



**Centre for  
Emerging Technology  
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EXPERT ANALYSIS

# **Reinventing National Security**

## **Innovation, Diversity and Inclusion**

Ann S and Paul Killworth

The views expressed in this article are those of the authors, and do not necessarily represent an official government position, the views of the Alan Turing Institute or any other organisation.



# Introduction

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**Innovation, the process of taking ideas from inception through to impact, is core to the ability of the UK's national security agencies to keep our country safe.**

Maintaining a competitive edge over those who would do us harm means not just keeping pace with technological developments but getting and staying ahead of them.

In just the last few years, we have seen the importance of cutting-edge bioengineering technologies in combating COVID-19,<sup>i</sup> the role of AI in combating online child abusers,<sup>ii</sup> and the value of new open-source analytical techniques to countering the Russian invasion of Ukraine.<sup>iii</sup> These and similar developments depend on a rich ecosystem of skilled technologists, world-leading external research institutions, and private sector partners able to pull-through new products and services.

The national security community is far from alone in recognising the importance of innovation and emerging technologies, as well as the cultivation of a diverse skills base that can support the development and operation of capabilities that help keep the public safe. The UK's Integrated Review (2021)<sup>iv</sup> draws out their importance to the UK's national ambitions as a Science Superpower, central to both the risks and opportunities facing the country. The Government's new Innovation Strategy (2021),<sup>v</sup> recognising that the world sits on the edge of unparalleled technological transformation, seeks to make the UK a thriving hub of global innovation and diverse talent.

This article explores the links between this next wave of technological and social change, the future of the UK's national security community, and the themes of diversity and inclusion. Our community is moving from a model where closed organisations pursue slow but steady innovation, to one where teams of diverse individuals drive change, in partnership with broader UK society. This is a call for more inclusive and diverse forms of leadership than ever before - in short, a reinvention of what it means to keep the UK safe.

# Diversity = mission critical

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**The need for innovation, whether realised through game-changing advances or fast incremental growth, has never been clearer within national security.**

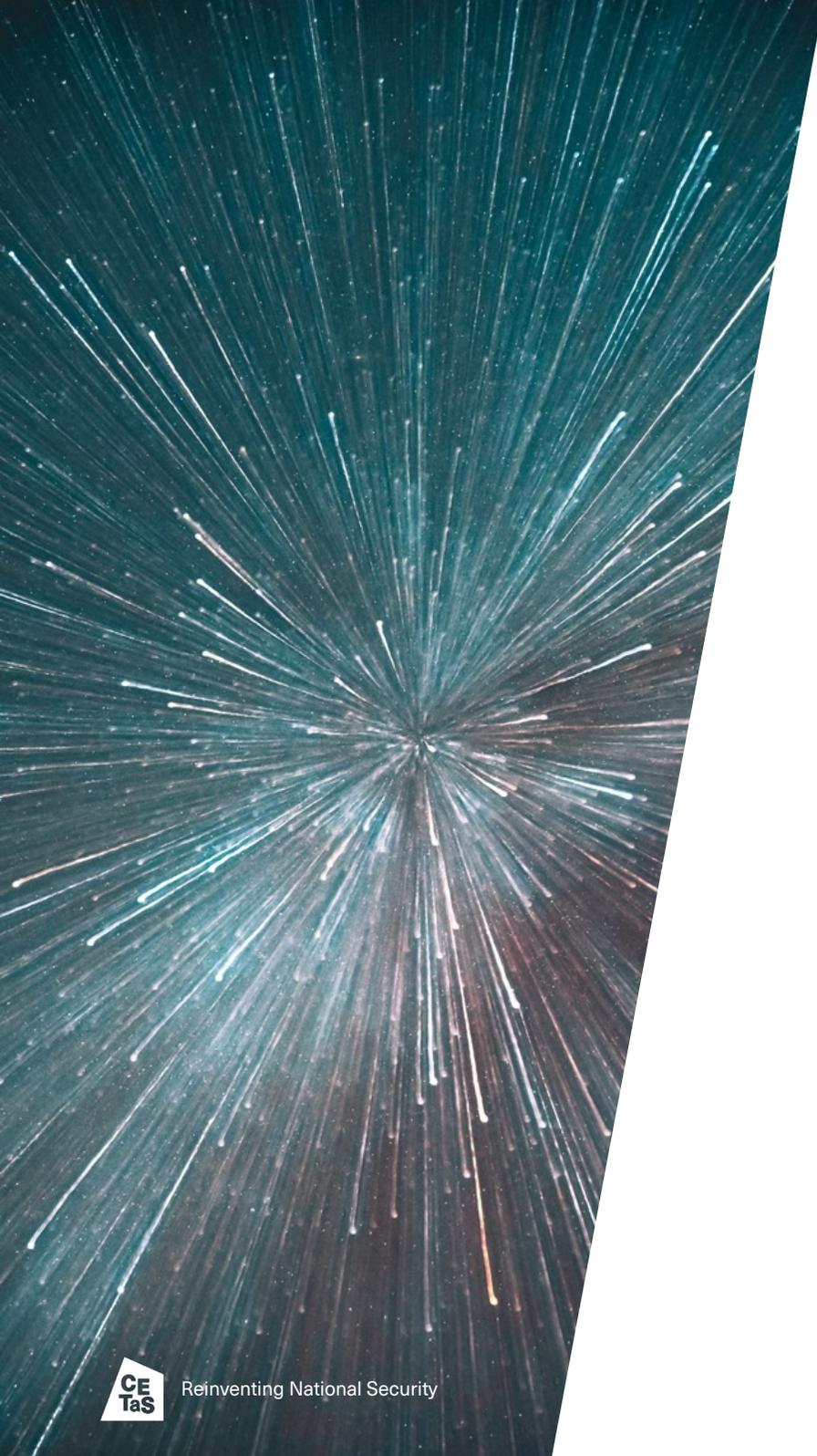
In the face of rapid technological change, the capabilities giving the agencies an edge over our adversaries have ever shorter half-lives. Where once we could plan ahead and adapt to tackle well-established threats, now our teams must constantly invent and reinvent our tradecraft, in a more chaotic and uncertain world. Innovation is increasingly about ethics and society too. As Jeremy Fleming, the Director of GCHQ, argued last year, the next epoch will be defined by those nations which seize “the innovation initiative” and succeed in promoting their values through emerging technologies.<sup>vi</sup>

The science is clear: innovation depends on highly diverse teams working closely together.<sup>vii</sup> With the right organisational culture, people with different backgrounds, personalities, and experiences will combine to deliver more

invention, better decisions and apply new capabilities more quickly. As the UK Parliament’s Intelligence and Security Committee concluded in 2015, diversity should be “pursued not just on legal and ethical grounds – which are important in themselves – but because it will result in a better response to the range of threats that we face to our national security.” From cryptography to machine learning, diversity will drive the innovation that is so critical to our mission.

But doing that in practice is hard. Many UK organisations have struggled to recruit, retain and develop diverse talent, and national security has perhaps historically found it harder than most. We know that women and ethnic minorities are underrepresented in our teams today, especially in senior leadership positions.<sup>viii ix</sup> The national security community understands that it needs to do more to address this, and is committed to taking action to improve our diversity, including widening the talent pools from which we attract our people.

When we get this right, however, the results shine through. Take the National Quantum Technologies Programme,<sup>x</sup> which brought together a brilliant set of thinkers and do-ers from multiple backgrounds: academia, the private sector, intelligence agencies and wider government. The team has taken quantum technology from the edge of science fiction to a flourishing ecosystem of companies in only a decade, making the UK second only to the US in investment<sup>xi</sup> and strengthening our strategic edge over our adversaries and competitors.



# Starting and staying diverse: talent and opportunity

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**Talent may be evenly spread around the UK, but as a recent White Paper has stressed, opportunities are not.<sup>xii</sup>**

We know it is harder for some groups in society to gain access to higher education, funding, or the commercial opportunities which will enable them to contribute to national security missions. To be clear, these potential innovators don't need fixing: the system itself needs fixing. The experience of doing this across the cyber security sector shows that we need to intervene to embed opportunity and diversity from the start of our early school years. We are making progress here, through initiatives such as GCHQ's Cyber First Girls competition, targeted internships for those from lower socio-economic backgrounds, and apprenticeships giving a different route for those who might not choose to gain skills through a university degree. But we know we need to do more to spread opportunities across all our diverse communities, changing perceptions of who can have a career in national security, and what that career might look like.

We also recognise the influence that government has in helping new entrepreneurs and technologists advance along their early careers. New organisations such as the National Security Strategic Investment Fund (NSSIF), which invests in emerging technology companies, or the co-creation centres sponsored by the National Security Technology and Innovation Exchange (NSTIx), can help foster diverse teams of successful founders. The funding decisions made by UK Research and Innovation (UKRI) and other research partners can similarly influence the careers of researchers and academics, helping to create an even more diverse generation of UK thought leaders.<sup>xiii</sup>

Geography also matters. Bringing together government, academics and private companies through regional economic clusters and hubs hugely reinforces the impact of policy interventions. The emerging "cyber corridor" between Manchester and Preston is one prominent example, but we are seeing similar stories from the Bristol, Swindon and Cardiff triangle in the south-west, Strathclyde's Quantum hub in Scotland, or through Belfast's cutting-edge work in data science. These provide innovators with access to national opportunities at the regional level, and in turn give the national security community links to the best of the UK's talent.

# Inclusion, innovation, integration

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**Inclusion, creating an environment in which everyone feels their contribution is welcomed and valued, is essential to realising the benefits of diversity.**

Across the national security community, we are seeing a renewed focus on open, transparent engagement. And we are also committed to listening and learning, as well as sharing. In his first public speech, for example, Ken McCallum, the Director General of MI5, laid out his intention for his agency to “open up and reach out in new ways”,<sup>xiii</sup> realising this was key to its ambition of being brilliantly adaptive.

We can see this approach of driving innovation through diverse talent brought together in an inclusive environment at the National Cyber Security Centre’s innovation hub in Manchester. The hub takes recruits from non-science educational backgrounds who can demonstrate an aptitude for solving technical problems, and creates an environment in which they can learn, challenge, experiment and innovate.

Another example of engaging differently is the use of “problem books”, descriptions of the kinds of technologies and issues that the agencies believe they need help to address. Even once the need to retain some essential secrecy is factored in, these and similar tools can open up new conversations around innovation with diverse partners. As Richard Moore, the Chief of SIS, pithily summarised last year, “we must become more open to remain secret”.<sup>xiv</sup> This means providing external experts – and the broader public – with more insight into the types of challenges the national security community is grappling with, and the sorts of skills we need to address them.

Indeed, the careers of our senior operational and technology leaders are increasingly externally focused, with value being placed on their ability to engage, build trust, and communicate the national security story across all parts the UK. GCHQ’s publication of its approach to AI ethics is one example of this. Working with civil society partners, the agency

opened up a national conversation on the use of AI, deliberately including groups who might disagree with its conclusions.<sup>xv</sup> This principle of openness may be uncomfortable at times, but it will underpin our future mission success, and separates the UK’s approach from those of our adversaries. Open debate and challenge are cornerstones of our future success as a global, democratic society.

# Conclusion

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**Diversity and inclusion are central to innovation; in turn, in the modern technological world, innovation is critical to our national security.**

How the UK pursues diversity, opportunity and inclusion matters; both to our future national security capabilities and to the regional ecosystems we increasingly depend on. Our culture and beliefs have never been more essential to the UK's future as a Science Superpower, or to our ability to keep the country safe. We must keep challenging ourselves to improve, and we ask for your help along the journey.

## **About the Authors**

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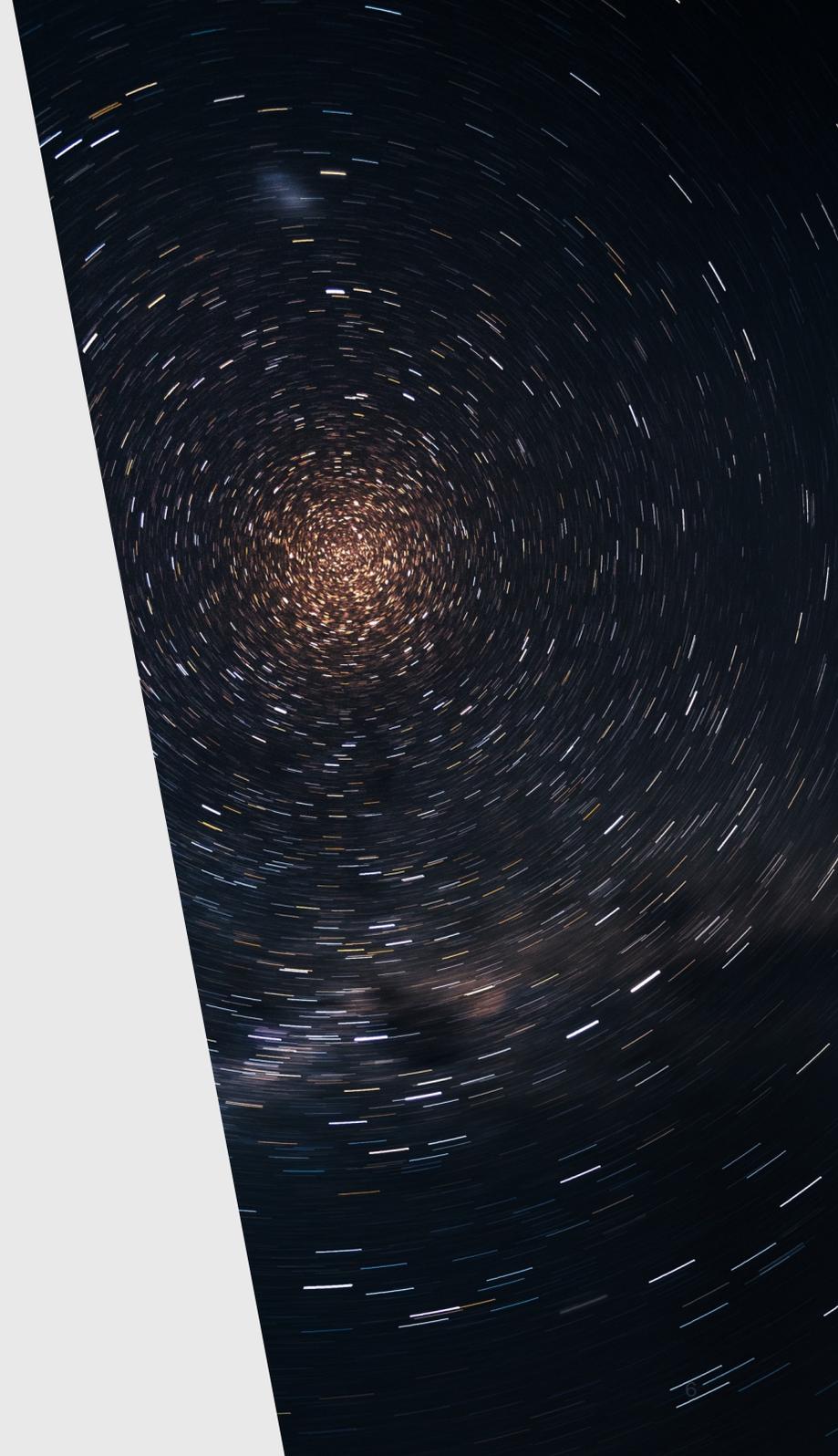
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