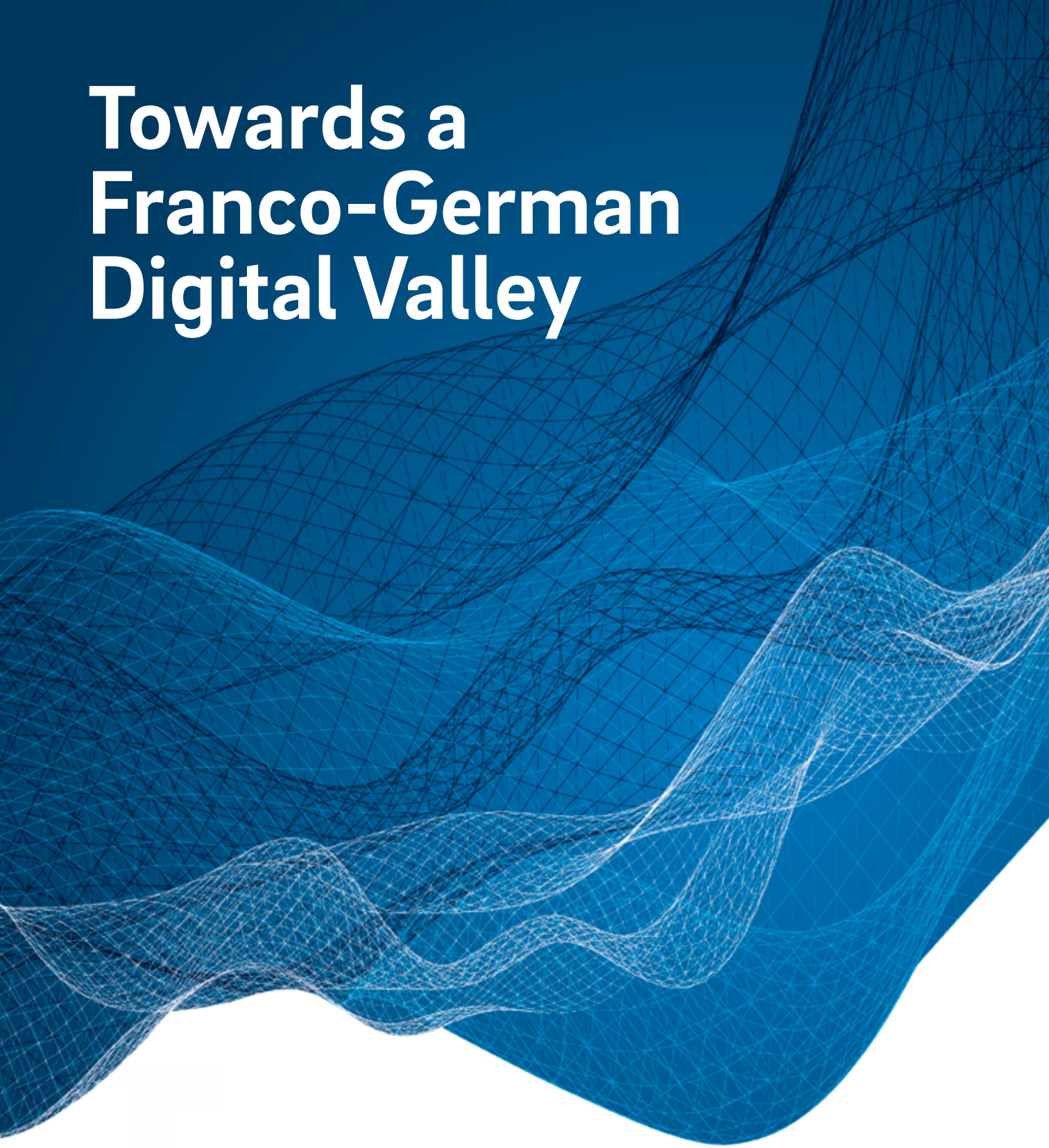
Towards a Franco-German Digital Valley



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RÉPUBLIQUE FRANÇAISE
AMBASSADE DE FRANCE EN ALLEMAGNE

Botschaft der Bundesrepublik Deutschland Paris

Roland Berger

Key figures

415 bn

The estimated additional GDP impact of a digital single market, in EUR → 27

15%

Germany's share in goods exported by France (compared to 9% which is France's share of goods exported by Germany) → 33

2%

The average volume of digital-related VC investments in France or Germany that come from cross-border German or French investors → 35

Contents

Making Europe's digital transformation a success

France and Germany have demonstrated at the highest political level their common interest in making Europe's digital transformation a success. Well aware of what is at stake, Chancellor Angela Merkel and President François Hollande met with the President of the European Commission, Jean-Claude Juncker, at the first "Franco-German Digital Conference" in October 2015 together with many other representatives of the digital industry and major international players.

To be successful in the long run, this Franco-German joint approach requires the support of companies, institutions, academia and civil society. The digital transformation of Europe will not happen without the help of those start-ups and experts experiencing digital innovation every day.
Hence we, as the Ambassadors of France and Germany, have recognized the need to mobilize those strengths and introduce new forms of cooperation in particular in the day-to-day operations of young companies. We therefore decided to organize jointly two digital events in spring 2016 with Roland Berger and NUMA, one of the most renowned accelerators in France, bringing entrepreneurs and industry as well as government representatives to Spielfeld, Roland Berger's Digital Hub in Berlin and to the premises of NUMA in Paris. Both workshop events were followed by important conferences with panel discussions at the respective embassies (see Appendix).

The participants underlined the need for more common standards and cross-certifications, for more cross-border financing, for more change spirit in society and for a strong Franco-German motor with more "teamup" meetings between ministries, corporates and start-ups.

We are very pleased that our initiatives and the alliance between Roland Berger and NUMA have contributed towards the creation of a true Franco-German Digital Valley between Berlin and Paris. We are convinced that these events helped to maintain the momentum created after the first Franco-German digital conference in October 2015. We hope that the various initiatives and proposals which came out of our joint initiative will contribute to the success of the next conference, which will take place in Berlin in December. The goals are clear: establish a set of favorable regulations and incentives at European level; maintain an ongoing dialogue between the operators on the ground.

Nikolaus Meyer-Landrut
Ambassador of Germany to France

Philippe Etienne
Ambassador of France to Germany

Digital is everywhere

When the dotcom bubble burst in the mid-2000s, the foundation of EADS (now Airbus Group) as a cross-border industry giant epitomized the success of Franco-German collaboration in the business community. At the time, Google was a 2-year-old start-up, Mark Zuckerberg, an anonymous 16-year-old student. Most of what is part of our daily digital life today did not exist. In the meantime, the digital dimension has imposed itself on our world as one of the major levers transforming companies, governments and societies. Furthermore, it is commonly recognized as the new imperative for economic growth.

Germany and France, in many respects the driving forces of the European Union, must embrace digital and other innovative technologies to make sure that Europe stays at the forefront of development. This is not only important with regard to new products and services, but also vital in order to reinforce the competitiveness of our traditionally high-quality, high-performing industries. Digital is everywhere.

In cooperation with the German Embassy in Paris and the French Embassy in Berlin, we have successfully connected our existing digital players and started a movement of dialogue and confidence. The workshops organized at Spielfeld and NUMA generated many innovative ideas and concrete opportunities for cooperation. And above all, one message rang out loud and clear: from large corporates to SMEs and start-ups, from institutional leaders to civil society, people believe the turning point for French-German cooperation on digital matters has arrived.

This report – which is produced under the sole responsibility of Roland Berger – aims at providing a factual basis for discussion between policymakers and business leaders by describing the environment and challenges of the digital ecosystems in France and Germany and by exploring new as well as existing opportunities for collaboration and exchange. It is an important first step on the road forward.

Supporting the French and German governments in their attempt to strengthen cross-border cooperation in the digital sphere will involve developing practical solutions which link players in both countries, and establishing a network of confidence. Both NUMA and Roland Berger are committed to making the Franco-German Digital Valley a reality. This report is part of our contribution.

Marie-Vorgan le Barzic
CEO NUMA

Charles-Edouard Bouée
CEO Roland Berger

France and Germany should stand out as one continuous valley in the digital economy. Partnership opportunities to strengthen our digital ecosystem are legion, it is time to take action.

The digital revolution is here, it is global, and the stakes in terms of economic growth, job creation and prosperity are immense for France and Germany. However, these benefits are yet untapped and may remain so. As a result, in the context of their digital ecosystems, France and Germany rank only average on the international and European stages. There are start-up success stories, but they are rare. The digital transformation is underway, but lacks pace. Of course it is not all doom and gloom. Many of the initiatives started by France and Germany over the past 5 years have accelerated the creation of the necessary supporting infrastructure, boosted VC funding availability, developed digital innovation, and strengthened the international branding of their digital ecosystems. Yet structural barriers on both sides of the Rhine continue to hold the digital revolution back.

There is good news too. Firstly, France and Germany have differing strengths and as such are affected by issues arising in the digital economy in different ways – thus they can complement one another. Secondly, some of the issues encountered by France and Germany can be solved by working together to eliminate the red tape, open their respective markets, and gain the critical scale needed. And finally, France and Germany have an unprecedented history of cooperation to build upon.

This is why there are already numerous examples of the two countries cooperating on digital matters, in particular since the Elysée conference: standards and regulation harmonization, French-German networks on digital, or exchanges of start-up data to foster cross-border funding. Nevertheless, three areas critical to the success of the digital economy remain, where both France and Germany still fall short and where existing initiatives fail to address the problem. The report addresses this, making the following three recommendations.

Firstly, secure transformation of innovative start-ups into successful businesses by leveraging corporates' capital, knowledge and networks. Cooperation means fostering cross-border VC investments, starting with clear coordination of deal flows. Secondly, secure the adoption of digital technologies by providing cross-border infrastructures thanks to sovereign cloud solutions. Finally, firm up the international reputation by speaking with one voice: one large research university, one talent team of start-ups, etc.

→ *Make funding cooperation a reality by coordinating corporate VC deal flows*

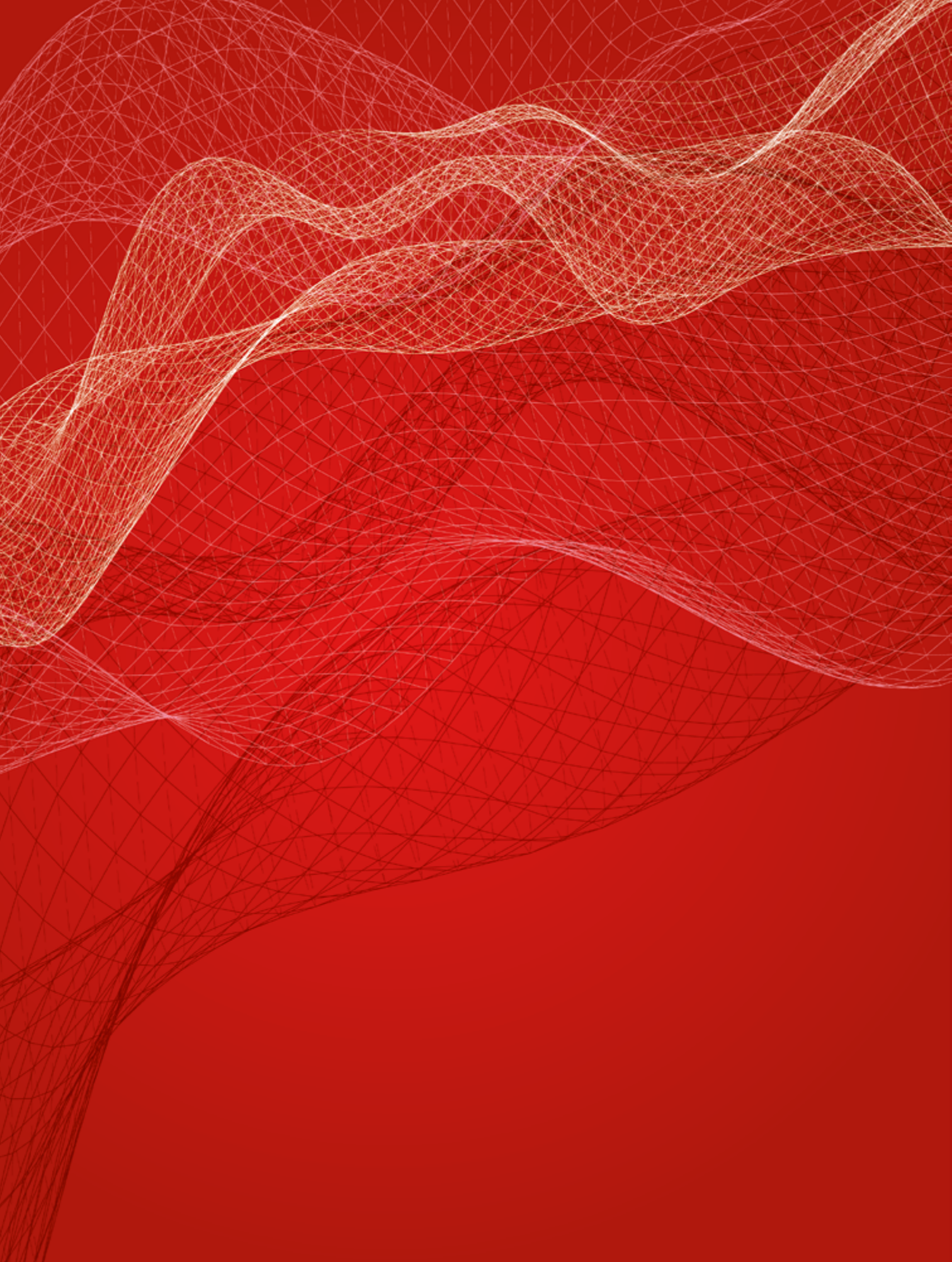
Direct large corporations' capital, markets and knowledge towards start-ups by fostering cross-border corporate VC investments, starting by creating joint funds (50/50) in order to start coordinating deal flows.

→ *Develop cooperation on a French-German sovereign cloud*

A threefold partnership: solidify the legal basis to ensure sovereignty; build a European software security standard that would guarantee data encryption and privacy; and boost intelligence on new cloud technologies to make sure we are part of the next innovation wave and that we are developing a common infrastructure.

→ *Act as one single valley for entrepreneurship and the digital economy on the international stage*

Multiply cross-border initiatives for greater visibility (consolidation of universities, "Tech" labeling, joint teams at international events) and attractiveness (start-up visa, etc.)



1

FRANCO-GERMAN DIGITAL ECOSYSTEMS: RAISING THE GAME

The digital revolution is here, it is global, and the stakes in terms of economic growth, job creation and prosperity are immense for France and Germany.

Setting the stage – what are we talking about?

What do we mean by digital? The word "digital" implies hyper-connectedness and unprecedented speed of data generation & processing. It continues to encompass an ambiguous galaxy of concepts. We will use the word "digital" in the broader sense of the term: encompassing the usage of internet and new computational technologies, from e-commerce to big data, from cloud technologies to online gaming.

What do we mean by ecosystem? There is an obvious but striking paradox: growth in the digital world, which is dematerialized, occurs in very specific locations. In what we call ecosystems, there is an unparalleled concentration of knowledge, funding and talent spread across top universities, start-up accelerators, investors and corporate innovation centers. Such ecosystems[1] encompass most economic players, are geared towards innovation and include R&D entities, talent pools of people, universities and training centers, investors (public & private), customers and domestic corporations. →A

What are the stakes in a digital ecosystem? The digital revolution is here and it is global: 1.7 bn people have a Facebook account, nearly 3 bn people have access to the internet[2], and the digital economy contributes 8% of G-20 GDP. Yet, the list of untapped benefits of the digital revolution is mind-blowing: 1.5 m net additional jobs in the EU that could be created by

A DIGITAL ECOSYSTEMS ANALYTICAL FRAMEWORK

1	Infrastructure (physical and digital)	Data centers, cloud, telecommunications networks
2	Financial capital	Business angels, VC funds, corporate VC, equity markets, public funding, love money
3	Human capital (people, skills, willingness to innovate)	Entrepreneurs, intrapreneurs, engineers, digital specialists ...
4	Intellectual capital/ knowledge	Universities, industrial know-how, presence of established digital businesses
5	Networks connecting people (reach)	Events, professional networks, lobbies

Source: Roland Berger

1 See for example German Productivity and Innovation Centre (2015), *Entrepreneurship Ecosystem Canvas*
2 European Commission (2016), The importance of the digital economy

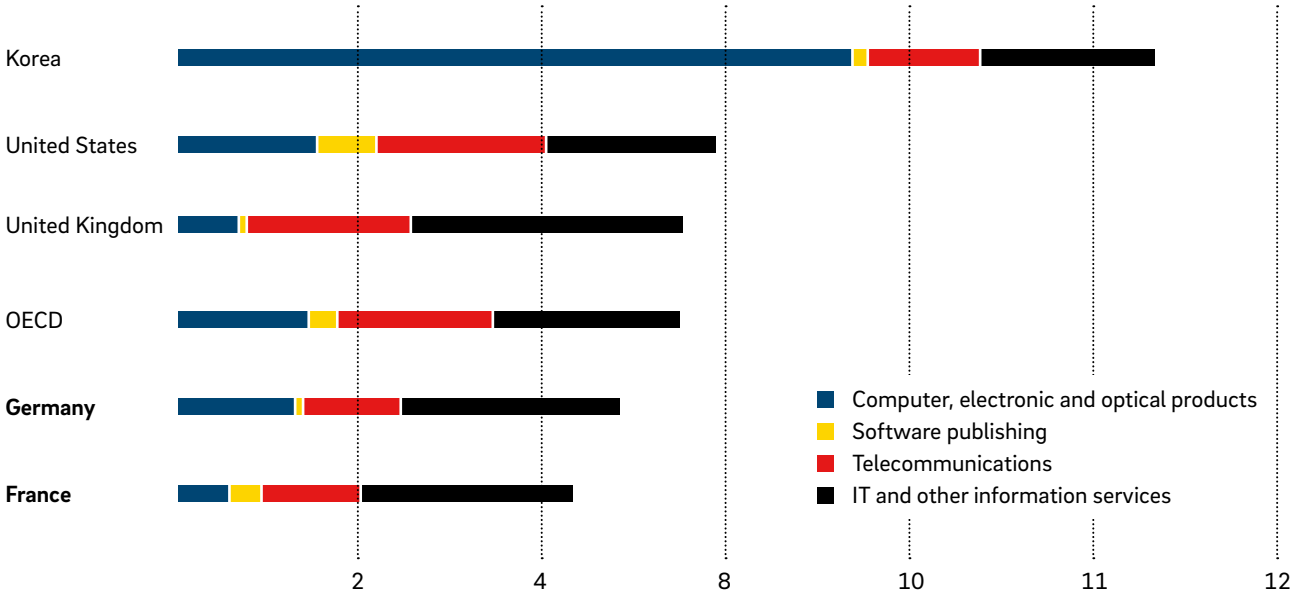
the internet economy, EUR 1.25 trillion annual GDP by 2025 in EU for the manufacturing industry alone[3]. In France and Germany alone, ICT accounted for c. 5% of GDP in 2013. →B

What will we cover in this study? A great deal has been written about the pros and cons of the digital economy, but for the purposes of this study we will divide the digital economy into four interlinked areas of change:

- **The emergence of radically new technologies,** usages and ways of doing business: encompassing start-ups and those ecosystems nurturing innovation
- **The transformation of existing industries and businesses** with the help of digital technologies: "digitization" can impact all economic sectors, including the 4th industrial revolution in manufacturing
- **The adoption by consumers and citizens of these technologies,** and the transformation of their habits and ways of communicating: the sharing economy is a particularly salient example of change
- **Modifying the structure of society** (legislation, infrastructure, informal rules, distribution of power ...)

We will focus hereafter on the first point and touch on the second in the context of Franco-German cooperation. "Start-ups" refers to new businesses bringing innovative technologies or services to the market. It is worth noting that digital innovation or penetration cannot be achieved in isolation. It is rather the result of targeted interaction between structures, thus enabling innovation and digital change. Rules, connections, institutions and people in the digital economy constitute per se an ecosystem. It cannot be imposed but it can be nurtured.

B VALUE ADDED OF ICT INDUSTRIES AS % OF GDP



Source: OECD (2013 data)

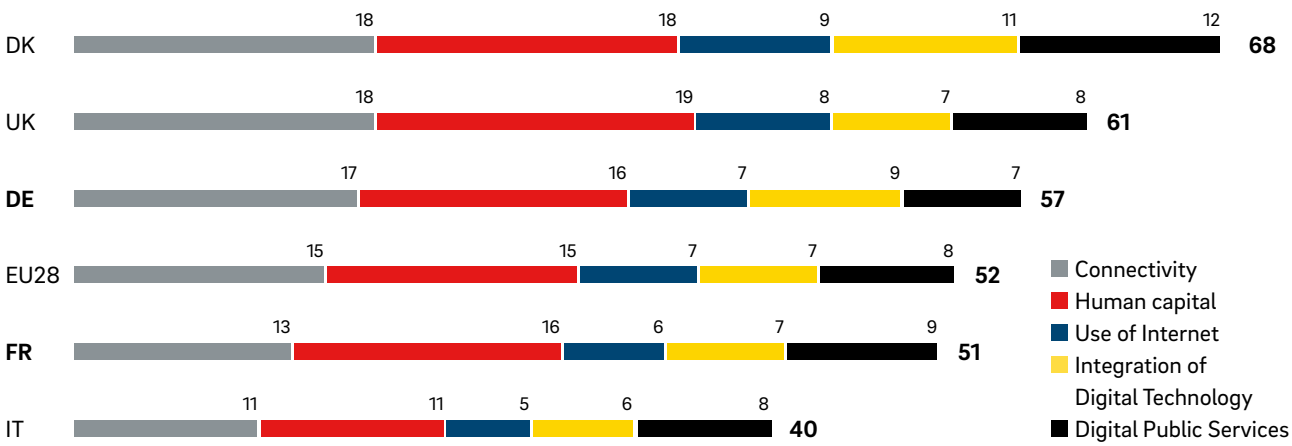
3 Roland Berger study for the Federation of German Industries (BDI)

C INTERNATIONAL & EUROPEAN RANKING BENCHMARKS

Global Startup Ecosystem Ranking	Global Entrepreneurship Index	Networked Readiness Index	Global Innovation Index	European Digital City Index	European Startup Nation Scoreboard
1 Silicon Valley	**1 United States**	**1 Singapore**	**1 Switzerland**	**1 London**	**1 Netherlands**
2 New York	**2 Canada**	**2 Finland**	**2 Sweden**	**2 Amsterdam**	**2 Italy**
9 Berlin	**10 France**	**13 Germany**	**10 Germany**	**6 Paris**	**7 Germany**
11 Paris	**14 Germany**	**26 France**	**18 France**	**10 Munich**	**8 France**

Sources: Compass, 2015 GEDI, 2016 WEF, 2015 INSEAD / WIPO, 2016 NESTA, 2016 European Digital Forum, 2016
Note: "Networked readiness" refers to a country's ability to fully exploit the potential of new technologies

D DIGITAL ECONOMY & SOCIETY INDEX 2016



Source: European Commission (2016)

Talented underachievement: The plight of French and German ecosystems

French and German ecosystems typically occupy the mid-rankings

The global picture: In 1995, the European Commission issued a green paper on innovation[4] concluding: "Europe suffers from a paradox. Compared with the scientific performance of its principal competitors, that of the EU is excellent, but over the last fifteen years its technological and commercial performance in high-technology sectors such as electronics and information technologies has deteriorated". 20 years on, this conclusion remains unchanged and is reflected in the numerous global rankings that exist, six of which have been selected at left. →C

These rankings reveal one simple fact: While the countries propelled to the top by one methodology or another may differ, France and Germany are definitely not leading the pack.

The European picture: European-specific rankings often see France and Germany vying for position with one another: Paris is 6th and Berlin 7th (Munich is 10th) in the European Digital City Index[5]; Germany and France occupy 7th and 8th places respectively in the European Startup Nation Scoreboard[6]. According to the European Commission's Digital Economy & Society Index, France is an average (51%) overall in terms of digital economy, while Germany's slightly better than average (57%) is down to greater connectivity and better integration of digital technology. →D

So, despite recent and very promising improvements on both sides of the Rhine, Europe's two largest economies share the same problem: weak digital ecosystems that need strengthening, scaling and better marketing.

Looking beyond the rankings, the ecosystems of French and German start-ups remain fragile compared to other digital hubs

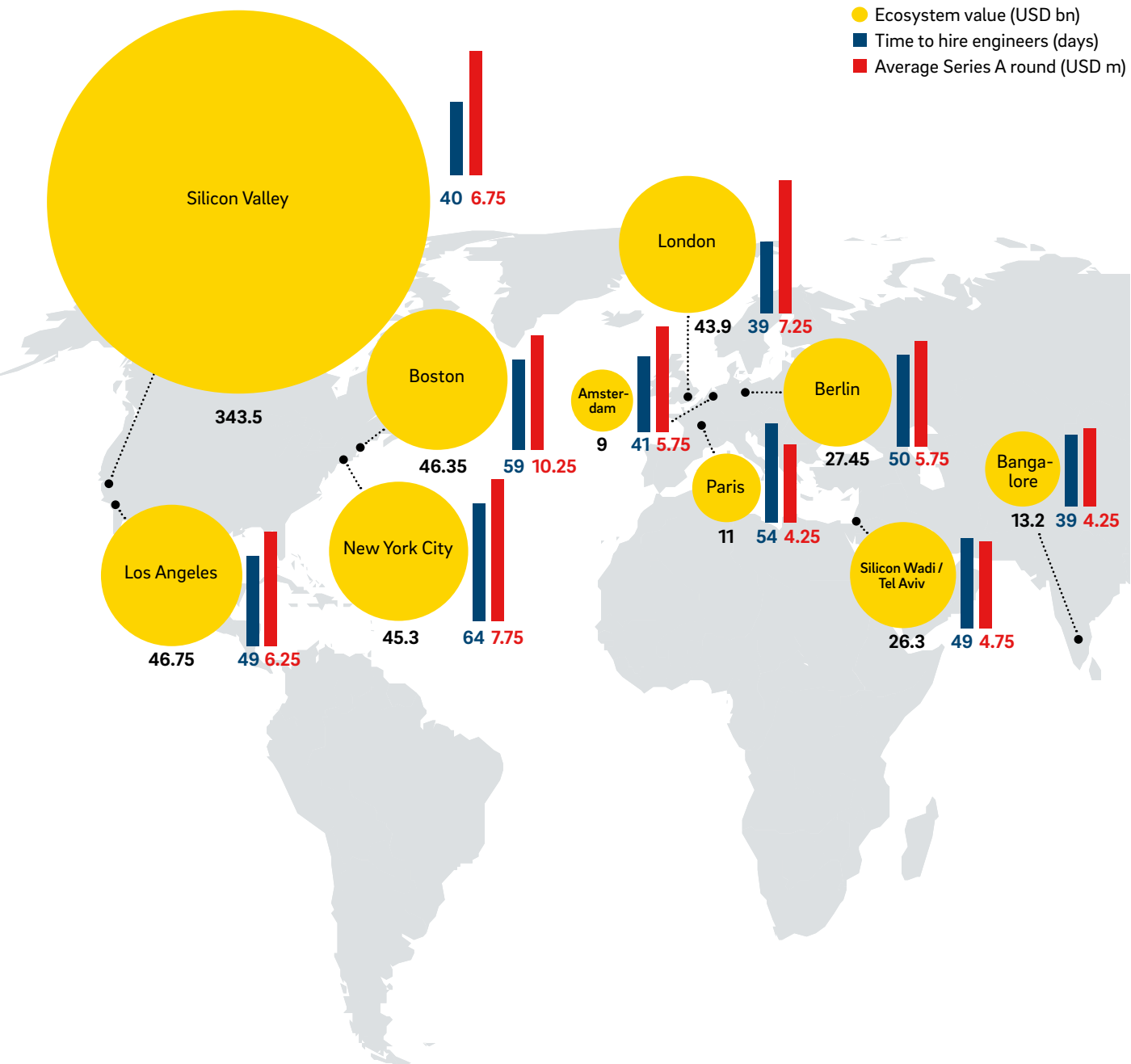
A detailed analysis of key ecosystems →E reveals one unsurprising but significant conclusion: volume is key. Despite having similar metropolitan areas, Paris and Berlin host fewer start-ups than Boston, Los Angeles, New York City or Silicon Valley, and derive less value from them. The more entrepreneurs there are racing to innovate, the greater the chance one or more of them will come out on top!

Funding issues to finance growth: While funding raised per start-up is not so significantly different for early rounds (seed & Series A) in European countries compared to the US, there is a large gap in total available funding, which impairs Europe's ability to

It is worth noting that digital innovation or penetration cannot be achieved in isolation. It is rather the result of targeted interaction between structures, thus enabling innovation and digital change.

4 European Commission (2015), *green paper on innovation*
5 NESTA (2015), *European Digital City Index*
6 European Digital Forum / D. Osimo & Startup Manifesto Policy Tracker (2016), *The 2016 Startup Nation Scoreboard*

E COMPARATIVE START-UP STATISTICS



Source: Compass (2015), *The Global Startup Ecosystem Report*

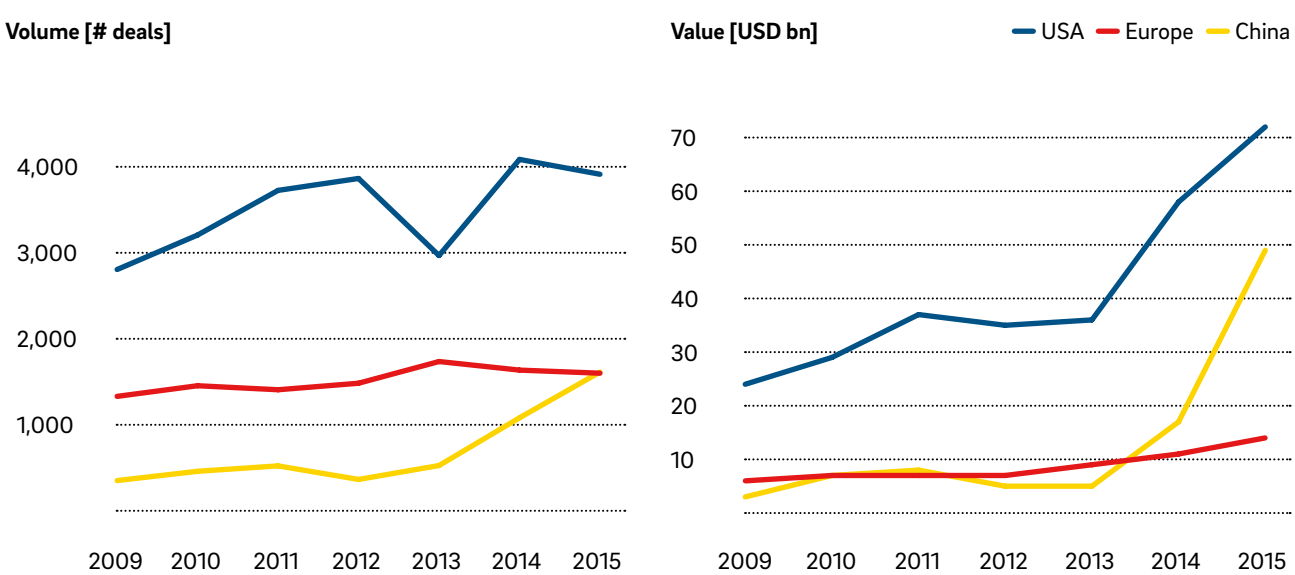
grow its own digital champions. As the following table highlights →F, despite having more than twice the US population, Europe still lags behind and its start-ups raise five times fewer funds, partly because of fewer deals, and partly because of less investment raised per deal. While the US is historically the birthplace of start-ups and therefore of venture capital, European venture capitalism is now being dangerously outpaced by new rival China and is yet to catch up with the US.

Within this European context, France and Germany experienced relatively modest VC growth, and are now clearly being outpaced by the UK, which is responsible for a third of the investments in Europe.

Furthermore, as is regularly stressed, there is a salient lack of funding for late stage and large operations; those of a kind capable of scaling up young innovative companies. 112 investments over USD 100 m were made to VC-backed companies in 2015 in the US[7] compared to only 24 in Europe. For H1 2015, 70% of late-stage funding (Series B or later) came from non-European investors[8] compared to 17% for early-stage funding. The lack of late-stage funding is still being debated: Some believe that European start-ups are not bright enough – otherwise they would automatically attract international funding – while others believe there isn't enough local funding available for growth capital.

Fewer unicorns: And while funding isn't solely responsible, this obvious discrepancy between the US and Europe results in slower growth for EU start-ups, leading to fewer "unicorns"[9]. As of September 2016, 11% of the world's unicorns, (both in volume and value[10]) come from Europe, whereas 39% are located in Silicon Valley, 9% in New York, 6% in Beijing and 5% in Los Angeles[11]. Ignoring valuation up and downs, 37 unicorns are European. →G The majority

F GLOBAL VC MARKET TRENDS



Source: EY, Global VC Report (2016)

7 Clipperton (2016)
8 CB Insights (2016)
9 Start-ups with an enterprise value of USD 1 bn or more
10 Out of 171 unicorns listed in live time by CB Insights (www.cbinsights.com / research-unicorn-companies)
11 G. J. Tellis (2016), *2016 Startup Index of Nations – Unicorns Index Report*

(17) are in the UK, 3 are in France and 6 in Germany (5 of which are tied to Rocket Internet). It is anticipated that European start-ups may soon be joined by an additional 3 from Germany (Check24, Kreditech and Soundcloud) and 1 from France (Sigfox). Nevertheless, calculations by VC fund Atomico in 2016 rightly pointed out that today's European unicorns were founded in 2011 or earlier, implying that the number of unicorns we have today in Europe is attributable to policies put in place 4 or 5 years ago, and that recent policy supporting start-ups may hopefully give rise to more unicorns in the future.

Increasing emergence of incubators and accelerators supports the expansion of digital ecosystems

A growing number of structures. If the objective is to grow start-ups, dedicated institutions are necessary to detect talent, coach them, finance their early stages and foster a digital culture.

One of the new, visible trends affecting German and French digital ecosystems is the emergence of incubators (long-term programs with rolling applications) and accelerators (short term programs with cohorts) for start-ups, providing the framework for digital innovation clusters.

6 years ago, the US were on their own developing incubators; in the meantime France and Germany have come on in leaps and bounds. →H Together with the UK (~70 structures identified), they have collectively bridged the gap vis-à-vis the US (82 structures) in terms of the number of pure players working to structure the market. 90% of incubators / accelerators in France are generalist while Germany counts only 57% of generalist structures, highlighting a tendency towards higher specialization.

An inflection point. The years before 2010 were characterized by US dominance of the digital market on the one hand and the feeling by players in the market that this dominance needed to be countered on the other. In 2007, Apple had seen the arrival of the iPhone, Facebook was officially launched and a year later Google launched Android OS. But in the aftermath of the financial crisis, "cheap money" was available to stimulate economic growth thanks to low rates policies. By 2010, almost a billion people had embraced social networks and 431 m smartphones[12] were in use (compared to 2.2 bn today). The digital transformation ceased to be an abstract concept as it began to impact people's lives at every possible level, and plans like French Tech followed in its wake.

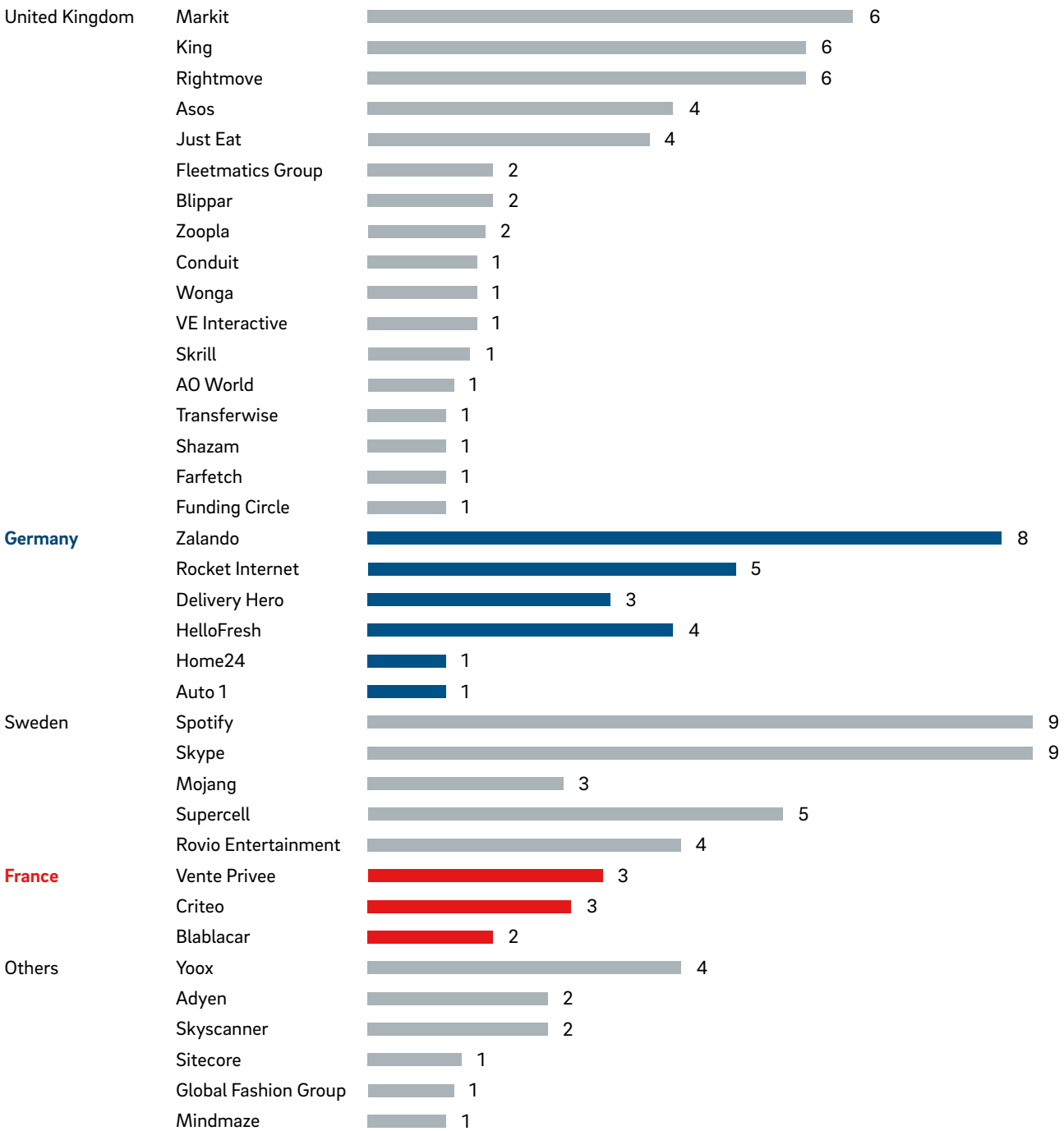
Supporting the French and German governments in their attempt to strengthen cross-border cooperation in the digital sphere will involve developing practical solutions which link players in both countries, and establishing a network of confidence.

Meet-ups on the increase ... but still not enough

Entrepreneurs' reunions (meet-ups) are key to boosting innovation and exchanging best practices. Berlin and Paris rank respectively 2nd and 3rd in Europe, but well below the UK: The UK saw 4,000 events in 2015 compared to 1,500 in France or Germany.

12 Statista (2016) with GSMA data

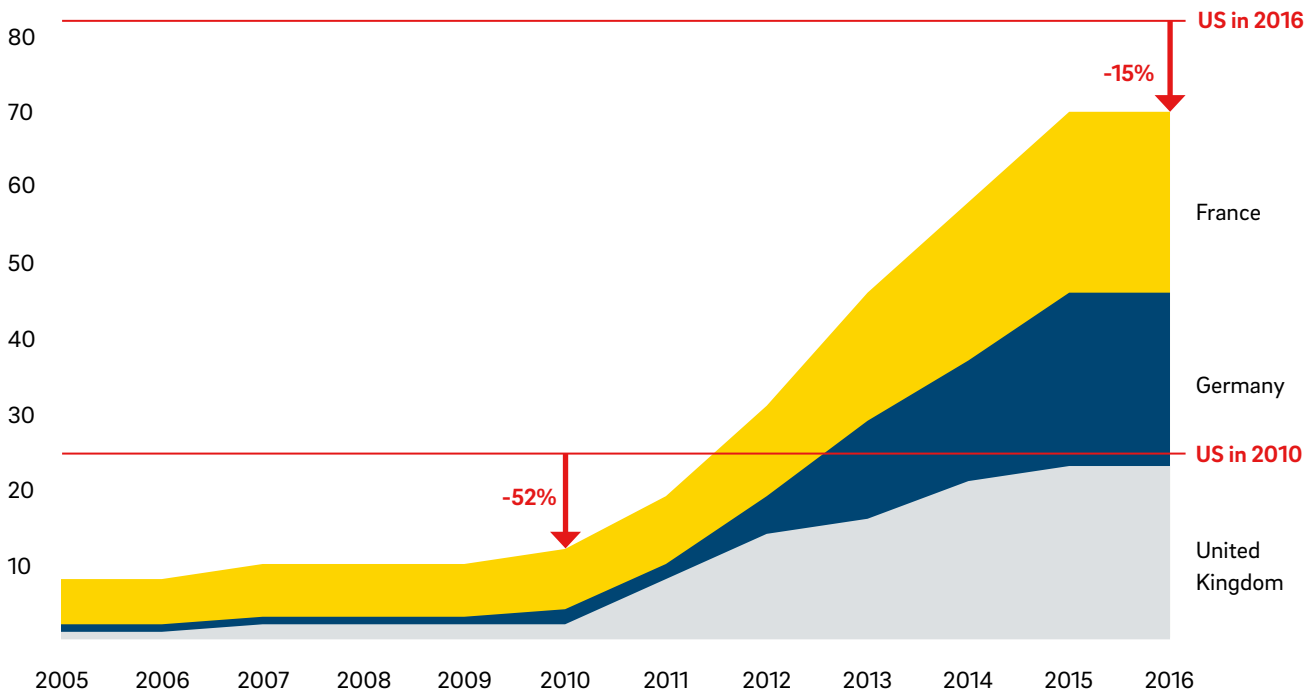
G EUROPEAN UNICORNS



Source: G.P. Bullhound (2016), *European Unicorns 2016, Survival of the Fittest [Israeli, Russian and Maltese start-ups were excluded]*

H TRENDS IN INCUBATORS AND ACCELERATORS PARENT ENTITIES

Evolution of incubator & accelerator structures [# parent entities; 2005–2016]



Source: Roland Berger

France and Germany: different but similar

While the French and German positions may appear similar, there are fundamental differences between them. →I

Differences. Germany has a stronger high-tech legacy, with more patent issues, higher R&D expenditure, greater high-tech exports and a larger digital economy workforce (in the sense of ICT jobs). France, on the other hand, has a larger number of entrepreneurs, with more companies and higher creation rates – hence the higher rank in the World Bank's "starting a business index". There are more business angels in France though they collectively spend the same amount as in Germany.

Similarities. Supporting ecosystems are similar in size, with similar financial support available from VCs and business angels. The quality of high-end research is comparable, as is the size of the talent base (same number of engineering graduates per year).

COMPARISON TABLE BETWEEN FRANCE AND GERMANY

			Unit	FRANCE	GERMANY
	General indicators	New businesses creation rate	%	9.5%	7.4%
		Share of population with above basic digital skills	%	27%	35%
	Digital ecosystem indicators	Incubators' / accelerators' main entities (brands)	#	24	23
		Coworking spaces	#	250	300
		Starting a business ranking	189 countries	32	107
1	Infrastructure	Average transmission speed	MB/s	8.9	12.9
		Infrastructure ranking	rank / 144 countries	8	7
2	Financial capital – access to funding	Business angels	#	4,621	1,930
		Total business angel investment	EUR bn	42	44
		Amounts raised via crowdfunding platforms	USD m	154	140
		Total venture capital investment	EUR bn	1.9	3.1
		VC investment growth	%	46%	19%
		VC deals per year	#	484	406
3	Human capital	Average office rent costs	EUR / m^2 / month	26.33	24 (Berlin)–34 (Munich)
		Engineering graduates per year	#	104,746	91,897
4	Intellectual capital / knowledge	Number of patents per year	#	16,533	65,965
		Number of universities in QS world ranking	#	39	43
		R&D expenditures	EUR bn	48	82
5	Networks	Online retailers selling abroad	%	64%	59%
		Innovation competitions	# p.a.	100	n/a

Sources: OECD, WEF, EY, European Commission, Roland Berger

French Tech initiative boosts awareness of the French digital ecosystem

How a policy is becoming increasingly digitally friendly

A long tradition of French industrial policy planning. The "Competitiveness Poles" were created to facilitate research and the transformation thereof into innovative products, across various technological areas. Universities, companies of all sizes and research centers were bundled together. This is the core concept behind the French cluster policy, a typical example of which is the incoming Saclay cluster. France had already attempted to develop its own digital policy but sometimes it was rather top-down and unsuccessful, as numerous failed attempts ranging from the Minitel computer to the Quaero search engine demonstrate. A dedicated digital innovation policy is indeed a relatively recent phenomenon in Europe, and has been restructured in three ways in France since 2012.

There is increasing support for entrepreneurship, transforming the image of France as a start-up nation. Inspired by the "Tech City" labeling initiative launched in London in 2008, France decided in 2013 that it would label districts to enhance their international exposure and attractiveness for young digital talents. The "digital districts" initiative was born, and was later renamed "French Tech label". 13 cities have become digital districts thus far and 4 thematic labels distributed – for a total funding envelope of EUR 215 m: EUR 200 m to finance supporting structures for start-ups (fablabs, accelerators, incubators,...) and EUR 15 m in subsidies to attract talent, entrepreneurs and foreign investors. French Tech has now become the collective term used to describe start-up ecosystems in France, and has given birth to a plethora of supporting measures: international hubs, networks, and privileged access to support, including the French Tech ticket for foreign entrepreneurs, multiple events and fairs (Viva Technology for instance). The largest incubator in the world is being built at "La Halle Freyssinet" in Paris and will be home to 1,000 start-ups in 2017. Moreover, other public institutions are now increasingly supporting digital start-ups, namely Business France (for export) and Agence France Entrepreneurs (providing administrative support to those creating a new business).

Extension of public investment to bridge the finance gap, in particular with the creation of the French Public Bank, Bpifrance, in 2013. A dedicated innovation department was set up to boost the creation of start-ups, with EUR 300 m investment funding available for digital start-ups and a EUR 600 m fund for so-called "large ventures". The supporting scheme is complemented by a wide range of subsidies and loans. In addition to Bpifrance actions, R&D tax subsidies were granted (Crédit Impôt Recherche and Crédit Innovation). However, public intervention has been criticized by some economists, including Nobel Prize winner Jean Tirole, for lack of clarity and being spread too thin. According to tech.eu, Bpifrance is the main VC player in Europe!

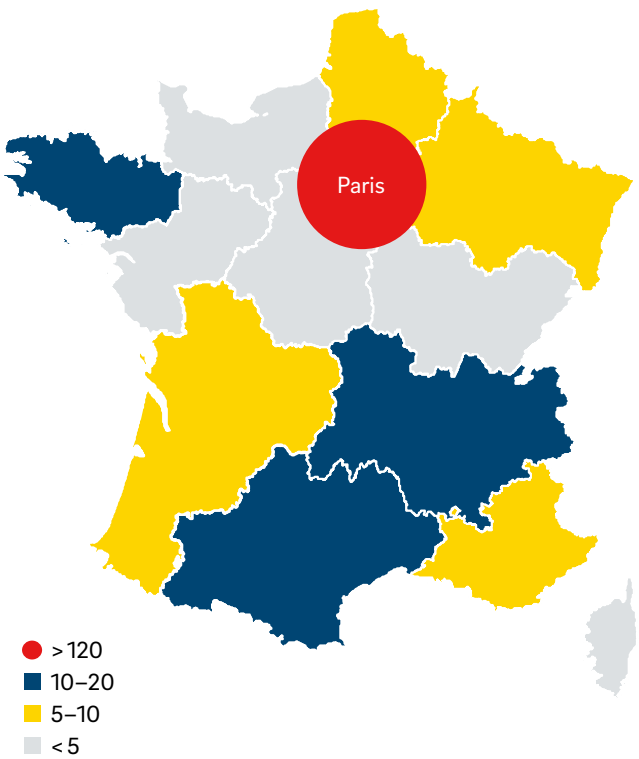
Change to the legislative framework. Full exemption from tax on profits is now granted to entrepreneurs via the "Young Innovative Company" status. And most of all, the "Digital Republic" bill of 2016 enforced open-data practices, especially in administration, clarified the legal framework for digital privacy, and established net neutrality. For instance, instead of having to pay an annual EUR 70,000 subscription fee, INSEE company aggregated data is now available free of charge.

In order to properly assess the impact of French Tech, it helps to highlight two distinctive facts: First-

ly, with regard to VC, the 42% growth rate in investments over 2015/2014 demonstrates that France is in the fast lane, and secondly regarding international reputation there has been a tangible net improvement. French Tech has generated a real buzz; witness for example current Google search results: "French Tech" is almost as popular now as "Tech City". In 2015 when Cisco CEO John Chambers claimed that "France is the next big thing" because "it leads Europe when it comes to entrepreneurship and start-ups", it felt like French Tech had just grabbed pole position.

J ACCELERATOR DISTRIBUTION IN FRANCE

Numbers of accelerators and incubators per region [Sep. 2016]



Source: Bpifrance (2016)

Dynamic ecosystems with a positive outlook

Paris remains the major hub. According to a study by Trendeo[13], between 2014 and 2016, 586 start-ups launched in Paris creating 10,212 jobs – out of a total in France of 1,400 and 22,000 respectively. On the whole, a third of new start-ups and half of new jobs are in Paris.

It is difficult to accurately estimate the number of start-ups in France but French Tech data provides an impression of what is happening. Out of c.1,500 start-ups listed by French Tech[14], 920 are located in Paris, 110 in Lyon, and there are about 50–60 start-ups per city in Lille, Nantes, Montpellier, Aix-Marseille, Bordeaux, Toulouse and Rennes. Again, one third of French start-ups seem to be located in Paris.

And if we consider the availability of supporting ecosystems, half of all French incubators →J and accelerators (126 out of 217[15]) are located in the capital. Besides, Paris has now gained international recognition in the fields of sharing economy and artificial intelligence[16].

Positive dynamics. Recent years were marked by good news from the French start-up scene. Blablacar raised a record EUR 177 m in funding in 2015. Facebook opened a laboratory on artificial intelligence in Paris, Cisco opened an innovation center and other major moves (Google cultural center, Intel Big Data Center, Samsung cloud & IoT center…) all contributed to putting Paris into 3rd place globally behind Silicon Valley and London[17] in the race to attract innovation centers. Fundraising is on the up too, with a 20% increase in value and +34% in volume in Q1 2016 compared to Q1 2015[18].

It is also interesting to highlight the rising interest of corporates: 40% of French CAC 40 companies have now launched start-up incubators and 25% have a corporate VC fund, most of them being created after 2012.

13 Trendeo / Les Echos (2016)
14 lespepitestech.com
15 Bpifrance (2016)
16 Compass (2016), *The Global Startup Ecosystem Report*
17 Cap Gemini / Altimeter (2016), *The rise of innovation empires*
18 Cap Gemini / eCap Partner (2016), *Baromètre des start-ups du numérique*

Limits and promises of the French digital euphoria

French Tech has certainly revived the dynamism of French entrepreneurialism. Furthermore, France enjoys a number of structural strengths when it comes to digital: excellent scientific research, entrepreneurship culture, high-speed broadband infrastructure, sectorial leadership in video games or IoT, and presence of homegrown leaders in ICT (Cap Gemini, Atos).

Nonetheless, the still limited number of French unicorns (3) conceals more structural issues[19] that have been evidenced by numerous studies[20]:

- **High cost of living**
- **Difficulty to attract and retain talent:** Well-educated engineers still prefer to work in large corporates or abroad. Among other factors, Parisian start-ups only pay half of what engineers would earn in Silicon Valley (c. USD 50 k vs. slightly over USD 100 k – despite total package differences resulting from social security and insurance coverage gaps, it is still financially more attractive to work in San Francisco than Paris). And on the other hand, talents are flying away, motivated by the pull of greater prospects elsewhere. A movement called "Reviens Léon" was even created by entrepreneurs to enable talented people to return to the French start-up ecosystem.
- **Limited founders' experience:** Only 5% have previous experience in a hyper-growth start-up vs. 35% in Silicon Valley (and 12% in Berlin)
- **Limited international awareness** regarding cultural adaptation and legislative openness to new technologies, as evidenced by strikes against Uber or AirBnB or recent tensions with Silicon Valley superpowers on fiscal enforcement
- **Limited attractiveness for foreign investors,** fearful of administrative complexity and fiscal conditions
- **Insufficient funding,** especially in the scale-up stage, and **untapped business angels potential:** With a similar number of business angels as the UK – France lists 4,621 BA[21] compared to 4,738 in the UK and 17,514 in Silicon Valley – French BA investment represents half of the British figure (EUR 42 m vs. EUR 96 m). The fiscal conditions are once again at stake: Over-taxation of divestment capital gains was avoided in 2012 thanks to a notorious rebellion of entrepreneurs ("Les Pigeons" movement). Measures are currently being considered to decrease revenue taxation (wealth tax) after the sale of a company by its owner. Added to that, a recent CAE report[22] revealed that private investment today relies too much on Bpifrance action towards start-ups, and should develop complementarily, not additionally.

France and Germany have differing strengths and as such are affected by issues arising in the digital economy in different ways – thus they can complement one another.

19, 20 Business France / French Tech (2016), *Tech Book: France's ecosystem and start-ups in international rankings*

21 European Business Angels Network (2016)

22 Conseil d'Analyse Economique – with Jean Tirole, Marie Ekeland & Augustin Landier (2016), *Renforcer le dynamisme du capital risque français*

The German case

Support emerges from federal and regional administrations, as well as from large corporates

German digital policy was redefined at federal level with the launch of the Digital Agenda 2014–2017, to cover the huge digital transformation which was impacting infrastructure, the workplace, administration, and social, cultural, and international policies. The federal government has a long-standing tradition of support towards start-ups. Forward-thinking measures include:

- The **High Tech Gründerfonds**: a public / private fund launched in 2005, unifying the Federal Ministry for Economic Affairs (BMWi), KfW (main investor with EUR 500 m) and 12 industrial groups (BASF, Braun, Daimler…). It has EUR 560 m under management to support seed and first round investments in tech start-ups.
- **INVEST**, created to support business angels: 20% tax deduction for BA investments
- **EXIST**, composed of three schemes:
  - **Culture of Entrepreneurship**: funding towards greater entrepreneurship culture in universities. EUR 104 m was invested from 1998 to 2012 in 72 projects – 22 universities are currently funded, all across Germany. An "Entrepreneur University Award" is organized each year
  - **Business Start-up Grant**: funding for innovative technology / service projects, covering living expenses (EUR 1,000–3,000 per month), materials & coaching over one year, for recent university graduates, scientists, researchers and students launching their own company
  - **Transfer of Research**: financing to turn research project spin-offs into new businesses

Furthermore, a collection of public competitions (e.g. ICT Startup competition), backed by the Länder (federal states) or at federal level exists to spur innovative spirit. And free advice is granted to entrepreneurs in all federal states by KfW and regional chambers of industry.

Going forward, the tech scene may benefit from the launch of the Tech Growth Fund, recently announced by the Federal Ministry of Finance. The next stage will be greater involvement on the part of the KfW state bank, which signed recent partnerships with its French counterpart Bpifrance on start-up funding, and in 2015 it launched a fund with the Federal Ministry for Economic Affairs to strengthen venture capital markets, by directly investing in start-ups. The fund itself will not take equity shares, but provides credit. Financing should come via the KfW.

Each entrepreneur also receives support at regional level from the regional public banks (Förderbanken), offering low interest rate loans. Nonetheless, support has been cut significantly with loans being steadily cut from EUR 32 bn overall in 2010 to EUR 23 bn in 2014[23]. Grants have been hit in the same way.

In addition to this, the corporate side is active, too, due to a combination of tax breaks fostering the set-up of corporate VC funds. Finally, Germany benefits from the European Recovery Program (ERP) of the European Investment Fund, a EUR 1.7 bn fund of funds dedicated to German-based high-tech start-ups and SMEs.

The Berlin effect: a magnet for creative people and entrepreneurs

Since the fall of the Wall in 1989, Berlin has drawn artists and entrepreneurs of all kinds, attracted to a city which is dedicated to re-inventing itself and to the relatively low cost of living there. In the eyes of an entrepreneur, Berlin is cool.

Subsequently, Berlin has emerged as the top address for digital ecosystems in Germany, and has moved rapidly up the global tables as well. It climbed

23 Figures are from Statista and Bundesverband Öffentlicher Banken Deutschlands

from the 15th to 9th spot between 2012 and 2015 in Compass' Global Startup Ecosystem Ranking[24]. It is home to the Rocket Internet success story, but also to Soundcloud, 6Wunderkinder and Wunderlist, among others. Due to its success stories, Berlin's start-up ecosystem is double the value of its Parisian cousin (USD 25–30 bn vs. USD 10–12 bn), while it has just as many tech start-ups. It has spurred a huge sense of dynamism in digital ecosystems, beyond start-ups, and the network of supporting structures (incubators, accelerators) is rapidly becoming more professional. Large corporates like Axel Springer or Bayer Pharmaceutical have opened dedicated start-up incubators. Google opened its own incubator in June 2014 called The Factory (USD 1 m invested for 3 years). New supporting structures like the Rainmaking Loft are being built every year. Cisco is in the process of opening a tech lab called OpenBerlin dedicated to IoT. Overall, more than 45 coworking spaces (Factory, betahaus, Social Impact Lab ...) and other types of labs exist, supporting the lives of entrepreneurs. Finally, the entrepreneurship pipeline is also fully operational thanks to university initiatives, such as the Technische Universität Berlin Center for Entrepreneurship.

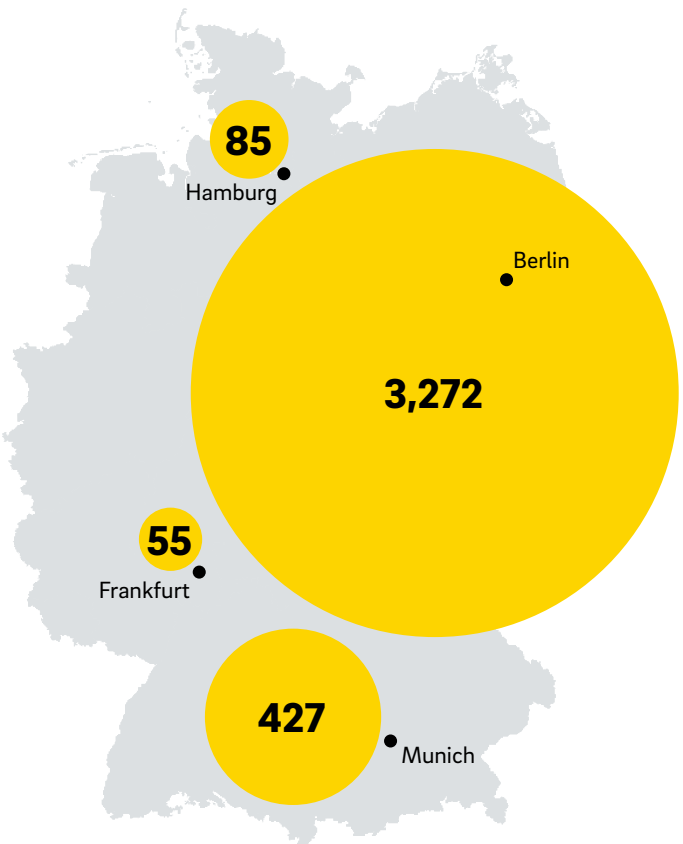
Regarding public support, the decentralized German system also helps to foster the important role of regional players. The Berlin public bank, Investitionsbank Berlin (IBB), is one of the main VC players in Germany, with over EUR 1 bn invested since 1997. It has recently been granted EUR 100 m to pursue its course of funding until 2022. The Berlin chamber of commerce is very active in fostering start-ups too. Moreover, the public-private partnership Berlin Partner, an association between regional government and businesses (200 companies / institutions represented), is highly active with the aim of fostering the spirit of innovation.

The bulk of German digital ecosystems is still concentrated in the capital: 9 out of the top 10 German incubators (Seedcamp, Axel Springer's Plug & Play, hub:raum ...) are located in the city. 39% of German start-ups are in Berlin[25].

Looking ahead, one of the key challenges might be diversification: today Berlin is well-known for e-commerce, gaming and marketplaces, but in order to go beyond the hype, strengthening other sectors may well be critical.

K GERMANY VC DISTRIBUTION

VC investments in Germany by key city [2015; USD m]



Note: figures are cited by EY and extracted from Crunchbase, hence total may differ with cumulated VC market estimates previously given for Germany due to definition differences

24 Compass (2015), *The Global Startup Ecosystem Ranking*

25 European Startups Monitor (2016) – *based on a survey*

Munich and Hamburg are catching up, but may be too focused on national requirements

While Berlin is the only German city to benefit from international recognition on the global start-up scene, Munich, Dusseldorf, Frankfurt, Cologne and Hamburg are also strong nationally. →K

Munich in particular focuses on high-tech start-ups, which though capital-intensive due to high complexity and technical effort, remain off the international radar screen. Despite being highly innovative, this is down to the fact that they are mostly B2B focused and have local, German-speaking clients. Prime Bavarian leaders like BMW, Siemens or Allianz are involved in start-ups ecosystems.

The Rocket story

Created in 2007 by the Samwer brothers, who sold their first website to eBay for USD 50 m in 1999, Rocket Internet built its success on a unique idea: instead of rushing towards innovative solutions, it copied successful (US) business ideas (especially e-commerce) and developed them in new locations (in particular in emerging countries). Of the 6 German unicorns, 5 are Rocket Internet businesses: Zalando (e-commerce), Delivery Hero (food delivery), HelloFresh (food delivery), Home 24 and Rocket Internet itself (IPO in 2014). Other notable successes are Lazada and Citydeal (acquired for USD 126 m by Groupon).

Overall, Rocket Internet has successfully positioned itself as the front-running digital player. It participated in 16 out of the 20 largest funding rounds in Germany[26] since 2012 and enjoys a net cash balance of EUR 1.7 bn to be reused in digital investments.

Strengths & weaknesses of the German ecosystem

The Rocket story shows how Germany is something of a paradox: its core economic strength is its high-tech industrial sector, yet its renowned start-ups are in e-commerce. The reason for this lies in its ecosystem characteristics.

Some of the issues encountered by France and Germany can be solved by working together to eliminate the red tape, open their respective markets, and gain the critical scale needed. And France and Germany have an unprecedented history of cooperation to build upon.

26 Frontline Ventures & Point Nine (2016), *Startups & Venture Capital in Germany*

A shared horizon at EU level to be taken into account by France and Germany

A voluntary EU-level policy environment towards start-ups, innovation and the digital economy

There is a long list of measures at EU level dedicated to supporting innovative start-ups and digital businesses that need to be considered prior to looking at French-German cooperation.

We can start with a word on the institutional context. Since 2012, the European Union has a dedicated European Commissioner for the Digital Agenda and he benefits from the administrative support of the Directorate General for Communications Networks, Content and Technology (DG Connect). Its core policy field is to frame the digital single market strategy, which is one of the 7 pillars of the "Europe 2020" strategy defined in Lisbon in 2010. Another connected but highly important pillar is the Innovation Union initiative, which in particular includes the master funding program Horizon 2020 (EUR 80 bn available over 2014–2020). A budget of EUR 800 m is dedicated to ICT research[27].

In essence, the digital single market is articulated around three topics: access to digital markets, setting the right environments for innovation to flourish, and an "economy and society" package which encompasses various subjects, including a big data strategy (2014), a cloud strategy (2012), the radio spectrum policy, a research strategy (on IoT, new protocols …), and a Start-up Europe plan.

Startup Europe gathers numerous initiatives to support start-ups and digital innovation ecosystems. →L

Startup Europe is integrated into the Entrepreneurship 2020 Action Plan led by another Commissioner, not in charge of the digital agenda but of Internal Markets, Industry, Entrepreneurship and SMEs (DG-GROWTH). It includes numerous initiatives to develop entrepreneurship learning and culture (education program), facilitation of SME access to bond markets, Erasmus for young entrepreneurs, EU-wide events … Finally we must mention here the support being offered to clusters (Cluster Excellence, European Cluster Observatory, etc.).

What's more, the European Commission is not the only EU-level institutional player targeting digital ecosystems. The European Investment Fund for instance has launched a European Angels Fund, granted with EUR 253 m to support business angels. It works on a long-term pari passu co-investment agreement: every time a selected BA invests EUR 1 in an SME or start-up, the EAF invests EUR 1 too.EUR 75 m has already been committed to business angels across Europe.

The new deal of the digital single market

A constellation of local sub-critical-scale markets.

315 m Europeans use the internet every day. In particular, online retail accounted for EUR 206 bn sales in 2015. Yet, cross-border services only account for 4% of e-commerce revenues. And as of today, only 7% of SMEs sell cross-border via online channels. If the European ideal fostered during the past 60 years was the emergence of a physical single market, and achieved by steadily eliminating trade barriers, why is our digital single market so unintegrated?

It stems from several legal barriers: geo-blocking of media content, VAT differences, regulations on heterogeneity, and delivery costs. Examples of such hurdles are rife. The German Zara website only serves Germany-based customers. It is more expensive for a small clothing retailer in Milan to sell its products online to a customer in Nice (315 km) than in Puglia (750 km), etc.

27 European Commission (2015), *Horizon 2020 Monitoring Report 2014*

L STARTUP EUROPE INITIATIVES

Financial capital	**FIWARE Accelerator Program:** EUR 80 m funding for start-ups developing innovative applications for FIWARE APIs
Human capital	**Made in XX:** highlighting success stories by country **The ACE program,** a consortium of 15 leading incubators providing support and assistance to start-ups in their move cross-border to adjacent European and international markets **Startup Europe Club,** a one-stop-shop website providing information to start-ups and ecosystem players on funding available and regulation **Europioneers**, the organizer of the Web Entrepreneur Award
Networks	**Startuphubs.eu**, a geo-localization of start-ups in Europe, gathering 600,000 businesses **Startup Europe Partnership,** a platform created in 2014 and connecting top European start-ups to large corporates. It organizes events and workshops **Startup Europe Accelerator Assembly,** a platform supporting the promotion of acceleration programs across Europe. One key partner is OpenAxel, a tool listing start-ups, digital corporates, accelerators and investors **European Coworking Assembly**, which is the same kind of network / lobby as the accelerator assembly, but for coworking spaces **European Crowdfunding Network,** the crowdfunding lobby group **Startup Europe Leaders Club,** an independent group of founders in the field of tech entrepreneurship (Spotify, Angry Birds, SeedCamp ...) who provide guidance to the Commission – Members of the club launched a start-up manifesto for entrepreneurship in Europe
Reciprocal market entry	**Startup Europe Roadshow,** taking young entrepreneurs for workshops and connecting them with role models in 10 different countries **Erasmus for Young Entrepreneurs,** a cross-border exchange program taking new or aspiring entrepreneurs to other European countries by connecting them with experienced entrepreneurs running small businesses

Source: European Commission

Huge untapped potential: Overall, the impact of the digital single market is estimated at EUR +415 bn GDP by the European Commission, along with 100,000+ jobs created, knowledge circulation bolstered and productivity increased.

A need for common action: Such issues are currently being tackled at EU level. Sequential policies have been implemented since the 2010 Lisbon strategy, the latest development being the framing of a digital single market strategy in 2015 and the digital single

market act in early 2016. By 2017, the EU plans to have reviewed e-privacy and audio-visual directives, reformed telecom rules and VAT regimes, rooted an action plan for e-government, and finally to have removed roaming charges.

Brexit: opportunity or threat for Franco-German ecosystems?

The economic impact of Brexit is still uncertain, across all sectors. Turning to the digital economy, a recent HBR paper[28] highlighted the fact that 87% of members of the tech industry group "Tech London Advocates" were opposed to Brexit. Subsequently, the study warned against serious delocalization: UK digital giants want to harness the potential of the incoming digital single market (and single market overall, especially so in the case of fintech players), and might move outside the UK. Moreover, as of today 20% of start-up talent in the UK comes from other countries. 34% of software developers are not from the UK[29]. And access by British start-ups to EU funding will be seriously called into question, if not completely withdrawn, when Brexit is implemented.

Therefore, two phenomena could arise: a weakening of the London tech scene, benefiting other EU ecosystems, and the migration of tech talent and organizations from the UK to other countries; hence bringing additional strength but also additional competition to their digital ecosystems. But these are only suppositions.

What is certain by contrast is the call for action it triggered. Brexit has weakened European unity. So now, more than ever, Franco-German cooperation is needed, especially in forward-looking sectors, of which digital is one.

28 Harvard Business Review (2016), *Brexit could deepen Europe's digital recession*
29 Frontline / Pointnine (2016), *Startups & Venture Capital in Germany*

And yet, beyond digital ecosystems, Franco-German structural discrepancies are not to be overlooked

From an entrepreneur's point of view, launching a business can be very different depending on whether you are in France or Germany.

The first key difference concerns centralization and concentration: in France, growth and value creation tend to be concentrated in a few companies, in a few cities, populated by people stemming from a few, select institutions; whereas Germany, by history and tradition, is more decentralized. The figure below highlights for example the fact that the ratio of French companies / German companies is pretty close to population ratio (81% as of 2013) for small companies and large companies; there is a clear deficit of "mid-sized" companies when we compare France to Germany. These mid-sized companies, known as the Mittelstand in Germany, represent 45% of Germany's GDP and 70% of employment[30]. Conversely, in France, mid-sized companies (250–5,000 employees) represent 28% of cumulated French companies' revenues and 24% of jobs[31].

In terms of territory, France is also much more centralized. Paris' region Ile-de-France concentrates 20% of the population[32] and 31% of national GDP in 12,000 m^2. By contrast, the state of Berlin accounts for 4% of the German population[33] and 4% of national GDP in c. 900 m^2. And finally, there is a concentration of elites, too. French top engineers and managers are educated in a select circle of fragmented small insti-

30 L'Usine Nouvelle (2016), *Comment s'inspirer du "Mittelstand" allemand,* article published on 07/04/2016
31 Bpifrance (2014), *ETI 2020: trajectoires de croissance*
32 CCI Paris IdF / INSEE (2016), *Ile-de-France Key Figures 2016*
33 State of Berlin (2015), *Investor Presentation*

tutions (Grandes Ecoles) whereas Germany is loyal to a university system. There are 40,000 students in the Technische Universität München alone (TUM) whereas ParisTech, a conglomeration of the top 10 engineering schools in France, only has 20,000 students. Paris is easy to target because it concentrates talent and money, and draws on national ecosystems, whereas in Germany, having a federal strategy enables the participation of many cities, companies and territories. Local ecosystems have considerable power in Germany (for financing, business deals…), which is not the case in France.

The second key difference is related to the labor market environment. In general, 56% of German youngsters (15–24 years old) have been educated by vocational training / apprenticeship compared to 26% of French youngsters. German youngsters gain experience at an earlier age of working in a "traditional" company. Germans tend to work more: 36 hours per week compared to 32 hours in France, according to a recent study that eliminated methodological biases to compare the time spent at work[34]. Germany is actually less flexible regarding labor protection than France, despite preconceived ideas: Germany is the 4th most rigid country of the OECD (34 countries) compared to France in 12th place (below Mexico)[35]. Employees' participation in corporate governance is different too: 17% of German employees belong to a Union, compared to 7% in France[36]. And according to a recent survey[37], 74% of German employees enjoy being at work vs. 68% in France. Two last differences are worthy of mention: the preference for longer degree courses in Germany, where the PhD is a prerequisite to accessing leading positions compared to a Master's degree in France, and the legal retirement age. People retire at 60–62 in France compared to 65–67 in Germany[38].

The third key difference is related to economic conditions. In short, employment prospects are much better in Germany than in France. 74% of people aged 15–64 are in salaried employment in Germany compared to 64% in France[39]. Regarding youngsters, 6.9% of Germans below the age of 25 are unemployed compared to 24% in France[40]. Regarding the availability of funding, there is a German familial tradition of reinvestment in companies, favoring business transfers and R&D, but this can limit openness to international investments. On fiscal conditions, the approaches are different since France uses more tax incentives (with specific status for Young Companies for instance), though overall tax burdens are comparable.

A final but certainly not insignificant difference is of course cultural. Germany has 4 research networks with distinct areas spread across Germany: Max Planck, Fraunhofer, Helmholtz and Leibniz. Strong coordination exists between public and private players[41] through the representation of private players on supervisory boards. On the contrary, France has made several attempts at structuring its innovation policy (Institut Carnot, Poles de Compétitivité) but the overall picture is somehow complex. Nevertheless, this mixture of approaches to innovation makes the Franco-German couple a surefire candidate for winning the prize of European digital leadership.

These differences imply that a German innovator would rather join a large corporation guaranteeing stable, long-term employment prospects; while his or her French equivalent would launch their own start-up as a result of not being able to find the right company.

34 INSEE (2016), *La fragile comparabilité des durées de travail en France et en Allemagne*
35 OECD (2016), *Indicators of Employment Protection*
36 OECD (2016)
37 Edenred / Ipsos (2016), *Baromètre du bien-être au travail dans le monde*
38 MISSOC (2015)
39 OECD (2016), Better Life Index
40 Eurostat, March 2016
41 A. Loudière (2013), *Quel rôle pour l'Etat dans le système d'innovation?*

2

THE ROAD TOWARDS FRANCO-GERMAN COOPERATION: FROM 1963 TO TODAY AND BEYOND

Ever since the 1963 Elysée treaty signed by Konrad Adenauer and Charles de Gaulle, the relationship between France and Germany has stood as a symbol of the common European approach.

"In order to make the digital single market a reality, we need volume to attract the necessary investments. Bringing the two most important markets, Germany and France, together is a huge step in the right direction."

Matthias Machnig
German State Secretary at the Federal Ministry
for Economic Affairs and Energy

The reasons and conditions for cooperation

The benefits of cooperation

Franco-German digital cooperation is legitimate, due to a long-standing history: Ever since the 1963 Elysée treaty signed by Konrad Adenauer and Charles de Gaulle, the relationship between these two nations has stood as a symbol of the common European approach. In 2010, the French-German Agenda 2020 proposed a common political vision and agenda for cooperation. Within this framework, little attention was given to digital affairs, however clear statements were made regarding the willingness to strengthen cooperation in Research & Innovation. In 2013, 50 years after the Elysée treaty, the concept of a Franco-German digital academy financed by business was put forward. And on May 29th, 2013, French and German ministers jointly issued a call to launch a European "New Deal" to promote youth employment. Start-ups are mostly founded by young adults so the New Deal is projected to include SMEs, and this will of course encompass start-ups.

Furthermore, our economic and social ties are legion. In 2015, France exported goods worth EUR 67 bn to Germany and, in return, imported goods worth EUR 103 bn from its neighbor. Germany is the top export destination for French companies (15% of exports), and France has been the top export destination of German products for decades and is now on equal terms with the USA (9% of exports). About 580,000 German and French citizens work for companies based in each other's countries. 1,000 French-German weddings are celebrated each year (917 in 2013[42]). Diplomatic, economic and social ties lead inevitably to harmony with regard to the digital economy.

And France and Germany are already intertwined in digital terms: Geographic proximity and prevalent economic relations between France and Germany have naturally induced some links when it comes to the digital economy. But these links remain tenuous[43].

On the financing side, first of all, there is only one French fund, Iris Capital, within the top 15 VC funds active in Germany (ranked 14th)[44]. Yet, viewed over the long term, France would appear to be more active in the German VC environment than the other way round – in particular owing to activity from Xange Private Equity, which was behind a quarter of the investments over the period. →M

Yet a more detailed investigation reveals that French investments are directed more towards the digital sector[45] than the rest of the German VC market. The same trend does not apply the other way round. →N

A prime example of German VC investment in France is Qwant. Qwant is a French start-up created by Eric Leandri in 2013 to establish a new search engine that respects privacy and does not use cookies. It has quickly benefited from expansion support in the German market, thanks to the sale of a 20% equity stake to Axel Springer Digital Ventures in 2014. As of May 2016, Qwant counted 21 m monthly visitors (vs. 8 m in November 2015) – 50% of which were based in France, 30% in Germany and 20% in the rest of the world.

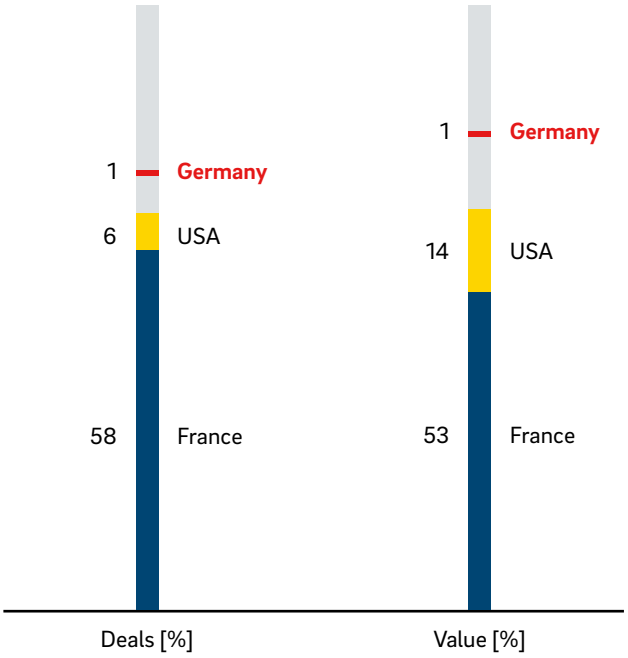
On the consumer side, we should take a look at the two largest unicorns: Zalando.fr has 10.2 m visitors per month[46] (vs. 15.2 m for zalando.de); and blablacar.de has 3.8 m visitors per month vs. 12.8 m for blablacar.fr. In other words, digital start-ups have solid client bases in both countries. More generally, with regard to digital business expansions, one should recall that France and Germany represent one of the largest e-commerce markets in Europe (given their population) and market maturity. Interestingly how-

42 INSEE, Statistiques nationales sur les mariages mixtes
43 Important caveat: the figures are extracted from Crunchbase deals database and therefore may differ from other market sizes previously discussed (French VC market is worth EUR 2.6 bn in Crunchbase vs. EUR 1.9 bn according to EY)
44 CB Insight (2016)
45 Digital encompasses here the following categories defined by Crunchbase: big data & analytics, apps, software, e-commerce, social networks, IT, internet, IoT, mobile, online platforms, web development
46 Figures from similarweb.com, as of 05/09/2016

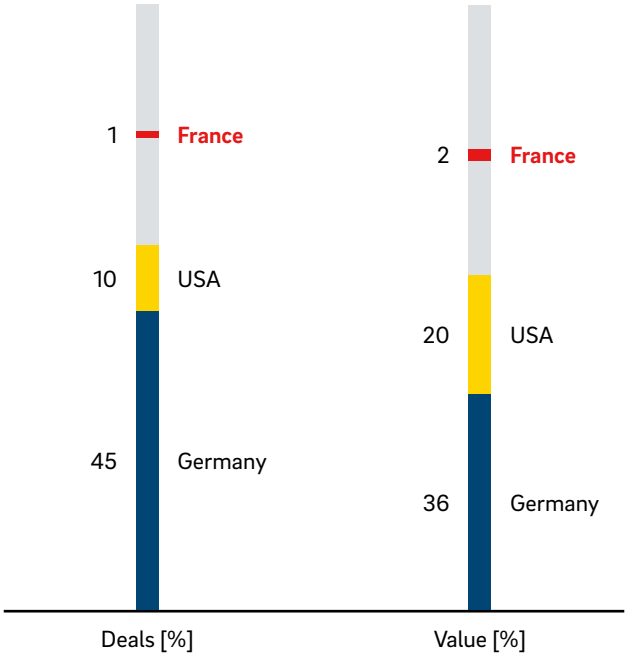
M ORIGIN OF VC INVESTORS

1998–2015

Top VC investors' origin in France



Top VC investors' origin in Germany



Source: Crunchbase (2015). Caveat: The figures may differ from other market sizes previously discussed (French VC market is worth EUR 2.6 bn in Crunchbase vs. EUR 1.9 bn according to EY)

ever, France imports online much more from Germany than Germany imports from France, in proportion to their respective populations: French customers buy 14% of their foreign purchased products in Germany (#2 foreign country behind UK) and Germans buy 4% of their products from France when buying online from a foreign country (#5).

Vision, principles and objectives of a Franco-German Digital Valley

Building a cross-Rhine project, bold and clear visions for the future are required to make the Paris-Berlin axis a digital reality. What is a Franco-German Digital Valley?

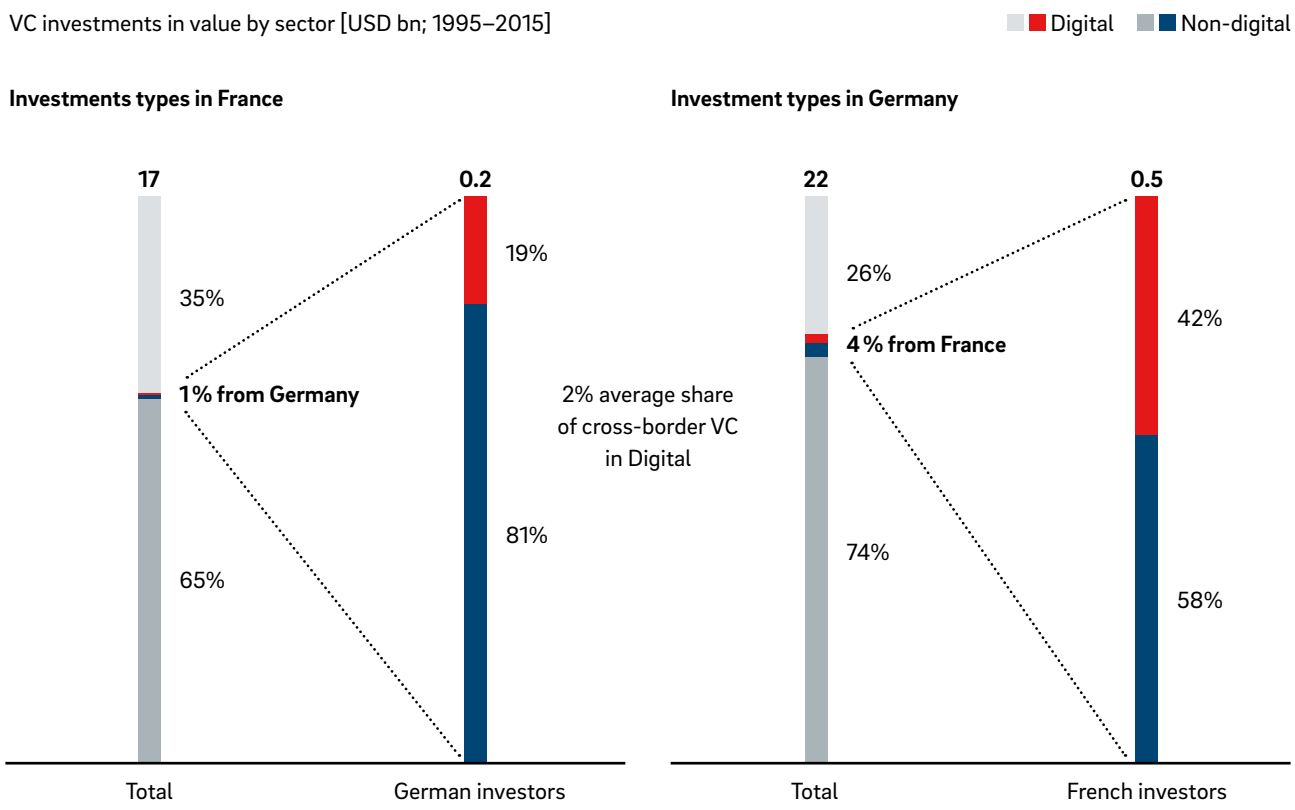
The goals are clear: A contribution to economic growth, new jobs, intellectual leadership and international stature by developing new businesses in the digital economy, and the assertion of prevalent industrial positions through accelerated digitization – thereby facilitating the adoption of digital technologies by all, and the related positive impacts. The French, Germans, and EU-level political leaders generally, are individually working to achieve these goals.

Going forward, Franco-German cooperation could help achieve these goals in three ways: →O

- **Digital ecosystems:** French and German ecosystems are both lagging behind in the digital race, with dif-

N SOURCES AND SECTORS OF VC INVESTMENTS IN FRANCE AND GERMANY

VC investments in value by sector [USD bn; 1995–2015]



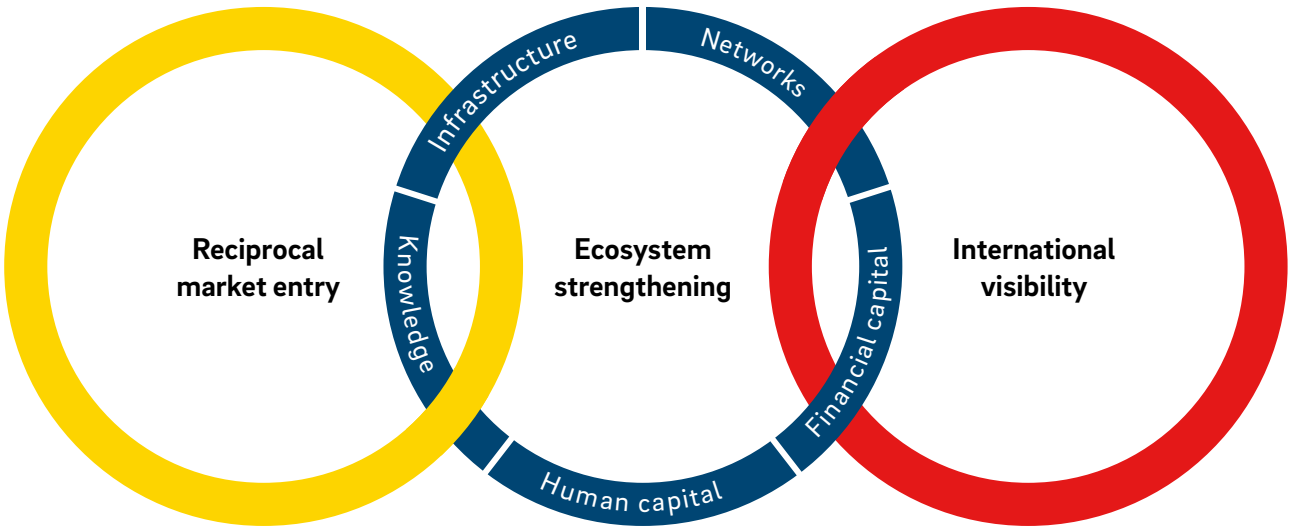
Source: Crunchbase, 1998–2015, Seed & Business Angel & VC

ferent reasons, and shared issues shouldering the blame. Leveraging complementary features will be the key.

- **Respective market entry:** Help start-ups and digital businesses enter our respective markets: France / Germany, as the key economic partner, should also be a top destination for German / French digital businesses and investors. Currently, this is not the case. The work on the digital single market will certainly help remove trade barriers and foster legal harmonization, but bilateral cooperation is expected.
- **International visibility:** Stand together as one innovation and digital ecosystem on the global stage: France and Germany can turn their economic ties in the "real world" into ties in the "digital world". Airbus and Co represent the best of what Franco-German industry can offer to the world, and we should aim to push digital in the same way.

So there needs to be a convergence between Franco-German ecosystems, but it should also extend beyond French (or German) ecosystems and their equivalents elsewhere. A Franco-German Digital Valley is the quintessence of a digital Europe, one space for innovation shared between France and Germany and one taking its rightful place among the top three in the world. However, talking about a Franco-German

O DIGITAL ECOSYSTEM COOPERATION FRAMEWORK



Inspired by German Productivity and Innovation Center (2015)

valley might seem presumptuous, firstly because geographic proximity does not imply geographic uniqueness and secondly because ecosystem consistency requires that we overcome structural, social and economic differences.

The end result of all this convergence might not look like a carbon copy of Silicon Valley. If venture capital funds are not ubiquitous, France and Germany can build on existing strengths, namely their industrial corporations that are already starting to align in matters digital. They are not "Silicon" by nature because their origin is not ICT. But they are digitizing. Furthermore, in a Franco-German Valley public contracts will have less importance than they had for Silicon Valley, where military contracts drove internet creation, but also more recently big data expansion, giving birth to unicorns such as Palantir Technologies. One of the reasons for developing an innovation model primarily driven by business is to take start-ups and new digital organizations forward.

However, a Franco-German Digital Valley requires certain conditions to flourish:

- **Complementary leverage:** Innovation can be accelerated by bringing the best of both German and French worlds precisely due to their ability to complement one another
- **Favor cooperation over competition:** The Berlin-Paris axis is neither in competition, nor does one substitute the other. Adapting start-ups as they move cross-border will be facilitated as a matter of course.
- **Work together to achieve basic rights and harmony:** Infrastructure, standards, funding schemes

Current state of cooperation

Cooperation initiatives already exist on digital topics

Mutual interests in digital, existing diplomatic and economic relationships, as well as the recent impact of the Elysée conference, have given rise to new forms of cooperation between France and Germany in the digital environment.

Bilateral cooperation examples in the field of digital

- **IrisNext fund:** Currently being created EUR 150 m VC fund jointly managed by Iris Capital (Orange / Publicis) and Capnamic (German VC), and chaired by Gerhard Cromme (Siemens Chairman)
- **Euroquity platform:** Joint Bpifrance / KfW platform listing start-ups and investors
- **French-German economy prize – start-ups category:** Awards ceremony for successful start-ups that embody French-German cooperation
- **Electronic billing FNFE-MPE and FeRD:** Best practices sharing between the 2 agencies specialized in dematerialization and electronic billing
- **Inria – CISPA meeting on cybersecurity:** Meeting held in April 2016 gathering French and German cybersecurity players
- **ZVEEI / FIECC joint digital agenda:** Joint strategy on industry digitization between electric and communication industry groups (lobbies)
- **French-German chamber of commerce start-ups breakfast:** Breakfast / debate at le Village by CA, in cooperation with Germany Trade & Invest
- **Start-up Show 42:** Start-ups meeting by French Tech Lorraine inviting Saarbrücken start-ups in April 2016
- **EUnicorns / French-German digital workshops:** Events in Paris and Berlin gathering entrepreneurs, industrials and institutionals, with workshops organized by Roland Berger, NUMA and the French & German embassies
- **Industrie du Futur / Industrie 4.0:** Partnership consolidated between the 2 industrial networks at Hannover fair – joint digitization strategy issued
- **Paris & Co / Berlin Partner partnership:** Exchange program for French or German start-ups that can spend 6 weeks in a partner coworking space / incubator across the Rhine
- **Berlin's nomination as a French Tech Hub:** French Tech will set up a Hub in Berlin at the Rainmaking Loft, to help entrepreneurs expand in Germany

We can derive four key messages from this list, as well as from external research (not displayed here). Firstly, there is currently little cooperation in infrastructure. Secondly, the core of initiatives relate to network strengthening: events, workshops, networking platforms, professional associations. There is energy and enthusiasm for Franco-German cooperation per se, but it is not being turned into substantial progress. Besides, events to foster mutual market entry and partnerships are all well and good, but their impact is also limited by structural barriers (standardization, legal harmonization, language barriers, etc.), some of which are being tackled via greater bilateral economic and diplomatic cooperation, and some of which are being tackled at EU level with the digital single market plan. Thirdly, many of these initiatives are very recent, underlining the positive impact of the Elysée conference. And finally, it seems that cooperation on digital is led by organizations which are already used to cooperating. In other words – and with the exception of the Berlin Partner / Paris & Co partnership – existing cooperation initiatives are being translated into digital, but digital is not a reason to start cooperating.

From the examples listed above, two can benefit from a more detailed explanation:

- **Euroquity platform:** In 2008, Bpifrance (then Oseo) launched a matching platform to link companies

looking for funding and investors. In 2012, KfW partnered with Bpifrance to launch the platform in Germany, before it was extended in 2013 to all EU Member States, and more recently to Africa. It is therefore a prime example of an extension of Franco-German cooperation at EU level. The website is designed like a social network: people can browse companies or investors by subject, explaining what they are looking for (money, partnerships, etc.) and like and be liked by other members. As of today, EUR 300 m has been raised thanks to the platform. However, the real impact on Franco-German cooperation is as yet unclear: out of 2,197 companies, 84% are French and 2.4% are German. Out of 491 investors listed, 78% are French and 1.6% are German.

- **French Tech Hub in Berlin:** To help French "start-upers" expand abroad, French Tech has created a network of hubs, i.e. labeled foreign ecosystems enjoying additional support to help French start-ups grow in new markets. Currently, 12 hubs have been labeled. And Berlin has been unofficially announced as one of the next French Tech Hubs. Headquartered at the Rainmaking Loft, the project enjoys the support of Axel Springer Ventures CEO Ulrich Schmitz and Deutsche Ventures, as well as numerous other organizations. The phenomenon is finding favor abroad too: 140 start-ups are listed for example in French Tech London compared to 38 in San Francisco[47]. Yet while Berlin's listing might be deemed to be no more important than Abidjan's or Cape Town's, it will have the effect of projecting new entrepreneurs into German ecosystems and fostering their visibility there.

Cooperation is pushed further at the highest political level since the Elysée conference

At the end of the Elysée conference, a joint declaration between Emmanuel Macron and Sigmar Gabriel heralded a new sense of dynamism in Franco-German relations by proposing an 8-point agenda. →P Three clear messages emerged. Firstly, actions have been taken on the immediate creation of institutions and events, but results are not yet forthcoming on matters relating to standardization and legal harmonization. Secondly, it is clear that the roadmap gathers objectives related to the adaptation of industry and to the creation of new businesses and ideas (i.e. start-ups). Apart from the launch of the joint KfW / EIB / Bpifrance fund, little has been done for start-ups and "pure" digital innovation. Thirdly, most of these programs already have counterpart initiatives at EU level. It makes it clear that the Berlin / Paris partnership can move faster and it fully legitimizes French-German cooperation on legal and fiscal matters.

Cooperation ideas going forward

Cooperation initiatives between other ecosystems are a source of inspiration

Cooperation between innovation ecosystems that are not geographically linked is not obvious, neither does it come with immediate benefits. Two examples of such cooperations are presented below:

- **Berlin Start Alliance start-up exchange programs:** Start-ups from Tel Aviv, Shanghai, New York and Paris can get a free seat in a partner coworking space (Rainmaking Loft, betahaus, HWR, GTEC, Center for Entrepreneurship, Ahoy) for 1–4 weeks to discover the Berlin and European scene. Free access is also granted to networking events and fairs, and access to VC and business development coaching is facilitated by Berlin Partner. The additional deal with Tel Aviv is that Berlin start-ups can in return spend 1 week to 3 months free of charge in Silicon Wadi. Tel Aviv also runs other bilateral start-up ex-

47 Source: lespepitestech.com

change programs, such as that signed in June 2016 with Lithuania.

- **New Technology Venture Accelerator (NETVA):** The French Embassies in the US and Canada offer a special program in North America to start-ups and innovative SMEs. Selected candidates have one week of training in Paris on how to address American markets; then they are granted a US mentor and taken on a tour of one ecosystem with tailor-made introductions. 65 start-ups have benefited from the NETVA program so far. Moreover, it is worth mentioning here that the French Embassy in the US is extremely active on the tech scene with its activities in science and technology.

P ELYSEE CONFERENCE MEASURES FOLLOW-UP

		Status	Topics	Comments
1 **Foster convergence between French and German start-up ecosystems**	French-German status for young innovative companies	▮▯▯▯▯	Reciprocal market entry	
	Joint development of crowdfunding platforms		Financial capital	Already pushed at EU level
	Harmonize commercial and bankruptcy legislation	▮▯▯▯▯		
	Have an integrated infrastructure policy (France can help on high-speed broadband)	▮▮▯▯▯	Infrastructure	Question addressed during ministerial meetings
2 **Attract and gather talents**	Salon Industrie du Futur & regular private tech events	▮▮▮▮▯	Human capital	Tech event in Mulhouse where Germany was invited
3 **Continue the tradition of high-level conferences on digital**		▮▮▮▮▮	Networks	Conference scheduled for December 2016 in Berlin
4 **Develop venture capital in France and Germany**	Partnership KfW / Bpifrance / Italian public bank for a joint VC fund	?	Financial capital	
	Partnership Partech / KfW / Bpifrance	▮▮▮▮▮		
5 **Coordinate industrial policies**	Partnership between Industrie 4.0 and Alliance pour l'Industrie du Futur	▮▮▮▮▯	Reciprocal market entry, Knowledge, Networks	Joint strategy issued
6 **Create a French-German Academy for the Industry of the Future**		▮▮▮▮▯	Knowledge	Partnership signed with roadmap between Institut Mines-Télécom and Techn. Universität München
7 **Have a French-German standardization policy**		▮▮▯▯▯	Reciprocal market entry	Standardization Council Industrie 4.0 announced at Hannover fair
8 **Reach a common agenda for the digital single market**		▮▮▯▯▯	All topics covered	

Source: Ministère de l'Economie et des Finances, Press Review

"Since participating in the initial work-shops of this initiative, we have made contact to some French start-ups and identified perfect synergies between our own offering and that of the French start-up (Qwant) and other European start-ups in the digital space. This shows that if we join forces in Europe and be pragmatic, we have a good chance of competing with the big players from the US and China."

Frank Hoberg
Co-Founder & EVP Sales Worldwide, Open Xchange

Other cooperation ideas have emerged

As we have seen, the Elysée conference gave birth to a series of events and workshops to revitalize Franco-German cooperation on digital matters. The joint paper between CNNum and bjdw issued before the conference, and the two events organized by Roland Berger, NUMA and the French and German embassies in Paris (digital workshops) and Berlin (EUnicorns) provided a list of ideas. → Q

The key takeaways are the following: The willingness to connect ecosystems remains high for market entry and the pooling of financial and intellectual resources. Specific ideas to communicate on the global stage have emerged and the idea of cooperation on infrastructure was put forward with a view to sovereign clouds.

Q FURTHER IDEAS

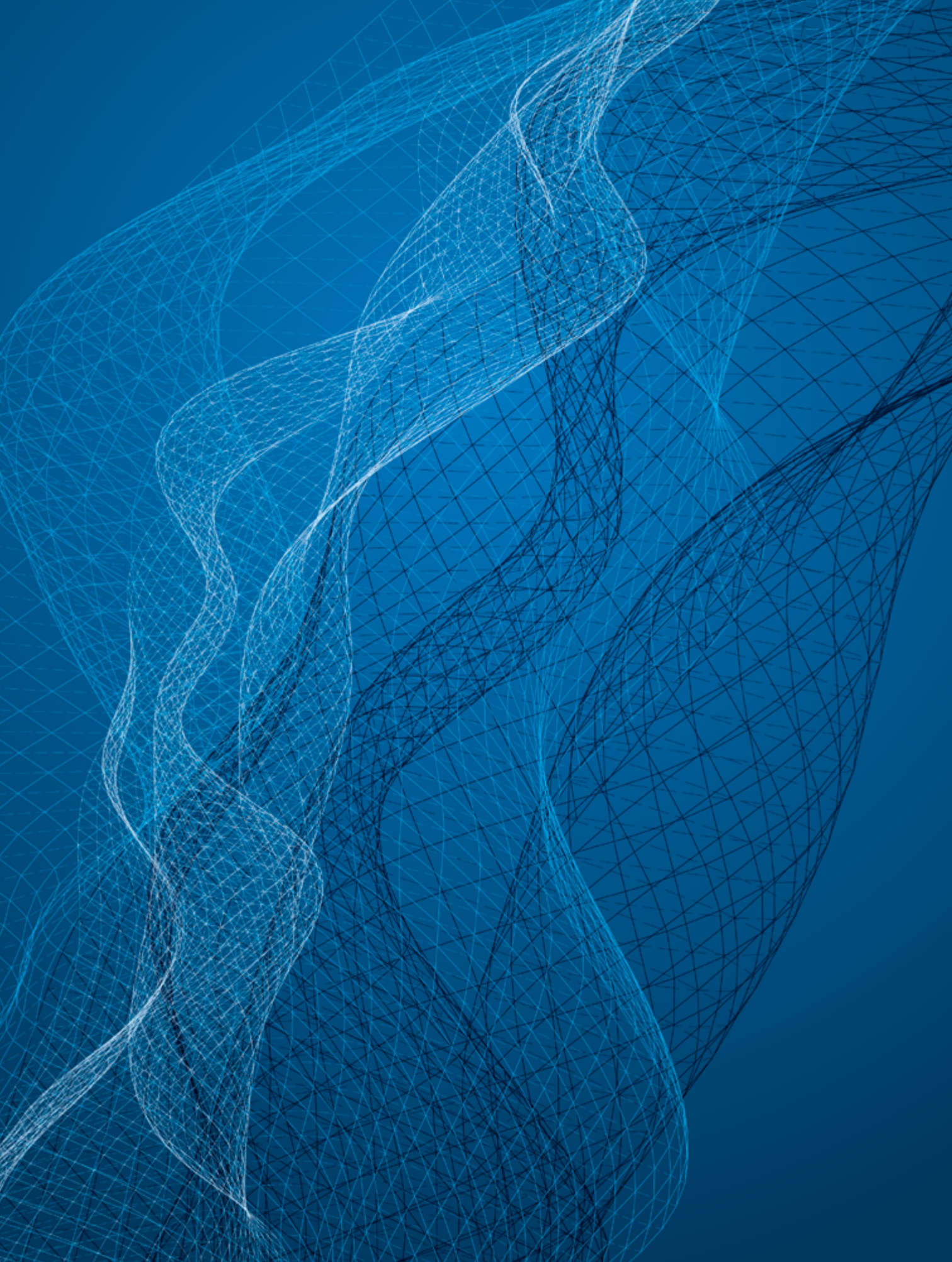
		Impact	Discussed?
Infrastructure	Pool French and German sovereign cloud efforts to lead to an EU sovereign cloud	■■■■■	✓
Financial capital	Lobby for EU support of fablabs, hackerspaces, makerspaces	■	
	Leverage family offices to fund the scale-up of start-ups	■■■	
	Stengthen readability of deal flows	■■■■■	✓
	Lobby for facilitated mergers of start-ups	■	
	Create other multi-corporate funds to facilitate cross-border market entry for start-ups	■■■■■	✓
Knowledge	Shared platforms for open innovation / cooperation between start-ups and corporates	■	
	Handbook for doing business in Europe, targeting SMEs	■■■	Already exists
	Create a platform to inform SMEs on new manufacturing technologies, foster partnerships	■■■	
Networks	Partnerships between future German Internet Institute and French equivalents	■■■	
	EU funding for trade fairs / events for digital start-ups	■■■	
	Create a council of Franco-German start-ups	■■■	
Reciprocal market entry	Startup Visa program with facilitated access to procedures	■■■■■	✓
	Create a Franco-German start-up incubator / thematic incubators with "the best of both worlds"	■■■	
International exposure	Create a EuroTech label based on French Tech	■■■■■	✓
	Have an emblematic French-German realization project (like a smart city)	■■■■■	✓

Source: Roland Berger, CNNum, bjdw

R IN A NUTSHELL: WHERE DO WE START?

Goal	Topic	France		Germany		Common issues faced
		Ecosystem strength	Individual issues	Ecosystem strength	Individual issues	
Strenghten digital ecosystems	**Infrastructure**		Insufficient cloud usage (no sovereign cloud)			
	Financial capital		Untapped business angel potential Unattractive fiscal conditions			Limited VC markets, especially for late stage
	Human capital		High cost of living for entrepreneurs		Risk-averse culture	Difficulty to attract top talents and avoid brain drain in large corporates or abroad
	Intellectual capital / Knowledge				Language barriers in some regions	
	Networks					
Foster respective market entry			Insufficient cross-border VC		Insufficient cross-border VC	Insufficient harmonization of commercial laws, fiscal conditions and technical standards
Enhance international exposure			Mitigated inter-national reputation regarding fiscal conditions			Insufficient visibility

Rationale for cooperation	Existing bilateral cooperation	EU-level actions	Elysée conference roadmap	High-impact ideas to go forward
		European cloud for scientists	Integrated infrastructure policy	Pool sovereign cloud efforts
	IrisNext VC fund Euroquity match-making platform	European Angels Fund Horizon 2020 funding, Startup Europe partnership (for large corporates / start-ups)	KfW / Partech / Bpifrance joint VC fund	Strengthen mutual readability of deal flows Create multi-corporate French-German VC funds
	Promotion of French-German entrepreneurship via prizes	Highlighting success stories		
	Industry and high-level cooperations on digital agenda and research (cybersecurity)		French-German Academy for the Industry of the Future	
	Events by embassies and chambers of commerce, partnership of Industrie 4.0 and Alliance pour l'Industrie du Futur	Crowdfunding network, Accelerator Assembly, Coworking Assembly …	High-level conferences on digital	
	Start-up exchanges (Paris & Co and Berlin Partners) Berlin as a French Tech Hub	Erasmus for Young Entrepreneurs, ACE program, Startup Europe Roadshow	French-German status for young innovative companies Regulations and standard harmonizations	EU start-up visa
				EuroTech labeling Emblematic actions



3

DAY 1 OF FRANCO-GERMAN COOPERATION ON DIGITAL: A CONCRETE BLUEPRINT FOR ACTION

Only convergence will create a Franco-German Digital Valley.
Everything is here, connections exist, and coordination is on its way.

"Capital is mobile and the best European companies can attract capital from anywhere. Our first priority should not be on European investors, but on making it easier to start successful European companies that create jobs and support their communities."

Tao Tao
CEO & Founder, Get Your Guide

Make funding cooperation a reality by coordinating corporate VC deal flows

The issues and the proposed measures

Limited availability of funding highlighted in the previous sections has been one of those key areas where French and German ecosystems were facing difficulties. There is not enough venture capital in total, and the private market is generally underdeveloped, with a more pronounced culture of risk aversion than other countries. In Germany, the unicorns owe a lot to the Rocket Internet model, which is uniquely brilliant, but not the best way to fabricate domestic, innovative companies successfully.

Yet in recent years, a movement has emerged with encouraging growth in VC markets on both sides of the Rhine. And France has built a great ecosystem for early-stage and seed funding with French Tech. In Germany, measures are ongoing, including the launch of the Tech Growth Fund. But the need remains to increase the availability of funding for start-ups. It does not mean that money should be poured recklessly into impractical business models, but greater opportunities should be given to entrepreneurs.

Measures exist at national levels and many reports have been written but the fact remains that France and Germany under-invest in each other's start-ups, relative to their economic relationships. And greater cross-Rhine investments might be the foundation of a French-German Valley, thus boosting further cooperation.

Cooperation already exists, relying mostly on the KfW / Bpifrance partnership, with Euroquity matching platforms between investors and start-ups and the recent joint EUR 75 m investment in Partech Growth, along with European Investment Bank. But looking ahead, there are few concrete actions beyond lobbying proposals towards the Commission. So the case for cooperation is made.

Cooperation in corporate VC: Leveraging existing economic links in the start-up world

What can we build upon to consider further cooperation between France and Germany on financing?

- **Public financing** is already stretched in both countries, and cooperation already exists.
- **Love money** is in essence an individual activity, despite the fact that greater emphasis should be placed on favoring crowdfunding on a cross-border basis.
- Being a **business angel** is also an individual activity, networks like the European Business Angels Association exist, and their sphere of action is traditionally more local. So emulation is possible between business angels, but bilateral French-German cooperation might not be the major source to unlock funding for start-ups.
- When it comes to **private venture capital funds**, which need public co-investment and fiscal incentives, actions have already been taken to foster Franco-German cooperation.
- Regarding **financial markets**, the creation of a Franco-German stock exchange for start-ups, based on the efficient Alternative Investment Market in London, might be a good option[48], but it would be in direct competition with the existing activity of Alternext, the Euronext-NYSE subsidiary.
- Looking at **family offices**, which in Europe generally invest 23% of their funds in private equity[49], a rising interest from them in start-ups has emerged, especially in Germany[50]. Encouraging family offices is key to broadening their risk spectrum by investing in a few start-ups (they rarely have the resources to exhaustively screen start-up markets), but cultural

48 See recommendations by the Cercle d'Outre Manche (2016), *Start-up c'est bien, scale-up c'est mieux: France vs Royaume-Uni – 8 mesures prioritaires pour faire décoller nos start-ups*

49 UBS / Campden Research (2016), *The Global Family Office Report 2015*

50 EY (2016), Venture Capital and Start-ups in Germany 2015

factors and risk-aversion might limit incentives and cooperation impact (more "familial" activities).
- However, the remaining case of **corporate VC** is a reservoir to be leveraged.

Indeed, many large French / German corporations that have close economic ties with their counterparts (in energy, aerospace, manufacturing…) are also looking at start-ups, and building corporate VC funds and accelerators on both sides of the Rhine, from Siemens to EDF. Corporate VCs have shared interests. What's more, these corporations have distinct needs when it comes to innovating. Technological intelligence (for in-house digitization) and deal flows (for acquisitions) would clearly benefit from mutual actions. The unrivalled solution a German manufacturer is looking for might come from the other side of the Rhine. And finally, French and German organizations have already started cooperating on the digital scene, thanks to the partnership between Industrie 4.0 and Alliance pour l'Industrie du Futur. No mention of VC was made in their 2016 strategic statement[51] but future plans could leverage this partnership to work towards the creation of several French / German corporate VC funds able to harmonize deal flows between France and Germany. An intermediate player providing visibility on each other's market might be key, and a 50/50 Franco-German corporate fund might be the solution, ensuring a balanced portfolio and therefore a balanced screening process for start-ups beforehand.

51 Industrie 4.0 & Alliance pour l'Industrie du Futur (2016), Joint action plan

A European sovereign cloud: The key to digital leadership

A sovereign cloud is needed to ensure applicability of national laws regarding data privacy and data protection

Today, all organizations need cloud technologies. As a recent Accenture[52] report reads, "the question is no longer whether organizations are using cloud computing, but how". And most cloud solutions are currently offered by American companies, either owned by the organization selling the service (public cloud), or the client organization (private). Hybrid public / private solutions exist too.

Yet, Edward Snowden's revelations regarding NSA spying activities 3 years ago have revived the feeling that extra-territorial storage of data might be a threat to European sovereignty. The Patriot Act is indeed a risk to data privacy.

Users of data platforms[53] therefore encounter four questions when using cloud services: Who has legal power over my data? Who is accountable for data protection? How can we know which platforms are trustworthy? Do platforms lock us in or can we transfer data freely from one to another, or to other systems? The lack of a clear response from American cloud providers has led many to consider building their own cloud at national level: a sovereign cloud. What this requires is having data centers located in-country, systematic and controlled data encryption to ensure data privacy, and controlled data transferability.

France has made two unsuccessful attempts at building sovereign clouds, critically needed to develop cloud usage among SMEs

For the reasons mentioned above, two sovereign clouds were created simultaneously in France in 2012,

52 Accenture (2015), *A new era for European public services: Cloud computing changes the game*
53 European Commission / K. Ducatel (2014), *European Cloud Computing Strategy*

thereby creating artificial competition: Numergy and Cloudwatt. The French state owned 33% of the equity in both structures, which targeted companies and public administrations wishing to have their data stored in France. Structures competed with French data storage capacity that already existed thanks to several start-ups (OVH, Ikoula, Gandi, Oodrive ...). However, Cloudwatt and Numergy almost went bankrupt: public investment of EUR 150 m resulted in cumulated losses of EUR 108 m over 3 years. Private investment provided respite to Numergy (Numericable bought back the state and Atos share) and Cloudwatt (now integrated with Orange). In 2016, Numergy was selected along with 4 other suppliers (IBM, Atos, BT and Microsoft) in an EU bid for cloud computing services and Cloudwatt won a French state EUR 1 m bid for state cloud building.

Yet, cloud computing usage in France remains immature, only 11% of companies with under 250 employees using it[54] and 36% of companies with over 250 employees using it. An INSEE study found in 2014 that the main reasons for French companies not to use cloud solutions were cost (31%), uncertainties related to data safety (31%) and location (31%). And regarding sovereign cloud usage by public authorities, the French government requested in April 2016 that local authorities store their data only in France. Indeed, the new open data imperative for public services in France, as stipulated in the "Digital Republic" bill, makes it urgent to find a reliable sovereign data solution. However, the government cannot impose a requirement that the French source their data services exclusively from French companies, since this would not comply with EU legislation on public markets.

Through T-Systems, Germany now has a recent but comprehensive sovereign cloud package to offer – German companies have the lead in terms of cloud adaptation

Germany is in a very different situation. Usage of cloud computing (survey of c. 400 firms) has risen in German companies from 28% in 2011 to 54% in 2015. This figure rises from 52% for firms with less than 100 employees to 69% for large companies (over 2,000 employees). Cloud computing is used in all industries, from IT (74%) to machinery & plant engineering (45%).

Germany has developed its own sovereign cloud, DSI Intercloud, owned by Deutsche Telekom (T-Systems), with the help of Cisco. Launched in 2015, it can be accessed worldwide, by companies of all sizes, yet data is securely stored in Germany, in compliance with German data sovereignty legislation. The T-Systems solution is compatible with existing clouds that can distribute it, such as Microsoft's Azure cloud. T-Systems has also developed an "Open Telekom Cloud". And with good reason: the expansion

Secure the adoption of digital technologies by providing cross-border infrastructures thanks to sovereign cloud solutions.

54 INSEE (2014), study across 16,000 respondents

"Going forward, a fourfold cooperation roadmap shall be followed: nurture co-investments and partnerships to foster the emergence of European cloud champions; coordinate and enhance support for innovation in cloud technologies; establish shared specifications for sovereign clouds; and shared regulations on data privacy and protection."

Eric Guyot
CEO Germany of Sopra Banking Software

of Industrie 4.0 initiatives will lead to an explosion of data handled by industrial companies, most notably in the Mittelstand. US companies have reacted to German fears regarding data sovereignty: IBM, for instance, set up a new center for Watson, its cloud-based cognitive platform. Interviewed by Bloomberg BusinessWeek[55], IBM General Manager for Watson said: "If a customer wants data never to leave Bavaria, then it won't". Other leading players include of course SAP, which has its own gold-standard cloud, or ProfitBricks, a German IaaS cloud provider. Data management is being developed in Germany with investments in data centers at around US 8 bn per year[56].

Europe is currently building a cloud for scientists; expansion for businesses and civil society will take time

The European Commission framed its strategy in 2012 to accelerate the use of cloud computing in Europe and harmonize technical standards. One of the first achievements is the listing of valid cloud certifications for example (Cloud Certification Schemes List).

At European level, a European Open Science Cloud is currently in preparation, targeting primarily scientists and researchers. It is indeed critical to equip researchers with the best data management and treatment capacities, in order to accelerate innovation on the continent. A tender was launched in July 2016 for the establishment of a European hybrid cloud platform for scientists by the public / private partnership Helix Nebula – The Science Cloud. However, it is not clear that data won't be stored outside the EU, especially if the project includes US partners in a consortium led by European players.

Overall, through Horizon 2020, the EU will dedicate EUR 3.5 bn to data infrastructure. Sovereign cloud policy remains to be clarified nevertheless, in the aftermath of the repeal in October 2015 by the European Court of Justice of the Safe Harbor Act on transatlantic data flow.

A Franco-German cooperation is key to sovereign cloud computing, to lay the groundwork for an EU cloud

So a Franco-German initiative in the cloud would undoubtedly make sense, for three reasons. Strategically, it would merge efforts and lay the groundwork for a European cloud, only developed for scientists at this point in time, and the scaling of which is hampered by EU processes and lobbies. Economically, it would bring in additional economies of scale, and enable the value of the cloud services market (jobs, etc.) to be captured. And technically, it would also help counter the eruption of new US-based technologies that we would then have to catch up with again.

But where should we pull the trigger? We are late onto the technical and commercial battlefields. A sovereign French-German copy of Azure or IBM Cloud might not be the way forward. What could be, by contrast, is a threefold partnership: solidify the legal basis to ensure sovereignty; build a European software security standard that would guarantee data encryption and privacy; and boost intelligence on new cloud technologies to make sure we are part of the next innovation wave.

A recent Roland Berger report[57], for instance, recommended the adoption of a European cloud based on blockchain technology. It is an emerging field (though already tackled by Microsoft for instance) that basically reinvents data storage: instead of physically storing data in data centers, data is shared between data centers that communicate with each other via blockchain networks[58]. At EU level, this would also certainly make sense.

55 Bloomberg BusinessWeek (2016), *Building a National Fortress in the Cloud – article published on 19/05/2016*

56 Statista (2016), figures from Datacenter Dynamics

57 Roland Berger & Internet Economy Foundation (2016), *Going digital: Seven steps to the future – Germany's path to lead European digital transformation*

58 Information extracted from: https://blockchainfrance.net/2015/10/05/police-cloud-et-blockchain/

Dream big: A Franco-German innovation identity to boost international recognition and visibility

French and German ecosystems are already getting closer to each other in the wake of the Elysée conference – the effort is to be continued

The vision of a Franco-German Digital Valley, as we highlighted, is the vision of a continuum: from a US or a Chinese point of view, chasing business opportunities and new ideas should be the same in France as in Germany. As we have seen, internal issues would need to be fixed locally, and the cooperation agenda of the Elysée conference lays greater emphasis on linking French and German digital ecosystems, on their convergence. A series of events has been organized (digital workshops, Start-up Show 42, etc.). Research institutions and associations are starting to draft shared digital strategies (INRIA / CISPA, ZVEEI / FIECC, etc.). Incubators are seeking partnerships, like Paris & Co and Berlin Partner. And finally, French start-ups are now aiding their German market entry with the recent set-up of a French Tech Hub in Berlin. Convergence is ongoing.

The next stage is to build international recognition: The Franco-German Digital Valley is a place where innovation happens, but differently

One point which is both omnipresent and absent from Elysée conference transcripts is the question of international recognition. It is not a point in the roadmap per se, but is one of the implicit objectives.

Behind the communication lies the question of the identity of the Franco-German Digital Valley. What is the right benchmark for a Franco-German Digital Valley? Is it really Silicon Valley, with its predominance of VC funds and history of computing innovation, in reference to the "Silicon" of the first computers? Other innovation places have proven that it can be done differently. Cambridge University in the UK, which produces 50% of the biotech start-ups listed in the alternative UK market, is an example of another model, where PhD students are also entrepreneurs and where cross-departmental research transfer is replicated. Hence, French and German organizations can foster their innovative spirit in the digital sphere since they are complementary to one another. Four simple actions could be taken in this regard:

- **Extend the French Tech label experience** by creating a mirror label in Germany or by creating a joint label. This could be the first step towards a European label, inspired by French Tech with an example to follow in terms of communication. International cooperation would then be ensured between the German Silicon Valley Accelerator and the French Tech Hub network abroad.
- **Bring joint Franco-German teams together for worldwide tech events,** like the CES show in Las Vegas or the World Economic Forum in Davos
- **Support immigration of talented entrepreneurs,** via a Franco-German start-up visa, before lobbying for an EU-level start-up visa. The e-residency visa granted in Estonia since 2014 is an excellent example to follow. E-residency in Estonia is a transnational digital identity card available to every world citizen interested in administering a location-independent business online. It allows anyone to do by electronic means and from afar everything legally required for starting business, including setting up a company, signing contracts, opening bank accounts, making and receiving payments and paying all taxes.

- **Make mutual projects happen:** A French-German smart city initiative on the border has considerable potential, in Mulhouse or Freiburg for example.
- **Continue to pursue convergence of universities,** to build a Western European "Stanford", in order to keep on attracting talent. Indeed, France and Germany both suffer from the lack of recognition of their ecosystems in international rankings. On the international academic stage, size matters as much as excellence. And the solution already exists. Since 1999 France and Germany have run the Franco-German University (FGU). The FGU consists of a group of more than 185 affiliated member universities from both France and Germany. But it is a virtual, not a campus university. Consolidation might be needed, taking into account mergers and networks already ongoing in France (PSL, Paris Saclay, etc.) and German specificities (policy at regional level).

Conclusion

Pushing French and German cooperation on digital topics is the original no-brainer: the stakes are high for employment and growth, both France and Germany are currently underperforming on the global digital stage, they have common issues, can complement one another and most of all, their exceptional economic relationships point the way forward.

However, many initiatives already exist, especially at EU level. Ecosystems are boiling, connections are happening, but from a high-level perspective, cooperation seems rushed and marked by more enthusiasm than concrete achievement. And most of all, bilateral cooperation in a globalized world and a dematerialized digital sphere could look outdated. Nothing would be more modern, however. Furthermore, cooperation may theoretically look easy and thus not deserve the attention of a report. But long-lasting structural barriers remain to be overcome, including language and culture, and stand in the way of spontaneous cooperation.

This report has made three recommendations to take cooperation to the next level. Firstly, consolidate funding capability by leveraging French and German strengths: their leading large corporations are already economically linked. And cross-border VC funds could lay the groundwork for the coordination of deal flows before corporate VC goes cross-border. Secondly, solidify the digital sovereignty by unifying efforts on sovereign clouds. This is a necessary preliminary step before pursuing leadership. Finally, work up the international reputation by speaking with one voice: one large research university, one talent team of start-ups, etc.

In the end, convergence will create a Franco-German Digital Valley. In a Europe shaken by Brexit and scattered over too many distinct individual contexts, Franco-German cooperation is a simple, easy way forward. Everything is here, connections exist, and coordination is on its way. It is just a matter of joining the dots.

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In the wake of the Elysée conference, Roland Berger and the French & German embassies organized two events in ad hoc locations (NUMA and Spielfeld incubators); open to entrepreneurs, industrials and institutional leaders; for a day of workshops, talks and networking around French-German cooperation.

PARIS FRENCH-GERMAN DIGITAL WORKSHOPS OVERVIEW – APRIL 5, 2016, NUMA

50 participants, French and German in equal numbers, start-ups, institutionals and corporates from all industries

Expert speeches from Klaus Fuest on Industrie 4.0 in Germany and Anne Bioulac & Olivier Mougenot (NUMA) on French start-up entrepreneurs

5 start-up testimonies by Boris Mittermüller (Foodora), Jean-Daniel Guyot (Captain Train), Stuart Lodge (Sigfox), Eric Leandri (Qwant), Tao Tao (GetYourGuide)

4 thematic workshops on digital single market, Industrie 4.0, scale-up of start-ups & SMEs, and energy transition

Macro context and public policy perspective by Mounir Mahjoubi (French National Digital Council) and Clark Parsons (Internet Economy Foundation)

Closing ceremony at the German Embassy with Ambassador Nikolaus Meyer-Landrut and Charles-Edouard Bouée

EUNICORNS MEETING IN BERLIN – MAY 9, 2016, SPIELFELD / FRENCH EMBASSY

Some 200 participants – start-ups and corporates – came to Berlin and took part in the 1st German French EUnicorns Event

Spielfeld is part of Terra Numerata™, a digital network launched in 2014 by Roland Berger to bring together innovators, investors and talent.

3 workshops moderated by Roland Berger experts brought the participants together for lively discussion about cybersecurity, mobility and Industrie 4.0

A panel discussion at the French Embassy widened the perspective with insights from start-ups and representatives from corporates like Dirk Hoke (CEO Airbus)

Ambassador Philippe Etienne and Charles-Edouard Bouée opened the event at Spielfeld, the Digital Hub of Roland Berger

Closing ceremony at the French Embassy marked the ideal finish to a great day.