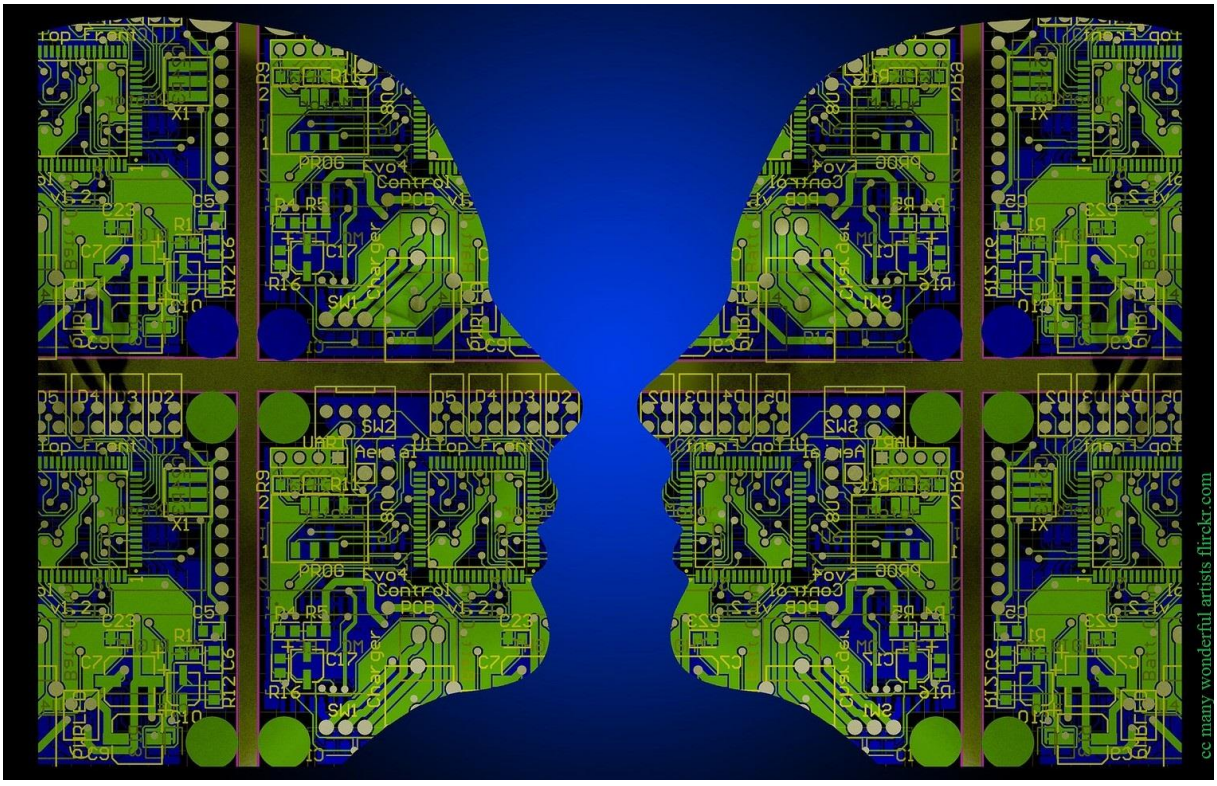
JACQUES DELORS INSTITUTE
BERLIN
Centre for European Affairs at the Hertie School of Governance

POLICY BRIEF 18.12.2018

Better Together?

Franco-German Cooperation on AI

Paul-Jasper Dittrich
Policy Fellow at the Jacques Delors Institute Berlin



Alongside many other industrialized countries, in 2018 France and Germany published national strategies on the development and governance of artificial intelligence (AI). While the two countries have committed to working together more closely on AI, concrete policy proposals for cooperation are largely missing from their strategic documents. In this Policy Brief, Paul-Jasper Dittrich reviews both strategies to find policy areas where cooperation between France and Germany would be mutually beneficial and serve the AI strategic goals of both.

Pariser Platz 6
D – 10117 Berlin
Tel.: +49 (0)30 467 26 09 – 01

Online: delorsinstitut.de
E-Mail: office@delorsinstitut.de
Twitter: @delorsinstitut

1 A Growing Momentum

In July 2018 Peter Altmaier, the German Minister of Economy proposed an "Airbus for Artificial Intelligence", in an interview with French newspaper Le Figaro. The minister envisioned a concerted effort from French and German carmakers: by creating a joint company, they could pool their resources to compete with American tech companies such as Google and Uber in developing the technological preconditions for autonomous driving. It is unclear whether this concrete proposal will come to fruition, not least due to hesitation among European car companies. However, it would be a logical step in line with various current policy objectives and analyses on AI shared by many European policymakers, because it relies on two major insights. First, it acknowledges that **European countries are lagging behind in the development and deployment of artificial intelligence (AI) in core industry sectors**. Second, it expresses the political will for joint Franco-German projects that has been pushed on both sides of the Rhine.

This political momentum should not be wasted. "Artificial Intelligence" is a general purpose technology already transforming virtually every sector of the economy and society at large. In order to come on par with world leaders, large initial investments in research and infrastructure, as well large data pools are needed. Research and development of AI applications appears thus to be an ideal candidate for creating synergies and sharing resources between European partners, and especially between France and Germany – well beyond lighthouse projects such as an "Airbus for AI". Based on an examination of the two national strategies on AI, which reveals differences but also striking similarities in analysis and approach, I argue in this Policy Brief that **the two countries could and should collaborate more closely on key features of AI policy and development**. The timing for a new, forceful Franco-German partnership is perfect: in early 2019, Emmanuel Macron and Angela Merkel want to sign a "new Élysée Treaty" between the two countries; a new version of the treaty of friendship signed by De Gaulle and Adenauer in 1963. Such a treaty could provide the golden opportunity for ambitious Franco-German collaboration on AI. **A new Élysée Treaty with AI as a centrepiece of cooperation** would acknowledge that both countries could fare much better if they addressed their current weaknesses in this key technology framework for the 21st century together.

In what follows, I first review the significance of recent technological developments subsumed under the label "artificial intelligence". I then take the two countries' recently published AI strategies as a starting point for finding suitable areas for cooperation. This is followed by a comparison of the two strategy documents, to find policy areas and initiatives where strategic interests overlap and a pooling of resources could be mutually beneficial for the strategic interests of both countries.

2 The Evolution of AI over the past Decade

There is no consensus on the exact meaning of "artificial intelligence", and most national strategies on AI published in 2017/18 do not offer a comprehensive definition of the term. The reason for this is partly historical. In the past 50 years, the term "AI" has been used, especially outside scientific circles, to describe the latest algorithms or statistical techniques and computer programs capable of copying and eventually automating human-level cognitive abilities (such as recognising objects, detecting patterns in unstructured data and learning from repetition how to autonomously perform a task). Some of the mathematical models underpinning these programs were already discovered decades ago. However, **the past decade has witnessed a strong acceleration in the development of practical applications for "artificial intelligence"**. Thanks to vastly increased and remotely accessible computing power and, crucially, the exponential growth of

human and machine-generated data, possible applications for these statistical techniques, especially through using deep learning with neural networks, have virtually exploded in the past ten years.

Without capable data analytics tools, it would be impossible to make sense of the huge amounts of data being created daily, for example, by smartphones. **Statistical techniques for machine learning such as "deep learning" use neural networks to find patterns in these large data sets and in a consecutive step help automate more complicated tasks**, thereby giving machines higher degrees of autonomy. Other machine learning techniques such as reinforcement learning can be used to "train" a machine to perform a task autonomously; for example, how to play Go, or how to recognize different objects on a road in hazy weather conditions (to help steer a driverless car). In the current debate many of the statistical techniques being applied in, for example, data science, robotics and language processing are often lumped together under the label "artificial intelligence".

Despite the definitional fuzziness, there is no doubt that there are numerous research opportunities in the field and an abundance of potential industry applications. "Artificial intelligence" conceptualized in a broader sense is already, or will soon be, applied in all sectors of the economy, as well as in administrative and military settings. Examples include health care, where AI can help automating the research of new pharmaceutical drugs and drug trials, autonomous vehicles, better manufacturing and service robots, delivery drones and live translation programs. Given the depth (transformation of business models) and breadth (number of sectors affected) of AI applications, it is no wonder that **governments around the globe are seeking to participate in the shaping of both the future technological developments and their framework conditions and ethical guidelines**. Another important reason that has led many governments around the world (and almost all industrialized ones) to publish national AI strategies in the past two years is a rising fear of losing the race of technology leadership on AI to a handful of countries, of which China and the US are the most advanced. Technology leadership in AI is even perceived by some as a matter of national security or national sovereignty.

3 Two National Strategies on AI

A strategy for catching up on those countries leading the way in AI technology – in addition to the US and China, these mainly include Israel, Canada and the UK –is urgently needed in a post-Brexit EU. **The pooling and sharing of resources between member states should be a central element of such a strategy**; although this will require a convergence of views on the way forward, especially between France and Germany.

Finding common ground between member states is always a complicated and slow political process. However, **the following examination of two national strategic documents reveals that there is already a great deal of congruence in goals and means**. For example, both the French and the German reports promote similar ideas on how to foster research on AI and concepts for technology spillover – and also harbour like-minded approaches towards ethical guidelines.

The French administration published its strategy on AI under the auspices of French mathematician and MP Cedric Villani (LREM) in April 2018. The German Strategie Künstliche Intelligenz was published in mid-November 2018. In general, we can say that the German strategy places a heavy focus on the development of AI applications and technology adoption for the German Mittelstand (small and medium-sized enterprises), while the French industrial policy vision for AI has a broader focus. The French document is also much longer and hence includes more concrete measures for individual sectors, including the defence sector.

The French strategy is overall more concrete on key elements and structural preconditions underpinning the development of new AI applications, such as talent, data and computing power. **It is also more explicit in expressing the need for strategic autonomy of France/the EU when it comes to key input factors such as microelectronic components**. France has announced an investment in its AI-related actions of 1.5 billion euros by 2022. The German strategy seeks to reinforce existing strengths, in basic research and engineering excellence, amongst others. The country has 500 million euros earmarked in the federal budget to carry out the strategy for 2019, and 3 billion euros in total funds are planned to be provided by 2025. It is important to note that the strategy merely formulates intentions – whether these intentions will be put into policy is a completely different matter.

The two documents reveal similarities in analysis and proposed solutions, such as on the need for talent development and the emphasis on facilitating a faster technology spillover from research to industries. Although France and Germany have different economic structures and industrial priorities, six areas feature prominently in both documents:

1. Research

Both countries intend to spend more public money on AI research. The German government intends to finance at least 100 new professorships working on various aspects of AI research. Furthermore, existing regional AI research clusters are to be connected to a network of at least twelve different research and test centres spread across Germany, so as to create faster spillover to industries (see point 2. below). Similarly to Germany, France aims at setting up a network of research institutes across the country for various aspects of AI research. The French strategy also places an emphasis on the need for more computing power for researchers: research institutes must be able to compete with the sheer scale of the computing power available to private actors.

Another area of communalities is disruptive innovation. On the German side, AI should become a key element in the planned "Agentur für Sprunginnovationen" (Agency for Disruptive Innovation) currently being set up by the German Ministry of Education and Research. This means that the development of particular AI solutions should be one of the priorities for the mission-oriented approach of the new agency – developing more efficient and sustainable traffic management systems, for example. **The French strategy praises breakthrough innovation based on strategic missions**. In terms of management, DARPA should be the role model. France wants to hire genuine programme managers whom have high autonomy, and the right to fail with their mission-based assignments.

Research cooperation is the only area where the German strategy becomes more specific on possible Franco-German cooperation. **The document proposes setting up a "virtual network" of exchange and cooperation between leading AI centres in France and Germany.** It also states that the German Agency for Disruptive Innovation will work together with French partners on AI, without providing further details on the planned cooperation.

2. Technology Adoption

One of Germany's main priorities regarding AI is the digital transformation of the German industrial base. As already stated in earlier documents and strategies, the German government is worried that the German Mittelstand, especially firms from the manufacturing sector, will not be able to catch up fast enough with AI technological innovations. Among these are new technologies capable of rendering more efficient the production process itself – in automated value chain management, for example – and other technologies that disrupt business models and change the distribution of value creation (with the advent of platform models for b2b marketplaces or service

provision, for instance). Ensuring the competitiveness of the Mittelstand by helping it to adopt AI-powered solutions as fast as possible is thus one of the strategy's main aims. **A central objective of the strategy is to turn Germany into a leading hub for "AI made in Germany" and improve the link between research and practitioners** – in test centres adjunct to the nodes in the research network, for example. In these centres, companies should have an opportunity to test new technologies in order to generate faster spillover from research to industry.

France also wants to support key sectors of its industry in their adoption of AI technologies and the development of "AI ecosystems". However, the approach is broader and sector-based. Four strategic sectors are explicitly mentioned: health, ecology, mobility/transport, and defence/security. These sectors serve the "general interest" and would according to the strategy therefore require state intervention. However, the choice of sectors also appears to be clearly driven by further industrial policy interests and reflects in part the structure of the French economy. This ecosystem approach is based on bringing together all relevant stakeholders (researchers, companies, public authorities) for the development, adoption and regulatory support of new technologies. Better access to data across sectors and the provision of computing infrastructure for researchers are also part of the approach. From an industrial policy perspective, it is also interesting that the French strategy calls more explicitly for strategic autonomy: knowledge about microelectronic components and computer architectures, for example, must stay within Europe.

3. Talent Development

Attracting talented AI engineers and slowing down the brain drain of "homegrown" AI experts to leading nations in AI development such as the US, Canada, the UK and Israel, as well as to large tech companies, is a major priority for both Germany and France. One proposed instrument in the German strategy to increase the attractiveness of Germany as an AI research hub for national and international talent is the development of programmes that link industry and academia; for example, by supporting dual career programmes for researcher-entrepreneurs. Access to data is identified as another key objective in making Germany a more attractive location for the development and implementation of new AI technologies.

The French strategy has similar objectives and planned instruments. To increase the attractiveness of the French research network, it calls for a European cloud infrastructure, European supercomputers, and measures such as the increasing of researcher salaries.

4. Skills and Education

Another important aspect mentioned in both strategies is the question of skills and reskilling of the labour force in the face of the rapid technological changes and the loss of job and stable income security that is likely to accompany their widespread implementation. **The German strategy calls for a national reskilling strategy in order to prepare the population for AI-related job insecurity**, without, however, specifying many further details on the aims or means of such a strategy.

In the French document, the chapter on the impact of AI on the labour market addresses the main uncertainties related to mass automation of cognitive tasks and advanced robotics (changing skill sets, distributional challenges, type of new jobs created). The strategy acknowledges that it is almost impossible to quantify the exact impact AI will have on labour markets or skill sets, despite a large number of publicly debated forecasting exercises on the number of jobs likely to be lost or affected due to AI. **On account of this uncertainty, the strategy proposes creating**

spaces for anticipation and experimentation, so as to create faster, targeted public policy responses – with regard to reskilling and retraining programmes, for example.

5. Ethics and Inclusion

The ethical challenges of AI are currently the subject of very broad national and European debate. One of the most discussed ethical challenges is the question of how the autonomous decision-making of algorithms and more advanced automated systems can be made as free of discriminatory patterns as possible. In order to tackle these highly sensitive questions, **Germany's strategy calls for collaborating with its partners on European and international ethical guidelines.** The strategy is very clear in its support of a multilateral framework for the development of guidelines. It calls for a "European answer" to data-based business models and for data-based value creation to correspond with German and European values. To this end, the German strategy postulates "AI made in Europe with ethics by, in, and for design". Ethical considerations are to be factored into the development of AI from the beginning and constantly monitored during application. With regard to ethical standards on decision-making systems, it counts on the "Brussels effect". **Due to the size of the Single Market, European regulation in this area would have a strong effect on the rest of the world**, just as the General Data Protection Regulation (GDPR) has had on worldwide regulation on data protection.

According to the strategy, developing ethical guidelines, building them into AI from the start and afterwards monitoring their success, will require a new supervisory agency dealing with these challenges in a way similar to that of the data protection agencies. To this end the German document suggests as a first step the building of a German observatory for the monitoring and screening of AI technology. It also specifically supports a European and international AI observatory. The French strategy formulates similar goals and instruments. It calls more explicitly for an "**opening of the black boxes**", more (and better) methods of explaining the decisions of machine-learning algorithms. It also highlights the auditing of AI applications and algorithms by an independent third partner, at national and European level. Similar to the German strategy, the Villani report favours **ethics by, for, and in design**.

The third chapter of the German AI strategy is devoted to inclusion and diversity in AI. It promotes the idea of "human-centric development" and the use of AI, especially in the workplace. One prominent example of the current lack of diversity is the gender bias prevalent in research and the tech industry: **AI is still a male-dominated technology**. Lacking diversity and inclusivity in AI could have long-lasting consequences as existing biases in data sets are overlooked and eventually contribute to algorithmic discrimination. The French strategy also addresses the perceived threat of AI technologies not designed and implemented from the start with a mind-set that favours inclusivity and diversity. The report calls for a target of at least 40% female students in digital subjects in schools and universities by 2020. Such concrete targets are largely absent from the German strategy.

6. Standards and Regulation

One of the most important aspects in both strategies is the regulation of data and new business models. Both the national documents seek to improve framework conditions for data sharing in accordance with the GDPR and encourage private companies to collaborate on voluntary sectoral and cross-sectoral data pooling. The French strategy is more assertive on data sharing and access to data: data that is useful in developing new services should be made much more available, even if this means taking data from large corporate stakeholders. **Both**

strategies agree that public administrations should take the lead as an exemplary first mover in AI solutions on data sharing. Regulators and entrepreneurs should also work together more closely to identify and rapidly fix regulatory challenges concerning new technologies in "regulatory sandboxes". The idea behind this approach is a temporary easing of regulatory restrictions in order to test products and bring them to market quicker. **France's strategy markedly differs from that of Germany in that it features an entire chapter devoted to AI and ecology**. Among the measures called for in this chapter is the development of faster and less energy-consuming chips and the provision of better access to ecologically relevant data, i.e. on weather, traffic and energy consumption.

The table below sums up the main similarities and differences between the two documents.

Area	Similarities	Differences
Research	Focus on building networks of research clusters and emphasis on public money for "disruptive innovation"	German focus on Mittelstand; French approach more sectorial, including emphasis on defence and ecology
Technology Adoption	Shared analysis of key problems of technology diffusion and the need for stronger links between industry and researchers	German approach places stronger focus on experimenting; French approach is more systemic (building of ecosystems of researchers, entrepreneurs and regulators)
Talent Development	Suitable and competitive infrastructure (data, computing power) identified as key pull factor for talent, besides salaries	Few
Skills and Education	Shared sense of urgency to act on reskilling in the face of AI	German focus on reskilling for manufacturing; French focus on experimentation in reskilling
Ethics and Inclusion	Large overlaps in goals and instruments. Both favour European ethical guidelines	Few
Standards and Regulation	Both identify data regulation / access to data and more room for experimentation as key enablers	French strategy more assertive on the need for data sharing, more concrete approach to sharing public data

4 Franco-German Cooperation: Finding Common Ground

The governments of both countries have already committed to collaborating on the development of AI in one way or another. However, apart from plans to set up a joint research centre that are distinctly lacking in details and the general lip service paid to the Franco-German friendship, any concrete plans for collaboration have so far not been made public. Indeed, the plan to build a joint research centre, a prominent feature of the German coalition agreement, has changed over the course of 2018. The German strategy now only mentions setting up a "virtual network" of French and German research institutions. This centre is intended to bring together expertise and vaguely encourages the pooling of data and the creation of joint research project in key sectors. The plan for a physical centre has been dropped as agreeing on a location for the centre, even within Germany, transpired to be more complicated than anticipated. The plans for collaboration between the two agencies for disruptive innovation remain equally vague. The French strategy is more concrete on European projects (calling explicitly for European technological sovereignty in certain sectors and certain AI applications), but overall it also does not offer a concrete framework for enhanced Franco-German cooperation on AI.

The reason for this impasse might lie in the logic of national strategies**. Despite mentioning possible areas of cooperation and the apparent overlap of goals and instruments, both strategies focus on the development of the respective country's individual strengths**. They are each written as a reflection of the country's economic structure and industrial policy goals. While this is indeed understandable, **it should remain a priority of both countries to develop more concrete and mutually beneficial cooperation projects**. The idea of an "Airbus for AI" promoted by Peter Altmaier would, even were it successful, not replace the need for a more comprehensive and results-oriented strategy for Franco-German cooperation on AI. Such a strategy would instead need a compelling, underlying common logic of mutually beneficial cooperation on which both countries could agree.

Examples for such a mutually beneficial cooperation can be derived from the current strategic documents on AI. Each country's national goals could in fact be elevated by cooperation with the other. From the documents alone, the similarities and possible areas for further cooperation are apparent. Crucially, the documents reveal the similar weaknesses of both countries (and the EU) in key areas where cooperation will yield higher added value. From an economic and growth perspective, there are areas, which both France and Germany seek to address with their respective strategies, that are ripe for cooperation. **Research, technology spillover and access to data for AI applications are among their highest priorities**. Another common element in both documents is the emphasis on technological sovereignty, albeit expressed more directly in the French document. **Finding strategic aims and instruments to collectively increase the degrees of strategic autonomy could thus be another joint project for France and Germany**. Last, but not least, both countries could come to terms on the development of ethical guidelines for AI and should thus aim for a joint strategy on how to promote these guidelines at EU level.

Defining goals and instruments for a new Élysée Treaty

Rather than only focusing on isolated projects such as an "Airbus for AI" for their respective car industries, France and Germany should address their shared weaknesses together and capture synergies. They should formulate a joint strategy. **The new Élysée Treaty project provides a perfect political framework for producing such a strategy**. Therein, France and Germany could assess each country's priorities from their individual strategies and then put their weight behind those projects where cooperation yields the highest synergies for both partners. **The strategy should be as concrete as possible, define instruments for each goal, set concrete targets with a delivery date, and develop benchmarks for success** (for example, attracting 10,000 AI specialists from non-EU countries in the next two years). Concretely, France and Germany could prioritize collaborating on the following goals:

Area	Aim	Instrument
Research	Jointly research and develop applications with a societal added value (e.g. cleaner cities)	Agree on mission targets for joint research between the new German Agency for Disruptive Innovation and the French Innovation Council for joint missions with a focus on AI (e.g. on sustainability targets or mobility)
Technology Spillover	Improve cross-border links between research, regulators and industry	Build a cross-border network of "AI clusters" in various industries (health, environment, mobility, and others) and an accompanying ecosystems of regulators, researchers and companies
Access to Data and Resources	Enable joint access to data and computing power for researchers from both countries	Set up joint test beds and shared data sets, and provide jointly usable computing infrastructures for those ecosystems
Strategic Autonomy	Increase the technological sovereignty of the EU in key industrial sectors	Set joint targets to regain a degree of autonomy vis-à-vis other powers in the availability of core technologies (e.g. microelectronic compartments or computer architectures)