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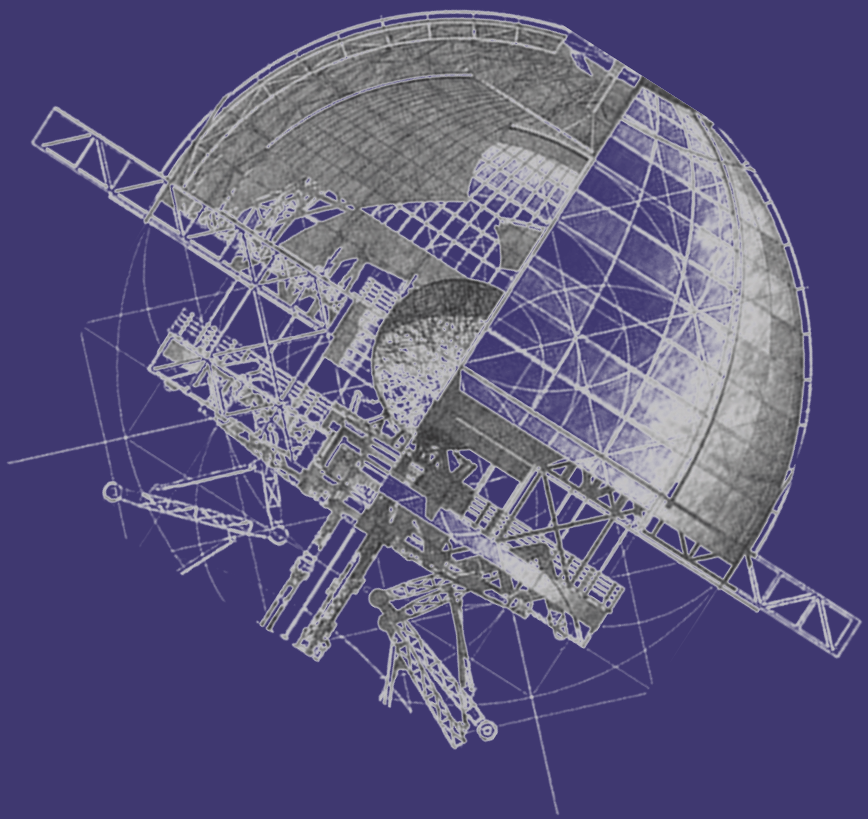
KNOWLEDGE SERIES

THE NEXT SILICON VALLEY

… SHOULD BE REINVENTED IN SAUDI ARABIA



Over the past years, Saudi Arabia has embraced innovation and entrepreneurship, giving rise to the development of a burgeoning tech ecosystem. While initial success has predominantly come from on consumer innovations in transport, food & beverage, and e-commerce, there is significant potential to expand the investment ecosystem to the development of emerging technologies, as Saudi Arabia exhibits many indicators which harken back to the rise of Silicon Valley.

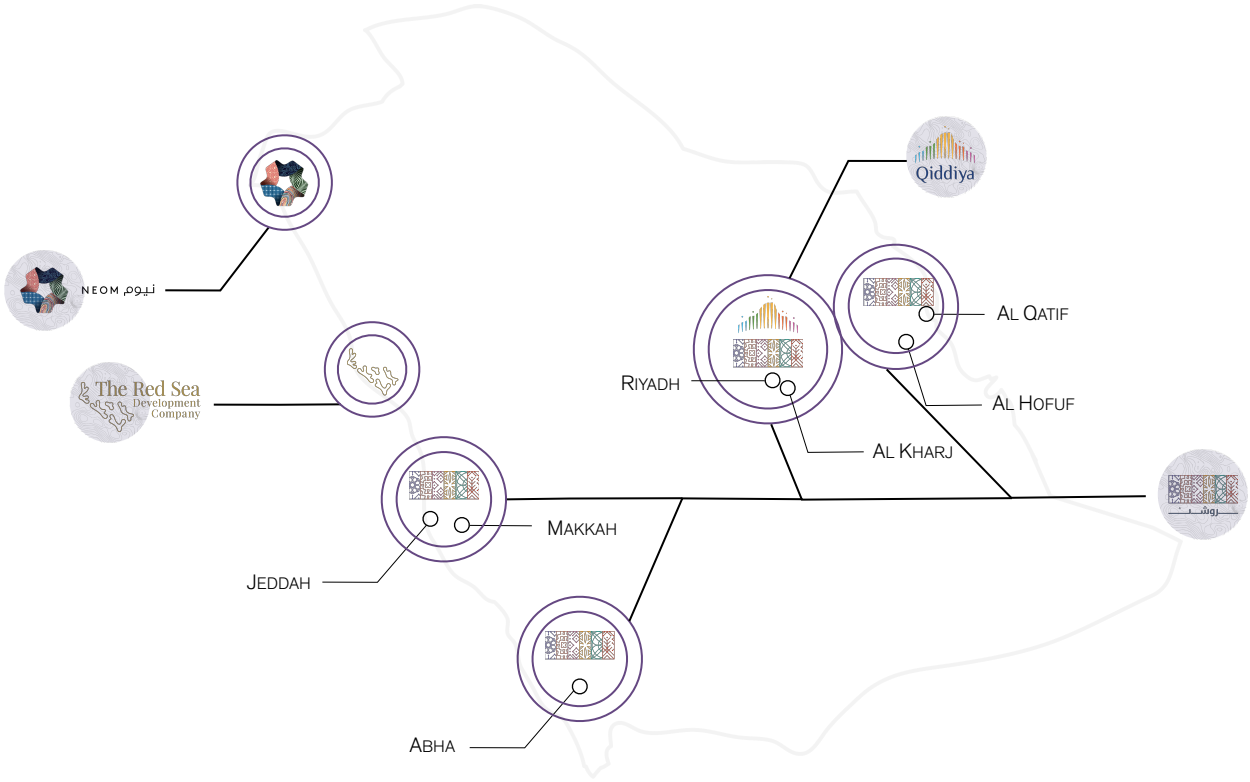


Fig 1: Geographical Location of Saudi Arabia's Giga Projects

Given the country's ambitious list of GIGA projects and plans to develop its main metropolises as Smart Cities, it is a natural next step that Saudi Arabia localize the research and development of the technology needed to realize these efforts instead of importing it.

Implementing the Saudi Arabia's aggressive economic development plans, which includes the development of a Circular Carbon Economy national program, defense & healthcare initiatives as well as FinTech priorities, requires the utilization of emerging, or frontier, technologies; in this paper to be referred to as *DeepTech*. The term DeepTech refers to science-based breakthroughs and technologies that have a wide impact on industries and people's lives, such as Internet of Things (IoT), advanced materials, artificial intelligence and quantum processing, as illustrated in Fig.2. Most of the development in DeepTech to date has been the domain of Europe and North America, with significant contributions from China. However to overlook Saudi Arabia's global potential in the field of DeepTech would be largely misguided.

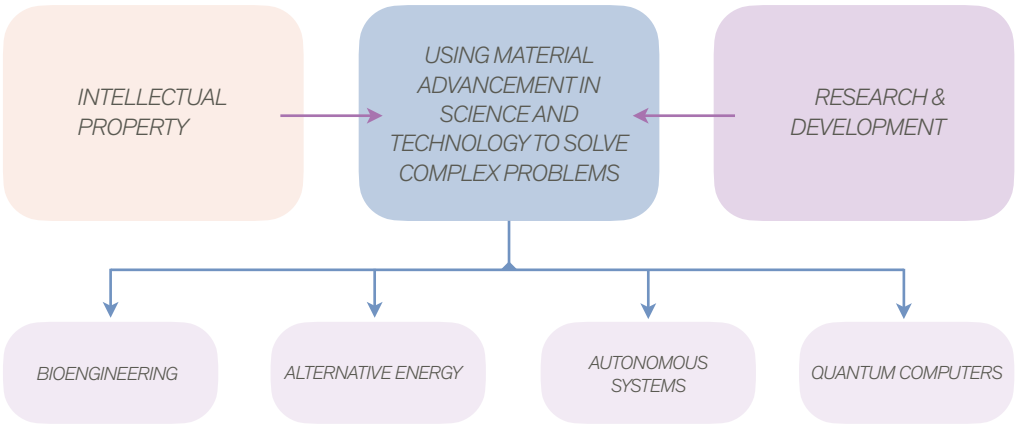
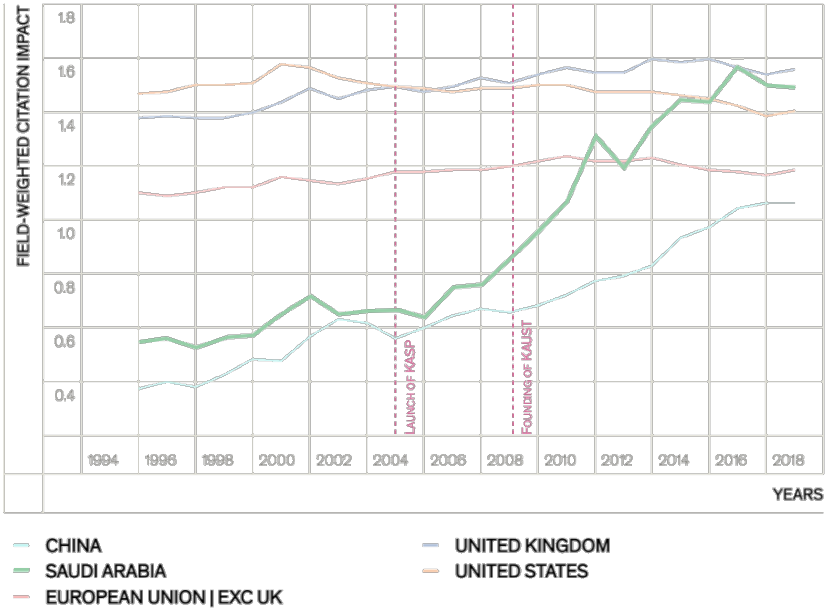


Fig. 2: Defining deep tech

At the core of any country's success in DeepTech is a supply of innovative minds & strong research capabilities which take time to develop from the ground up. Saudi Arabia, however, is home to some of the largest industrial companies in the world, such as Aramco and SABIC, boasts the Vision 2030 which is one of the boldest national programs globally, and has exhibited a dynamic transformation over the past few years, from social to regulatory changes.

Saudi Arabia already boasts exceptional advanced science and technology institutions such as King Fahd University of Petroleum and Minerals (KFUPM), King Abdulaziz City for Science and Technology (KACST), and King Abdullah University of Science and Technology (KAUST) which have enabled Saudi Arabia to become one of the top quality research producing countries in the world as depicted in Graph 1.[1] It also has some of the world's brightest science & technology graduates from some of the leading global universities.[2]



Graph 1: Top quality research producing countries (1996-2019).[3]
Image source: 01 Ventures' research, based on SciVal/Scopus data for Field Weighted Citation Impact (FWCI) score.

[1] Research prepared by 01 Ventures based on SciVal/Scopus data for Field Weighted Citation Impact (FWCI) score.

[2] Elnozahy , M. (2021, April). Building a Research University in the Arab Region: The Case of KAUST. Communications of the ACM, 64(4), 46–49.

[3] King Abdullah Scholarship Program (KASP) was launched in 2005, supported by the Saudi Government and implemented by the Ministry of Education.

Silicon Valley's Early Days

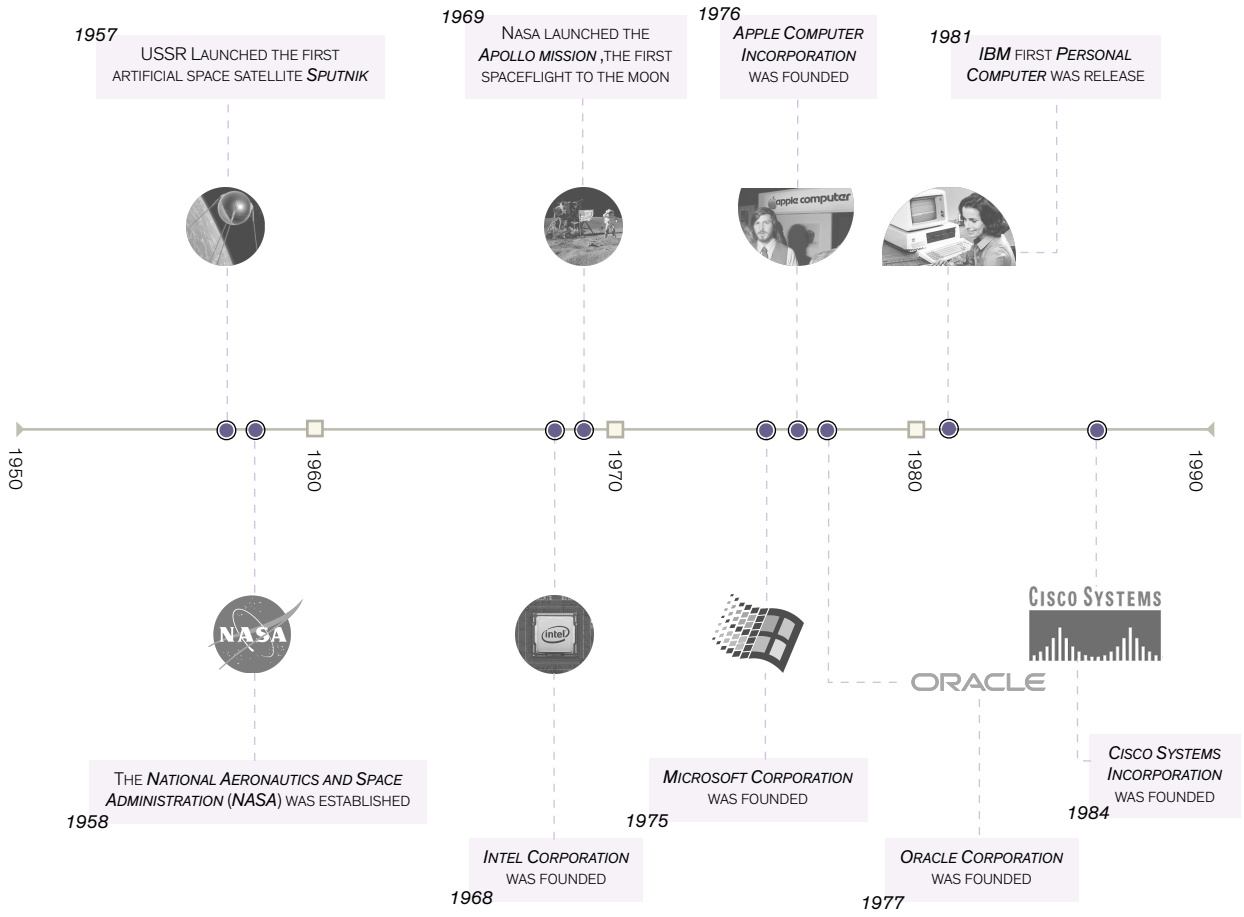
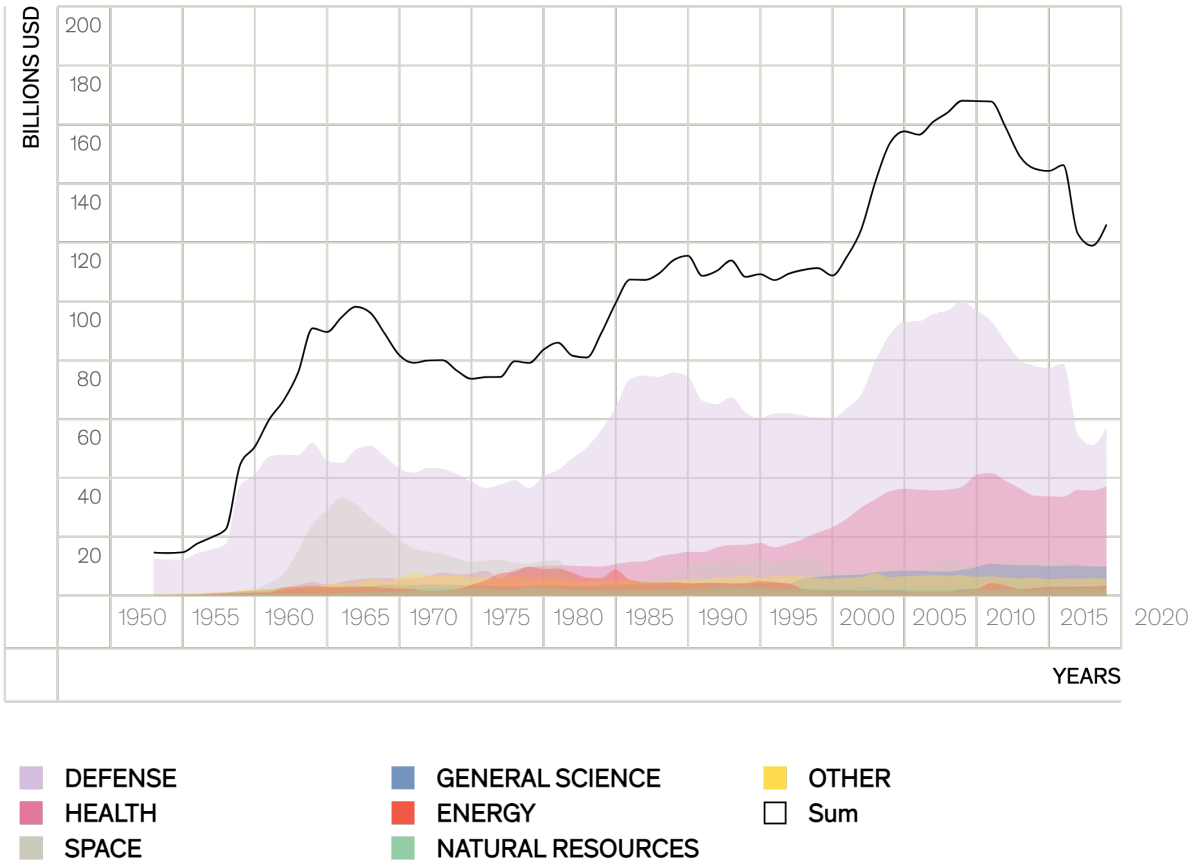


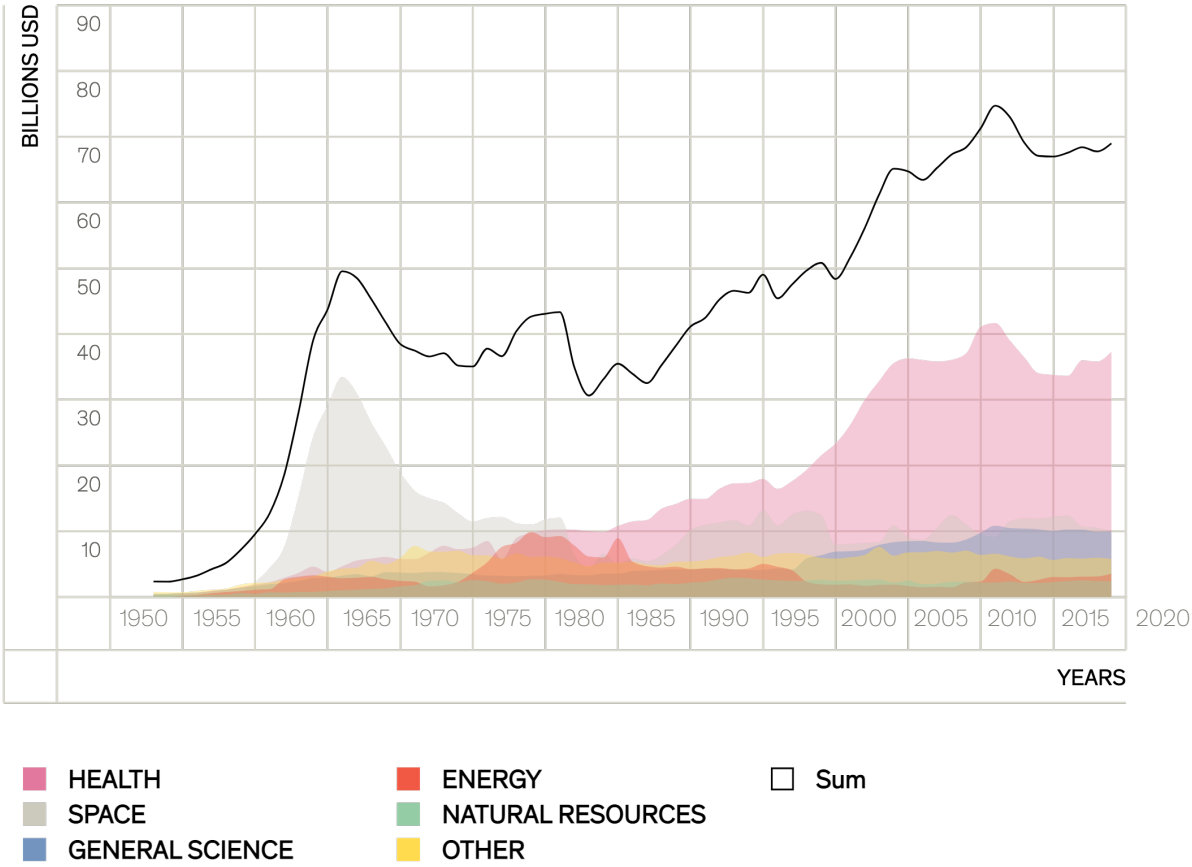
Fig. 3: Historical events in the early days of the Silicon Valley

Silicon Valley got its start and reputation by tackling hard problems. From the 1950s through the 1980s Silicon Valley represented the cutting edge of technological advancement, giving rise to companies such as Intel, Apple, Cisco, Oracle, and Microsoft. The majority of the initial seed funding was provided by the United States of America's (U.S.) government, which launched venture capital funds as well as technology companies.



Graph 2: United States of America's historical federal spending on R&D (1953-2019).
Image source: American Association for the Advancement of Science, Historical Trends in Federal R&D. Retrieved November 25, 2020.

In the first two decades, this funding came primarily from the U.S. Department of Defense, and combined with a local ecosystem that boasted deep science & technology research talent at the university level, advancements such as microchips, GPS, and the Internet were born. These early, defense-funded innovations paved the way for private investment, as well as R&D investment from corporations, to enter the field of DeepTech. Without this initial patient capital from the government, it is unlikely that such a level of technological innovation could have been achieved given the complexity of the research and development (R&D) required, and the longer lead time to commercialization and market that these technologies tend to have.



Graph 3: United States of America's historical federal spending on R&D, excluding defense (1953-2019). Image source: American Association for the Advancement of Science. Historical Trends in Federal R&D. Retrieved November 25, 2020.

Note: *We illustrate the shift in the type of technology investment because it is often the later-stage software and SaaS[4]-focus that countries use to model their own versions of Silicon Valley, as has been done especially in the Middle East entrepreneurship ecosystems such as Saudi Arabia. The reality is that DeepTech, because of its longer investment time horizons and required technical experience, is broadly undervalued, while "tech" companies like WeWork and Uber continue to be overvalued by the market. What these ecosystems should be doing, however, is thinking like Silicon Valley in the 1950s.*

Despite its cutting-edge beginnings, over time Silicon Valley has become more focused on profit: betting on technology-enabled enterprise models rather than on further investment in DeepTech. If we compare some of the Valley's biggest successes from its early days to its biggest successes today, it is clear that the focus has drifted from pushing the envelope of technology in favor of financial returns.[5]

Driving the decline in U.S. R&D spending is a decline in availability of government grants as well as a decease in corporate R&D budgets, corporations having shifted to a short term profit-maximizing focus. In the U.S. today only 9% of all venture capital funding invests in true DeepTech, a total of approximately USD 11 billion.[6] Government funding for DeepTech has also plateaued, as illustrated in Graph 2.

[4] Software as a Service

[5] Revkin, A. C. (2014, November 2). Panel's Latest Warming Warning Misses Global Slumber Party on Energy Research. *The New York Times*.

[6] MIT Pitchbook data reports that In 2018 all US startup financing was $130B. This excludes AI/ML which are not generally considered "cutting edge," as well as Life Sciences, which is its own established investment category. See: DeepTech Investing Report 2020. Different Funds.

RECOMMENDATION

- SCALE PUBLIC INVESTMENTS IN SEED-STAGE DEEPTECH COMPANIES THROUGH NEW AND EXISTING GOVERNMENT GRANT PROGRAMS OVER THE COMING DECADE, WHILE LEVERAGING SUPPORT FROM LOCAL PRIVATE SECTOR COMPANIES WHO COULD BE OFF-TAKERS FOR THIS ADVANCED TECHNOLOGY.
- PARTNERSHIPS SHOULD ALSO START AT THE UNIVERSITY LEVEL TO FOCUS GRADUATES ON DEEPTECH INNOVATION, AS WELL AS INVESTMENT IN INCREASED LABORATORY SPACE AND TECHNICAL SUPPORT ACROSS DISCIPLINES.

Given that there is an observable gap for DeepTech investment in the United States, it is possible to imagine an ecosystem for DeepTech investment being built in Saudi Arabia, with the right government support and capital.

Humanity now faces significant existential challenges similar to when Silicon Valley was founded, which true technological advancement can help solve. From COVID-19 to climate change, DeepTech investing has the ability to solve the world's large, structural problems: vaccines, carbon removal technology, blockchain-enabled infrastructure, and electric vehicles are all consequences of DeepTech investing. The X-factor in these DeepTech investments is that they require patient capital; capital that does not seek investment returns in 3-5 years but stays invested over longer time horizons in order for true technological advancements to be realized and new markets to emerge.

Saudi Arabia has the opportunity to learn from the Silicon Valley of today, and be forward-thinking and hedge against future risks. This is because it commands a significant amount of patient capital which can be used to invest in DeepTech. It can build a new ecosystem prototype that leverages the best thinking from Silicon Valley, but in a localized and more targeted way. Saudi Arabia presents the opportunity for a new Silicon Valley built for the 21st century. LAUNCHKSA might have just sparked the age of the "**QUANTUM SANDBOX**".

This paper seeks to plant the idea of a new Saudi Arabia which is dominant on the stage of emerging technology. This is the first in a series on making Saudi Arabia a global leader of DeepTech investment and development. We believe that the next version of Silicon Valley can be fostered in Saudi Arabia and we invite responses to this Spark.

ABOUT THE AUTHORS

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Chris is a founding partner at European deep tech venture capital firm, 01 Ventures. Within the sphere of deep tech Chris has a particular passion for decentralized processing, AI and the emerging brain-computer interface space. Chris is an avid believer in the power of deep tech to impact the world around us and holds a strong belief that Saudi Arabia has a largely untapped potential in deep tech that, if harnessed, could drive substantial change across the region and, most likely, the world.

Along with his role as an investor, Chris loves to spend his time as an active member of the tech community. Over the last few years, he's been the Investor in Residence at Startup Bootcamp IoT, a mentor and coach at Level 39, CYLON, ReLab, Startup Sauna, Mind The Bridge and Capital Enterprise and runs the investment readiness masterclass for the Greenlight Program, OneTech London and Barclays Eagle Labs. Additionally, Chris is an expert evaluator for the European Commission's Horizon 2020 programme.

Chris is an active participant in global tech events where he is often participating in panels, judging startup competitions and hosting investor office hours. He loves to meet entrepreneurs, investors and ecosystem players.

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Ellen is a Partner for Business Development and Strategy at Aeon Strategy based in New York. Ellen advises on finance, accounting and budget, client acquisition, and process improvements. Ellen Has a decade of expertise working in the Middle East in finance, investment advisory, fundraising, and policy; previously a Vice President in JPMorgan's Private Banking division.

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