improvement: Interventions related to joints, vision, cognition and genetic changes.

Before making an evaluation of attitudes about individual technologies, a general assessment was made of the participants' existing knowledge on the subject. The picture was clear. Of the Americans surveyed, 76% had not yet heard anything (40%) or hardly anything (36%) about such technologies. Less than 10% said they had already used technologies, and named prostheses, organ transplants, pacemakers or joint replacement as examples.

The study investigated attitudes toward the circumstances under which participants judged it appropriate to apply technologies that might be used for human enhancement. Choices were presented to participants along a continuum of intended outcomes: therapeutic application to restore ability; prevention when there is a known risk or relevant family history; improvement beyond the ability that one would normally have; and finally, improvement far beyond normal. As was to be expected, the type of technology in question influenced participants' readiness to accept different levels of intervention, and across different technologies there were underlying trends concerning the degree of improvement perceived to be acceptable. Restoration of a function has long been considered a desirable medical outcome, whereas improvement in performance far beyond the human scale is perhaps a more alien and uncomfortable possibility to some participants. Nearly all supported the restoration of vision (96%) and joint replacement to restore mobility (95%). In contrast, acceptance of vision improvement well beyond normal human ability fell to 44 percent, and the acceptance of joint replacement to improve mobility and performance to a level far beyond normal sank to only 33 percent.

The results showed a very similar pattern when it came to cognitive improvement, although the questionnaire offered examples with two different levels of invasiveness: drugs and implants. The study strongly supported the use of drugs to restore the cognitive abilities of dementia patients with 95 percent, and many (88%) also felt it was appropriate to use implantable devices for this purpose. On the other hand, approval declined significantly when it came to cognitive improvements that went far beyond normal human abilities: Here, only a third signalled their approval if it is achieved by drugs (35%), or less than a third (31%) if brought about by implantable devices.

## Controversial gene editing

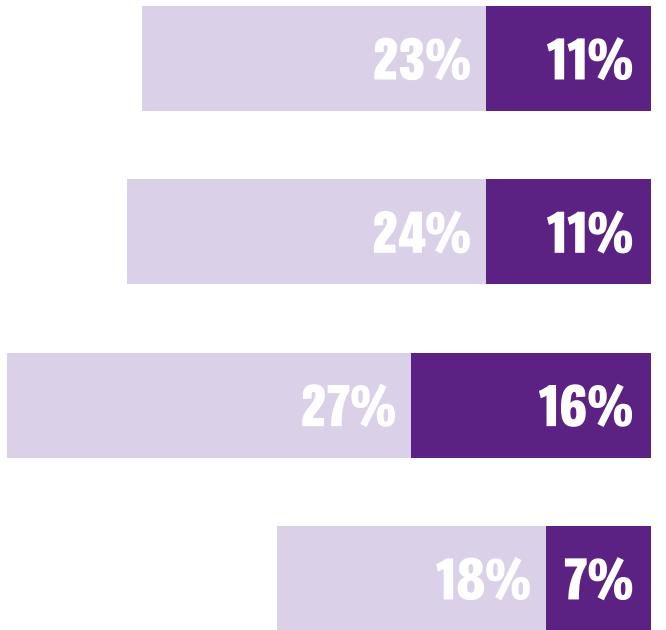
Another result of the investigation was also to be expected: Although 60 percent of Americans believe that genetic engineering could improve the quality of life, two thirds of the participants feared that technology would have a negative impact on society. Nevertheless, a large proportion of those questioned were in favour of gene editing (83%) when it comes to curing diseases or suppressing pathogenic genes. However, the support for non-therapeutic interventions differed significantly depending on the respective goal of the application. For example, when it came to making people stronger or smarter, only less than half (46%) agreed, and less than a third (32%) when it came to defining certain human characteristics.

A closer look at the acceptance of the various improvement technologies, broken down according to different criteria, reveals a rather consistent picture among all age groups, ethnicities, education and income. However, there was a clear difference in the breakdown by gender: while only 55% of women were in favor of using such technologies for vision enhancement, this figure was 72% among male respondents.



# INTEREST IN IMPROVEMENT OF ONE'S OWN ABILITIES

Improvements are beyond what is considered normal ability.

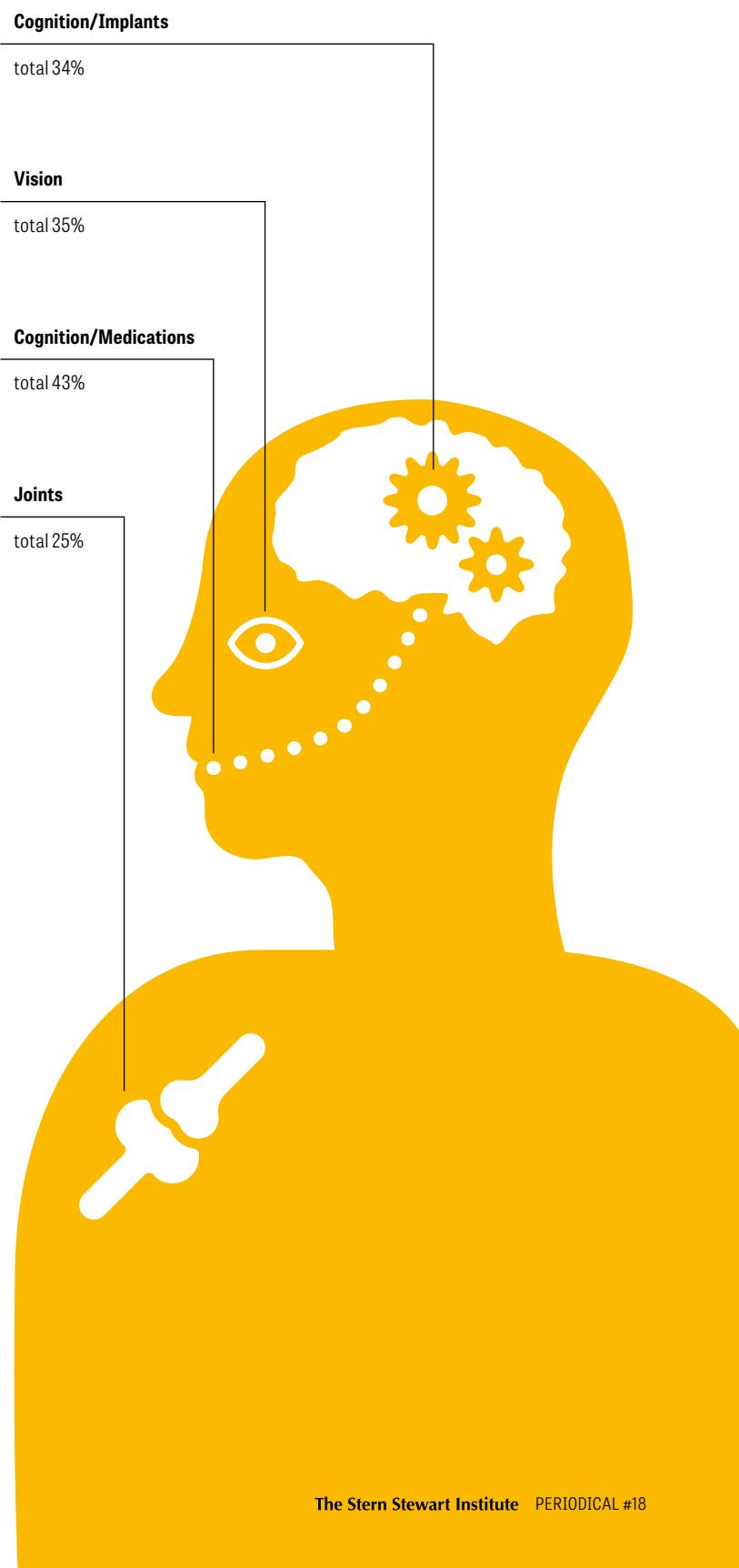


Source: AARP®

## Strong personal interest

Although there are concerns about certain applications, the results of the survey indicate that a significant number of Americans would be willing to use technologies on themselves to improve their performance. This points to the possibility of a sizeable market for such technologies, even when there is no medical necessity for such a treatment.

Almost one in two Americans (43%) showed interest in improving their own cognitive abilities beyond the medically necessary level through medication (27% of which were slightly interested and 16% very interested). However, the overall level of this interest dropped to 34% if the performance improvements could only be achieved by an implantable device. More than one in three Americans is interested in improving their vision beyond the normal range.



## And what about society?

Even if most Americans believe that enhanced performance would improve a person's quality of life, two thirds are concerned about negative effects on society as a whole. Concerns include the fear of a loss of uniqueness and diversity, of a misuse of technology against those who cannot afford enhancement and the risk of a widening gap between rich and poor. The last concern seemed to be recently substantiated when a Philadelphia-based pharmaceutical company announced it would charge an astonishing \$850,000 for a gene therapy to treat blindness.

A majority of Americans say that people who have experienced an improvement should be screened for possible health side effects and that the widespread use of certain technologies should be regulated by medical experts. One of the tasks facing scientists today is therefore the definition of guidelines that benefit both individuals and society and are in line with general social needs and standards.

## There is still much to be done

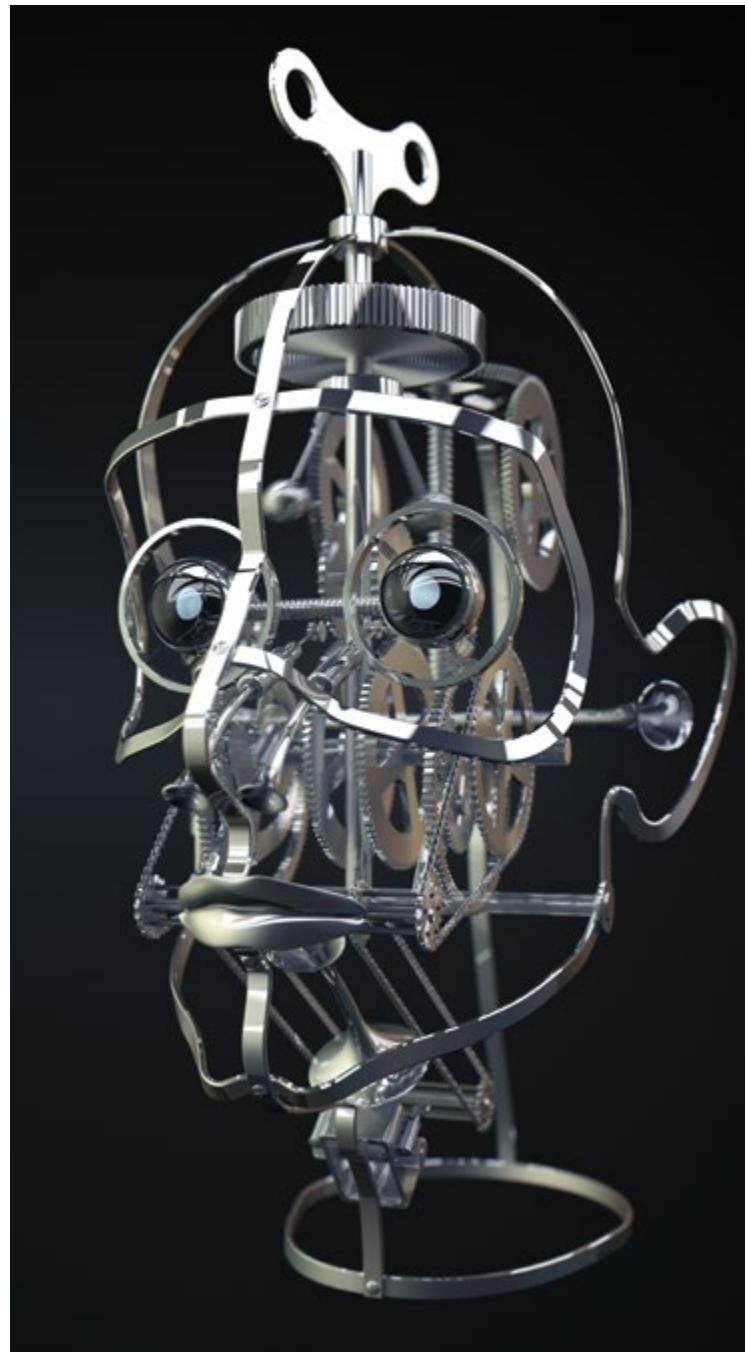
Rapid and drastic technological change is not a new phenomenon, but rather a feature of modern life. And yet human enhancement adds a whole new dimension to the concept of technological progress, since it has the potential to alter the essence of what it means to be human. This is what makes a broadly inclusive public discussion on this topic such an urgent social task.

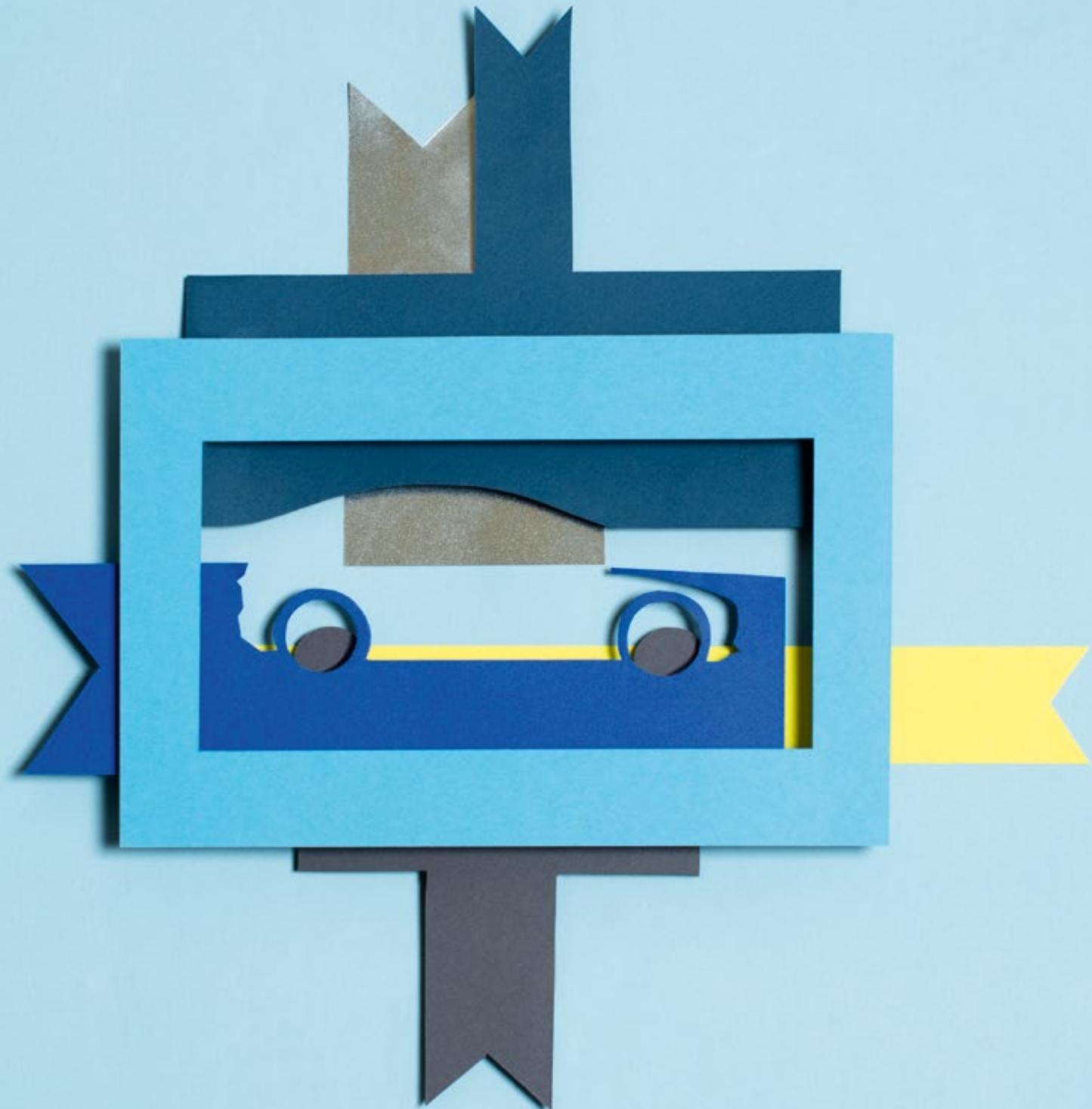
The study presented here is intended to raise initial questions and provide information on attitudes toward a number of new technologies of human enhancement. Though these attitudes are likely to evolve over time, they certainly offer a valuable starting point for further discussion.▪

### Sources:

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<https://blogs.scientificamerican.com/observations/what-americans-think-of-human-enhancement-technologies/>





# System Integration as a Major Strategic Advantage in the Automotive Industry

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**Oliver Zipse**

Member of the Board of Management  
BMW AG

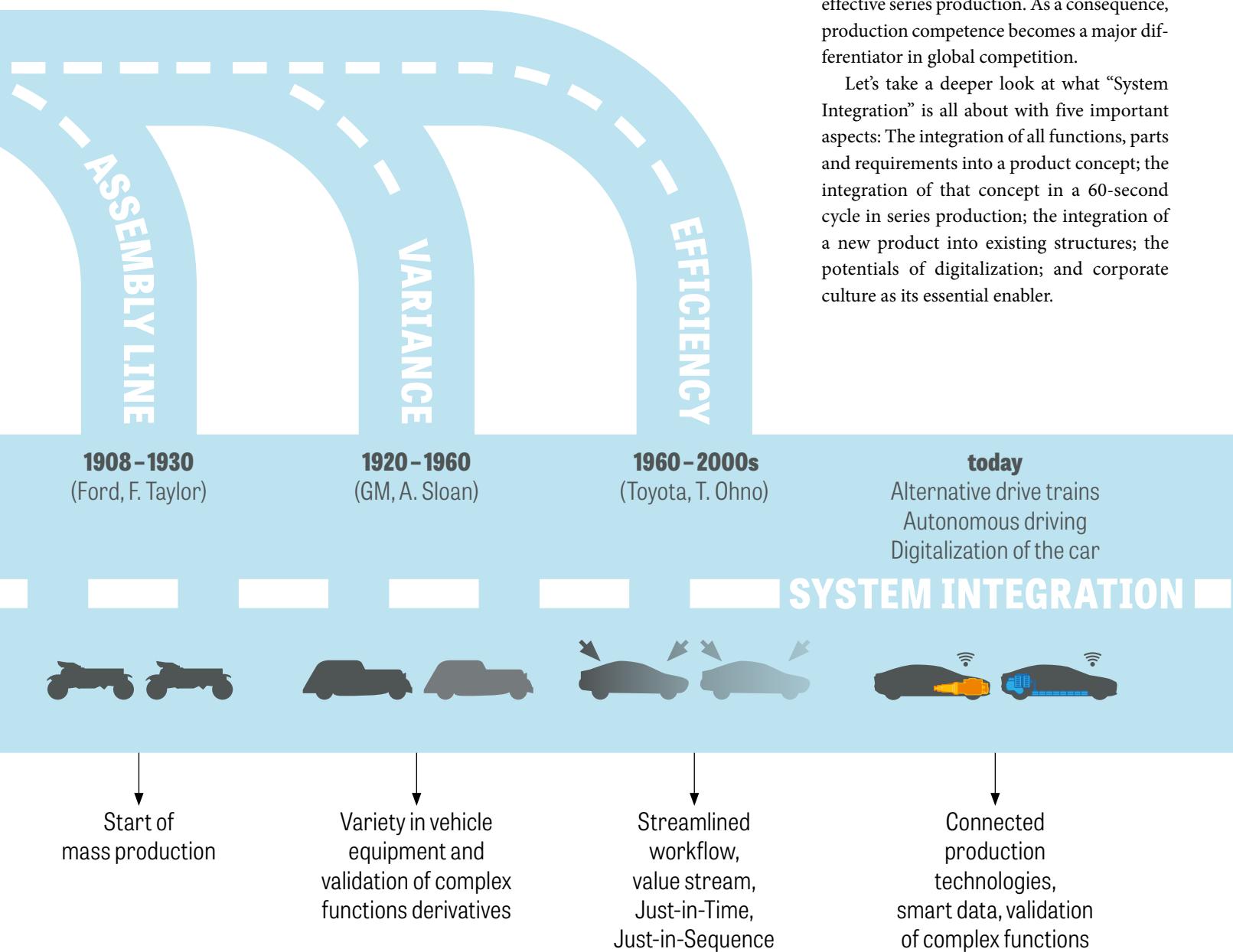
## The evolutionary steps of car production

In the automotive industry, production has always had a crucial role in making mobility affordable and enabling more and more individualized products. The basic requirements have not changed significantly over the last century: production provides technology, processes and manpower to realize a stable output of cars. However, the way production fulfills these requirements has evolved in some major transformative steps. In 1908, Ford started producing cars in series with the process principles of Frederick Taylor. In 1913, he introduced the first assembly line. It was the start of automotive mass production and cars became affordable. Beginning in the late 20s, GM President Alfred Sloan made the next big step and brought variance into the production lines. Different cars with different colors and setups could now be produced. Since the 60s, the efficiency orientation and “zero waste” philosophy of the Toyota Production System has changed the way automotive production is organized. Major parts of the value creation have been outsourced to suppliers. The principles of lean production and the value stream organization of Just-in-Time, Just-in-Sequence have been widely established in series car production worldwide.

## System Integration

Today, the next major step is emerging. At the BMW Group, we call it “System Integration”. It is the answer of production to the megatrends that influence individual mobility: alternative drive trains, autonomous driving and digitalization. These megatrends lead to a rising complexity of the car and, at the same time, to increasing requirements to secure an effective series production. As a consequence, production competence becomes a major differentiator in global competition.

Let's take a deeper look at what “System Integration” is all about with five important aspects: The integration of all functions, parts and requirements into a product concept; the integration of that concept in a 60-second cycle in series production; the integration of a new product into existing structures; the potentials of digitalization; and corporate culture as its essential enabler.



## Product integration

The complexity level of a car is in many regards comparable to that of an airplane. However, an average driver must be able to operate it. Hence, when designing and developing a car, many things have to be considered. A user-friendly interface, connectivity as part of the digital every-day life, high quality, emotional design, driving dynamics and affordability for the target group are key to customer experience. There are also different regulations globally regarding active and passive safety and the important topic of drive-train emissions. If a product does not deliver on each of these requirements, it will not be able to succeed in the market.

With upcoming autonomous driving functions, an entirely new level of complexity has to be integrated into the car: a combination of camera systems, LIDAR, RADAR and ultrasound sensors that together create an accurate and real-time picture of the car's surroundings. Only then, and with the help of HD maps, can artificial intelligence navi-

gate the car driverless through traffic. Of course, the "devil is in the detail": for example, the integration of sensors and cameras into car design. Sensors are going to be in literally every corner of the car. Placing a big sensor unit on a car roof and sticking others on the side of the car would probably do the job and save some headaches in product integration. But the design would not meet the taste of the customers – and design is an important purchase reason. However, integrating the sensors into the car design comes with some challenges, for example the reflection of the RADAR from materials around it, even from the car's own paint. In this case,

integration competence ensures that form and aesthetics present no disadvantage: all sensors can work reliably in a series product and are blended with the car design. And of course, integration should always follow a basic principle for the safety of customers and other traffic participants: technology should not be rushed to the market when it is not ready yet. Customer safety is non-negotiable and has to be ensured in every single car produced.

## Process integration

Bringing a product concept into series is the second element of "System Integration". On average, efficient car plants have an output of around 1,000 cars per day. That means one car every minute. Hence, production is basically organized in 60-second cycles where the car is manufactured piece by piece. After a vehicle body leaves the mostly automated production in the pressing shop, body shop and paint shop, thousands of parts from hundreds of suppliers are delivered just-in-time and just-in-sequence to the assembly line where they are integrated into a working product by well-organized and trained employees. As the overall complexity of a car and its functions are increasing more and more, it is crucial that the production of a model is considered from the early stages of

development on. It is one thing to build a working product once. It is something completely different to scale it. This requires a strong alignment between development, purchasing and production. As a result, product development and production will become even more synchronized and integrated. This extends to suppliers for mutual benefit, where more than 70% of total value creation takes place. It is important to have comprehensive evaluation competence of every component to understand what a supplier does and what he needs. Because without the necessary

parts and components in the required amount and in good quality, production is not possible.

To better align product development and series production, the importance of the total vehicle function will increase even further. It ensures not only that a product concept can be produced later, but also the validation of quality and functions of every single produced car. This validation has to be implemented into the overall production process – and the higher the complexity of the car is, the greater the importance of time-efficient and clever validation solutions.

Against this background, it is important to empower a constant exchange of experience even throughout a worldwide production network so every plant and department can benefit from effective innovations and use cases. This is especially valuable during the preparations for a new model launch.

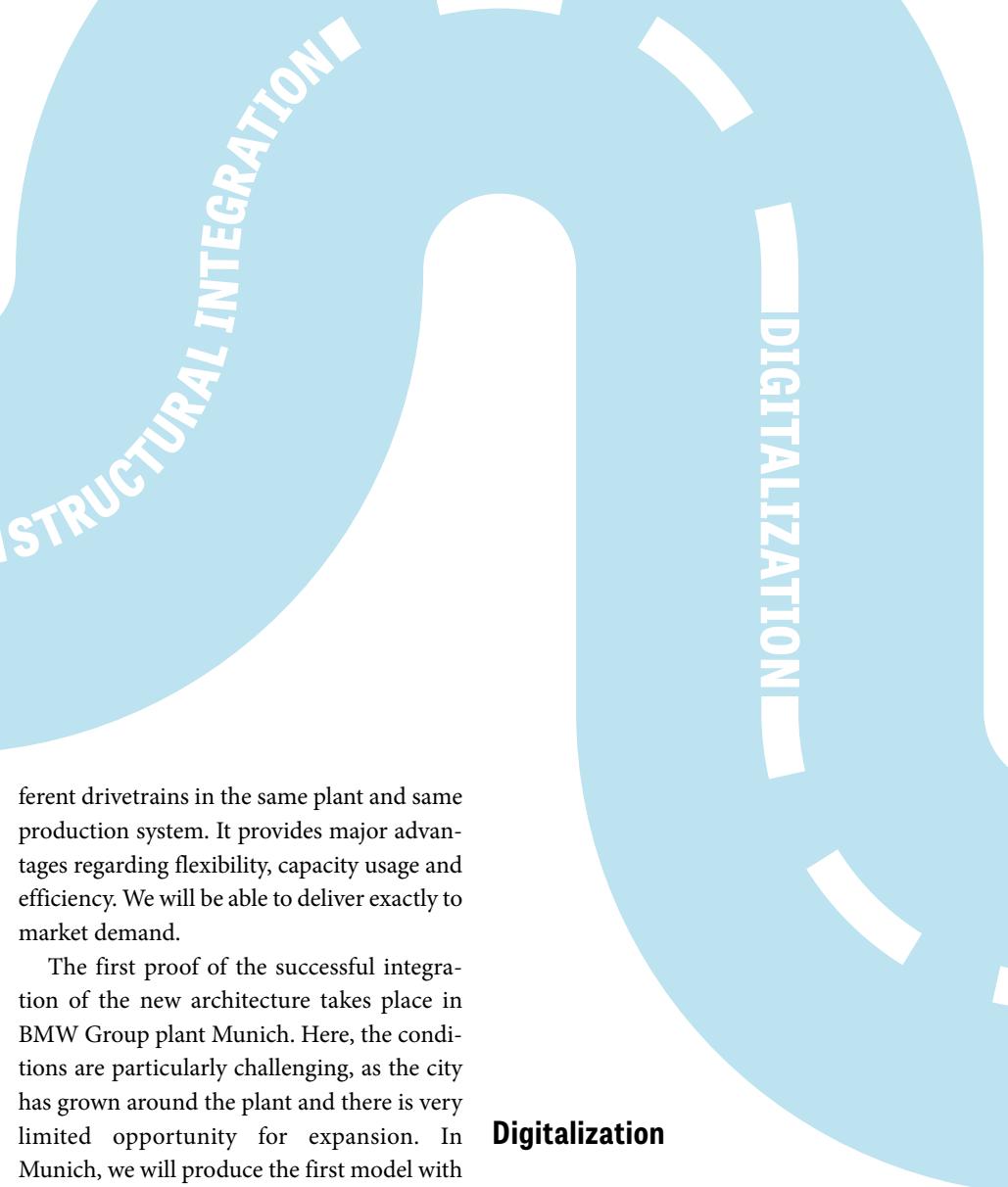


## Structural integration

When a new model is introduced, a few fundamental questions have to be considered. Can existing production structures be used to build it? How much money needs to be invested to integrate that new model? The reason is that production structures are very capital-intensive – a car plant is a billion Euro investment. This makes the integration of a new product into existing production structures the third element of “System Integration”. A good example is electro mobility.

In 2013, the BMW Group started producing the fully electric BMW i3. The car is based on a unique architecture and purpose built as a mega city vehicle. To bring it into series, the BMW Group built entirely new production structures in Leipzig. The company invested a lot into this project because it was the icebreaker for the acceptance of electro mobility – for customers, employees and management alike. This early advance into sustainable mobility yielded crucial experience with electric drivetrains and new materials like carbon fiber. But the stand-alone production has also resulted in limited flexibility against market demand. For the future, another approach is needed. In 2025, the BMW Group expects the share of electrified cars to be 15 – 25% of total sales. So as electro mobility becomes part of our core business, we want to achieve a high level of integration that allows for easy scalability.

In a first step, we introduced plug-in hybrids for most of our model series and have produced them in several plants alongside conventional-powered cars. In the next step, we are designing our new vehicle architectures in a way that they can be fitted with all drivetrain variants: fully electric, plug-in hybrid, or only combustion engine. Having a common architecture for all drivetrain variants allows us to produce models with all dif-



ferent drivetrains in the same plant and same production system. It provides major advantages regarding flexibility, capacity usage and efficiency. We will be able to deliver exactly to market demand.

The first proof of the successful integration of the new architecture takes place in BMW Group plant Munich. Here, the conditions are particularly challenging, as the city has grown around the plant and there is very limited opportunity for expansion. In Munich, we will produce the first model with the new architecture that can be fitted with a fully electric drivetrain or with a combustion engine.

Cultivating the competence for a smooth integration is a very valuable asset. The ultimate goal when integrating a new product is not only to minimize investment costs, but also to minimize integrational losses. A single day without production in a plant results in 1,000 cars less to sell. Multiplying that volume with the average price of a premium car gives a clear impression why integrational losses should be kept as low as possible.

## Digitalization

Integration into a product concept, into series production and into existing structures: These three steps of “System Integration” are supported by two important enablers, namely digitalization and corporate culture.

The possibilities of digitalization seem to be unlimited. In production, where quality, cost and output are the goal, a clear focus on effectiveness is necessary. As digital applications become more and more established on the shopfloor, the agile working methods of software development are applied as well. That means small “BizDevOps” teams, flexi-

ble project budgets and topic prioritization, a shift of decisions from top management to operational level and a higher speed of implementation. The motto is fail fast, but learn fast – as long as useful results are provided within short periods of time.

An Intranet of Things platform supports this goal on the technical side by lowering the entry barriers for employees regarding sensor installation and analytics software with a self-service approach. The IoT platform provides a cloud for data storage and enables data processing and machine learning. It is the backbone for sensors that provide live information about product quality, maintenance of machines or production status. To avoid bottlenecks in data volume and data transfer, edge computing is used as an additional layer in proximity to the applications on the shopfloor. It presorts data for the cloud and transmits only relevant information.

It is crucial to combine IT skills with engineering experience as installing a sensor or running an analytics application becomes a common every-day process. Machines can “talk” to us – but it is still up to us to make sense of what they say and to draw the right conclusions. In a smart factory, the smartest beings will remain our employees. They ensure that big data becomes smart data, using the means of digitalization where it makes the most sense. Digitalization provides powerful tools to handle complexity but yields its true potentials only when you combine it with human creativity and problem-solving competence.



## Corporate culture

And this competence is a question of mindset first. It requires out-of-the-box thinking. Clever solutions often involve adjusting planning assumptions through close cross-department cooperation. They rely on sharing expertise, lessons learned and ideas. They rely on the commitment of everyone involved. It requires fighting for the last inch when it comes to reorganizing a production line and a strong will to find better solutions every day. It builds on a broad base of skilled experts with long-time experience and constant training. Essentially, the goal is a culture of collaboration over the whole process chain, marked by the core values responsibility, appreciation, transparency, trust and openness. These values form strong links between the engineering experience of decades and the merits of new innovations and digitalization.

## CORPORATE CULTURE

The capability of realizing sophisticated series products is a great competitive advantage in a time where several megatrends are impacting the automotive industry. Whether you call it “System Integration” or something else: to bring new technologies on the road, automotive production is about to take another evolutionary step. ■





Hans-Ulrich Engel

CFO  
BASF SE

# Thoughts on the Security of European Natural Gas Supply

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Natural gas is a major component in the energy mix and a key feedstock for the chemical industry. It is the cleanest of the fossil fuels, with 41% less greenhouse gas (GHG) emissions than coal and 23% less than oil, and should thus be substituting coal and oil to the greatest extent possible to help achieve GHG reduction targets.

In 2017, Europe consumed 500 billion cubic meters (bcm) of natural gas, while the figure for Germany was 89bcm; domestic production accounted for 25% and 8%, respectively. Domestic production in Europe dropped from a high of 270bcm in 2001 to 125bcm in 2017 and will drop further to 60bcm by 2030. Europe's largest gas producing field in Groningen will stop production in 2030. BASF is Europe's biggest industrial gas consumer, with a total demand for feedstock, power and steam equal to that of Denmark. So much for the facts.

## Declining domestic production leads to rising import demand

On this basis, one would think that the conclusion would be logical: The higher the availability of gas, and the better the gas in-

frastructure and supply security, the better it would be for Europe and for Germany. But unfortunately, life isn't that simple.

Due to the steep decline in domestic production, Europe will have to increase significantly its natural gas imports. Luckily, there are sufficient opportunities to fill the gap. The most important options are pipeline gas, in particular from Russia, and liquefied natural gas (LNG). Russian gas is abundantly available and competitive. The commissioning of new and modern import pipelines (e.g., Nord Stream 2, EastMed) can increase the liquidity of Central European gas trading hubs and further diversify the European gas portfolio. Competition on the European market will be further intensified by increased imports of LNG to Europe. Together, these import options add to the strength and bargaining power of the European gas consumer. Despite the clear advantages of a diversified

European gas market, some countries are opposing the construction of new pipelines like Nord Stream 2 due to their own specific interests. Even the European Commission, which should be interested in a highly competitive market and in achieving its climate targets, is trying to hinder Nord Stream 2.

## Natural gas for Europe: New sources of supply

With a share of 23%, natural gas is crucial for the European energy mix. Natural gas consumption in the EU-28 is expected to increase from an average of 470bcm for the years 2015 to 2017 to somewhere between 480 and 520bcm in 2030. Furthermore, the EU-28 aims to reduce its CO<sub>2</sub> emissions by 40% by 2030 compared to 1990 levels. Renewable energies will play an important role

here, but are not yet sufficiently available and secure. On the road to achieving the EU's ambitious emission goals, natural gas can play an important role and replace coal in the energy mix, even though, in future, domestic production will only be able to meet ever smaller proportions of the demand. Gas production in the EU-28 is forecasted to drop from around 130bcm today to 60bcm by 2030. The reasons for this are the depletion of conventional fields (including phasing out of production at Groningen by 2030) and public reservations about unconventional gas production in Europe. To close the growing import gap for natural gas, there are two main alternatives: pipeline gas and LNG.

### It's obvious: Pipeline gas is efficient

Today, EU-28 gas demand is mainly covered by pipeline-based imports from Russia (165 bcm), Norway (115bcm) and North Africa/Caspian Region (45bcm). LNG-based gas imports provided 60bcm to the EU-28 market with an unused regasification capacity of 150bcm in 2017. As of today, the import alternatives for the declining domestic production are limited: Russian gas is sufficiently available, but the pipeline capacity is almost fully utilized; Norwegian gas production is expected to decline, and LNG is comparatively expensive. In addition, one has to consider the urgent need of refurbishment of significant parts of the Eastern European transmission system and the associated reduction of capacities. Consequently, new pipeline infrastructure for Russian gas is necessary.

### DENMARK

In the last years, the European gas market has shifted from a seller's market to a buyer's market. Due to the intensifying competition between LNG and pipeline gas, the European gas market will remain a buyer's market for the foreseeable future. Consequently, customers will benefit from competitive prices. In transparent commodity markets, the purchase price is the dominant factor. Due to the existence of a pipeline grid in comfortable distance

and low production costs, Russian gas has price advantages over LNG in the short and long term. Per IHS Markit, Russian pipeline gas has landed costs in North West Europe of \$4 to \$6/MMbtU, whereas U.S. LNG has landed costs of \$7 to \$8/MMbtU.<sup>1</sup>

The recent winter again proved the role of Russia as a reliable supplier to European consumers. When it was very cold in February/March, no one else could meet the increased demand for natural gas, additional LNG or Norwegian gas was not available. Russian gas was urgently needed to keep European homes warm and power plants running. Overall, increasing LNG deliveries are positive in diversifying natural gas imports to Europe, but these gas volumes will not be sufficient to meet Europe's need to fill the widening import gap. Experience shows that Europe is the market of last resort for LNG. This was also evident last winter: Even though spot prices rocketed in the European market, LNG vessels from the United States went to Asia rather than to Europe or did not leave the United States at all, due to higher domestic demand caused by the long and harsh winter.

Due to Russia's geographical proximity to Europe, Russian gas is not only a competitive energy source for Europe's economies and consumers. It also has environmental advantages compared to LNG. The GHG intensity during the pipeline transport from Siberia to Europe via Nord Stream 1 or, in the future via Nord Stream 2, will be significantly lower (2.4 to 4.6 times) than in usual LNG value chains.

<sup>1</sup> Source: © 2018 IHS Markit. All rights reserved. The use of this content was authorized in advance. Any further use or redistribution of this content is strictly prohibited without prior written permission by IHS Markit.

### SWEDEN

Lubmin  
near  
Greifswald

- - - Nord Stream Route
  - Nord Stream 2 Route
  - - - Territorial waters border
  - - - Exclusive Economic Zone Border
  - - - Midline between Denmark and Poland
  - Landfall
- (schematic map)



**Controversial discussion of Nord Stream 2**

Over the last months, the Nord Stream 2 project which is intended to transport gas from Russia to Germany became the subject of an intense political debate. The 1,220-kilometer-long Nord Stream 2 pipeline, a €9.5 billion investment, is expected to have a total capacity of 55bcm per year and is to be commissioned at the end of 2019. With a capacity to supply up to 26 million households, Nord Stream 2 is necessary to compensate for the decline in European gas production and, thus, to contribute to the EU's long-term energy security. The project company (Nord Stream 2 AG) is owned by Gazprom and is financed without any EU or government subsidies. Five European energy companies – French ENGIE, Austrian OMV, Dutch-British Shell and German Uniper and Wintershall – support Nord Stream 2 AG as financial investors with up to €950 million each. Like Nord Stream 1, the new pipeline will connect Europe with the gas fields in northwestern Siberia via the Baltic Sea. This Northern route is economically and ecologically more advantageous due to the shorter distance and lower CO<sub>2</sub> emissions.

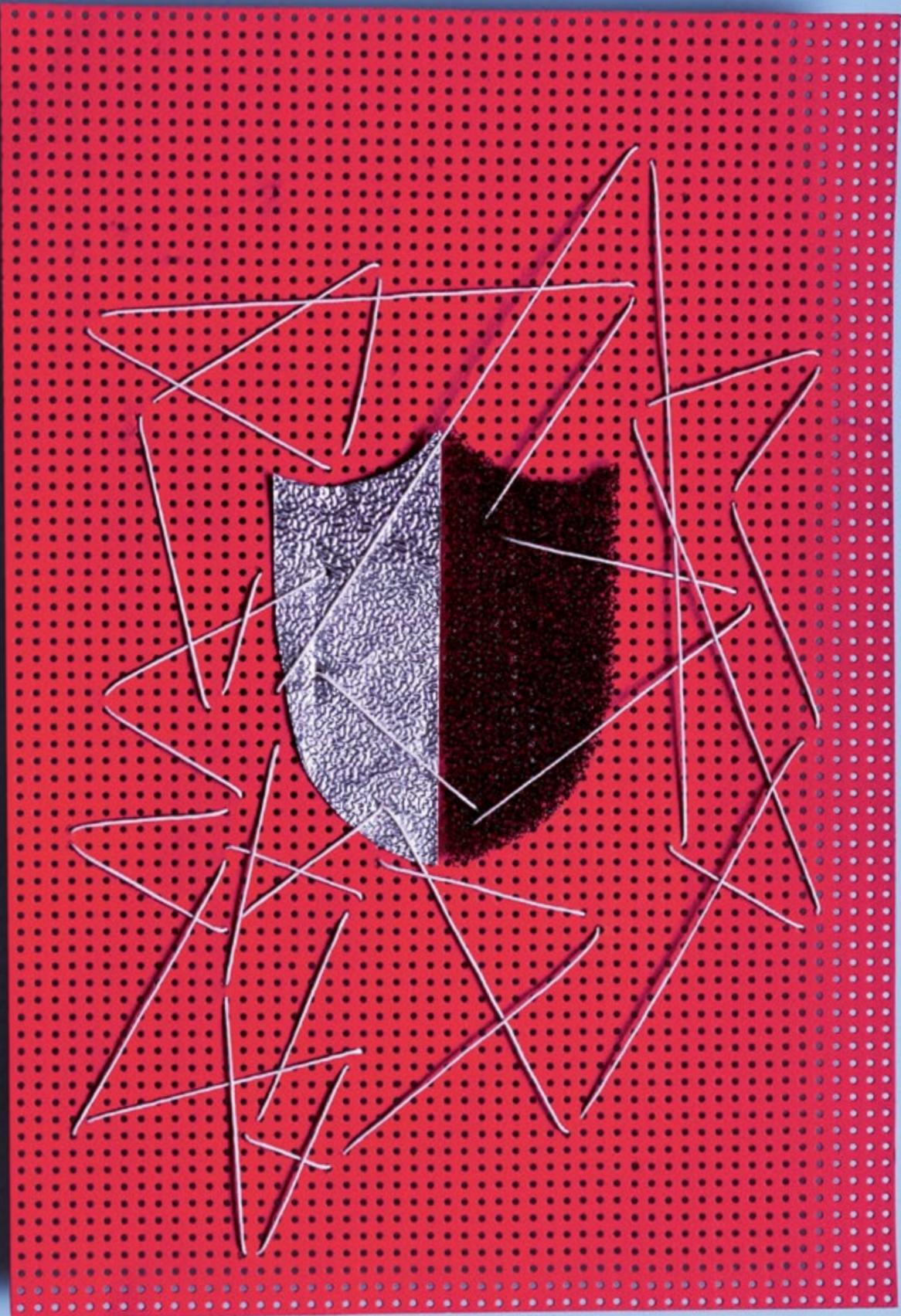
#### LITHUANIA

The political discussion about Nord Stream 2 is heated because of diverging geopolitical and country-specific interests. Several countries are opposing the project: Ukraine fears a decline in their transit revenues; Poland and the Baltic States want to become independent of Russian gas supplies. Besides Ukraine, the strongest opposition comes from the United States, which claims that the project would increase Europe's dependence on Russia and thus endanger European security. However,

the main grounds for opposing the project is the objective of the United States to develop Europe as a sales market for the shale gas it produces. The U.S. Sanctions Act of August 2017 openly states the goal of increasing sales of U.S. LNG to Europe. Even the European Commission, which should be interested in supply security and a highly competitive market, is trying to hinder the Nord Stream 2 project by revising the European regulation for onshore pipelines, so that it applies also to offshore pipelines. Previously, the European Commission had claimed that Nord Stream 2 requires a legal framework in the form of an intergovernmental agreement between the EU and Russia or wanted to apply the EU regulation for onshore pipelines directly to Nord Stream 2. All attempts have been rejected out of hand by the Legal Service of the EU Council.

#### Customers benefit from single and transparent EU gas market

In conclusion, we should consider that a diversified gas market (including a modern infrastructure) is a basic requirement for a competitive energy market and supply security in Europe. Access to natural gas via pipelines has contributed to European supply security for decades. Pipelines are therefore important to the European energy system and strengthen the power of European buyers. The EU has already made many efforts to link the previously independent gas markets within its borders and to create a single and transparent EU gas market for the benefit of European industry and consumers. New pipelines such as Nord Stream 2 and the expansion of the LNG infrastructure will strengthen this approach by creating additional options for the availability of gas and increasing supply security. After commissioning of Nord Stream 2, Russian transit through Ukraine should not end. All transit routes will need to be used to fill the widening European import gap.▪





**Gerhard Lohmann**

Chairman B3i and CFO Reinsurance  
Swiss Re

# Blockchain-based Risk Exchange – The Next Big Thing?

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Seven truths on Blockchain and its impact on re/insurance

1

## Mainstream's press Focus on crypto- currencies misses the point of Blockchain

In the 2016 Annual Summit poll, more than 70% of CEO/CFOs said they could not describe Blockchain technology's potential threat or benefit for their business models. This will have changed fundamentally by now. Blockchain technology has arrived in the mainstream of management

discussions and it is now taken seriously in boardrooms. Total funding for Blockchain-related ventures has seen a tenfold increase over the last five years, hitting the 1 billion mark in 2017.

Mainstream press still throws most attention on "noisy" cryptocurrencies when addressing Blockchain as a phenomenon. With this attention, a significant hype arose with Blockchain-related Insurtechs and Fintechs. Similar to 2001, when internet business models were at the height of attention, companies are quick to understand how to utilize Blockchain for their investors' communication strategy.

Blockchain however is much more than an infrastructure for Bitcoin and other cryptocurrencies. To host a monetary infrastructure for cryptocurrencies was the first but proba-

bly not yet the most suitable application of Distributed Ledger Technologies (DLT). Instead, the future of DLT looks much more promising in a 'closed' B2B context: Common standards and utilization are decided centrally instead of relying on adoption by individual users. The solutions are tailored for specific B2B use cases. As open DLT networks partly struggle with exponential demand for calculation power, storage capacity and energy consumption, semi-private networks can be optimized for performance. In addition, funds are available quickly if the underlying business case looks promising.

Open source Blockchain projects are often compared to the internet. In the long run, this might be the case. In the mid-term, however, the success of B2B networks is more likely.

2

## Blockchain technology is much more than secure cloud storage

Technologically, Blockchain is a decentral ledger to share information among multiple participants. This alone could also be accomplished via encrypted cloud storage. But to build a business model, several other technological specifics are key: a “consensus mechanism” ensures that only “one version of the truth” exists; this is paramount to establish trust and contract certainty between counterparties. Common standards – usually implemented via integration layers between Blockchain and legacy systems – ensure that different corporate processes and data sets can interoperate. And more than anything, smart contracts are key. They are the vehicle to capture all rules relevant to a business model: information exchange, transactions, payments, etc. are programmed into smart contract code to allow for automated operations.

3

## Tangible business concepts emerge across industries beyond the ico-driven buzz

Despite these characteristics, Blockchain is still often only a solution in search of a problem. Even though the technology has created much awareness, many DLT applications probably could also run on (a combination of) other technologies. The weekly surfacing of new cryptocurrency ICOs (Initial Coin Offerings) is sustained more by investors hunting for quick profit than by sound business ideas.

But in my view there are some major reasons why Blockchain will make a profound difference to business models going forward, bearing the real option for a true business model game change. Two of the technological capabilities of Blockchain technology stand out, given their fundamental economic impact:

1. **Integration of data sets:** Blockchain allows the sharing of data while retaining ownership, privacy and control over it. In today's economy, where Google-sized data sets accumulate in multiple industries, secure and selective disclosure of information will become a core capability for a technology to qualify for a business model game changer.
2. **Automated tradability:** Shared, encrypted storage makes transactions secure and removes counterparty risks. This enables the exchange of assets (and liabilities) without an additional intermediary, e.g., a notary, adjudicator or broker. When both parties have met obligations captured in smart contracts, ownership rights automatically transfer.

In addition, the momentum surrounding Blockchain has increased the willingness to think jointly about technology. Joint ventures now seem tangible that were unimaginable in the past. The excitement to utilize Blockchain-related opportunities is equaled only by the fear of missing out on an important development.

**SOLUTIONS TO ESTABLISH RISK EXCHANGES HAVE FAILED IN INSURANCE, AS THEY REQUIRED CENTRAL CONTROL OVER DATA TO OPERATE, FORCING THE MARKET PARTICIPANT TO REVEAL TRANSACTION-RELATED PREFERENCES IN AN UNCONTROLLED FASHION.**

4

## Risk exchange will be a game changer For reinsurance by more effectively bringing risk to the best owner

Looking at insurance, Blockchain could be the facilitator for a large-dimensional shift. Over decades, the reinsurance value chain has remained stable, building on trusted relationships among insurers, reinsurers and brokers. However, the traditional multi-stage process to transfer risk from policyholders to capital markets is costly, manual in many ways and efficient only if historically relevant technological boundaries are accepted. Various intermediaries and complicated transaction procedures are involved, leading to high transaction costs, asymmetric information and often inconsistent data. As a result, risk might not even be allocated to the 'best owners'. In addition, high administrative costs are more often seen as a barrier to solving one of the greatest issues in modern insurance today: to close the protection gap, e.g., in developing countries.

Looking at stock exchanges, it becomes apparent that technology has facilitated much more efficient ways to exchange economic rights. Although insurance risks are not as homogenous as typical financial products traded on stock markets (standardization in

insurance contracts has increased materially over the past decades though, partially driven by the introduction of the ACORD standard, and 'blockfinder' technologies allow for contract clause identification in unstructured data research), Blockchain technology by its core features bears the opportunity to change currently fragmented processes of connecting risk with capital dramatically. Why did it not happen earlier? Mainly due to the "man-in-the-middle" problem: Solutions to establish risk exchanges have failed in insurance, as they required central control over data to operate, forcing the market participant to reveal transaction-related preferences in an uncontrolled fashion. In a central ledger environment, every transaction detail becomes transparent to the intermediary, causing issues of trust, security and independence.

What is different today? With the ability to securely integrate and transfer data sets to enable automated transactions, Blockchain can provide the infrastructure for a true insurance risk exchange: A trusted and secure network can now be established between risk owners and risk takers. Network participants can establish direct private connections with identical transaction details being shared in distributed ledgers. Smart contracts enable frictionless execution of risk exchange transactions. In such a risk exchange, commercial enterprises seeking risk transfer solutions, reinsurance players, brokers and capital market investors could directly transact risk products without reference to the "man in the middle".

Such an ambitious vision might be compared to full autonomous driving in the automotive industry, as it seems equally disruptive. Also, similar to autonomous driving, many obstacles are still in the way before a risk exchange can be realized. But first steps have been taken: multiple Blockchain-related Insurtechs and joint ventures are exploring ways to shape the reinsurance value chain. Together with banks, the reinsurance industry is the most advanced in adopting Blockchain technology. Nevertheless, even though markets are not short of venture capital these days, few have overcome the hurdle of going operational and gaining critical size.

# 5

## B3i is at the ForeFront of exploring Blockchain For re/insurance and becoming the leading exchange of insurance risk

The assessment of how Blockchain's capabilities can enable business models is ongoing within many companies right now. From these considerations between Aegon, Allianz, Munich Re, Zurich and Swiss Re in the year of 2016, the idea of B3i has evolved.

B3i is the insurance industry's leading Blockchain initiative today, driven by brokers, insurers and reinsurers. The ambition of B3i is simply to become the market leading exchange of Blockchain-based insurance risk. More practically, the recently founded B3i Services AG based in Zurich, Switzerland, will operate a Blockchain-based infrastructure connecting multiple re/insurance industry players to offer different risk transfer solutions. From 2019 on, the network will facilitate transactions between insurers and reinsurers. A significant improvement in process automation, data quality and contract certainty is expected as an immediate benefit for its users.

With the B3i ecosystem evolving, many other value-creating applications and products will find their ways. In the upcoming months, the focus will lie on building the company and reaching out to investors in an investment round that will run until the end of September.

# 6

## *THE AMBITION OF B3i IS SIMPLY TO BECOME THE MARKET LEADING EXCHANGE OF BLOCKCHAIN-BASED INSURANCE RISK.*

To succeed, B3i needs to achieve critical size by offering true innovation to its large member base

In the early days of the internet, the race for users was intense. Facebook, Amazon, eBay, Airbnb, UBER and others finally succeeded, relying on the better business model, better partners, stronger client growth and stronger capitalization. For different economic categories, one platform finally emerged in a "winner takes it all" way. Building on these experiences it is key to attract volume quickly. It's the network effect, stupid!

B3i is best positioned to generate this network effect and build a successful B2B platform. It can rely on a first mover advantage and – already now – is the strongest global insurance consortium: with its 15 founding members and 23 market testers, many of the industry's leading companies have committed themselves to the idea. This allows aligning B3i's product roadmap to the needs of its investors, establishing a tested pricing mechanism and many other aspects of the business model. The members of B3i alone represent a significant share of annual re/insurance premiums already. Having sufficient volume on the platform will attract additional companies to join and benefit from the ecosystem. Re/insurance users will be able to access new markets and new risk data pools. And benefits also exist outside of re/insurance: B3i aims at establishing an open ecosystem to provide "plug-and-play" risk solutions to address a broad range of business needs. Due to this wide scope, industrial corporations and their captive insurance entities are also among the target investors. These potential future shareholders have the opportunity to influence the product portfolio of B3i to further adapt B3i's services and applications to the specific needs of captives.

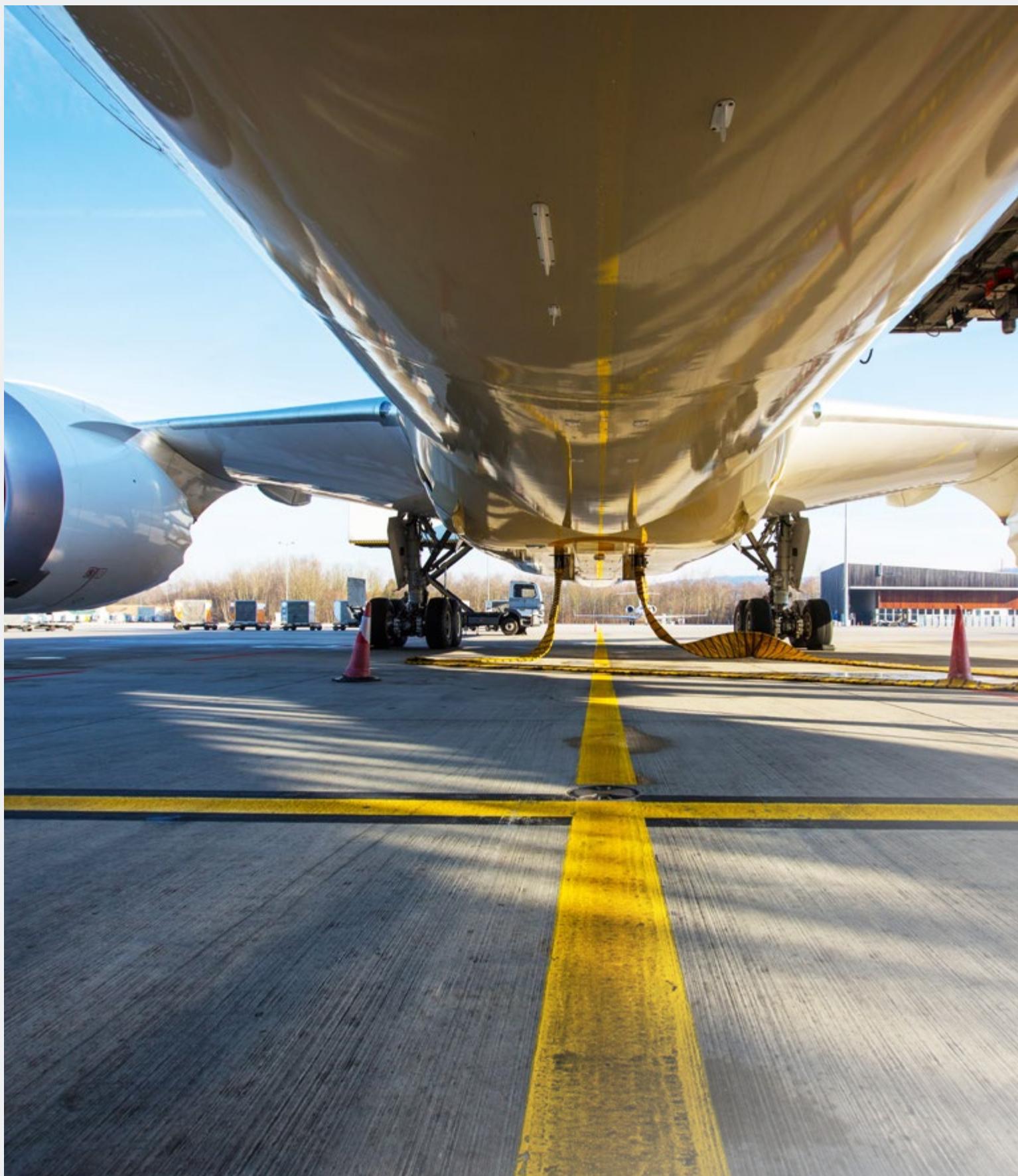
*B3i AIMS AT  
ESTABLISHING AN OPEN  
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SOLUTIONS TO ADDRESS  
A BROAD RANGE OF  
BUSINESS NEEDS.*



## Blockchain is on the rise

It is still early days for Blockchain-based business models. Especially with regard to the integration with other technologies such as IoT, AI or big data analytics, it is easy to imagine many heavily disrupting models. Still, there are several critical hurdles on the way towards realizing business models, including not just gaining critical volumes but also getting it right in terms of technology, user incentives, management and regulation, to name only a few examples.

I believe that B3i with its “by the market for the market” philosophy has made a significant step forward to unlock meaningful network effects, and is in a strong position to capitalize on Blockchain’s potential to significantly shape the industry. True innovation comes from successfully distinguishing noise from signal and focusing energy on the right strategic option. Although it is a mid-term bet, Blockchain bears the potential to become one of the “next big things” in enabling new and innovative business models. ▀





In an **interview** with CNN's Emerging Markets Editor and Abu Dhabi based anchor, **John Defterios, Sir Tim Clark**, President of Emirates Airline since 2003, after belonging to the founding team of the Airline as early as 1985, talks about the airline's current situation and the outlook for the future, especially with regard to the purchase of 40 Boeing 787 aircraft, which the airline completed at the end of last year.

“IT BECOMES  
MORE  
CHALLENGING,  
BUT NOT  
IMPOSSIBLE...”

# F

or decades, Sir Tim has been closely associated with the aviation industry. First at British Caledonian, later as a route planner at Gulf Air, before finally coming on board with the core team of Emirates over 30 years ago and since then being instrumental in making the company one of the world's most successful airlines. 2013, Sir Tim was named Person of the Year by Aviation Week & Space Technology magazine and appointed Knight Commander of the Order of the British Empire (KBE) in 2014.



**Sir Tim Clark** (left)  
**John Defterios** (right)

**John Defterios:** Sir Tim, let me first ask you a question about the purchase of the 787. Most people didn't expect anything like this. Is it an affirmation of the technology of the 787 and the flexibility on point to point travel that led to this commitment in such a large way at Emirates?

**Sir Tim Clark:** Well, I think it recognizes, as you say, the technology and its versatility. Besides, it fits into our network. Don't forget that the delivery will take place in 2022, where we see more and more 2nd or 3rd level points being brought into the network. And the 787 is a perfect fit for all of those. The Dreamliner will retain 5% of our markets today, without having to stop at all.

**John Defterios:** In light of a single digit passenger growth in the last year, we were wondering why you're expanding your fleet.

**Sir Tim Clark:** Well, we have quite a few aircraft retiring when the new airplanes are being delivered, but we've faced a flat lining of demand for all the reasons out of our control. We really think it will pick up and Emirates will continue to grow its business. Particularly, as we have now cleared our relationship with Fly Dubai, which has already produced tens of thousands of passengers that have started to fly across the two carriers, and as a result of that, we believe that this aircraft will be very gainfully employed on a multitude of new destinations as well as existing destinations. So, it gives us far more in our arsenal to deal with the type of segmentation demand that we are looking at in the next decade.

**John Defterios:** I call it constant chaos, but economic embargo on Qatar, laptop ban, terrorist activities in Europe, all the developments that influence traffic growth here, and you still earned \$415 million in the first half of the year, after a bad year.

**Sir Tim Clark:** That is correct.

**John Defterios:** How did you do it?

**Sir Tim Clark:** Well, we tailored everything. We cut our cloth according to the demand, we had to deal with it. Don't forget, Emirates has been at it for 32 years, we have an international market framework in which we operate, and we have had to deal with all sorts of things over the last 30 years and were kind of getting used to trauma, whatever that may be: geopolitical, economic, terrorist, call it what it is, so we are getting better at it. Apart from the reasons you have given, we must also mention the higher price of oil, but, as I said, we all must deal with it. If you are in this business, you must be able to grow the business. And some of the things you have seen today with the new 777 and the announcement of the 787 order sends out a clear message: that we are here to grow our business and will stay in the business for a long time, and profitably so.

**John Defterios:** What does an oil price between 50 and 65 dollars per barrel mean as a new standard for consumer confidence and how will traffic be affected by it? How do you deal with this difficult framework?

**Sir Tim Clark:** Well, that's interesting indeed, because obviously, when oil went down to \$40, there was a huge economic downturn as a result. All the states in the Gulf Cooperation Council produce oil and it's the primary source of income. Because of that, there was a cascading effect on demand. As the oil price comes up again, there is a revitalization of interest and a revitalization of those traffic segments. More money comes into the states, so work starts through the supply.

**John Defterios:** Just that difference is interesting, just that difference between 40 and 60 dollars.

**Sir Tim Clark:** Actually, it is even up to 63, and that makes people wonder whether it's going to stay there, but I would say it will settle at about 55, 50 or 55, in the next 18 months.

**John Defterios:** Everybody is looking at the political reforms, and economic reforms of course, in Saudi Arabia, but although there is virtually no growth, Saudi Arabia is still the largest economy in the region. How does that affect your traffic and how concerned are you about the most recent crackdown of corruption?

**Sir Tim Clark:** I don't comment on what happens in Saudi Arabia. Saudi Arabia is a very important market to us. This applies to both the religious markets that we serve extensively, as well as to the business market which is still very robust. We are Fly Dubai partners serving a multitude of destinations within Saudi Arabia, so we do not believe too much in downturns. To be honest, I'm not overly concerned as things move on in Saudi Arabia, hopefully for the good.

**John Defterios:** In recent years we have seen single-digit growth figures for all gulf carriers, which leads some experts to consider whether these airlines may already have passed the zenith.

**Sir Tim Clark:** Well, I think they have to look at our history and they would realize that Emirates in many times and periods in its past has had to adjust its capacity, its growth and its network to take account of major geopolitical or economic turbulences. So, this is nothing new to us.

This has just been a period in our history where we have done just that and just as in the past we will bounce back and grow our business successfully and as voluminously as we did in the past. Just wait until we get by the next few years, just wait until the 2020 strategic plan is implemented and the annual number of passengers increases from 150 million to 220 million. Even though I probably won't be here then, I think many people will say in retrospect: "Well, that was probably not such a good comment to make."

*"WE WILL BOUNCE  
BACK AND GROW  
OUR BUSINESS  
SUCCESSFULLY AND  
AS VOLUMINOUSLY AS  
WE DID IN THE PAST."*



**John Defterios:** The Boeing 787 and the A350 from Airbus allow point to point travel from Asia to Europe; do you need to adapt yourself to that bridge being created by technology?

**Sir Tim Clark:** We had the same issue when the then newest 747 models were delivered in the late 1980s and it was said that soon nothing more would run over Dubai and we would lose out. Those who prophesied this to us then were as wrong as those who prophesied it to us today.

**John Defterios:** The other emerging markets in your region are coming on strong with their own plane orders. There's something in Iran and India merging. Turkey is obviously already there. It is said that imitation is the best form of flattery, but it is quite fierce competition, isn't it?

**Sir Tim Clark:** It's just one more of the things we must deal with. It's like any other factor that effects our trading conditions. Competition is one, of course. Of course, it becomes more challenging, but not impossible. We've just got to be smarter, we've got to use technology, we've got to use the right aircraft, we've got to get our segmentation right, the way we market those segmentation, reach the segments, and adjust our pricing policies, our product policies, our inventory management. So, may the best man win. We won't lose.

**John Defterios:** The final question here, what can you tell us about the collaboration between Emirate and Etihad which has caused much astonishment?

**Sir Tim Clark:** Well I'm guided by the people who employ me, Sheikh Ahmed bin Saeed Al Maktoum is chairman of the Emirates group, Emirates airline, the airport, Fly Dubai and a lot of other things. It was his initiative to get the two carriers in case of Fly Dubai and Emirates to work closer together and at the same time it was clear that there was a possibility that perhaps we should be looking to do something with it. Whether it will be the same as in the case of Fly Dubai, I don't know. I take guidance from my bosses. If they want to take it on, we can do a lot of things. I don't know whether they wanted to go so far, but there are things that we can do immediately without conflicting with competition rules and overseas markets and getting better value for both.

**John Defterios:** Thank you very much, I really appreciate you still had time for us.

**Sir Tim Clark:** It was my pleasure.▶

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