

Joint Committee on the National Security Strategy

Oral evidence: The National Security Strategy

Monday 17 November 2025

4.30 pm

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Members present: Matt Western (The Chair); Liam Byrne; Sarah Champion; Mr Tanmanjeet Singh Dhesi; Baroness Fall; Lord Hutton of Furness; Baroness Kidron; Mike Martin; Edward Morello; Lord Robathan; Lord Sarfraz; Lord Sedwill; Lord Tunnickcliffe; Derek Twigg; Baroness Tyler of Enfield; Lord Watts; Sir Gavin Williamson.

Evidence Session No. 6

Heard in Public

Questions 94 - 111

Witnesses

I: Professor Sir Anthony Finkelstein CBE, President, City St George's, University of London, and former Chief Scientific Adviser for National Security Deputy (2015-2021); Professor Sir Nigel Shadbolt, Executive Chair & Co-founder, Open Data Institute, Principal, Jesus College, Professorial Research Fellow in Computer Science, University of Oxford.

II: Sophia Gaston, Visiting Fellow in the Department of War Studies, King's College London, and Founder and Lead of the AUKUS Industry Forum; Air Commodore (ret'd) Blythe Crawford CBE, Director, GRAIL (Generative Real-Time Artificial Intelligence Lethality), Tiberius Aerospace, and former commandant of the Air and Space Warfare Centre; Lieutenant Colonel (ret'd) Haydn Gaukroger OBE, Head of Capability Development, Syos Aerospace.

Examination of witnesses

Professor Sir Anthony Finkelstein and Professor Sir Nigel Shadbolt.

Q94 **The Chair:** Welcome to today's meeting of the Joint Committee on the National Security Strategy. Today's session will focus on pillar 3 of the national security strategy, which focuses on the sovereign capabilities and the asymmetric challenges. I invite our first panel of witnesses to introduce themselves very briefly.

Professor Sir Anthony Finkelstein: Hello, my name is Anthony Finkelstein. I am by background a computer scientist and software engineer. Originally, my roles were at Imperial College and UCL. I am a former chief scientific adviser on national security and a former member of the UKRI. I am currently chair of the Police Science Council and the research security advisory board for DSIT, and a non-executive director

of the National Crime Agency and a major UK financial institution. My day job is president and vice-chancellor of City St George's, University of London. I blog as "prof serious" on Substack.

Professor Sir Nigel Shadbolt: I am Nigel Shadbolt. I am a professor of computer science at the University of Oxford, and co-founder and executive chair of the Open Data Institute. By background, I too am a computer scientist. I have been working in the field of artificial intelligence since the late 1970s. I have held research positions at Edinburgh University, Nottingham University, Southampton University and now Oxford, in various roles. Currently, I am a member of the Prime Minister's Council for Science and Technology. I am the chair of AI at Oxford Research, which attempts to co-ordinate research across the University of Oxford. I also sit on a number of boards in non-executive director roles as an adviser in the area of AI investments.

The Chair: Thank you very much. We have already explored pillar 1 and pillar 2 of the NSS. Today's session will look at pillar 3 and try to understand the Government's view on our sovereign and asymmetric capabilities. Do you think that the strategy sets out a very clear vision of those? What do you understand by those terms themselves, Sir Anthony?

Professor Sir Anthony Finkelstein: Some of the terminology that appears in the NSS has its distant origin in terminology that appeared in the integrated review. That in turn stems from a paper I had some hand in authoring, for which reason I feel like I have quite a big stake in the terms and their meanings.

I understand "strategic advantage" to be about a durable and asymmetric edge that gives the UK a differentiating capability that competitors cannot easily replicate, substitute or remove. It is not only about superiority in technology but rather about a position from which the UK can generate prosperity, resilience, security and influence over time.

In technology domains, advantage is often indirect as well as direct. Leadership in one capability confers leverage in products, services, systems, and so on, built upon them.

For advantage to be meaningful, it must also be commercially grounded. Market forces ultimately determine that durability. The state's role is, I believe, to shape the conditions in which markets generate sustainable advantages.

Strategic advantage is built from several interlocking components. I appreciate the time constraints but will just describe them very quickly. Informational advantage is understanding your competitors' intentions and capabilities. Positional advantage is control of critical assets. Temporal advantage is being ahead. Logistic advantage is being able to get resources to the problem rapidly and effectively. Resource advantage is, in essence, access to capital, materials and economic leverage. Knowledge advantage is critical knowhow. Skills advantage we may return to, I guess. Adaptive advantage is the ability to pivot, learn and

reconfigure; I commend the strategy for identifying that that may well be an important element of it. Values advantage is about the legitimacy, openness and challenge embedded in our democratic systems that underpin scientific excellence and public trust. Collaborative advantage is alignment with like-minded allies, however occasionally difficult that might be, to amplify capability and constrain adversaries. Basically, a national strategy needs to optimise the combination of all those different asymmetries.

Professor Sir Nigel Shadbolt: That is a very good summary. The other thing we should bear in mind is, as we are looking at this landscape that is very fast-evolving—particularly in my own field of AI—that strategic advantage, and certainly asymmetric advantage, will derive from part of the distinctive history and heritage of the work we have done and completed in the United Kingdom and the kind of institutions that we have built that allow us to continue to be world class in this area. I would just add that dimension.

Data is also a key part of our strategic advantage. We often think of a variety of infrastructures as being essential to our resilience and security, whether that be our power grids or communication networks, but data itself, properly understood as an infrastructure and properly curated and managed, confers strategic advantage.

The Chair: Do you think that should be the absolute dominant first priority?

Professor Sir Nigel Shadbolt: It is one of the priorities. Actually, I would suggest that data, although it is mentioned on a number of occasions, does not figure as an underpinning foundational component.

The key feature we have to remember with the modern generation of machine learning techniques is their absolute dependence on data—some of it good, bad and indifferent, and there the challenge is of course to screen and fine-tune models to be better able to deal with poor-quality data. So, investments around data as an infrastructure—to understand that it needs to be assured, curated and, ideally, its provenance noted—becomes a key requirement. Too often, not enough attention is given to the investment that that would require and the sort of regulation that would keep, maintain and sustain it as an essential part of the infrastructure.

The Chair: Sir Anthony, what should be the absolute first priority?

Professor Sir Anthony Finkelstein: My first observation is that rather than thinking of particular technologies or areas of technology, as it were, individually, we think of this as, in essence—I apologise for the terminology—a game on a network. In other words, we have a network of related and dependent technologies and we are seeking to play advantage over that network of related technologies and assets. Hence, I agree with Nigel on data, for example.

Q95 **The Chair:** Many observers have said that this is the least developed of the three pillars. For example, techUK has said there is not enough detail in it. ADS has said it wants to see more information about which areas we should be looking at owning, accessing or collaborating on. What do you think the Government need to do to create a tighter framework to help the private sector better understand what the challenge is?

Professor Sir Anthony Finkelstein: The first thing is that, in general, our overall HMG capacity to gather and analyse scientific and technical intelligence is inadequate. We do not know enough. I am not necessarily talking here about covertly acquired intelligence but open-source intelligence. We do not really know enough about the global laydown of technological competition, and we need to. We need to develop an associated analytic tradecraft that allows us to form fine-grained strategy.

So, I would not say that pillar 3 is inadequate. I would say that it is fine as far as it goes, which is not that far.

The Chair: Do you agree with that, Sir Nigel?

Professor Sir Nigel Shadbolt: Yes, and the challenge is then to understand what we need to survey. What should our horizon-scanning look like? What should our intelligence-gathering look like in the broadest sense?

As academics, we are constantly looking at and having to deal with the extraordinary deluge of research that is now available. That in itself is a significant challenge, for which we turn to various analytics tools to help us. Without that, it is hard to get a strong sense of just how fast-changing this field is and how certainties of just 12 months ago change into, "Well, maybe things aren't quite so obvious".

Again, if I were to take the current generation of enthusiasms for so-called large language models or foundation models, it is quite clear that there is massive speciation happening in this space—models large and small, models open and closed, models that are specialised or tuned to particular domains. This is a really important factor to understand. We are likely to begin to see a landscape emerge with very different types of AI capability, just in this one area, suited to running on everything from mobile phones to distributed networks to the very large-scale cloud infrastructures that we understand. Strategic asymmetry should not be seen as a guarantee to try to master, or indeed give up on, the attempt to build a very large language model on the scale that is available in some of the hyperscalers.

This is an issue I would like to come back to, because understanding it is an important part of the whole landscape of understanding how to be asymmetric.

The Chair: We will definitely come back to that.

Q96 **Lord Tunncliffe:** I came across this concept in pillar 3 and have

addressed it from one direction, the military direction, in my own mind. The more I thought about it, the more often I came across something that I have found throughout my career, which is that there is not enough discussion as to why. There is lots of wonderful science to do, and so on and so forth, but we are 60 million people and our competitor here is not the Russians; our competitor is the Americans. Surely we cannot have a broad-spectrum approach to try everything that they do. We have to have a more sophisticated approach that targets where we take our limited resources to lever big advantages.

That is not a matter of sitting back and letting the market forces answer the question. The question, firstly, must surely be handled by government and then transmitted into a relationship with industry where the right resources go to the right questions to produce the right result.

Professor Sir Anthony Finkelstein: The first thing to say is that, broadly, the priority areas identified by the Government and amplified in UKRI's strategy are indeed the right areas for us to have a national focus on. I think they are reasonably well chosen. But they are very broad and high level, and that is not a good foundation for a competitive strategy.

If we are identifying, as we are in pillar 3, the idea that we are going to take a highly competitive national approach, then we will need to refine those questions. I think that was implied by your question. We are going to have to refine those questions further. I do not think we are well positioned to do that at the moment.

Professor Sir Nigel Shadbolt: We have a strong sense of the notion of what we are incredibly capable of delivering from our core science base. It is not all of health and life science, but it is a substantial component.

We have extraordinary capabilities in quantum. Whether we can ever scale these things is another matter. It is the classic problem of: we do the basic science and then have a translational problem or a patient capital problem. It is the same, I would submit, in material science and in AI.

What we can do is identify where the potential disruption points are. Very large bets are being made at the moment on particular styles of delivering AI and particular types. Some of the assumptions are rather unquestioned about whether it is an appropriate focus that the only way to compete is to imagine building these super-large models, for example. One has to be very thoughtful about whether that confers advantage.

That is the kind of discussion we need to get into. The grain size of the discussion has to be at the level of, "Where does our science give us an inherent advantage? Where do we know world-class science is being done? Where do we think that may confer fairly rapid market advantage?" Because the gap between developing these methods and their deployment in the market is extraordinarily small.

Professor Sir Anthony Finkelstein: Many of our methodologies for determining research and other priorities are well suited to a situation

absent a competitive setting. When you have a competitive setting, you suddenly start to think, "How can we hold choke points? How can we hold particular knowledge as assets that make our position difficult to shift?"

This is a much more strategic form of thinking, more akin to what has been done historically in the national security community than in the research community.

- Q97 **Mr Tanmanjeet Singh Dhesi:** The national security strategy aims to develop a baseline level for sovereign capability in key frontier technologies, such as AI and quantum computing. However, you will no doubt have noted that the level of sovereignty required, for example, in supply chains or production capability is not even addressed in the defence industrial strategy. Also, if we look at autonomy, the defence industrial strategy does not even state the different levels of autonomy to be applied. Professor Finkelstein, if I may start with your good self, what should that baseline look like for these different technologies?

Professor Sir Anthony Finkelstein: The baseline cannot be determined bottom up from the technologies. It also derives from what one might think of as threat scenarios, so I would prefer to take a more scenario-based approach to thinking about how one secures sovereignty in particular technologies. We need to centre on knowledge sovereignty, the minimum scientific and technical understanding required for the UK to act as a smart customer, assure supply chains, and, if necessary, have capacity to bootstrap. My inclination is not to think we need to maintain, as it were, a baseline capacity in each of the underlying technologies. It is scenarios first, basically.

Mr Tanmanjeet Singh Dhesi: Okay. Professor Shadbolt, no doubt you will agree with me that there is a lack of clarity around these issues from the Government, so what do you think should be the baseline?

Professor Sir Nigel Shadbolt: It will be the issue about securing supply chains, particularly when you are at the material level—when you are at the kind of chip assembly. There is some concern that perhaps we too easily imagine we are incapable of being innovative around the fundamental design and innovation of the silicon fabric—or indeed potential new fabrics; compute fabrics such as quantum—upon which technologies depend. If you look at our historical ability to innovate in this space, that would be odd. It is clearly the case that, when investments have been made, really very interesting developments have arisen. We have been at frontier in the past.

We do not invest enough time thinking about where our core capability is to develop new styles of technology. But if you move up the stack, there is a very interesting area where sovereignty also becomes interesting. It is the ability to validate and verify the complex systems that now exist to be much more powerful and effective in establishing the security of these systems and their performance envelopes. That, again, is something where the UK has very strong traditions. I would recommend that we

need to think at each level in the stack, as we abstract higher up to fully emergent services, where the UK can actually secure its own capability.

The big argument will be around, "Should the UK be building its own frontier model? What would that look like?" Again, I think we can re-factor that in a more interesting way than is often understood, and I would commend that we look at countries like China and Switzerland who are making some very interesting bets in how you might do that.

Professor Sir Anthony Finkelstein: To round out an answer to this, I hope we will have an opportunity on subsequent questions to talk a little bit about skills, because skills clearly play into baseline capability, and they are an area where I judge the UK currently to be most vulnerable, or at any rate to know least about its vulnerabilities.

Mr Tanmanjeet Singh Dhesi: Professor Finkelstein, great minds think alike, because that is exactly what I was hoping to question you on next. I have two questions, first with regard to the barriers to achieving that baseline which we have just discussed. Could you just answer regarding that? Secondly, our Defence Committee indeed has looked into skills gaps. There is a lot that the Government and the Ministry of Defence want to achieve in our military capability, but we are seeing again and again that there is a huge skills gap. In your mind, given your expertise, are there any technologies where those skills gaps exist which you have just alluded to? More importantly, how are we going to address those skills gaps?

Professor Sir Anthony Finkelstein: I have mentioned already the S&T intelligence and the analytic tradecraft. Clearly, I am concerned about the erosion of domestic capability, particularly in technically mature but strategically essential areas. On my list are RF engineering, propulsion, metals, ceramics, acoustics, energetics and electro optics, but that is just a first pass, and I know that you have others more expert who might follow on. Other obstacles are limited stickiness of early-stage innovation, and the UK struggles to anchor emerging technologies and talent domestically. We have insufficient routes for rapid acquisition. Defence and national security procurement often lag market evolution.

Broader, the thing we badly need in the UK is a comprehensive skills and capability audit. We just do not have an understanding of where we have skills shortages. Then we need a preservation scheme for fragile or declining areas. This is not just something for Government; it is also something for industry. We need industry to take a long-term collaborative view of niche skills. This erosion in underlying skills base is slow but ultimately more dangerous than crisis shocks.

Mr Tanmanjeet Singh Dhesi: Professor Shadbolt, could you come in on the barriers as well as how we are going to address the skills gap, please?

Professor Sir Nigel Shadbolt: I can tell you from my own institution's perspective that we have 20 well-qualified applicants for every place in

our computer science courses. There is a massive opportunity to train the brightest and the best in these core technologies all the way through to the level of apprenticeships we know are required and the new professions that are beginning to emerge. With the notion of a profession of data insurance, a new set of skills are required to actually evaluate and understand the qualities of data that are being used in every kind of sector. That is a new sort of professional qualification that again we need to prepare for. This is not just about securing existing talent pipelines; it is about anticipating where these new jobs will emerge.

I shall just say something on the notion that all the jobs will be taken by AI systems. One problem we do have is a freezing lag that we are beginning to see, where a reticence to take on new interns across a range of professions suggests that those organisations feel that somehow it is a given deal that systems will simply be imported that fulfil those tasks. What you then lose is the deep embedded training that those internships provide for, and you are in danger of a demographic gap, literally, when people then realise, "Oh, we should have probably not frozen our hiring in quite these contexts in the way we did". What do we then do to reinstate—to backfill—that deeply hard-won expertise that human skilled workers often acquire in internships?

Q98 Liam Byrne: Sir Anthony, let me just check, first of all: do you think the national security strategy actually defines the sovereign capabilities that the country needs clearly enough?

Professor Sir Anthony Finkelstein: In all honesty, it does not, but I am wondering whether or not a strategy of this kind would be the best place to do that.

Liam Byrne: Where else would you do it?

Professor Sir Anthony Finkelstein: I wonder whether perhaps it has halfway done the job, and it might be a better choice either to say, "This is for a separately commissioned piece of associated analytic work", or pillar 3 needs to be to be fuller. It would be a judgment call.

Liam Byrne: The defence industrial strategy says we will define sovereign capabilities but then does not define them either. Where do you think they should be defined, and when?

Professor Sir Anthony Finkelstein: This needs to be a continuing process, because we are in a dynamic competed setting, so it cannot be static. My assumption would be that this is something that would best emerge from a continuing analytic capability.

Liam Byrne: Do you think, say, China has got a pretty good grip on the sovereign capabilities it wants for China?

Professor Sir Anthony Finkelstein: I will come back to that.

Liam Byrne: Pick another rival.

Professor Sir Nigel Shadbolt: Just to perhaps continue with what Anthony was saying, I do think that the term is not made out in much detail. A crisper view, certainly operationally, could serve us, and that is something we should think about. Sovereign capability in AI means having the ability to not only develop or own or host systems, but to understand, test and govern them. We can get under the skin of what is a sovereign capability—to evaluate whether they behave safely, to identify failure modes. There are failure modes that we are beginning to see now for which a sovereign capability could be super-important—are these systems capable of being deceptive? Are these systems capable of having their reward functions hacked in various ways to give very undesirable behaviour?

Liam Byrne: That is useful, but I just go back to what was listed in the national security strategy. It talked about nuclear deterrent, nuclear subs and cryptography. There is then a list which is described as where we need varied levels of autonomy: combat air ships, ground combat systems, complex weapons, munitions. Then there about another six sectors where action is needed: steel, construction, energetic material, batteries, semiconductors, rare earths. It just all sounds a bit vague. The question I have really got, I suppose, is: is that list right? What that is obvious is missing? Is it a clear enough list for the private sector to actually act on?

Professor Sir Anthony Finkelstein: As I previously alluded to, I do not think that these lists are adequate and I do want much finer-grain, much more intelligence-informed assessments framed around the competitive setting.

I have looked now to your earlier question, and I have recovered sufficiently to answer. I have looked at the open source material on Chinese technology priorities. They are not an enormous distance from the material that is available publicly from HMG. The point is: I want to do better. If that is your competitor's baseline, I would actually seek to secure an edge by better analysis, if that were possible.

Liam Byrne: Sir Nigel, what are your views on anything obvious missing from the list? There is a process that, as a nation, one might go through to evolve it, and I take the point about this needing to be a living list, but what about this clarity for the private sector? Ultimately, these things are going to be built with substantial amounts of private sector investment but, if there are no clear market signals, then the market ain't going to help quite as we might like.

Professor Sir Nigel Shadbolt: No, that is right. The market signals in this area may or may not serve you well. We currently see in an interest in, for example, China's adaption of AI systems to fulfil a range of specific capabilities within their industrial base, within their educational base, within their scientific base. To Anthony's point, that gives us the clue that we are perhaps broadly pursuing what each nation would think of as strategic aims. But, yes, how can we do better? How can we use the intrinsic features of an open and democratic system to actually further

enrich and empower the models that we are now using in AI? That is a real prize. The one thing that you can be sure of is that the models in the Chinese context are variously constrained and limited in ways that will not provide for the full range of effective deployment that you might find here in the UK.

Professor Sir Anthony Finkelstein: May I also commend an aspect of the approach of NSSIF—the National Security Strategic Investment Fund—which is to open dialogues round problem books? That is a model of how such engagement could be done.

Liam Byrne: My final question, then: who is in charge of developing this list and leading the process to get the living list that we have just agreed would be a virtuous thing to have?

Professor Sir Nigel Shadbolt: We have to imagine that that is a discussion we can do between the public and private, but also academic institutions have to be a part of this, and the academies as well. This is an organised dialogue you can have. I do not think it sits with any one single department, or indeed one single set of governance. Regulators play a role here too. We have not yet talked about the essential role that they might play in helping boost our innovative capability.

Liam Byrne: Is this dialogue going to start itself?

Professor Sir Nigel Shadbolt: No. It needs to be something that we orchestrate. Actually, this is where the national strategy perhaps might want to sit down and say, “How do we bring these voices into a discussion?”

Liam Byrne: Who is the “we”? Who is the first mover in this dialogue?

Professor Sir Anthony Finkelstein: The challenge is that a national security strategy of this kind requires a systems approach, which Government find difficult to achieve. “Perhaps a fusion approach?”, I look at somebody here and think. But it requires us to articulate mechanisms across Government. The security cross-cutting strand in Government has strengthened the linkage between the economic departments and the traditional security departments, but it is not all it could be.

Professor Sir Nigel Shadbolt: If we speak up for the academies here, I would say that they do lead pieces of work, and the work that has been recently completed by the Royal Society around AI in science is a great example that highlights where the strengths are and where the opportunities live.

The Chair: Edward Morello, you wanted to come in.

Q99 **Edward Morello:** To be honest, I think both professors have pretty much answered the question I was going to ask, which was just to allude to the point that, traditionally, Government is not particularly good at keeping up with the pace of change when you have a very loose articulation of what the need is. Sir Nigel, you alluded to how bad the UK

is at rapid procurement. How do you create the granularity that is needed to direct people without creating a straitjacket that results in us going down and effectively creating a situation where we are uncompetitive with our enemies?

Professor Sir Nigel Shadbolt: We are seeing in the not-yet-released but much-anticipated reframing of what UKRI funding will look like in the university system, and we are seeing in the AI opportunities report, that there was a clear sense of what could be done. The issue of whether we have stood up the resource in the right place to realise it is something that exercises the Council for Science and Technology. You have a commitment to a national data library. Will that be realised in the way that a Government are able to procure and operationalise that concept quickly over the data that matters? That is always the challenge here. How can you get a red-teaming mentality into these areas, trust them to get the job done and not bury them in endless amounts of complex procurement? Speed to action is important.

Universities are having to adapt and moderate. The speed with which my own field is changing and the application of AI to particular areas in science, engineering and health are lessons in miniature of the challenges of communities that are trying to respond quickly in terms of the skills we need our graduates and post-doctoral students to have, the resources we need in the laboratory, and the data we need to have access to. We can actually find great use-cases in that space. Do we have the courage to trust them to get on with the task of strategic delivery?

Professor Sir Anthony Finkelstein: When I joined Government, a very senior MoD former official said to me, "My dear boy, whenever we have a very difficult spad, we just point them towards defence procurement and then they are gone for the next few years".

The Chair: Now we know the root of all the problems. Baroness Kidron?

Q100 **Baroness Kidron:** My question follows on naturally, in thinking about the frontier technologies. You both talked about knowledge assets, choke points and so on. Given that the frontier is so huge, what should we be looking at specifically as a sovereign proposal for the UK? Maybe, Sir Nigel, you would like to start.

Professor Sir Nigel Shadbolt: We know our health data is extraordinary—and not just our health but our social care data. It is rung around with challenges around how we present that in a way that looks like an opportunity and does not raise all sorts of concerns around expropriation by particular sorts of private interests. Again, the NHS suffers from some of the same challenges of procurement that the defence department does—the idea of being able to stand up experiments and demonstrations of the art of the possible. We do understand what some of these environments can look like. I point to the work in Oxford of Ben Goldacre's OpenSAFELY, which is safely looking to find patterns in all of NHS England's primary GP patient data, but is actually running into obstacles because of procurement and licensing conditions that exist in a

fractured, complicated governance structure. Sometimes our challenge is in the way we try and adapt existing governance to get the technology we know exists liberated and used in a proportionate way.

Health would be one. Our social care data or longitudinal educational data is a second one. We have really quite well-curated data assets in major areas of the economy and in major areas that relate to social provisioning and care that could be opened up—and that is without moving into issues about what exists in our cultural heritage domains.

Baroness Kidron: You were talking about asymmetry on the first question. These are the assets that you think the UK can create asymmetry with.

Professor Sir Nigel Shadbolt: Yes, and my fear is that the siren call of getting large amounts of compute to solve the problem for us will lead us to give access to these extraordinary resources at massively discounted value.

Baroness Kidron: Can I just push you on that? I am coming to you, Sir Anthony. My second question was really around: what does “sovereign” mean in this context? I am thinking about the US-UK trade deal, for example, and some of the announcements that I read in the newspaper about access to government data or who we should give it to. Where is the sovereign bit in what you have just said?

Professor Sir Nigel Shadbolt: Clearly that is the essence of the discussion. Is it entirely clear what would be the nature of any compute availability for the data availability? Has that trade-off been properly understood and reasonable economic models provided of what the opportunity cost in doing that is? I am not against these deals at all—they are probably a very important way forward—but let us be clear and not woefully undervalue the inherent and intrinsic long-term value of those data assets built up over many decades of public purse investment. We have poor models for actually estimating the value of those public data assets.

Professor Sir Anthony Finkelstein: I do have a top 10 list of tech that I think lies somewhat beyond HMG’s priority areas but that we should pay attention to. To build on Nigel’s earlier point, one clear area where we have strong UK capability which could be leveraged to national security strategy benefit is UK strength in the social sciences. Our ability in the social and behavioural sciences may well confer advantages which we know that some of our competitor states could not achieve because of their other values disadvantages. My top 10 are privacy-enhancing technologies, novel sensors, edge compute, behavioural analytics, adversarial AI, smart environments and cities, smart materials, micro-robotics, and neuroscience.

Baroness Kidron: I am grateful for your list. Can I just ask about the previous list of skills that you gave us? Do those two lists marry?

Professor Sir Anthony Finkelstein: No. They are orthogonal.

Baroness Kidron: I did not think so. I would like you to say a little bit about skills in this area, because some of these areas feel under pressure in our academic community.

Professor Sir Anthony Finkelstein: We have a risk associated with the current strategic thinking about how research spending is to be made, in that we may overconcentrate and lose this penumbra of critical technologies that would serve our national security interests. In my earlier observations, I feel like there are areas where, for certain, we need to keep a baseline UK skills base—the most obvious illustration being RF engineering. Unlike Nigel’s earlier description of researchers queuing up, we do not have a queue of domestic researchers for those areas. That is a worry.

Baroness Kidron: This is my final question, but I am just interested in the connection between Sir Nigel saying that we are not seeing interns going in to get—if you like—analogue skills that they may need in these new frontier technologies over time and the sort of hysteria about AI investment. Do you think there is any UK advantage in this moment, while everyone is very distracted by the hyperscalers?

Professor Sir Nigel Shadbolt: There could be. The other area where we have an interestingly developed and growing capability—I know how this may sound—is in the values. It is in the actual understanding of the so-called alignment of these technologies. In AI model alignment, it is all about ensuring that these models actually conform to the kinds of rules and norms that you expect them to follow. We have that in the kinds of institutions that are set up across the UK; there is Ethics in AI and very strong work around alignment within the AI Security Institute.

One thing I would just like to say on this—one thing that I think is important on the skills story—is that, if we have an asymmetry, we have it between the supply of talent out of our universities and the somewhat extractive industry that is the very notable companies that sit alongside developing this technology. The grab for talent is so competitive that, very often, graduates could well do with more time in the lab to develop those skills. I have heard this just very recently from CEOs who say, “On balance, we’d much rather you retain some of your key research graduates a little longer to round them out”. We could come up with a better-balanced compact between industry and academic research.

Professor Sir Anthony Finkelstein: One thing to add is that—

The Chair: Could you keep it fairly brief, because we are running out of time?

Professor Sir Anthony Finkelstein: Yes. I have made some advantage in my personal career by looking at what the most able people are doing, and doing something slightly to the side of it. That is generally not a bad—

Baroness Kidron: That is a great lesson for the committee.

Q101 **Sir Gavin Williamson:** The national security strategy makes only limited reference to the role of data and data policy in national security. Should we be seeking to do more in this area?

Professor Sir Nigel Shadbolt: I absolutely think so. As per my earlier comments, the Open Data Institute has run a number of reports and surveys on data quality indices and what we know about the deployment of various data training assets, as the models are being trained from the outset and then subsequently fine-tuned. With much more attention to this, it would be an asymmetric strength that we could possess.

Sir Gavin Williamson: It was fascinating that you said that we do not really understand the value of the information that we have. I sometimes feel there is a little bit of naivety in this country. If you look at health data and at a company such as BGI Genomics, which is harvesting a vast amount of data and has been linked with the Chinese military and the repression of ethnic minorities through that data, countries such as the US have already labelled it as a significant risk. Do you think we have to be less siloed in government and look across the board at where some of these emerging threats are coming from?

Professor Sir Nigel Shadbolt: I am sure we do. We need constant recognition of where attention is being put, particularly in terms of data assets, whose value we have talked about. People often talk as if data is a set of given resources that we just have to put up with or repurpose. There is often not enough attention given to the new classes of data that we could collect, into the future, which we should absolutely ensure is important data for this country's strategic well-being.

One example I will give you from our earlier work in the Open Data Institute is the potential for automobile and platform data from intelligent cars—EVs and intelligent autonomous vehicles. What if a condition of licensing them was to provide some of that data for a public good—a public purpose—for example, examining congestion or black spots or the whole range of potential, rather than just imagining that that all has to end up in private silos as well as government silos?

Thinking ahead, and this was very much the lesson from the pandemic, what data would we have liked to have had in advance of that pandemic? We can make some fair bets as to the classes of data we should be collecting right now.

Sir Gavin Williamson: Do you think the Government just have to be much more assertive? I imagine Lord Sedwill would be very in favour of this, and of the Cabinet Office having a bit more of an iron grip on these things. When you are in a department, you are always operating as a silo to some extent. If you are in Health, all you want is the cheapest availability for doing something, whereas you are not necessarily always standing back and looking at the overall good. You have seen Government both from the inside and externally. What would be your

dream for a Cabinet Secretary to say to you—I will be honest with you, it would be a Cabinet Secretary as against a Cabinet Minister who would say it—in the vein of, “We want you to lead this. How do you draw it forward?”

Professor Sir Nigel Shadbolt: Periodically, we make some progress on this or take steps to imagine that we are going to build up this much more integrated view of, for example, what our data infrastructure could be. The problem is that that does not often survive contact with political attention spans. It seems sensible to me to build this in as a core operating principle. It is an asset. It spans different departmental jurisdictions. It is not just about making it all open although, the more open foundational data you have, the more you will get network effects off it. It is about understanding the different grades of data you have and how you need to license them, secure them and understand the intrinsic value of connecting them up in advance, and then building standards that allow for interoperability. Even if you choose not to share the data, use standards that anticipate that you might in an emergency. Again, this was another great lesson from the use of mobile data and population movements.

Professor Sir Anthony Finkelstein: In my judgment, as I alluded to earlier, Government is poorly set up to deal with systems challenges. Personally, I do not think the solution to that is to concentrate greater control within the Cabinet Office but rather to provide a set of mechanisms that allow much more granular collaboration across Government and escape from the bind of the accounting officer model that at the moment makes it quite difficult for us to achieve the sort of systems impact we need.

Q102 **Lord Sedwill:** I just want to touch on the wider domestic framework, to pick up that point. The national security strategy includes a commitment to spend at least £86 billion by the end of the decade to drive up innovation. There are a series of different strategies that the Government have produced, such as the environment strategy and the industrial trade strategy. The national security strategy itself asserts, in essence, that our national security imperatives and economic competitiveness imperatives are, or at least can be, aligned. Is that true? Because it is not necessarily the case. Building on your last point, Professor Finkelstein, what other action do you think the Government should be taking?

Professor Sir Anthony Finkelstein: The first thing to say is that I commend to the Committee an excellent paper called *Everythingism: An Essay* by the think tank Re:State. The author, Joe Hill, points to the slight habit of every policy seeking to do everything in government, and the consequence, which is that you submerge trade-offs and basically lose clarity of focus. If I am honest, I would say that there are occasional touches of “everythingism” in pillar 3 of the national security strategy. For amusement, this weekend I blogged about a closely related pathology, which I called *Something Must be Done*. Committee members may wish to read that at their leisure.

Q103 **Lord Sarfraz:** Sir Anthony, do you support using private capital to fund some of these priorities? Should there be limits on the involvement of private capital? Are there enough investors involved? Has everyone left for Dubai or are there good groups left in this space?

Professor Sir Anthony Finkelstein: I am delighted that the NSSIF has had increased funding proposed within the strategy. In general, I am very pleased to see the expansion of NSSIF. It gives out a very interesting model of how private capital and government direction can be usefully blended. If that were then combined with accelerated means of translating those technologies into application within Government, that would be an improvement. The investment side of things is well treated.

Clearly, clear missions, strategic signalling and procurement certainty will drive further private capital engagement, but the NSSIF model shows the way.

The Chair: I thank both witnesses for their time today. That concludes our first panel. We will now suspend the meeting as we change over panels.

Examination of witnesses

Sophia Gaston, Air Commodore (retd) Blythe Crawford and Lieutenant Colonel (retd) Haydn Gaukroger.

Q104 **The Chair:** Welcome back to our second panel. I ask the witnesses to introduce themselves incredibly briefly; I am sorry, we are running over time.

Lieutenant Colonel (retd) Haydn Gaukroger: I spent 23 years in the Army and left in October last year. I have spent probably the last nine years of my life focused on Ukraine, either working in Ukraine or supporting it. My last job in the military was director for the UK drone programme for Ukraine for two years, and now I work for a drone start-up heavily focused on supporting Ukraine.

Sophia Gaston: I am a fellow at the Centre for Statecraft and National Security at King's College London, working on Euro-Atlantic and Indo-Pacific defence, security and foreign policy.

Air Commodore (retd) Blythe Crawford: I work for a defence start-up called Tiberius Aerospace, where we are building the world's largest defence capability development platform. Until last week I was at the Ministry of Defence, where I served for 34 years. For the last 10 years I have been specifically focused on defence innovation, and my last job was running the Air and Space Warfare Centre, where we were focused on supporting our partners in Ukraine over the last three years.

The Chair: Thank you for your forbearance. We are running 15 minutes or so later than planned. We are due to be finishing around six but unfortunately we are expecting some votes as well, in 20 minutes or so, which might cause some disruption. We may have to suspend the sitting. Apologies if that is the case, but if members could bear that in mind and, if possible, phase the voting, that would be appreciated.

Q105 **Lord Watts:** The Government have an ambition to strengthen defence's industrial base. Have we now identified the weaknesses of our defence base? What are the lessons to be learned? It is interesting that you spent some time with Ukraine. What are the lessons to be learned from Ukraine? It seems to have been quite successful in changing its own policies to be more effective and to help it to defend itself. How should we strengthen the defence industrial base? How do you think we should go about that?

Lieutenant Colonel (retd) Haydn Gaukroger: I come at this very much from a practitioner's perspective. I had to utilise the defence industrial base in many ways to build the programme to support Ukraine. We found that pretty challenging across a whole range of different areas, and the previous panel talked about some of them: the availability of propulsion systems, motors, compute or whatever it is. Finding sovereign sources of those kinds of capabilities was incredibly hard. That introduces

a significant limitation when you are trying to build lots of something. The supply chain was inevitably the biggest problem when you were trying to do anything at scale, and that is still very much the case.

Ukraine has shown an ability to utilise global supply chains. For instance, there are now more limitations on the Chinese supply of components than there were in 2022, which has been significant, but that has given them enough time to essentially onshore some of those capabilities because they saw that coming since the signalling was there. Obviously China was not trying to completely undermine itself, but they have moved quickly. They do that with a clear focus, and it is that focus that perhaps we miss. We have talked about areas that we could work in, but we have not talked about actual capabilities that are built on those areas and using those skills that would be in our national interest.

Air Commodore (ret'd) Blythe Crawford: There are four key areas that we need to focus on. The first is the key industrial areas, such as the development of munitions. I know there is an aspiration to build some new armaments factories in that regard. These are key core capabilities. Barrels for tanks in the war in Ukraine are a key area that that we need to focus on, for example.

Secondly, there is a challenge around procurement. Our procurement process has been discussed at length but it was specifically designed around building aircraft carriers, tanks and planes rather than the fast-paced asymmetric capabilities that you see being deployed in Ukraine today. We do not have a system that is optimised for that.

Thirdly, we need to widen the scope as to who is involved. Look at the support for start-up industries in Ukraine. Obviously they have had to pivot to an entirely new model to be able to rapidly absorb those capabilities.

The fourth aspect is that obviously the imperative in Ukraine is national survival, and therefore there is a whole-nation approach. How can we pivot from a scenario where furniture makers were making wardrobes last week but this week they are laser cutting the frames for drones?

To underpin some of the points made in the last session, national defence is a national endeavour and therefore it needs to have a whole-nation approach, particularly underpinned by national resiliency. I argue that one of the key questions we should be asking is: what is our national resiliency around those manufacturing capabilities, and what is our national resiliency around a whole-nation approach to defence and national security?

Sophia Gaston: I will add one point on the lessons from Ukraine. One of the most interesting aspects of the way in which we have been able to support Ukraine is that we have had this extraordinary procurement process, and it has been ring-fenced and kept quite separate from procurement proper in the MoD. I have spent the last few years trying to investigate the question of why we cannot adapt some of these

extraordinary processes to become more institutionalised, particularly in the context of other projects such as AUKUS, where pace is crucial. I suppose the conclusion I draw from that is it comes down to a fundamental challenge around risk appetite and the relationship between the Civil Service and the political offices. The reason why we were able and willing to institutionally absorb the risk of having that extraordinary procurement process is that we had support from the highest political levels, which were then able to give that directive and galvanise the system. There is an important lesson from that, too.

Lord Watts: You have raised the issues. How well are we addressing those issues? You have raised some solutions, but how near are we to finding those solutions?

Air Commodore (ret'd) Blythe Crawford: Measures are being taken to address our procurement process but, to be frank, I do not think they are necessarily ambitious enough. We do not necessarily have the timelines we need to work at the pace we need to in order to defend ourselves in the delivery of that.

There is a large debate going on at the moment about risk appetite. I worked closely with the Defence Safety Authority, which regulates all our activity, in developing new capabilities for Ukraine. By bringing in the DSA at the beginning of the process and explaining to it what we were trying to achieve, we managed, in the development of the Raven surface-to-air system, to do our testing and evaluation in three days, which would normally have taken us six months. It is important to address that bureaucracy and process by getting the right people in the room at the right stage of the process so you are not surprising them further on downstream and having to reverse-engineer what you have done already to get after it.

There is a challenge around incentivisation. If we are going to challenge bureaucracy and process, what is the incentive for those developing that policy and process? It is easy to be incentivised when you are at war. If you are an end user—if you are a war fighter—you are incentivised by getting the job done and delivering something on the battlefield, but if you are sitting in Whitehall developing bureaucracy and process, and that is the role of personnel within the Civil Service, what is your incentive to get after it in the same way as a war fighter would?

Lieutenant Colonel (ret'd) Haydn Gaukroger: I was lucky to be one of those people sat in Taskforce Kindred for a couple of years, being given the authority to spend half a billion on supporting a programme that I essentially had the authority to manage—so I would say that was possible because it has been done today. It all comes down to how you measure the results of your actions; that was critical. Kindred is still focused on the effect that it is trying to achieve, not just the volume of things that are provided that do whatever they potentially could do. It is about whether or not they are being used for something that is making a difference for the war in Ukraine now. If they are not then do not do it,

even if that may be helpful to some companies outside Ukraine. It is pretty simple. That would be my take.

Air Commodore (ret'd) Blythe Crawford: If I could add a quick point, we talk in defence about a term called a LARP, a risk as low as reasonably practicable, but we tend to misconstrue the word "practicable" with "possible" so we tend to drive risk as low as we possibly can, rather than what is appropriate for the scenario.

Q106 **The Chair:** Let us turn to autonomous systems. The Government have committed £4 billion to this area. There is much talk about it in the aerial sphere, but what do you know about the development of platforms in other spheres?

Lieutenant Colonel (ret'd) Haydn Gaukroger: Obviously there are some very expensive autonomous systems—let us be clear, Protector is not a cheap autonomous system—so, although the money is at that kind of scale, a considerable amount of it will be spent on one particular system.

The Chair: Is this the sort of innovation that we should be looking at, or looking at partnering with other nations on, or what?

Lieutenant Colonel (ret'd) Haydn Gaukroger: Personally, I think the problem is that we are continually chasing different platforms around. By a "platform" I mean that, whether it is a boat, a plane or a submarine, it carries a certain amount of a payload to do a thing. We keep changing those—we keep changing how big or small they are and how far they go—and that causes us all sorts of problems because the industry is continually building a slightly bigger or slightly smaller thing. We keep changing the platform part of it when actually the bit we should be focusing on is its intelligence to do its action—the bit that you are talking about, its autonomy. It does not really matter whether it is huge or small or whatever; the autonomy is the bit that we really should be able to own.

The Chair: Someone said to me about the Chinook, "The Chinook's been up in the air for decades but they keep changing the brain". It is the same thing for the autonomous system.

Lieutenant Colonel (ret'd) Haydn Gaukroger: The brain in the autonomous system is a combination of what sits on the platform itself and the operators who use it. It would help us massively if we focused on autonomy, as that function of humans and machines, as opposed to just chasing around the latest platform, be it very big or very small.

The Chair: Blythe Crawford, do you agree or disagree?

Air Commodore (ret'd) Blythe Crawford: You need to break down the platform into autonomy itself—as in the brain of the system—and the platform, and then the mutual support that they potentially have between them in terms of their operation. There is read-across between air, land and maritime. In fact, there are some terrific UK start-ups doing

autonomy in the maritime space. Another area where we could develop further autonomy is to take autonomy into synthetic environments where we can then—

The Chair: What is “synthetic”?

Air Commodore (ret'd) Blythe Crawford: Something like a simulator, creating a synthetic wartime scenario into which we can put autonomous agents and then see how they perform against either real-time pilots or other actors within that environment or against other autonomous systems.

The Chair: Do you think these are areas where the UK can have advantage and should absolutely be sovereign?

Air Commodore (ret'd) Blythe Crawford: We definitely have advantage in this area. I was fortunate to be in a briefing by Nvidia in the Pentagon in 2017 discussing the sexy phrase “generative adversarial networks”, where essentially two autonomous agents teach and train each other to develop new capability. I did a bit of probing to find out where Nvidia had got the capability from, and it turned out there was a scientist in Cambridge who had actually developed it for them under a subcontract. I think we are world-leading in this regard, and we should be making more of it.

Q107 **Lord Hutton of Furness:** Turning our attention to the forthcoming defence investment plan, we have heard a lot today about the defence industrial strategy and we have a lot of pretty high-level ideas about the capabilities that we want to develop, but at the moment we do not really have an investment pipeline that is going to help us to do that. I assume we all agree that the defence investment plan will be that pipeline. Could you set out for us what you think the defence investment plan needs to focus on if we are going to strengthen the defence industrial base and secure some of the important sovereign capabilities that we have been talking about today?

Lieutenant Colonel (ret'd) Haydn Gaukroger: My take would be: what are we trying to achieve with the defence industrial strategy? I guess we had that question in the first session, really, but, as someone who has spent a long time achieving things that have been directed under a strategy, I would expect to be told what the country expects to achieve in order to then have a defence industrial plan to follow through with. If we are talking about autonomous systems, and some of that is highlighted in the defence industrial strategy, then let us break that down into the various parts where we are weak. If it is something that we need to do at scale then we are going to need to develop subsystem manufacturing so we are not reliant on other countries in order to deliver it, and then we should ensure that we incentivise companies to essentially act as integrators for those systems that we have built using UK-based companies. That is how I would see the defence investment plan being of most benefit. By the way, we should set a timeframe that is meaningful

in order that we can essentially ramp to an effective production rate during that time.

Sophia Gaston: I think about it in terms of three areas. The first is around the most vital technologies for our future, the second is around the kind of core commodities and industries necessary for our basic resilience, and the third—this is probably a little more unusual—is to think about our strengths in areas of value to our adversaries. Of all three of those, the first is the area where we have the greatest natural advantages at the moment, but for us to excel in those we need a much more active, interventionist state that is willing to pick winners.

Some of this comes down to the capacity for strategic focus. We have a lot of government objectives at the moment that are conditional. For example, if we are looking at ambitions around growth then it might be economic growth but we also want that to be regionally balanced. If we want to have a laser focus on sovereign capability then we need to be willing to double down in areas of strength and make hard choices in that respect.

On the second sphere around core capabilities for fundamental resilience, we have to be able to look at this issue in the round. We have eroded a lot of our manufacturing capability. Take a commodity like steel: we have allowed its fundamental long-term de-industrialisation of this, but, if you think about it, it plays an integral function in many of our defence capabilities and critical national industries. That makes the point about why you need a holistic purview.

We have already mentioned procurement so I will not go into that, but another challenge that needs to be addressed in the defence investment plan is that we have a problem in building the next generation of companies. We have an amazing ability to generate start-ups—we have outstanding start-ups—but we do not allow anything to move from the “S” to the “M” in “SME”, so they are vulnerable to acquisition, and that is a crucial point at which we are losing sovereign capability.

On the third dimension relating to our adversaries, it is going to be crucial for us to shift our conception of value from always starting with our own indigenous conception of value to accommodating our adversaries’ perceptions of value. That is the only way we can move away from constantly being in a reactive posture.

Q108 **Edward Morello:** I want to dig into a couple of things from the previous panel and what you have been talking about regarding sovereign capability. I am thinking especially about the air commodore talking about the desire for sovereign capability and strengthening the defence industrial base. To what level do you think the UK Government, the MoD or whoever you want to point the finger at has a granular understanding of the full UK supply-chain capacity potential for a whole-society solution if we do need to switch manufacturing? I think your example was switching from wardrobes to drones. Does your sense from being inside Government make you feel that we do understand that, or do we not?

Air Commodore (ret'd) Blythe Crawford: We are definitely making progress with it. If you had asked me 18 months ago then I would have said probably not, but there has been some significant work since. I tend to think of sovereignty in two brackets: there is sovereignty for the economy—that is, getting after steelmaking and so on, things that enhance our economic growth—and then there is sovereignty in terms of defence, security and national resiliency. To go back to the point about making it a whole-nation approach, there is a line in there about the fact that data, comms and energy resiliency underpin defence and national security but also the economy and, if you are not getting after those, you are not supporting either. That relates to the point that Lord Sedwill made about how you link together investment in defence and economic growth and try to make them one and the same thing. So they are linked in the sovereign capabilities that underpin them, but then it is about how you turn that into capability for growth downstream.

On where that work should be done, I argue that work needs to be done within the Cabinet Office on national resiliency. However, within the security sector and the security agencies alongside Defence, we need to understand what needs to be sovereign for our own activities, and there will be synergies between all three. I think we can work collectively to get after those synergies.

Then there is an area of compromise. For example, we have collaborated with the United States on nuclear capability, going right back to World War Two, and we need to continue that collaboration. We need to rack and stack, in terms of risk assessment, what needs to be purest sovereign, in underpinning our own national resiliency, and then what we can afford, on a risk-based assessment, to collaborate on with allies and partners to get after it.

Q109 **Baroness Kidron:** Sophia, I was really interested in the third pillar that you described when you talked about strength in areas of value to our adversary. I wondered whether you could unpack that by giving an example. Do you see it as being the same thing as the choke points and knowledge value that the previous witnesses were talking about?

Sophia Gaston: In one way you can see it manifest in the “small yard, high fence” approach that had been taken among western allies over recent years towards China. There is a reason why that concept gained such a foothold: it is institutionally convenient. It is much easier for us to say we will go in hard and ring-fence certain things, because the implication is that then many other areas are safe. The problem is that having a list of things you want to ring-fence means that you are still fundamentally operating from a principle of openness with an asterisk of caution, whereas, frankly, it should be the other way round.

An area where you can see this is semiconductors. The Newport Wafer Fab decision in Wales was an interesting example of that. We were able to use the new powers that had come in under the National Security and Investment Act to call in that decision, and ultimately the Chinese-owned takeover of that plant was blocked. That was an example of something

that was outside the purview of the small yard with the high fence that we had created. We said, "It's going to be the most sophisticated semiconductor chips that we will protect", but China had identified that those other, legacy chips are also vital in batteries for electric cars and all sorts of other commodities and uses.

That is why it is helpful for us to institutionalise the concept of adversarial value systems and to challenge our thinking, because, frankly, our adversaries have been very exploratory in their acquisition of assets and commodities while we are always reactive and addressing gaps in the past. Until we can be fully confident that we have the capacity for foresight and to think in an anticipatory way about this, it is better for us to instil a principle of caution and invest in understanding what is of value to them.

The Chair: I want us to move on, as we have a hard stop at 6 pm.

- Q110 **Baroness Tyler of Enfield:** I apologise if you have already covered this, but I want to ask about international collaboration. The national security strategy specifically talks about AUKUS as an example of international collaboration. I wondered what lessons you thought the UK should learn from the way that AUKUS has operated, and indeed from other partnerships, for future international capability collaborations that will actually strengthen UK national security.

Sophia Gaston: This comes back to the point on Ukraine. You have to have political leadership from the very top to galvanise the system. We have had some challenges with the AUKUS delivery pipeline and, frankly, that is because we have been trying to optimise our systems for a project that is fundamentally disruptive. You have to have the political leadership to allow the system to embrace that disruption. What is interesting about AUKUS and GCAP is that they are both Euro-Atlantic, Indo-Pacific collaboration projects. That is something that we should look at as a model moving forward.

There are many lessons, but there are a couple to highlight. You need a balance between bureaucracy and delivery. A lot of attention in AUKUS has gone towards creating this well-functioning trilateral bureaucracy, which absorbs a lot of attention away from the urgency of the original mission of pace and mass. You have to make sure that these processes can be nimble and adaptive. You do not want a collaborative project to be held hostage to the weakest link. We have tried all the time to move at this trilateral pace, where we always try to have a balance between producer and consumer. Actually, working out who is good at what and dividing up around strategic advantage and contribution is a better way to go—

The Chair: I will have to interject because we have 30 seconds left. Lord Robathan, briefly?

- Q111 **Lord Robathan:** I am sorry to interrupt and I am sorry to have been away. This is to the two former service personnel, because all three of us

have a little experience of defence procurement, which, in my opinion, always falls short. Ukraine develops things in a month or a week. What do you think about defence procurement in the UK?

Lieutenant Colonel (retd) Haydn Gaukroger: I would say that we can equally do the same, but we just—

Lord Robathan: We do not.

Lieutenant Colonel (retd) Haydn Gaukroger: We do not, but we can. We just pull ourselves apart in terms of how our functions and structures work. It is the same in the US: if the driving measurement of performance here is speed, why would not we be able to do that equally? We can, in my opinion.

Air Commodore (retd) Blythe Crawford: We have done it. We did EW capabilities for Ukraine in four weeks. We converted a Raven from an air-to-air system into a surface-to-air system in 10 weeks when the industry said it would take over a year. The main blocker to that was bureaucracy and process, but we managed to overcome that by basically cutting through all the red tape. Organisational culture is an essential moderating factor in order to deliver that. We have the same challenge as the US. If you listen to the Secretary of War Hegseth's speech last Friday, you will find that they have replaced the priority of compliance with one of speed, and we have the same problem here.

The Chair: That is very helpful. Sorry that this session has been so disrupted. Thank you for your forbearance. I also thank colleagues for hanging on and ensuring that we retained quoracy despite a series of votes. That concludes our second panel and today's session. Thank you once again. Perhaps we can write to you with some further questions because I appreciate that I had to curtail some of the answers during the session.