

Dossier de synthèse inversée – Gp 7 : Louis / Pascal / Paul B. / Gabriel

En vous appuyant uniquement sur les documents du dossier thématique qui vous est proposé, vous rédigerez une synthèse répondant à la question suivante

What is at stake with the current tech race between countries?

Votre synthèse comportera entre 450 et 500 mots et sera précédée d'un titre. Le nombre de mots rédigés (titre inclus) devra être indiqué à la fin de votre copie.

Document 1 : “JUST IN: U.S. Falling Behind China in Critical Tech Race, Report Finds”, by Josh Luckenbaugh, July 7, 2023, *National Defense Magazine*

The United States risks losing the technology competition with China if it doesn't take significant steps to shore up its defense industrial base and integrate advanced capabilities into its military systems, according to a new report from commercial data company Govini.

In its 10th annual “National Security Scorecard” released July 17, Govini evaluated 12 technologies critical to national security using its Ark.ai commercial data platform, which the report described as “the first digital twin of the U.S. industrial base.”

(...) Ark.ai “presents a digital representation of the companies, capabilities and capital that together form the industrial and innovation bases of the United States,” the report said. “By traversing these systems, analysts, managers and decision-makers in the national security sector are able to solve challenges that restore and strengthen America's position in the competition with China.”

However, the picture of the industrial base Ark.ai currently paints is not encouraging for the United States, the report said. Govini found that in all 12 technology areas, “the United States is falling behind China in the core science as measured by the patents granted in each country.”

Patents are “a leading indicator of technological dominance in the future,” said Govini Chairman and former Deputy Secretary of Defense Bob Work. (...)

For most of the critical technologies, “the United States is largely stagnating in patents in these areas,”(...) (said) Govini CEO Tara Murphy Dougherty (...). And for the capabilities actually in development, the United States heavily relies upon Chinese suppliers, she said.

“This is not just a defense problem,” Dougherty said. (...) All 12 of the critical technologies Govini analyzed “are highly dependent on Chinese entities for completing their projects, for developing their products, for bringing their goods and services to the market, and that market includes some of our most sensitive national security programs.”

One of those critical technologies is artificial intelligence, and over the last five years the United States’ total spending on AI has increased incrementally at best, even as “the technology advancements in AI have been staggering,” Dougherty said. Meanwhile, China has openly stated its commitment to be the global AI leader by 2032, and has granted patents for AI systems significantly faster than the United States in recent years, she added.

If the United States is to reverse the trend of falling behind China in critical technology competition, significant change is needed, she said. (...)

Work said China is doing everything it can to outpace and then catch and surpass the United States. “By 2049, they want to be the number one economy in the world and the number one military power in the world. Is that a future that the United States wants?

“I would hope not, and I would hope that we go into this and say, ‘This is an existential competition that we have to win, and we are going to make decisions based on data which gives us the best opportunity to win the competition,’” he said.

Document 2 : “Indian startups compete in race for affordable autonomous driving”, by Subhrojit Mallick and Himanshi Lohchab, February 04, 2024, *Economic Times*

Bengaluru-based robotics engineer Mankaran Singh (...) and his engineering batchmates Gunwant Jain and Raghav Prabhakar have developed what appears to be a version of something that Tesla, Google and others are spending billions to create. FlowPilot is an autonomous driving assistance system that can be operated with a laptop or a mobile phone. About 2,000 volunteers are testing it across the world, according to Singh. (...)

OpenPilot is an open-source advanced driver assistance system (ADAS). Available in costlier vehicles in India, ADAS enables--among other things--automated lane centering, adaptive cruise control, lane change assist and driver monitoring.

While ADAS is not necessarily equivalent to driverless operation, Hotz has said that Comma's mission is to “solve self-driving cars while delivering shippable intermediaries” and it’s “looking increasingly like we will win alongside Tesla and Mobileye.”

To be sure, Tesla and its rivals operate in countries where compliance with traffic rules is better than in India.

Motoring author and historian Adil Jal Darukhanwala points out: “This technology, as a demonstrator in an open field, works brilliantly. In a field dotted with pedestrians, two-wheelers and little regard for road discipline, it is a recipe for disaster... Our roads are mayhem at their best.” (...)

FlowPilot has local rivals.

Bhopal-based Swaayatt Robots, founded by IIT Roorkee graduate Sanjeev Sharma, has been working on the technology since 2016. His algorithms are a step ahead of Waymo and Tesla but lack of funding and adequate regulations have kept the startup in stealth mode, according to Sharma. (...)

Swaayatt takes a more end-to-end approach to the emerging technology, developing algorithmic models to pursue level 5 autonomy—where no human attention is needed—keeping safety and operational cost efficiency in mind.

The Bhopal-based startup has a team of 15 full-time engineers and 11 data annotators, with Sharma acting as the chief research scientist. Swaayatt has a fleet of SUVs fitted with off-the-shelf lidar, cameras and sensors. (...)

Sharma says Swaayatt is the first company to successfully showcase the ability to negotiate bi-directional traffic on a single-lane road, where the vehicle may even need to shift off the road, and drive through uneven terrain. Sharma says this remains uncharted territory for larger companies dealing with the tech.

Swaayatt raised \$3 million seed funding in July 2021, along with a \$1 million research grant from the Ministry of Electronics and Information Technology (MeitY). Sharma is now looking to raise more funds before attempting a 100 kmph test on Indian roads.

Darukhanwala said these technologies could find a market overseas.

“The technology will be developed here. India is a hotbed for developing these complex algorithms, but to put them in use, they will have a better success rate in mature markets, where rule of law and traffic discipline is above everything else,” he said.

Document 3 : “Addressing Europe’s technology gap”, by Sven Smit, Magnus Tyreman, Jan Mischke, Philipp Ernst, Eric Hazan, Jurica Novak, Solveigh Hieronimus and Guillaume Dagarret, McKinsey Global Institute, September 22, 2022, www.mckinsey.com

Europe as it is today has been forged in times of crisis. The European Union (EU) was created in response to the ravages of World War II. The fall of the Berlin Wall marked the start of a period of economic catching up by economies in Central and Eastern Europe. The 2008 financial crisis and the eurozone crisis that followed led to more

financial cooperation among European countries. The COVID-19 pandemic then triggered a higher level of fiscal coordination through the NextGeneration EU fund.

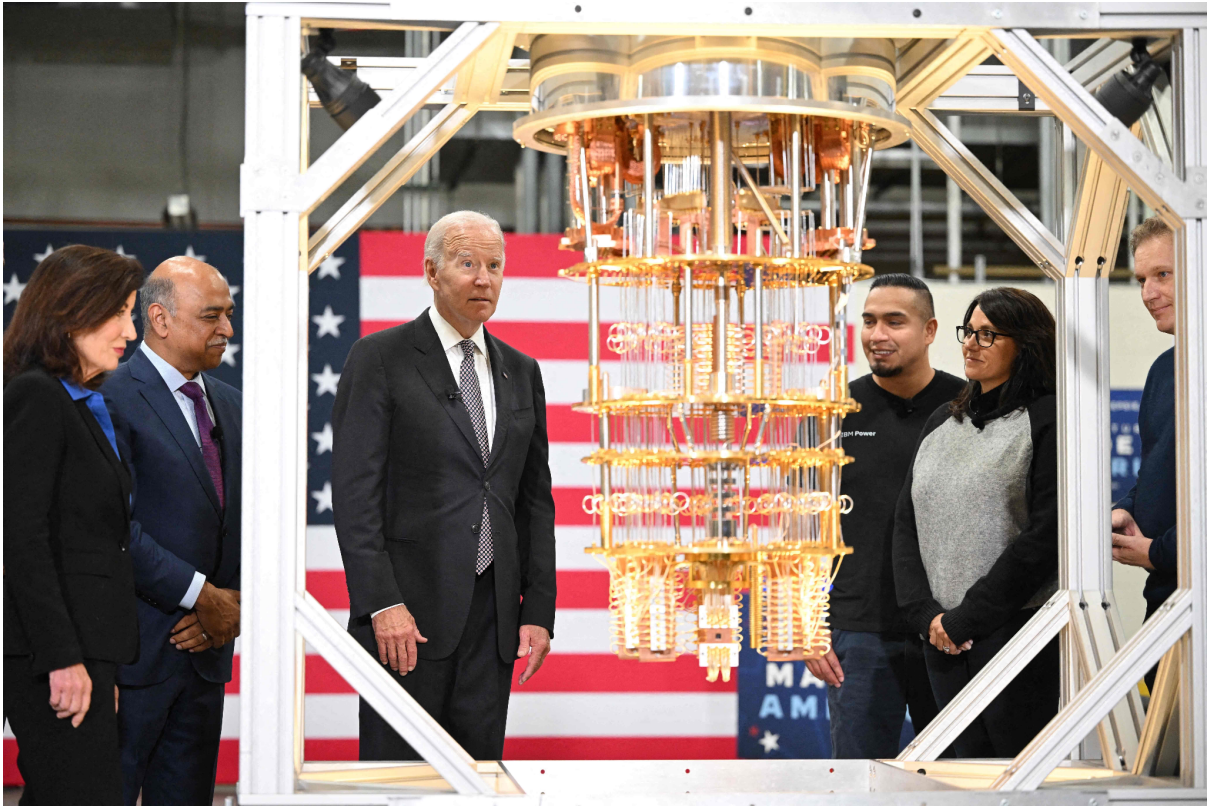
Technology is pivotal, too. (...) Given seismic events within its own continent, a robust Europe is arguably needed more than ever. (...) That is the topic of this article. Confronting this gap will require leaders to show the same resolve and collaboration as they initially displayed in their response to the war in Ukraine.

Although Europe has many high-performing companies, in aggregate European companies underperform relative to those in other major regions: they are growing more slowly, creating lower returns, and investing less in R&D than their US counterparts. This largely reflects the fact that Europe missed the boat on the last technology revolution, lagging behind on value and growth in information and communications technology (ICT) and on other disruptive innovations.









































ICT and other tech sectors have spawned a range of transversal technologies, which are spreading horizontally across sectors and determining competitive dynamics. This research looks at ten transversal technologies and finds that Europe leads on only two of the ten. If Europe is not successful in competing in these technologies, it could also lose its strongholds in traditional industries. To give just one example, Europe has been a leader in automotive but could become a laggard in autonomous driving.

The stakes are high. We estimate that corporate value added of €2 trillion to €4 trillion a year could be at stake by 2040—value that could generate wages, employment, investment, and economic growth to the broader benefit of society. To put the estimated value at stake into perspective, that would be equivalent to 30 to 70 percent of Europe's forecast GDP growth between 2019 and 2040, or one percentage point of growth a year; six times the gross amount needed in Europe to achieve net-zero emissions by 2050; and about 90 percent of all current European social expenditure, or €500 monthly universal income for each European citizen.

Unless tackled, this crisis will handicap Europe on many dimensions, including growth, inclusion, and sustainability, and its strategic autonomy and voice in the world. Europe can continue to build on its strengths. Its socioeconomic model has served well thus far. But if companies are to play at the scale and speed needed to compete in a world in which technology disruption is spreading everywhere, often with winner-takes-most dynamics, a reevaluation of long-held beliefs and trade-offs may be needed. An integrated package of initiatives could create an environment that enables them to do so—in the process helping to ensure that today's high quality of life for many of Europe's citizens is preserved for the long term.



Document 4 : “Quantum Computers Could Be Truly Useful in Just Two Years”, Joe Biden observing the new IBM Quantum computing system, Photo by Mandel Ngan, July 13, 2023, *India Today*

Technology	Top 5 countries					Technology monopoly risk
Nanoscale materials and manufacturing	 58.35%	 6.73%	 4.90%	 4.06%	 3.84%	10/10 8.67 high
Coatings	 58.47%	 7.34%	 5.97%	 3.22%	 2.84%	8/10 7.96 high
Smart materials	 42.57%	 8.13%	 6.96%	 6.69%	 3.27%	7/10 5.24 medium
Advanced composite materials	 40.82%	 14.03%	 7.30%	 4.04%	 3.93%	8/10 2.91 medium
Novel metamaterials	 45.56%	 16.90%	 4.01%	 3.89%	 3.01%	7/10 2.70 medium
High-specification machining processes	 36.21%	 13.84%	 11.75%	 3.59%	 2.85%	8/10 2.62 medium
Advanced explosives and energetic materials	 47.10%	 21.31%	 4.88%	 3.96%	 3.23%	5/10 2.21 medium
Critical minerals extraction and processing	 36.68%	 13.39%	 4.47%	 2.79%	 2.68%	4/10 2.74 low

Document 5 : “China leads global Critical-tech race, India among top five: New Report”, Top five countries ranked by their (%) proportion of high-impact research output across advanced technologies, source ASPI, March 4, 2023, www.popularmechanics.com