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Group

SCIENCE IN PARLIAMENT

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Transforming Organisational Culture: Navigating Innovation in Doctrinal and Regulated Environments

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12TH NOVEMBER DISCUSSION MEETING REPORT

PARLIAMENTARY AND SCIENTIFIC COMMITTEE

Can an App deliver positive nutrition and health outcomes?

A MEETING HELD IN PARTNERSHIP WITH THE NUTRITION SOCIETY

Visitors were welcomed to the meeting by George Freeman MP, Chair of the P&SC. He highlighted the cost to the NHS of obesity related disease; prevention is better than medical intervention. Modern technology can encourage people to take personal responsibility for their weight and health.

Presentations from 3 specialists in nutrition and health followed; Professor Philip Calder, Nutritional Immunology, University of Southampton; Professor Sarah Berry, Nutritional Sciences, King's College London; and Professor Clare Llewellyn, Behavioural Science and Health, University College London.

Improved nutrition means better health, a poor diet can mean disease and a shorter life. Many Britons do not have a good diet; apps used in addition to more traditional nutritional advice might help adherence to a healthier diet. The question 'Can an app deliver positive nutrition and health outcomes?' was posed by Professor Calder. He described 2 controlled trials:

PREVENTOMICS used 3 small groups of obese people given different levels of dietary support, 1 traditional advice but no app, and 2 groups using an app plus different levels of professional (AHP) support. Diets improved; those with greater support had better outcomes.

POWeR+ was larger, less intensive, lasted longer, and involved primary health care practices. Again 3 randomised groups received different levels of support, 2 with different internet-based interventions. Eating patterns changed; again, the most supported group lost most weight.

Any healthy eating advice will improve diet, but using apps combined with AHP advice may bring better dietary changes.

Professor Berry presented 'Application of novel technologies and community science in the future of diet-related disease prevention'. The Covid 19 Symptom Study used an app combining biological science with data science; 5.3m community scientists participated, providing a goldmine of social information and health data.

Applying this knowledge to nutrition and health led to development of the ZOE Health Study.

The Big IF Study, a large community experiment into intermittent fasting and the ongoing PREDICT study were devised. Using remote clinical testing to prevent diet-related disease is an objective. The personalised ZOE app, with 1m active users, recognises individual differences and behaviour and identifies interventions that work in a real-world setting. It improves diet and health better than traditional methods, with many potential additional benefits, such as the ZOE MenoScale menopause app.

In 'Use of digital apps to support underserved groups' Professor Llewellyn described a case study around infant feeding. Children from poorer backgrounds are twice as likely to be overweight at Reception age. Overfeeding in the first 2 years of life leads to obesity; breast feeding is better, but over feeding with formula can cause weight gain. Stretched health services find it hard to get the message to people needing advice.

The BRIGHT Baby Responsive Growth & Health Tracking app is being developed to support parents using formula-feeding. The existing free Baby Buddy app is already popular with lower income families, and ethnic minorities. Working alongside the NHS, with 24/7 access, it is easy to use; to reach people most in need of formula advice, it is advisable to adopt a similar approach. The BRIGHT app prototype uses FAQs, videos, personalised notifications, and tailored features; feedback has been encouraging.

Q&A discussions included infant feeding, supporting deprived families and the Baby Buddy app. Concerns were voiced about eating disorders, remote monitoring, personal data security, and whether participants in studies were truly representative. Apps need longevity and constant re-assessment to keep user interest; they are proving very useful in efforts to bring about dietary change, but some challenges still remain.

Sue Wharton



Rt. Hon George Freeman FRSA MP, Chair, Parliamentary & Scientific Committee (All-Party Parliamentary Group)

Welcome to this our Winter 2024-25 SIP publication.

It's been a busy last few months as the Parliamentary & Scientific Committee gets established in the new Parliament, the new Government set out its first Budget and new Industrial Strategy with important implications for science & the R+D economy, and the new Select Committee for Science Technology and Innovation - on which I am delighted to have been elected as Deputy Chair - takes office.

The Budget on Nov 2nd set out a major change to the fiscal rules governing the definition of public sector borrowing to allow c £70bn of additional public sector borrowing alongside £40bn of tax rises to fund a major increase in public expenditure focussed on the NHS & infrastructure, to help the Government's mission to boost growth. (Even after this major stimulus package the OBR

forecasts for growth remain stubbornly low at c1.5% with inflation and interest rates looking set to remain stubbornly high too). All of which serves to highlight the importance of the R+D Innovation Economy as the only part of the economy capable of delivering higher productivity and sustainably high Growth.

Whilst many Departments and areas of spend received below inflation settlements, the Chancellor announced she would stick to the previous Governments pledge (which I and then Chancellor Rishi Sunak announced in October 2021) to increase public R+D expenditure to £20bn p/a by 2025.

Within that the Department of Science, Innovation and Technology is the largest Departmental R+D budget with the Department of Health and Social Care, Ministry of Defence, Department of Environment, Food and Rural Affairs, Department of Energy Security and Net Zero & Department of Transport in the next tranche well head of the others.

Much devil will be in the detail of Departmental allocations announced in the Spring Statement, including in particular - the extent to which the reclassification of DSIT as the digital department means a cut in science spending, whether the Industrial Strategy focus on green transition means a cut in non-Net Zero science & innovation, and whether the £2bn Quantum &

£2pm Engineering Biology Industrial Strategies announced (by me last year) survive or are cut.

The Committee has kicked off its programme of events in the new Parliament with a series of fascinating Presentations and Roundtable Discussions on **'In the next Parliament and beyond, how can engineers contribute to achieving a more sustainable world?'** in partnership with the Institution of Chemical Engineers; **'Reuse, Replace or Repair'** in cooperation with the Institute of Corrosion; **'Can an app deliver positive nutrition and health outcomes?'** in partnership with The Nutrition Society; and **'How to tackle Contaminants or Emerging Concern (CEC's) in water'**, in cooperation with the Royal Society of Chemistry.

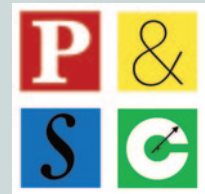
On November 5th we had our annual SiP lunch with my old friend and stalwart friend of Science David (Lord) Willetts as our guest speaker, and a lovely opportunity to thank my predecessor and our former Chair Stephen Metcalfe for his great service.

Each SiP publication I thought I would share a scientist quote. Here's my first. A reminder that Great science is not the cold dry empiricism so often portrayed but a great engine of enlightenment values driven by the imagination of new possibilities.

Ralph Waldo Emerson:
"Science does not know its debt to imagination."



The Journal of the Parliamentary and Scientific Committee (All-Party Parliamentary Group).



Science in Parliament has two main objectives:

1. to inform the scientific and industrial communities of activities within Parliament of a scientific nature and of the progress of relevant legislation;
2. to keep Members of Parliament abreast of scientific affairs.

Editor's Note:

We are very pleased to welcome a number of new P&SC members:

Parliamentary: Graham Leadbitter MP; Lee Dillon MP; Steve Race MP; Chris McDonald MP; Lord Foulkes of Cumnock and Lord Griffiths of Burry Port

Scientific and Technical Organisations: CPI; The Pandemic Institute and Health Innovation Network South London

Individual: Doris-Ann Williams MBE, Yousef Alzidanie and Vernon Hunte Leigh

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TRANSFORMING ORGANISATIONAL CULTURE: NAVIGATING INNOVATION IN DOCTRINAL AND REGULATED ENVIRONMENTS



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Organisational culture – the collective values, beliefs, and behaviours that shape how work is performed – serves as the foundation for collaboration, innovation, and adaptability. In doctrinal organisations such as NATO, as well as regulated industrial entities like MBDA, the challenge lies in transforming traditional, hierarchical systems into adaptive, innovative ecosystems whilst adhering to established operational frameworks. This article explores the interplay between culture change, innovation, and adaptation within such structures and emphasises leadership’s pivotal role in fostering innovation.

UNDERSTANDING ORGANISATIONAL CULTURE

Organisational culture can be defined as “how we do things around here,” encompassing shared values, behaviours, and assumptions. It manifests in every interaction, decision, and policy, shaping how organisations respond to challenges and opportunities^{1,2}. In doctrinal organisations and regulated businesses, culture often reflects rigid structures, strict adherence to protocols, and a ‘cautious’ approach to risk. While these features ensure consistency and safety, they can hinder innovation and adaptability in a rapidly changing and digitally-driven global landscape.

Cultural stagnation, in particular, poses significant challenges^{3,4}. As technological advances and geopolitical shifts accelerate, organisations must evolve their culture to remain relevant. For NATO and MBDA, this means

embedding innovation not as an auxiliary function but as a core principle.

THE INNOVATION IMPERATIVE

Both doctrinal organisations and regulated industries face disruptive forces^{5,6}, including technological advancements (e.g., artificial intelligence, hypersonics, and quantum computing) and external challenges such as geopolitical tensions, climate change, and economic instability. These entities cannot afford to remain static; they must innovate to maintain strategic and operational advantage.

Innovation is not merely about introducing new technologies; it involves rethinking strategies, operational models, and reformatting culture. For example, NATO’s initiatives to counter hybrid warfare and integrate AI^{7,8} into decision-making exemplify how innovation addresses complex

challenges. Similarly, MBDA’s efforts to develop sustainable practices⁹, predictive analytics, and advanced missile systems reflect the critical role of innovation in meeting industry and regulatory demands.

Rear Admiral Placido Torresi, Deputy Chief of Staff for Joint Force Development at NATO’s Allied Command Transformation, stated, “*In an era defined by rapid technological evolution and complex threats, adaptive capacity and innovation are no longer optional; they are the cornerstones of maintaining our operational advantage and securing collective defence.*” This perspective, articulated in the Warfare Development Agenda, underscores the critical need for doctrinal organisations to embed flexibility and innovation within their cultural frameworks.

LEADERSHIP'S ROLE IN CULTURAL TRANSFORMATION

Leaders in doctrinal and regulated organisations serve as catalysts for change. Their vision and commitment to fostering innovation create a ripple effect throughout the organisation. Key leadership strategies include:

1. Setting the Vision for Innovation

Leaders must articulate a clear vision of the value innovation brings to the organisation. For instance, NATO's long-term strategic planning has embraced emerging disruptive technologies such as cyber defence and autonomous systems, aligning these advancements with its broader mission.



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2. Promoting Psychological Safety

Cultures of innovation thrive on psychological safety – the belief that individuals can share ideas without fear of reprisal. Leaders can encourage experimentation and learning from failure to build confidence in teams. At MBDA, fostering a safe environment for innovation has allowed the company to explore cutting-edge

technologies without the fear of missteps derailing progress.

3. Enabling Cross-Functional Collaboration

By breaking down silos, leaders can foster ecosystems where departments and external partners collaborate to co-create solutions. MBDA's partnerships with academic institutions and NATO's joint initiatives with member states exemplify this approach, facilitating the exchange of ideas and resources to drive innovation.

4. Role Modelling Adaptive Behaviours

Adaptive leaders demonstrate openness to change, data-driven decision-making, and resilience in uncertain conditions. This inspires their teams to embrace similar

mindsets, creating a culture that is both dynamic and forward-thinking.

DOCTRINE: A DOUBLE-EDGED SWORD

Doctrine – the set of fundamental principles that guide organisational actions^{10,11} – plays a crucial role in shaping behaviour and decision-making. It provides the foundation for consistency and operational alignment but can also act as a

barrier to agility and creativity. The DOTMLPF-I framework (Doctrine, Organisation, Training, Materiel, Leadership and Education, Personnel, Facilities and Interoperability), widely used by NATO, provides a lens through which the influence of doctrine on digital transformation efforts can be assessed. Doctrine is both an enabler and a potential constraint, influencing military organisation's ability to adapt to the rapid technological changes:

• Facilitating Innovation:

Doctrine provides a common framework and language, enabling coordinated efforts and efficient communication. It ensures alignment with organisational goals and can serve as a foundation for building innovative ideas. For

may prevent the adoption of new approaches that deviate from traditional methods. This is particularly challenging in environments requiring agility and rapid adaptation to unforeseen threats.

Balancing adherence to doctrine with the need for innovation requires^{14,15} a dynamic approach, where doctrine evolves in response to emerging challenges and opportunities.

CULTURAL STRATEGIES FOR TRANSFORMATION

In hierarchical and regulated contexts, cultural transformation is a complex process full of uncertainty. Strategic interventions can help nudge organisations towards innovation. Actionable approaches include:

1. Redefining Metrics of Success

Shift from traditional key performance indicators to metrics that measure innovation impact, such as the number of experiments conducted, speed to market and deployment, or the adoption rates of new technologies. Here, tools such as Objectives and Key Results (OKRs) – a goal-setting framework used by individuals, teams, and organisations to define measurable goals and track their outcomes – can operate better, particularly, when managing uncertainty.

2. Flattening Hierarchies

Empower teams to make decisions by adopting more agile, 'decentralised governance' structures. This fosters faster innovation cycles and aligns with modern operational needs. NATO's decentralised and federated interoperability initiatives^{8,9} and MBDA's lean management practices are prime examples of this strategy.

• Hindering Innovation:

Conversely, rigid adherence to established doctrine can stifle creativity and discourage experimentation. When doctrine becomes inflexible, it

Denis Gardin, MBDA's Director of Innovation and Future Technologies, remarked, "Innovation thrives at the intersection of collaboration and vision. By integrating advanced technologies with strategic partnerships, we are redefining defence capabilities to ensure adaptability and effectiveness in the face of evolving challenges." This perspective highlights MBDA's dedication to cultivating a culture of innovation that delivers groundbreaking solutions, shaping the future of defence capabilities.

3. Leveraging Capability-Value Frameworks

Build organisational innovation stacks to enhance adaptive capacity. Assign roles to champion, enable, and scale innovations. Such Capability-Value Frameworks can help identify gaps and prioritise interventions effectively.

4. Utilising Storytelling

Communicate innovation successes through compelling narratives and use cases that resonate with employees and stakeholders. This reinforces the organisation's commitment to change and ensures buy-in from all levels.

5. Building Safe Experimentation Spaces

Create innovation labs or protected environments^{13,16} where teams can explore new ideas without the pressure of immediate results. NATO's innovation hubs and MBDA's advanced simulation centres demonstrate the efficacy of such spaces.

SIMILARITIES BETWEEN MILITARY ORGANISATIONS AND HIGHLY REGULATED BUSINESSES

Military organisations and highly regulated businesses share several characteristics:

1. Structured Hierarchies: Both operate within well-defined hierarchical frameworks that delineate authority and responsibility. This structure ensures accountability but can also limit flexibility.

2. Standardised Practices: Emphasis on standard operating practices ensures consistency and compliance with regulations or directives. While essential for operational safety, it can slow down decision-making in dynamically evolving environments.

3. Risk Aversion: A cautious approach to risk is prevalent, given the potential consequences of failure in both contexts. This culture can discourage experimentation, even when it is necessary for innovation.

4. Regulatory Compliance: Adherence to external regulations or internal doctrines is paramount to maintain legitimacy and operational effectiveness. Both NATO and MBDA illustrate how compliance intersects with innovation, balancing safety and progress.

INNOVATION IN PRACTICE: EXAMPLES

1. NATO

NATO's adaptation to hybrid warfare technologies and the use of scenario planning for emerging threats highlight how doctrinal organisations integrate innovation into their strategies. Tools like PESTLE and SWOT supported by AI analyses aid in understanding disruptive trends and shape interventions.

2. MBDA

MBDA's focus on sustainable practices, predictive analytics, and smart materials exemplifies how regulated businesses balance innovation with compliance

and operational rigour. Their ecosystem mapping methodology underscores the importance of collaboration with partners and academia.

THE PATH FORWARD

Transforming culture in doctrinal and regulated entities requires ongoing commitment and strategic leadership. To sustain change:

- **Institutionalise Innovation Practices:** Embed innovation processes into the organisational DNA through systematic approaches such as applying ISO 56001: 2024 and 56002: 2019 for innovation management.

- **Develop Leadership at All Levels:** Equip leaders with the skills to drive cultural change, including training in lean-agile methodologies, distributed decision making and design thinking.

- **Monitor Progress and Adapt:** Continuously assess cultural interventions and refine strategies based on feedback and results. Innovation is not static; it requires iterative improvement to remain impactful yielding the desired value for the organisation and the sectors it serves.

By leveraging leadership's influence to prioritise culture change, doctrinal and regulated organisations like NATO and MBDA can enhance their adaptive capacity and capability, ensuring resilience and sustained relevance in an ever-evolving global landscape.

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