

Singing an ARIA for Global Britain

The UK's Advanced Research & Invention Agency receives its curtain call...

Late last month, with surprisingly little fanfare or pomp and circumstance, the UK Government launched its very own 'Advanced Research & Invention Agency' (ARIA), a new arm of the Department for Business, Energy and Industrial Strategy (BEIS). Much remains to be determined about this fledgling organisation however, its inspiration and ambition are both novel and enticing.

Overture

Commanded to invest in high-risk, high-reward research and development (R&D), ARIA's mission will be to direct public money towards the rapid development of revolutionary intellectual property, unimpeded by traditional bureaucratic barriers. This is a vision of clustered neurons of scientific genius firing off new ideas and technologies to drive economic growth and societal advancement. Of course, with an acronym that lends itself to puns, the Government will be hoping ARIA will prove itself to be no operatic comedy.

Taking a novel approach to the spending of public funds, with a high tolerance for failure, ARIA is intended to sift out gems of technological opportunity for 'Global Britain'. Blessed with financial freedoms that will make bean-counting bureaucrats choke on their breakfast, ARIA will require a constant baseline of both budgetary and political dedication in order to survive and thrive; tolerance of failure not being something that opposition politicians and commentators are traditionally predisposed towards. For ARIA to reach a resounding crescendo, it will need to quickly show it can rapidly turn ingenious creations into cold, hard profit.

Act One: Kwasi's Lament?

Revitalised as an idea by the new Business Secretary Kwasi Kwarteng, ARIA will be permitted to take a 'dynamic' approach to scientific innovation. By pursuing projects considered likely to fail, ARIA will be encouraged to promote the development of pioneering cutting-edge technologies in areas such as artificial intelligence and data that would normally be left to the private sector. Forming a key element of delivering the Government's R&D Roadmap, this reflects a long-held concern that, while the UK has traditionally excelled in this arena from an academic perspective, it has proven less capable in securing the economic advantages that follow.

"We should think hard about the ARPA/PARC example: how a small group of people can make a huge breakthrough with little money but the right structure, the right ways of thinking, and the right motives."

Dominic Cummings, 2017

Hailed by Kwarteng as "putting the UK in a formidable position to respond to the most pressing global challenges of our time," the new agency will be established with an initial budget of £800 million out to 2024. That might sound like big money from any normal perspective - but, by comparison, the R&D spend of Alphabet, the parent company of Google in 2020 alone was said to have totalled more than USD\$27 billion. If the nature of ARIA is to speculate on risky projects, with most of them ultimately destined for glorious failure, such a budget might imply that it will be luck rather than judgement as to whether any one project emerges to pay the bill.

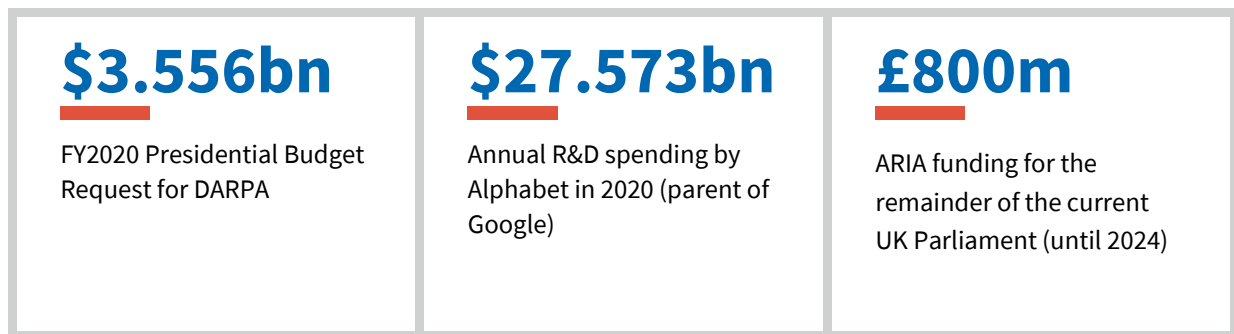
To even allow such a funding model to exist, ARIA must be exempted from normal Treasury spending rules that, understandably, are designed to prevent public money being put towards endeavours with too high a risk of failure. Instead, it will be granted maximum possible independence from

Whitehall bureaucracy and will have the freedom to experiment with novel funding models without first seeking approval. A brave move for any minister whose reputation is staked on its success, but perhaps characteristic of Boris Johnson's customary hubris.

Nevertheless, seemingly aware of these risks, the agency is also to be exempted from Freedom of Information laws. While justified as a necessary precaution to prevent the UK's scientific competitors from gaining an advantage, one imagines that it is the opportunity to avoid some of the associated scrutiny that is really enticing to ministers. Of course, while most of ARIA's speculative projects are not expected to realise very much in the way of technological or economic return, provided the successes can justify the

overall investment all will be well, or so the logic goes. But this conveniently ignores what in Whitehall is known as the Daily Mail test - can ARIA's reputation survive a tabloid exposé of wasted taxpayer money should an unsuccessful project be dissected in isolation. For a government that likes to shrink from public admonishment this surely has to matter.

Nevertheless, as 'Gunboat Diplomacy' was the foundation of the Victorians' Pax Britannica, then harnessing modern Britain's status as a global scientific superpower is clearly a core tenet of Boris Johnson's 'Global Britain' agenda. ARIA it seems is set to form a distinctive element of this new approach. However, scrutiny over a lack of transparency will follow any whiff of failure, especially at a time when the public purse is under unprecedented strain



Act Two: Nessun DARPA

The idea of an agency for inventions finds its genesis in the policy designs of Boris Johnson's former chief adviser and strategist, Dominic Cummings. In his blog in 2017, Cummings called for the UK to "think hard" about "how a small group of people can make a huge breakthrough with little money but the right structure, the right ways of thinking, and the right motives." Indeed, Cummings was reverential of the practices of the United States' Defense Advanced Research Projects Agency (DARPA), claiming that the US project through its own unique approaches created "35 TRILLION DOLLARS of value for society and counting." Cummings' WhatsApp profile once even read "Get Brexit done, then ARPA." While Cummings himself is now in exile from Downing Street, through ARIA, his legacy lives on.

The Government has been clear that ARIA is explicitly inspired by the model first established by the US and

intends to emulate DARPA's success. Originally created in the 1950s by President Eisenhower in response to the launch of the Sputnik satellite by the USSR, DAPRA has always had an inherently 'cool' reputation for developing breakthrough technologies that have expanded the frontiers of science beyond the immediate needs of the US military - from GPS to the computer mouse.

However, with an annual budget of more than USD\$3.5 billion this dwarfs the funding available to its UK cousin. As a result, DARPA has the resources to be fairly indiscriminate in its approach to funding new projects. Like it or not, ARIA will need to be far more clinical in how and where it chooses to apply its funds - and in doing so, some might argue, destroy the very principle it is founded on. Ultimately, the question is whether ARIA can ever be expected to replicate DARPA's outcomes with such miniscule funding. To do so, politicians may need to find a level of patience they are not usually renowned for.

Act Three: Don Cummings, The Phantom of the Opera

As a result of Cummings's influence, the policy to create a 'British ARPA' was made sacrosanct in the 2019 Conservative manifesto which committed to delivering a "new agency for high-risk, high-payoff research, at arm's length from government." Nevertheless, that elements of Cummings's influence lives on in Downing Street simply underlines his enduring impact. The ambition for ARIA to recruit a "visionary" Chief Executive and Chair is not so far from Cummings's famous drive to hire "weirdos and misfits" into the inner circle of government. More broadly, his ideas are set to underpin the Government's forthcoming defence review, which will reprioritise military procurement, pivoting spending towards the development of next-generation battle-winning technology.

Although dynamic and exciting, with ARIA seemingly cherry picked from Cummings's cardboard box of policy ideas as he strode out of the door of No.10, the agency was nevertheless launched with more of a lone party popper than a triumphant fanfare. Perhaps aware of the inherent risks, the Government sees ARIA as a long-term policy device that can be celebrated only when it delivers something tangible. Indeed, the creation of new spoils from R&D is a long-term process and it will be instrumental to that success that ARIA is given patience, even decades, to develop the next 'Iron Man.' To this end the Government has set a "10-year grace period before any potential dissolution of the agency can be triggered."

Whether a government of a different hue would uphold this remains to be seen. If there is little to show in results from the initial £800 million invested, it seems difficult to predict how ARIA may endure the winds of political change. Even if Johnson's ultimate successor is a Tory, they are unlikely to want to continue with a programme if it is seen to be failing.

Act Four: Don't Cry for Me Horizon 2020

In terms of where ARIA will sit amongst the UK's plethora of other high-end research bodies, Kwarteng has suggested that it will slot into the pre-existing ecosystem and "diversify" the UK's R&D environment. It will not replace any similar body such as UK Research and Innovation (UKRI) or the Defence Science and Technology Laboratory (DSTL). Ottoline Leyser, CEO of UKRI, has said that "ARIA has tremendous potential to enhance the UK and global research and innovation system... Working

closely together, UK Research and Innovation and ARIA will catalyse an even more diverse, dynamic and creative funding system that will ensure transformative ideas, whoever has them, can change people's lives for the better."

As the final Brexit settlement was being negotiated, the vision for ARIA might have been to replicate or rival the EU's own Horizon 2020 programme, despite both operating fundamentally different models. However, with the UK set to retain a legacy interest, ARIA will need to line up against this too.

ARIA may in fact take on an almost SAS-style 'who dares wins' approach to innovation, promoting the rapid trialing (and rejection) of implausible ideas in the shadows, with only its successes seeing the light of day. For businesses used to operating in this space, it won't go unnoticed that ARIA seems to be gearing up to hand out a serious pot of funding, backed by premier expertise, that could see successful projects rocket forward if they successfully draw the agency's attention.

Act Five: The Tenors for Britain to Remember

While an ambition to experiment with new funding models is evident, there is yet little clarity about how ARIA intends to convert ideas into output with commercial value. The rhetoric around ARIA has often repeated what has become pretty standard cliché, the idea that governments and bureaucracies can ever hope to replicate the Silicon Valley approach to innovation, an idea that easily invites derision. Nevertheless, the UK with its world leading universities and research institutions is not short on expertise. ARIA's success might therefore be better found in its ability to connect ideas on paper to the private enterprises that have the funding to invest in commercialising them; not so much a scientific laboratory, but an efficient clearing house.

A warning from the recent past was the UK's failure to capitalise on 'graphene,' a one-atom thick sheet of carbon, with 200 times the strength of steel discovered by scientists at the University of Manchester in 2004. Despite its revolutionary properties, a failure to suitably invest in the material at the time by the UK has seen other countries such as China dominate patent applications for the technology, with Britain trailing behind.

For ARIA to provide a real economic surplus to Global Britain, it will be from its ability to take good ideas successfully through the 'Death Valley Curve,' whereby an

invention or breakthrough is most vulnerable to under-exploitation during the span of time between receiving initial capital and finally generating revenue. This is why ARIA's ability to experiment with funding models will be so critical, as the agency's small funding envelope will ultimately leave it reliant on leveraging private sector investment to see its ideas come to fruition.

Finale

ARIA undoubtedly represents an exciting new prospect for UK R&D which could serve to harness Britain's expertise and support the 'scientific superpower' element of the Global Britain project. Done well, such an agency offers the potential to monetise the country's undoubted expertise and tap into the brilliant innovation that lives behind our most promising homegrown ideas.

However, to be successful, ARIA will need long term faith and commitment from policymakers, probably over decades rather than just a single parliament. £800 million is a small pot of money to deliver the kinds of programmes that its DARPA cousin across the pond can boast; therefore ARIA will also require more than just a sprinkle of luck if the Government is to deliver an encore.

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