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SECOND DRAFT

A EUROPEAN AI STRATEGY : BRAINSTORMING

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Origin of the AI interest of the author: To “make a drone fly only by thought” seems like a science-fiction story. However, this technology already exists, and it is considered an “easy AI.” I saw that when I first arrived in Silicon Valley in January 2018. Exploring the AI field from a business background, I’ve noticed that its impacts can be both promising and daunting.

Purpose of this document: The European Investment Bank asked me to reflect on my year in Silicon Valley and to come up with some takeaways for Europe. All of the takeaways from this document serve only as a first draft and brainstorming tool as to what could be included in a European strategy for AI. I do not believe that I am right or wrong; I am highlighting what I saw, heard, or read during my one-year research.

Who am I? A French academic researcher in *Business and Innovation strategy* working with UC Berkeley (USA) and University of Montpellier (France). I did a Ph.D. in France on “Strategizing and managing coopetition: collaboration between competitors” and a postdoc at UC Berkeley on “Open-innovation: unlock the open-innovation opportunities by collaborating with competitors.” My latest work aims to explore how previous experiences of industry participants govern the development of complex technologies. Indeed AI is a novel technology, but there are past models from which we can learn to govern the technology in the future. I firmly believe that we can learn from academic research to make NEW mistakes, rather than repeating PAST mistakes already experienced by other managers.

Takeaway 1: Develop A Clear European AI Teaching Strategy

- Who to train and on what?

According to one of Stuart Russel’s interviews¹, who is considered as one of the leading AI architects, **there is no point of training everyone** to become data scientist or robot engineer; there will not be enough jobs for everyone (only a few million worldwide).

¹ (Ford, 2018)

Moreover, from the many ethical discussions I had about AI, it appears critical to maintain a high level of diversity among the experts trained to become data scientists or robot engineers.

Who to train?	On what?	Why?
Citizens	<ol style="list-style-type: none"> 1. What AI is 2. How can citizens can co-exist with AI technology 3. Why they should care about the companies tackling AI challenges 4. How they can act to make companies care 	<p>Societal pressure: If citizens are engaged in tackling AI risks, they will put pressure on privat companies to engage too</p> <p><i>Remark 1: Europe has a leading advantage with GDPR (in some years, some people might refuse to go to China because of the absence of privacy)</i></p> <p><i>Remark 2: Kai-Fu Lee, one of the most famous Chinese Venture capitalist and AI experts takes the time to speak about AI and its challenges in front of kindergarten children.</i></p>
Private Companies That Develop And Use AI	<ol style="list-style-type: none"> 1. Why companies need to collaborate with others to govern AI (no one can tackle the AI risk alone) 2. Why companies need to have parallel research to tackle specific AI risk that could happen on each AI program (for each program one person should be in charge of the risk) 	<p>Survival: Any “significant AI catastrophe” caused by one company in any country, or even an independent teenager, could freeze any use of AI for everyone. This would generate what we would call a “second AI winter.” Being able to govern AI is not just a matter of societal concern; it is a matter of organizational survival.</p>
Data scientists Or Robot Engineers	<ol style="list-style-type: none"> 1. What are ethical behaviours 2. How to tackle the downside of AI while at the same time tackling AI research 3. What are their role and responsibility as a “whistleblower.” <i>(like the recent example of Google’s researcher taking a</i> 	<p>Current tangible risk: The risks arisen from some deployments of AI technology are not hypothetical but current and tangible facts. For example: killer robots, political advertising, and reinforcement of discrimination.</p>

	<i>stand against military use of what they develop at Google)</i>	
Government	<ol style="list-style-type: none"> 1. How to develop public-private collaboration for AI 2. Why the ability to tackle the AI risk is a mandatory condition to work for the government as a supplier. 	<p>Government set the standard: Together EU governments are powerful actors that can shift corporate behavior without regulations. Indeed, they are AI consumers, and their requirements as a customer can influence their use of AI.</p> <p>Predicted failure of a self-regulating model: AI is growing at an exponential speed. Alone, the government will not be able to generate regulations that empower a sustainable and fair AI economy. It is critical to create public-private collaboration.</p>
Universities and Professors	<ol style="list-style-type: none"> 1. What the cutting edge practice of AI are 2. How to undo AI consequences 	<p>Adapt the pedagogical curriculums and foster link between universities and AI companies: To spark awareness among citizens, professors need to be aware of the latest AI practices. For that, like MIT, each professor should have one day of the week to work with industry and having a social impact².</p> <p>Create AI Incubators inside University: Each year, each new student is a potential innovator. University can unlock these potential AI ideas by creating structure to help them Ai idea get their first proof of concept and get founding.</p>

² This idea was develop by Henry Etzkowitz and its concept of the Triple Helix (industry, government and university collaboration).

Takeaway 2: Create Or Align with A Neutral Third-Party Organization (apart from the government)³

We talk about the promise and peril of AI, but many don't understand the importance of governing AI technology now. Any "significant AI catastrophe" could generate what we would call a "second AI winter." To prevent this, Europe needs to talk openly and transparently about the AI risks. Sharing this risk is counterintuitive. However doing so is necessary to unlock the discussion around this risk. Creating a neutral third-party organization (apart from the government) could be the solution. Concretely, this third-part organization could:

- Be comprised of an independent, European team of peers with extensive expertise and technical skill in AI technology
- Offer a confidential and robust evaluation of each organization's AI strategy and co-create solutions
- Deliver a third party non-bias certificate that the company is working on its AI challenges and is actively working to tackle them.

This third-party organization has several benefits:

- It Overcomes the fear of opening an organization's doors and publicly sharing the AI risks. Indeed, the third party is not part of the government, and the report is confidential.
- Creating an incentive for companies to share openly the AI risks with the third party. One incentive could be that for each AI risk shared, the third team will co-create solutions with the company. The co-created solution can be one that they have seen or used in another organization or one that they develop specifically for this organization.
- A certificate that affirms a company is working on its AI will create public pressure. Not having the certificate could be damaging for a public relationship. For example, in the event of a law suit caused by an AI malfunction, a lack of certificate could prove that the company did not properly engage in risk management.

³ *This idea came up from studying how the nuclear industry acted to make nuclear plants reveal their safety weakness.*

A key question is how to implement this third-party organization: create or align? One such organization already exists: *The Partnership on AI*. The benefits of aligning with this existing organization include:

- Collaborating with leading companies in AI (Facebook, Amazon, Apple, Google, etc.) and leading NGOs already engaged with *The Partnership on AI*.
- Leveraging on their AI knowledge and experience in leading such third-party organization.

Remark : I am afraid that creating a European organization would only accelerate the “splinternet.” (the segmentation of internet/AI in multiple geographical areas)

More concretely, this collaboration could be the start of a European antenna of *The Partnership on AI*. This antenna could be a vehicle to bring all of the European AI companies and NGOs in the same place and serve to align their work, with the US while at the same time take in to account unique European concerns.

Takeaway 3: Use AI To Tackle “moonshots” and Make Them Globally Sustainable Goals

Typically, there is this shared idea that radical innovations solving societal needs are impossible, too risky, or not economically feasible. However, there is an emerging alternative mindset which urges organizations to “expand your growth potential by stretching your innovation process by solving real societal needs” and to not only focus on” Horizon 1 but also on horizon 2 and 3” (Henry Chesbrough, 2019). By doing so, you do not only have a positive societal impact, you unlock a market, you attract the leading experts (i.e. whether an organization tackles societal needs is a growing criteria for a professionals’ choice in workplace), and you create a path to develop of unexpected spin-off technology that can be reused in the current business.

It is mainly the development of Artificial Intelligence that makes this alternative mindset possible and Europe could be the first one to explicitly link the use of AI to moonshots. I did not come up with this initiative as it is already discussed in horizon 2020 and stretched by Mariana Mazzucato. However, I wanted to stress how strategic this path could become.

Takeaway 4: Create A Roadmap To Guide and Orchestrate The Complex Innovation⁴

Europe could actively help external actors identify and raise funding where there are AI needs and future demands (for instance for technology tackling AI discrimination bias or political abuse). The program could bring money to promising Small Medium Enterprise (like the Small Business Innovation Research program model) and develop clear roadmaps for future AI technology. Developing this roadmap would mean:

- (1) Putting AI worldwide experts together (includes experts from private companies and NGOs)
- (2) Making those experts identify the problems
- (3) Dividing the problem into concrete sub-needs with precise requirements
- (4) Diffusing these needs and guaranteeing a “buying contract” for the first company able to reach these requirements
- (5) Having the European governments support these initiatives by sponsoring half of the budget. This is what the US government did for the semiconductor industry⁵

⁴ *The idea of creating a roadmap came from studying past models of industries trying to govern complex technology, based on the Carlsberg example of how to do a “wood instead of glass bottle,” the “SEMATECH consortium” and the “Partnership on AI.”*

⁵ SEMATECH had a \$1 billion budget for five years and half was supported by the US government).

Takeaway 5 : There is No “Right” Way to Invest in AI but Multiple Options to Take

The European Innovation Bank asked me to highlight the promising trends that I saw in Silicon Valley with regard to investment. Here is a non-exhaustive list:

Topic	Ideas for EIB potential investment	Why?
Allowing people to own their data (data that feeds AI technology),	<p>Technology that :</p> <ul style="list-style-type: none"> - tracks data flows and gives the option to stop data flows <p>Business Models that :</p> <ul style="list-style-type: none"> - allow the end-user to be paid or to receive a compensation for the data flows 	<p>There is a famous sentence that you hear a lot in Berkeley “if a product is free that means you are the product.” Thus, I perceive a whole movement shifting the free data collected by companies into a non-free model. Similarly, Telefonica’s CEO highlighted in an interview that people should profit themselves for selling their own data, instead of others.</p> <p>Moreover, these technologies already exist.i. I’ve interacted with startups that are able to track and stop all data that you send from your home to external parties (e.g. localize where “Alexa” is sending the information collected; or stop your doorbell to send information to an obscure website in another country)</p>
Making AI more transparent and not discriminatory (and even reverse it),	<p>Research on :</p> <ul style="list-style-type: none"> - The “black box” of AI - The negative outcomes of AI - One reversing mechanism <p>Startup that :</p> <ul style="list-style-type: none"> - Contributes to one of these areas 	<p>A huge concern about AI is that it is a “black box”; the outcomes are good but can not be explained. This lack of transparency is one of the main causes of discrimination or risk in using AI. In response, some organizations try to react. For example, <i>The Partnership On AI</i>’s main pillar is “Fair, Transparent, and Accountable AI.”</p>
Ensuring Cybersecurity	<p>Cybersecurity startup that :</p> <ul style="list-style-type: none"> - Uses traps to attract hackers. - does not need data to be trained on 	<p>Machine learning and artificial intelligence can help guard against cyber attacks, but hackers can also foil the AI by targeting the data used to train the AI⁶.</p>
Cleaning and making	<p>Startup that :</p> <ul style="list-style-type: none"> - Reinvents the form 	<p>Energy and Water are part of the Global Sustainable Goals.</p>

⁶ Martin Giles (2018), “AI for cybersecurity is a hot new thing—and a dangerous gamble”, MIT Technology Review

affordable Energy and water	<ul style="list-style-type: none"> - Senses the production and use - Optimizes the process 	<ul style="list-style-type: none"> - Google worked on a carbon-neutral fuel based on carbon and hydrogen out of seawater - Microsoft campus is on track to become the first net-zero water building, and for that, you need AI startups that can optimize the water collection and use
Leveraging education with the creation of “Personal Tutors.”	<p>A startup that contributes to the trend identified by Forbes⁷ in 2018:</p> <ul style="list-style-type: none"> (1) helping the teacher, (2) having differentiated and individualized learning for the student; (3) giving universal access for all students, (4) Automating admin tasks 	<p>AI can have a complementary role in leveraging the human learning process. For instance, Tom Kalil highlighting that “a \$100 e-reader can read a child 10,000 stories in the voice of their favorite celebrity, dramatically reducing the gap in vocabulary size between children from rich and poor households.”</p> <p><i>Remark: I also perceive a need to invest in startups developing apps for leveraging society understanding and concerns about AI</i></p> <p><i>Remark: there is a risk of pushing this “exponential learning” too far. Having a helmet that allows us to focus on our task (without eating or drinking...)</i></p>
Preventing malfunction instead of fixing	<p>A startup that develops:</p> <ul style="list-style-type: none"> - Sensors - Anticipation models of malfunctioning - Traceability 	<p>The current mindset is to identify a malfunction and to fix it; with AI it is possible to anticipate any potential malfunction in advance. For that, we need a new mindset that values “prevention.”</p>
Providing Food-Nutrition	<p>Startup or Business model that :</p> <ul style="list-style-type: none"> - Optimizes food delivery or waste - Creates new types of food 	<p>Solving food challenges is a growing concern that Silicon Valley has tackled:</p> <ul style="list-style-type: none"> - Stanford has created a dedicated research group that helps corporations and start-ups to innovate in the food industry - There are more and more startups developing alternative food like “making meat using plants” (see: https://impossiblefoods.com/mission) - A growing concept of “Tech food”

There are multiple other trends highlighted by Bret Water in its 2019 report on Innovation like : Personal mobility; Consumer trend toward health/wellbeing; Consumer

⁷ Bernard Marr (2018), “Real World Examples Of Today And A Peek Into The Future”, Forbes.



expectations of “Meet me where I am”; buying experiences; Social consciousness and women’s rights. And for all these trends AI technology has a promising future.

CONCLUSION. The European Investment Bank can play two distinctive roles. As any investment organization, EIB can invest in the promising AI trends. As an arm of the European Union caring about integration and social cohesion, EIB could invest to improve our ability to govern this promising but also dangerous AI technology. Being able to govern this complex technology is a matter of survival because any “significant AI catastrophe” could have long term societal damage and even freeze the use of all AI for everyone (even the one that improving society).