Europe: Digital Superpower? Or Second-Rate Peripheral Player?

Against the U.S. and China, Europe appears to lag in digital prowess. With a Brexit looming, this gap could only grow. Look closer, though, and the makings are there for a radical fix, both in Europe’s historical strengths and in its hotbeds of digital activity.
Executive Summary

The U.S. is the undisputed world leader in software. In the last 20 years, Asia Pacific has become the hardware epicenter of the globe. Where then does Europe stand in this digital landscape, as it looks to the east and the west?

Frankly, a distant third.

Of the top 20 global technology companies, exactly none are European.¹

None.

A generation ago, a futurist who had predicted this dire state of affairs would have been laughed out of the boardroom. “But we have ICL, Olivetti, Groupe Bull, Nixdorf, Nokia – the future is bright. The future is European….”

Wrong.

Europe (through missteps too numerous to recount here) became a digital desert as tiny start-ups in far-away places the average European had only ever vaguely heard of – Mountain View, Seoul, Seattle – became the household names that in 2019 fill every European home … Google, Samsung, Amazon.

Though Europe does retain some global technological muscle – SAP in business software, Siemens in industrial equipment and now Spotify in music streaming – these exceptional companies are the exception to the rule. Europe has a problem (and we don’t just mean Brexit). Europe – digital Europe – urgently needs a reboot that repositions it for the coming waves of digitization that will see a “D7” (a “Digital 7,” the successor to the G7) emerge – a D7 that will consist of countries (potentially regions) with a place at the top table of economic and geopolitical power.

European technology companies and policymakers need to take a series of steps that address structural flaws and emphasize strategic advantages to reposition Europe for digital dynamism. Execute on these steps, and Europe could enjoy a renaissance of growth and opportunity, charting a middle way between late-stage American hypercapitalism and Chinese digital command-and-control. Fail to reignite Europe’s creative genius, and the Fourth Industrial Revolution will be a non-European event.
The question, therefore, is how likely is this reboot?

In this paper, we examine the groundswell of entrepreneurial activity emerging across the European continent, both in some well-known places like London and Paris and in some less well-known ones, as well – Tallinn, Budapest and Manchester. Be it in gaming technology, cybersecurity, app development or blockchain, young European digital natives are beginning to develop companies with the potential to compete on the global stage and, in the process, make Europe a digital destination – rather than just a lovely place for a vacation.

To analyze these developments, Cognizant’s Center for the Future of Work partnered with the UK government-backed start-up network TechNation to understand where this innovation is happening and where new forms of technology and work are catalyzing across the region.

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Key findings of our research revealed that:

I **Europe needs to increase its number of start-ups (by a factor of five).** Start-ups, like good ideas, are the lifeblood of the digital economy. The ratio between successful U.S. and European start-ups, however, is 5:1. European financiers and policymakers need to recalibrate funding models to accelerate new company formation, create more risk-tolerant entrepreneurial environments, and lift regulatory burdens for small and medium-sized organizations.

I **London is Europe’s Silicon Valley.** The path to finance for Europe’s native start-ups needs to expand beyond the traditional economies of Northern Europe, where London currently dominates. With Brexit looming, Europe needs to establish a clear financial market for local start-ups beyond Northern Europe and provide a home for the ecosystems that develop in their wake.

I **The “heat map” of digital activity in Europe reveals a rich, fragmented landscape.** Networks of talent and technology are emerging at different rates. The UK is pivotal to Europe’s positioning around artificial intelligence (AI) and machine learning, while Estonia’s society flourishes because of an early commitment to blockchain and virtual reality. Eastern Europe offers a test bed for multiple digital applications, with a high start-up birth rate, an engaged network of tech meetups and the highest concentration of cross-state funding awarded by the EU.

I **Meetups play a powerful role in shaping digital ecosystems.** There are thousands of meetups taking place around Europe every single week, focusing on everything from ethics and AI, to virtual reality experiences. In addition to enabling software developers to engage around shared objectives, views and missions, these communities could also work to connect passionate technologists, business leaders and early-stage start-ups on shared knowledge platforms, allowing the technology and best practices to evolve at a rapid pace.

I **Now is the time for inspired policy at the EU level.** Political capital needs to be directed at architecting a truly innovative union that punches above its weight. Doing so calls for strong coordination at the state level to unify the region’s many pockets of digital activity, potentially resulting in the establishment of a new “digital capital” for Europe, in Eastern Europe. This will require bold regulatory moves to enable emerging industries to grow around emerging technologies such as AI, autonomous vehicles and advanced manufacturing, rather than be usurped by the U.S. or China. These decisions will profoundly impact Europe’s economies and shape the work people do.

Europe’s digital future lies in the watchwords associated with the continent, forged on the back of two world wars: openness, collaboration, pluralism. These historic, cultural traits (and, frankly, aspirations) are the same characteristics around which a new Europe, fit for purpose in the 21st century, should rally in order to forge an identity – a brand – that will unleash creativity and innovation. Doing so will produce the waves of growth needed for European technology companies (and in turn, European societies) to be relevant in a fast digitizing world.

The question is whether Europe can unify its haphazard and uneven landscape of digital activity and focus its currently fragmented digital firepower so that business leaders can adapt to ever-evolving consumer expectations and technologies. And, of course, Brexit poses a challenge whose ramifications cannot be underestimated.
TIME FOR EUROPE TO HIT THE ACCELERATOR ON DIGITAL
The contrast between Europe and the rest of the world is stark. Its digital ambitions, snared between the innovative muscle of the U.S. and the steely determination of China, need a refresh. The traditional tools used by EU policymakers seem set for a different age, one moving at a snail’s pace. Was the hassle of GDPR really worth it one year on? Will the myriad of antitrust lawsuits really lead to a homegrown, European version of Google? Or will these measures slow things down when, really, they need to be sped up?

Take a look at the race for autonomous vehicles now taking place across the world. The commercial advantage that should belong to Europe’s prestigious automakers could very well slip away in favor of competitors from overseas. Neither the U.S. nor China is bound by vehicle regulations or traffic rules as restrictive as those found in Europe. So Germany’s Volkswagen is building and launching its self-driving car in the U.S. rather than in the sacred heart of Germany. And Daimler is right behind it.

In this landscape, Europe risks a serious stall as a new economy kicks off. The region’s AI ambitions, for example, need deeper clarification, coordination and acceleration, rather than leaving it to various countries to outline national strategies for AI. It’s an untested assumption that Brussels will succeed in its goal of mobilizing €20 billion in public and private investments in AI research and innovation over the next 10 years. Asia’s SoftBank Vision Fund, already stuffed to the gunnels with $100 billion, in contrast, is ready to splurge on AI start-ups and other wonders hailing from talented entrepreneurs from all over the world. Meanwhile, in the U.S., venture capital investment in domestic start-ups reached $100 billion in 2018. The gap is breathtaking. Europe needs to up its digital game before it’s left behind in the slow lane.

Show me the start-ups

Another marker for Europe’s digital status is start-up valuation. Despite rising numbers of successful start-ups and capital raised, Europe has some way to travel before it matches the valuation of start-ups born in the U.S. and Asia Pacific. Europe’s start-ups are cumulatively valued at $240 billion vs. $675 billion in Asia Pacific and $1,370 billion in the U.S.

Efforts are being made in Europe to fuel start-up success. Commissions such as the Startup Europe Partnership (SEP), for example, are aimed at scaling revenue, employment and active users for start-ups by connecting them with corporates and global investors. The EU also provides cross-national financial support to stimulate economic growth, augment risk capital, provide investment incentives and create new market institutions. Horizon 2020, launched in 2014, has served as a significant financial kicker to encourage innovation from the ground up, with €79 billion allocated for start-ups and consortia across the region to tap into. The program, now dubbed Horizon Europe, has been extended through 2027, with a proposed €100 billion in funding.
ALL ROADS LEAD TO LONDON (AND THEY NEED TO LEAD ELSEWHERE)
The U.S. has its Silicon Valley, China has its Zhongguancun, and Europe has its Silicon Roundabout. With the beating heart of Europe’s start-up scene located in London (see Figure 1), it’s easy to see how a mishandled “Brexit” could be disastrous for both the UK and Europe (see Quick Take, page 9).

The fact is, London start-ups attract more venture capital funding than any other European city despite the best efforts of pan-Europe initiatives such as SEP or Horizon 2020.

London (like the other global financial capitals New York and Tokyo) also has a plethora of financial institutions, accelerators/incubators and businesses that support it. A messy Brexit could choke off the money on which Europe’s start-ups rely. Europe needs London until it can build a rival in its place.

Europe’s start-ups coalesce in capital cities
The great majority of start-ups are in London – 2.5 times more than the next-highest concentration in Paris.

Figure 1
“British Exit,” or Brexit, is the term generally used to describe the UK’s decision to leave the European Union after 45 years, scheduled to go into effect this year. In terms of its impact on Europe’s quest for digital leadership, imagine California succeeding from the U.S. and ripping out the start-up dynamo that is Silicon Valley.

The UK is, for all intents and purposes, the start-up engine for Europe, and it drives commerce and jobs in its wake. In addition to a plethora of crowdfunding companies, global VCs, angel investors, and mid-size and large investment companies, the UK is also home to world-class universities (Cambridge, Oxford, Imperial College London, etc.), underpinning the deep specializations found in areas such as AI, machine learning, fintech and cybersecurity. The handling of Brexit is critical to get right, for both sides.

The loss of start-up financing could see Europe default toward government funding for its innovation. While that could work, entrepreneurs should be rightly concerned it could detract from private sector backing and lead to disincentives for addressing structural problems, like a haphazard education system or an over-protective regulatory environment (Europe’s Achilles’ heel). The long and short of it is, both the UK and the EU would have to reset how good ideas and tech innovation is financed.
Farewell old Europe: relocating the digital hub

A likely region for a new digital hub is Eastern Europe, which – along with its affordable cities and well-educated populace – has seen a high growth of start-up tech businesses, especially in nations like Latvia, Russia, Lithuania and Bulgaria. This would mean relocating the hub from northern Europe, where the continent’s executive power resides in Brussels, shifting the center of gravity and providing a powerful counterpull to the region’s reliance on the UK.

Additionally, our analysis reveals an engaged network of informal meetups in Eastern Europe, as well as a concentration of tech research funding by the EU. In fact, consortia from this region are by far the largest beneficiaries of Horizon 2020 funding. The region is one to watch for new tech start-ups and the formalization of grassroots networks that could scale with adequate EU stimulus. Just imagine if the €20 billion promised by Brussels for AI were instituted as a Softbank-like “Vision Fund” for Central and Eastern Europe.

As a hub, Eastern Europe could also provide a focal point for the emerging standards, lobbying efforts and decision-making related to the rise of a host of new digital industries. Estonia is a case in point, with the standards of its e-residency program providing a “digital nation” template for the rest of the region to follow. The country has become a hotspot for digital entrepreneurs in the last five years, positioning itself as an infrastructurally-sound testbed for new applications of creative and digital technologies.

Meanwhile, research and innovation spending in nations like the Czech Republic and Slovenia is on par with many Western European countries, while other Eastern European countries, such as Slovakia, have invested at a growth rate that’s four times higher than the EU average.

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EUROPE’S DIGITAL FIREPOWER: POTENT BUT UNFOCUSED
Whether or not Brexit becomes a reality, Europe’s business and political leaders must seize this once-in-a-generation opportunity to reengineer and revitalize the region’s digital ambitions. This will mean shoring up the dense network of support underpinning the continent’s tech community. In our analysis, these centers of activity will be a key factor in Europe’s ability to reach its digital ambitions, even beyond top-down state subsidies, cross-national funding, universities and corporate accelerators.

Europe’s thriving meetup and start-up communities, for example, are an essential way for people and organizations to connect and collaborate around digital tools and ideas, and catalyze digital ecosystems around new technology or platforms.

Our analysis of meetup data throughout Europe offers business leaders insight on where specific digital capabilities are scaling across the region and worth watching. By connecting passionate technologists, business leaders, early-stage start-ups and academics, meetups build connections based on shared objectives. Because these events represent a convergence of talent and advanced thinking, it’s essential for policymakers and business leaders to increase their awareness of the scale of meetup activity and understand how to tap into this rich source of potential insight (see Figure 2, next page).

For example, we identified a high concentration of AI and machine learning communities active in and around Manchester, in Northern England. Manchester University offers an advanced degree program in AI and is home to a thriving number of AI-related communities, with some groups running at over 1,000 members. These participants could offer businesses not just insight on an emerging technology but also a pipeline of capable talent.

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European meetups power digital ecosystems

Meetups in that region also focus on AI ethics, as well as its practical uses in an industry context. Groups self-form around a hypothesis and work collaboratively through shared platforms. As a result, the technology can evolve at a rapid pace. For example, Manchester Futurists assemble to showcase AI projects, allowing enthusiasts from multiple organizations to learn, share and collectively advance the AI agenda.13

Another example is in Estonia, where a virtual and augmented reality community, with 1,000 members, forges best-practice developer links across the Nordics, and held the world’s first virtual meetup held through an app.14

Source: Cognizant/TechNation
Figure 2
Connecting hotbeds of digital activity

Our analysis also reveals a mosaic of emerging capabilities in regions, nations and localities across Europe (see Figure 3, below, and Figure 4, next page). Europe, in effect, offers a menu of game-changing innovation moving at different speeds and trajectories. Some countries show a higher concentration around specific technologies, like AI in the UK, virtual reality in Estonia, or mobile commerce and big data in Hungary. We also discovered emerging industry-specific developments, as well, such as agricultural-tech (“agri-tech”) in Russia, and sustainable tech in Italy (“clean-tech”).

Tech specializations scaling across Europe

We studied the degree to which particular countries were specialized in an emerging technology, above the European average. The map below indicates these areas of specialization.
A digital heatmap reveals a rich and fragmented landscape

The shades of color indicate relative specialization in each tech area, compared with the rest of Europe.

Source: Cognizant/Tech Nation
Figure 4

A closer look at these digital hotbeds offers insight into how European businesses could potentially benefit from these developments.

UK dominates AI. The UK is forging a distinctive role as a pioneer in ethical AI by blending its national assets, such as its world-class universities (Cambridge, Oxford and the London School of Economics), access to finance and internationally recognized legal frameworks. Many AI start-ups are located in the
One of the deepest clusters of cryptocurrency activity is in Zug, Switzerland, now known as Europe’s “Crypto Valley,” although clusters in Estonia and Russia are fast followers. For example, venture capital firm Lakeside Partners, blockchain platform builder Blockhaus and business law and tax firm MME have teamed up to launch “Crypto Valley Labs” in Zug. Teams operating from the lab gain access to a range of services, including marketing, legal and development support, in addition to shared desks and office space. Now, the Swiss government is opening up government procurement using sprints and other start-up cultures found at home in Zug.

Mobile, big data and virtual reality are location-specific. Hungary is a key destination for mobile capabilities. Nokia Networks provides an anchor by building Nokia’s largest R&D center in Budapest, and the impacts are beginning to spread. Big data capability is also a strategic play, with start-ups like Gravity, RapidMiner and Prezi serving as a source of inspiration for a new generation of entrepreneurs. Estonia hosts a thriving virtual and augmented reality ecosystem for developers, business people and enthusiasts alike. There, members share industry developments, ideas, success stories and insightful failures. One notable stream of work was performed with the Estonian youth work center to design a series of VR workshops set around different careers and how to solve crises situations.
France recently announced an investment fund to finance disruptive technology innovations, and the government added AI and data protection to its list of strategic industries that can be protected from foreign takeovers.

- **Estonia is a hotbed for multiple digital innovations.** Estonia has sparked record levels of creativity and entrepreneurialism, with one of the highest per-capita rates of start-ups in Europe (six times higher than the European average). The government made an early commitment to digital technology, creating the first ever digital ID, available to anyone in the world. Once applicants are accepted, they gain “e-residency,” which allows them to start and manage a global business in an EU environment and access Estonia’s national systems (i.e., to pay taxes, vote, check medical records, etc.).

- **Finland showcases how digital momentum can build.** A long-running focus on research related to heart-rate measurements in Finland has produced world-class innovations that are now used by many leading consumer brands around the world. These, in turn, have sparked a wave of wearable advancements that attract global companies to engage, such as Samsung and Garmin. A plethora of Finnish sports- and wellness-focused companies are now taking wearables to the next level, with built-in GPS capabilities and sensor technologies that are completely waterproof. Commercial tie-ups are emerging between global sports apparel brands that are now looking to Finland for expertise in analyzing users’ muscle activity.

- **France is actively building an entrepreneurial economy.** France is gaining momentum in its quest to become a source of technology start-ups. The country recently announced an investment fund to finance disruptive technology innovations, and the government added AI and data protection to its list of strategic industries that can be protected from foreign takeovers. Many international businesses are looking to build AI research centers in France: Facebook and Google already work with hundreds of researchers in Paris, while Samsung, Fujitsu, DeepMind, IBM and Microsoft all announced plans to open offices in France to focus on AI research.

- **German digital capability spreads evenly over the country.** Germany vies with the UK for having the highest number of meetups, with over 3,000 active programs. The German government’s Digital Hub Initiative promotes and supports digital innovation in 12 selected city hubs across the country. Moreover, the country’s Fraunhofer Institute looks to drive innovation across sectors (health, security, communication, energy and the environment), with an emphasis on creative technology. Moreover, Germany’s leadership position within the automobile industry, where it focuses on digitally-networked mobility, driverless vehicles and electric mobility, provides an anchor to the country’s digital ambitions. Cars that drive themselves are finding a clear path to the showroom (albeit not in Germany but in China).
RECOMMENDATIONS: ONLY BOLD, INSPIRED, POLITICAL LEADERSHIP WILL POWER EUROPE’S DIGITAL AMBITIONS
The four freedoms that underpinned Europe’s 1990s single market – goods, services, capital and people – need a fifth dimension: digital. This potential force-multiplier on Europe’s economy would lead to a renaissance of growth and opportunity. Fail, and the much touted Fourth Industrial Revolution is a non-starter.

Although attempts to grow an open, innovative economy are working, judging from our analysis of Europe’s digital landscape, it needs to move much more quickly. We found native start-ups scaling and digital specializations forming, and the effects are beginning to ripple into the wider economy. But accelerating this capability needs to happen with urgency to catch up with the innovative firepower that the U.S. and a resurgent China bring to the table.

We believe Europe could improve its position in the digital landscape by taking the following actions:

1. **Double down and accelerate an “innovation union.”** Cross-continental initiatives to promote entrepreneurship and encourage innovation must spur Europe to unite its fragmented digital landscape. Right now, SEP could be refocused to provide robust interregional acceleration around specific industries (such as e-health) and an internationalization engine for emerging industry niches (such as sustainability, education or government services). Other initiatives could focus on the infrastructure investments in STEM subjects, training for new human-to-machine skills or early entrepreneurship education in schools that a truly innovative union requires.

2. **Add digital into the single market, with a unified “open data” strategy.** Europe needs to augment its “single market” with a single data market. Various European cities and municipalities use open-data policies and publicly funded accelerators to scale innovative ideas and concepts. We think these could be unified to spur improvements in efficiency and productivity across all of Europe’s towns and cities. Common API standards, platforms and data frameworks could then quickly replicate best practices from one city and country to another. This would catalyze innovation across the continent, coalescing Europe’s digital firepower into a single open and trustworthy data ecosystem.

3. **Catalyze a homegrown, stand-out, emerging industry rock star.** Entirely new industries are now being forged on the back of emerging technologies like AI, machine learning and IoT. Starting next year, potential business opportunities will also grow from climate change with the Paris Agreement, including in the areas of sustainability, advanced manufacturing and ethical AI. Europe must look to own these emerging plays, with coordinated policy at the interregional level. The European Commission could begin setting up and accelerating a steering group to identify the emerging areas where European specializations could dominate corporate spending the world over.

4. **Build connective tissue between digital’s multiple stakeholders.** National governments could use public policies to stimulate a raft of new industries, fostering investments to create unique IP and a new generation of entrepreneurs. The Horizon Europe program needs to continue the efforts of Horizon 2020, with the express target to strengthen, connect and deepen various digital ecosystems. The
The program should strive to unite the crackle of innovation across meetup and start-up networks and link into Europe’s secondary and tertiary education providers, universities, city planners and entrepreneurs to create a force-multiplier for digital innovation.

- **Invest for growth and don’t fall into the protectionist trap**. While the effort needs to be more transparent than it’s historically been, the direct provision of funds to companies via development banks, dedicated government-owned venture capital funds, or matched co-investment funds did so much to build out a shattered Eastern Europe in the 1990s. The EU could provide funding as limited partners, co-investing with other institutional partners in venture capital funds. It needs to be done with care, as the overdominance of government funding might hold back private funding and present disincentives to address structural problems, such as education systems and regulatory environments.

**Final word**

Europe’s digital ecosystem is innately human – it’s about people talking and connecting through a burgeoning network of meetups and start-ups. The region’s historical strengths – diversity, multiculturalism, ingenuity – underpin these ecosystems and are the watchwords for mastering the digital economy. In fact, this people-first approach could offer Europe’s political leaders a “third way” that balances the super-capitalist tendencies of the U.S. with China’s command-and-control mode.

We’ve outlined a series of bold steps that would do this and create a place for Europe at the top table of economic and political power. The continent needs strong leadership at the political level. By doing so, Europe will be positioned to ride the wave of opportunities that digital is now catalyzing.

**Study methodology**

Cognizant’s Center for the Future of Work commissioned UK-backed start-up platform TechNation to explore the hidden underwiring of technology innovation across Europe. TechNation collected data from publicly available sources, gleaning information from Eurostat, the European Commission’s Horizon 2020 fund, and industry meetup statistics through commercial event platforms like Eventbrite. The study was conducted in Q2 and Q3 2018.
Endnotes


15. Cognizant recently sponsored a sprint-based approach toward accelerated innovation in Switzerland, combining multinational capabilities with fast-moving technology start-ups. For more on this, see http://www.hackoutliers.com.


21. Finland boasts great companies that apply sensor technologies to the clothing industry.


23. Ibid.


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About the author

Euan Davis leads Cognizant’s Center for the Future of Work in EMEA. A respected speaker and thinker, Euan has guided many Fortune 500 companies into the future of work with his thought-provoking research and advisory skills. Within Cognizant’s Center for the Future of Work, he helps ensure that the unit’s original research and analysis jibes with emerging business-technology trends and dynamics in Europe, and collaborates with a wide range of leading thinkers to understand how the future of work will look. Previously, Euan held senior analyst, advisory and leadership positions at Forrester Research, IDC and CEB.

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About the Center for the Future of Work

Cognizant’s Center for the Future of Work™ is chartered to examine how work is changing, and will change, in response to the emergence of new technologies, new business practices and new workers. The Center provides original research and analysis of work trends and dynamics, and collaborates with a wide range of business, technology and academic thinkers about what the future of work will look like as technology changes so many aspects of our working lives. For more information, visit Cognizant.com/futureofwork, or contact Ben Pring, Cognizant VP and Managing Director of the Center for the Future of Work, at Benjamin.Pring@cognizant.com.

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