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International Perspective and Exemplars

A theme report based on the 7th meeting of the **All-Party
Parliamentary Group on Artificial Intelligence [APPG AI]**.

International Perspective and Exemplars is a theme report based on the seventh meeting of the **All-Party Parliamentary Group on Artificial Intelligence (APPG AI)** - held on 30 October 2017 at the House of Lords.

This meeting was chaired by Stephen Metcalfe MP.

The evidence presented in the report is not exhaustive but reflects what was discussed at the meeting, and the views and experiences put forward by the people giving evidence. Written submissions by individual expert advisors in relation to this meeting are also included.

The APPG AI was established in January 2017 and its officers include:

- **Stephen Metcalfe MP- Co-Chair**
- **Lord Tim Clement-Jones- Co-Chair**
- Chris Green MP- Secretary
- The Rt Rev Dr Steven Croft-Bishop of Oxford- Treasurer
- Lord Holmes of Richmond – Vice Chair
- Lord David Willetts – Vice Chair
- Baroness Susan Kramer- Vice Chair
- Lord Robin Janvrin- Vice Chair
- Lord Alec Broers- Vice Chair
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International Perspective and Exemplars

A theme report based on the seventh **All-Party Parliamentary Group on Artificial Intelligence [APPG AI]** Evidence Giving meeting.

30 October 2017 – House of Lords, Committee Room 4A



Overview

The aim of the seventh APPG AI Evidence Meeting looked at AI issues through an international lens and explored best practices from different countries.

The meeting was co-chaired by Stephen Metcalfe MP (Government Envoy for the Year of Engineering and former Chair of the Science and Technology Committee). Nine experts were invited to provide evidence reflecting their views on (i) how the international arena is preparing for AI, and (ii) whether AI is a national or international issue.

125 TOTAL PARTICIPANTS

9 Pieces of Oral Evidence

9 Pieces of Written Evidence

The panel included:

- **Janghyun Yoon** – Mayor of Gwangju Metropolitan City, with his speech on “Smart Human City, Gwangju, in the era of AI – Harmony of Mobility, Energy, Culture and Human Rights”
- **Allan Dafoe** – Research Fellow at Future of Humanity Institute, University of Oxford, and Assistant Professor of Political Science, Yale University
- **Andy Forrester** – Director, HypeAccelerator Solutions
- **Parry Malm** – CEO, Phrasee
- **Cateljne Muller** – **Rapporteur on Artificial Intelligence, European Economic and Social Committee**
- **Dr Scott Steedman CBE** – Director of Standards, BSI Group
- **Alenka Turnsek** – Co-leader UK value chain transformation tax network, PwC
- **Dr Blay Whitby** – Associate Tutor, Engineering and Design, Informatics, University of Sussex
- **Lisa De Bonis** – Executive Digital Director, Havas London, and Cannes 2017 Juror

AI promises to revolutionise the way all of us go about our daily lives, impacting important sectors including transport, health, education, defence, and finance. Governments across the world are working to understand the consequences of AI in order to create policy frameworks and regulations that harness its economic and social opportunities while also mitigating its potential risks. Governments are called to answer important questions, including:

- What will be the impact on the labour market?
- How can data privacy be met in this technological revolution?
- How can business and people best prepare?
- What governance structures need to be built to deploy AI in and out of government?

In this meeting, the group focused on providing an international perspective to these challenging questions, and to gain information on the international responses to AI.

The theme report is threefold. First, it dives into four international examples of how other

countries and intergovernmental organisations are approaching AI – looking at use cases from South Korea, Canada, Singapore and the European Union. Providing best practice exemplars, the group discussed what the ideal AI strategy for the UK should look like. Second, it considers whether AI issues should be addressed at a national or international scale. Third, it reflects on UK’s position in the global arena and how UK can lead the world in shaping the rules, norms and AI standards for safe and ethical innovation and commercialization and trade using AI.

Theme	Description
<p>AI Exemplars: A Dive into International Use Cases</p>	<p>Governments across the globe are seeking to understand AI’s implications and the scale and scope of the changes which are coming upon us. However, at this stage, the international arena is lacking the mechanisms and processes to steer, deploy, and champion AI technologies. Governments must be agile to create these structures in order to untap AI’s mass potential. In this section, we explore how South Korea, Canada, Singapore and the European Union are embracing AI.</p>
<p>AI: A national or international issue?</p>	<p>AI raises many concerns, related to matters that have to do with security, inequality, privacy, employment, and education. The technological revolution of today is of scale, speed, and complexity like no other in the past. And, hence, many believe that global coordination is essential to truly address the heart of these concerns. This section contemplates how AI issues can be addressed at both a national and an international level.</p>
<p>UK’s position in the AI global ecosystem</p>	<p>A challenging race to make most of the opportunities posed by AI has begun. China, the US, Russia, Canada, Japan, and many more countries have passed ambitious strategies in which they have put AI as a priority in their political agendas. Where does the UK place itself in the race? Where can the UK lead the international arena, when moving from e-commerce to AI-commerce? This section focuses on UK’s opportunity to convene in the international governance of the rules, norms and standards in AI and, hence, lead the ethical and safe deployment of AI technologies in society.</p>

This theme report is not research-oriented but aims to summarize these key themes, using the evidence gathered at the seventh APPG AI Evidence Meeting (details above). It is not exhaustive but reflects what was discussed at the meeting, as well as the views and experiences put forward by the people giving evidence. Written excerpts by individual expert

advisors in relation to the meeting are also included.

The All-Party Parliamentary Group on Artificial Intelligence [APPG AI] was created in January 2017 to explore the impact and implications of Artificial Intelligence, including Machine Learning. We aim: to unpack the term, to gather evidence to better understand it, to assess its impact, and, ultimately, to empower decision-makers to make policies in the sphere. Government, business leaders, academic thought leaders and AI entrepreneurs have come together in an effort to share evidence and beliefs, and assist in setting an agenda for how the UK should address AI moving forward.

Figure 1 illustrates the process of how APPG AI aims to contribute to increasing social value, through fact-based recommendations and well-informed stakeholders.

Figure 1. The Purpose of APPG AI



The first APPG AI Evidence Giving meeting approached Artificial Intelligence through a general lens, identifying the key issues within the umbrella term that stakeholders should focus on. The second and third APPG AI Evidence Giving meeting deep dived into ethical and legal issues in AI, regarding decision-making and the data-driven economy. The fourth APPG AI Evidence Giving meeting focused on changes in the economy, market structures, and business models. The fifth APPG AI Evidence Giving meeting looked at social and organisation transformations and the need for governance structures, in the private and public sector. While the sixth APPG AI Evidence Giving meeting focused on challenges in relation to education, skills, and increasing inequality gaps.

Event Summary

AI is receiving more and more attention from the international arena as governments across the world are racing to figure out what are its economic and social opportunities, as well as mitigate potential risks and dangers for society. Hence, the seventh APPG AI session, chaired by **Stephen Metcalfe MP**, gathered evidence on the different international perspectives on AI and exemplars.

Mayor Yoon of Gwangju, one of South Korea's most innovative cities, attended the meeting and acknowledged the group for their important work in informing the government on AI implications. He discussed Gwangju's strategy in preparing for the Fourth Industrial Revolution and how, as Mayor, he is building a "smart human city." He advised for international governments to focus on high impact, not just on high tech.

Allan Dafoe, from the Future of Humanity Institute, was next in the panel, reminding Parliamentarians and other key stakeholders the lack of consensus on technological progress. He suggested policies and institutions need to be robust to unexpected surprises AI might bring. AI is both an issue on the national and international domain. The UK should "lead by example" and focus on building a national infrastructure and investing in government competency in respect to AI. For best practices, UK can look at Canada.

Executive Digital Director at Havas, **Lisa De Bonis**, provided some best practices from the international arena from a marketing perspective. Individuals are bombarded with over 5,000 messages per day and studies show that they often feel overwhelmed. Hence, companies are struggling to create a sense of purpose and AI can help them understand their customer needs. One case study is a chatbot created for a global condom brand that can be used via Facebook Messenger to answer questions teenagers might have regarding sex. This product shows how key personalisation is in this era. Lisa suggested government to empower SMEs to recognise how AI can work for them, to invest in academia and attract a diverse group of programmers, and to "walk the walk" by making sure government has a sharing culture.

Andy Forrester spoke about his work as technology advisor for the Department of Business, Energy and Industrial Service. He spoke to the group about use cases within the UK public sector, highlighting how technology is increasing efficiencies in The Met Office, the Science and Tech Facilities Council, and Alder Hey Children's Hospital. He recommended that the APPG AI serves as a platform to connect different organisations and stakeholders. APPG AI should disrupt the status quo, he suggested.

CEO **Parry Malm** from Phrasee, a company that writes better email subject lines than humans, spoke about his experience being in the frontline of AI. He urged the UK government to consider long-term implications to become a leader in the digital economy of tomorrow. Although UK is a hotbed for academic research, this is not enough in order to reap the full benefits of AI. He called for government to build policies that ensures the future workforce represents diverse groups, opens borders to innovation and new talent, and incentivises R&D.

Speaking from the European perspective, **Catelijne Muller** from the European Economic and Social Committee provided evidence on the importance of ensuring "humans are in control." A recent report published by the Committee identifies 11 domains of impact and several regulations and policies that have already been affected by AI. Governments must

focus on the quality of AI to ensure responsible development and responsible use. She reminded APPG AI: “Technology does not overcome us and we have to manage it.”

Scott Steedman, Director of Standards at the BSI Group, informed Parliamentarians and the wider audience on how UK can lead setting the standards around AI. UK has already had an influential track record in international standard committees, with 95% of UK standards being international. There is an existing infrastructure that has already done much work in the area of standardisation, including BSI, International Financial Reporting Standards, and IEEE SA. UK best practices must be taken to a wider community to drive the economy and society forward. As in the past, standards for smart cities were created, we should use common language to do the same now.

PwC’s **Alenka Turnsek** shared evidence on how tax frameworks are transforming as a result of these AI technologies. Traditional tax structures were based on physical presence, but this has critical implications for some of today’s companies that are completely virtual corporations. Governments must consider how to tax a product that was produced and traded remotely. Alenka informed the group that there is no current international consensus on the issue, but this is dangerous for the future of international trade. These frameworks should be developed quickly and must be based on whether a country exports or imports AI.

Last to provide evidence was **Blay Whitby**, who has been specialising in AI ethics since the 1980s. His main conclusions for the UK are that it is not too early to regulate AI and that regulation must have an international approach. Now, technology can be created in various parts of the world with little control about the processes and standards adapted. Furthermore, the public is poorly educated about AI and its implications. Blay suggested the UK government to push for transparency and to lead the global arena in setting international standards.

Stephen Metcalfe asked the Parliamentarians and the wider audience to raise any questions they might have for the panel. Lord Simon Haskel asked about the priority areas government should first focus on. Scott Steedman recommended to use the APPG AI as a platform in which the community can voice areas of high concern. The Rt Reverend Dr Steven Croft asked for suggestions on how to communicate these issues to the rest of government and to the wider society. The panel agreed that AI can be used to help raise awareness and, furthermore, stressed the importance of using one common language. Blay Whitby, specifically, called for the establishment of “lingua franca” around AI.

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1. AI Exemplars: A dive into international use cases

AI has been recognised by governments across the world as the most transformative force in the twenty-first century. Its scale, speed, and complexity are unprecedented, disrupting every industry and sector across the globe. This force carries with it new social and economic opportunities but also challenges for policy-makers to address.

In the seventh APPG AI Evidence Meeting, the group discussed how other countries and intergovernmental organisations are dealing with AI. Precisely, the panel gave examples from:

- South Korea,
- Canada,
- Singapore
- and the European Union.

The Mayor of one of South Korea's largest cities, Gwangju, was invited to provide evidence to the Parliamentarians. He illustrated how South Korea is engaging with the Fourth Industrial Revolution and shared his vision of making Gwangju a 'Smart Human City.'



Janghyun Yoon

Mayor of Gwangju Metropolitan City in South Korea

In my life I had two life-long battles. First, having trained as a doctor, I was fighting for peoples' eye health as an ophthalmologist in impoverished countries around the world. Second, I was fighting for human dignity as a human rights and civil rights activist throughout Asia.

In 2014, I faced a new type of fight when I was elected mayor of Gwangju Metropolitan City, one of six metropolitan cities in South Korea.

Gwangju means 'a city of light, and light of life'. As a mayor chosen to lead almost one and half million people, I urgently needed to prepare the future of Gwangju to keep its bright light for its citizens.

I recognised that the 4th industrial revolution, including AI is now emerging as one of the most

urgent issues of our time. We must ask; is it a threat or an opportunity? What are the applications that will change our way of life for the better? I adopted these issues as critical to Gwangju's main policies.

Gwangju is the symbolic city of Korean democracy and human rights. It was the hometown of the May 18th Democratic Movement in 1980, when its citizens were massacred whilst peacefully demonstrating against brutal military dictatorship. The citizens of Gwangju have pride for their role in nourishing democratic progression in Korean contemporary history. Indeed it is the symbolic capital of human rights in Asia and hosts the annual World Human Rights City Forum since 2011.

In this new era, Gwangju wants to lead again. **It is now transforming to a high-tech and creative industrial city**, especially focusing on the 4th industrial revolution.

To achieve its goal of becoming a human-oriented and life-oriented city of science and culture, Gwangju is making three symbolic valleys, so-called as Gwangju is surrounded by mountains.

The first valley is the 'Smart Mobility Valley'.

Gwangju was selected as the first city by the Korean government to support eco-friendly future vehicles. Gwangju built the EcoFriendly Safety Research Institute and Autonomous Driving Test Roads based on emerging technologies such as AI and virtual reality. The industrial cluster will provide comfortable working conditions for the next generation.

We are taking the lead in implementing a sharing economy by supporting Fuel Cell Electrical Vehicle car sharing business projects. Also, we are planning the transition of public transportation to e-mobility. As a leading automobile city in South Korea, Gwangju hosts a company that manufactures high-efficiency electricity regenerative fuel cells. In addition, we are actively developing the infrastructure for an e-mobility society through energy storage systems, stable renewable energy, and power demand management.

This second valley is the 'Smart Energy Valley'.

Gwangju is the leader in the eco-friendly energy supply and energy technology based on KEPCO, the largest electronic energy company in the world. In addition to the power resource business, KEPCO is also focusing on intelligent power networks and upgrading projects utilizing information and communication technologies using AI.

KEPCO and Gwangju are working together for the development of e-mobility and intelligent-mobility. Gwangju is going to be a 'smart energy city' at the cutting-edge of ICT convergence and renewable energy.

The third valley is the 'Smart Culture Valley'.

Gwangju is a popular cultural destination in Asia. In the past, it was one of the main host cities of traditional music and fine art in South Korea. In the present, Gwangju hosts various cultural events and famous cultural institutions; for example, the Gwangju Biennale and Asia Culture Center, one of the biggest cultural venues in the world.

Gwangju is transforming the old Songam Industrial Complex into the Songam Smart Cultural Valley,

focusing on the Advanced Immersive Contents Cluster to support movie, drama and gaming industries for integrating between new technologies like AI, VR, 3D, holographic imaging and cultural contents. However, **Gwangju's vision is based not only on high-tech, but also on the harmony between emerging new high-technologies and human dignity.** Historically, Gwangju always supported vulnerable people and protected human dignity based on Gwangju's traumatic historical experiences of the May 18th Democratic Movement that led to loss of innocent civilian lives. Gwangju is the only local government in Asia with a dedicated highest officer with the biggest department dealing with various human rights issues. This department is now carefully considering the socio-legal and ethical dilemmas that AI and the 4th industrial revolution may bring.

I believe that AI should primarily aim to impact job creation. **Creating and maintaining stable jobs for Gwangju citizens is not only an economic issue, but also fundamentally a human rights issue.** Therefore, through this whole project, Gwangju plans to build a cluster of technology and infrastructure where human beings are considered as the first priority, focusing on creating full-time jobs with the living wage.

Therefore, **Gwangju declares our vision to go beyond just a 'Smart City', but rather as a 'Smart Human City'. Not just focusing on high-tech, but just as much on the human impact.**

In conclusion, Gwangju is a unique local government with **a special department dedicated to addressing the necessary administrative, financial and logistical tools for leading the 4th industrial revolution in South Korea.** As mayor, I believe this is also a great opportunity for future long-term cooperation between Gwangju and the UK industry and government.

We are now facing one of the most dramatic historical changes from new technologies, since Alan Turing, the father of the modern computer, asked 'Can machines think'? To many people, new technologies bring thickening fogs of uncertainty that are prevailing our time.

But, I strongly believe that we must keep our brave steps to the dawn when the fog clears with sunshine. I strongly believe that the most important aspect of AI is not the technology itself, but instead that we should continuously ask **"what is purpose of technology?"** and **"who is it for?"**.

Our future smart cities should be human-centred.

I would like to end on a quote from the "Inflammatory Essays 1979-82" in Tate Modern, By Jenny Holzer: "Change is the basis of all history. Nothing essential changes! That is a myth. It will be refuted. The necessary birth convulsions will be triggered. Action will bring the evidence to your doorstep"

To assure this technological revolution's impact will benefit all members of society, Mayor Yoon stressed the vital role of governments across the world. **Governments must pass policies which put the human in the centre,** in order to create technologies of purpose for the short-term and long-term horizons.

Like South Korea, many countries are pushing to establish mechanisms and policies that will champion this disruptive and transformative technology. However, most are still at very early stages in which they are sense-making the implications and impacts of AI for the economy

and for society. Few are at the point where they've gathered the evidence needed to build crucial structures and policies ready for implementation.

Two of the panellists, Parry Malm (CEO of Phrasee) and Allan Dafoe (Research Fellow at the Future of Humanity Institute and Assistant Professor of Political Science at Yale University), suggested UK looks at Canada for inspiration. Prime Minister Justin Trudeau has repeatedly acknowledged the importance of AI for the future wellbeing of the country; hence, he has put together a national strategy to create an innovation-friendly ecosystem in Canada that attracts the best talent from around the world.¹

Specifically, Parry Malm shared with the group evidence of Canada's progressive immigration policy. As discussed in the sixth Evidence Meeting, there is currently a large shortage in skill for people with the computer science, digital, and AI knowledge to use and manage these new technologies. Employers are increasingly demanding these skills and hence the supply side and demand side of the labour market are failing to align. Canada's immigration policy opens its doors to this type of talent from abroad, directly addressing the problem and ensuring the human talent needed to make AI is present in the country.



Parry Malm
CEO at Phrasee

Hello, my name is Parry Malm. I'm the CEO and co-founder of Phrasee. Phrasee is AI that writes better email subject lines than humans. If you get emails from Domino's, Virgin Holidays, Gumtree and dozens of other brands around the world then you've experienced our technology without knowing it. Global brands use our AI to generate and optimise email subject lines in their mass marketing campaigns.

Phrasee was founded in 2015. We have grown turnover 600% in the last six months, and aren't slowing down. We employ 30 people, half of whom are in R&D. We took on a £1m investment on July 1st, 2016 – the FIRST UK venture capital round to close after the Brexit referendum. We are the fastest growing AI company – in Putney.

¹ Etherington, D., (November 2017), "Justin Trudeau explains why Canada really 'gets' Ai and smart cities," TechCrunch. <https://techcrunch.com/2017/11/02/justin-trudeau-explains-why-canada-really-gets-ai-and-smart-cities/>

As a business owner, an AI practitioner, and an immigrant to the UK, I have a unique perspective on what the government can do to transform the UK in a global AI powerhouse.

The UK's history of innovation built an economic and social power. However, right now, all anyone talks about are short term blips, like Brexit and inflation. Instead, we need to talk about long-term challenges the UK is facing – in particular, a protracted under-investment in innovation. Today, **my evidence, much of which cites Canadian policy as an exemplar, will focus on what the UK needs to do to become a leader in the digital economy of tomorrow.**

The UK currently has SOME policy to incentivise innovation. For example, innovative companies like Phrasee can claim future tax credits against past R&D overheads. This forces companies like mine to self-fund, and retrospectively benefit from our blood, toil, tears and sweat. But by itself, it's not enough. **The UK is also a hotbed of academic AI research.** This is an externality of many things, and isn't linked to any individual policy. Having SOME people properly trained and educated is a starting point. But by itself, it's not enough.

It's not just about creating places at universities – it's about access to a broad range of talent. For example, over half of my business is comprised of women, but this isn't to be trendy. It's because a business is better when you have a diverse business culture. But: few women apply for certain roles, especially in R&D. Ensuring training is accessible to people of all socio-economic classes, genders, ages, ethnic backgrounds and sexual identities is key. For example, offering scholarships and incentives for more women, members of the working class, and other minority groups to train in AI-related fields. **Tangible policy to ensure tomorrow's workforce represents today's diversity is vital for global success.**

Further, the world is becoming more and more insular and protectionist. This is where the UK can stand out. I grew up in Vancouver, Canada, and emigrated to the UK in 2006 and founded Phrasee. Of the 30 people who I employ, over one third of them are immigrants, from Australia, South Africa, across Europe, and even The Sudan. **In Canada, the current government has opened its doors to both skilled and unskilled migrants, and has progressive policies in place to codify social mobility.** Today's penniless Syrian immigrants will become tomorrow's Steve Jobs – whose father, by the way, was a Syrian immigrant.

Lastly, the UK is home to research arms of large, global corporations, like Google, IBM and Microsoft... none of which were founded here. **The global tech oligarchy benefits a lucky few in the UK – but most of the beneficiaries are far from our shores.** This needs to change.

Let me leave you with one thought: small – and fast-growing – companies like Phrasee represent the future of the UK's position in the global digital economy. One priority for this APPG should be to ensure that the UK of today is a fertile petri dish for tomorrow's Googles, IBMs and Microsofts.

Forget reviving long-gone industries, forget populism, and forget the status quo. Let's focus on the future. Let's make the Great British AI economy a global leader. To do so, I would encourage you to support policy that:

- ensures our future AI talent pool represents the country's diversity;
- keeps our doors open to innovators – and future innovators – from around the world; and
- economically encourages companies to start – and grow – on our shores.

My adopted country – of which I am proud to be a member – will be better for it.

Furthermore, Canada has been working closely with the tech giants to build smart cities with the infrastructure essential for the emergence and application of these new technologies. Alphabet, Microsoft, and Facebook have already established research labs in Canada – bringing with them high talent, innovative ideas, and, of course, finance.² It is important for the UK to also jump on this bandwagon in order to reap the full benefits of AI. As Parry Malm said in the Evidence Meeting, **the UK must create ‘tangible policies’ to make sure a diverse AI talent pool is available to innovate now and in the future.**

More than looking for ways to untap AI’s economic potential, governments must also pass policies and implement structures which address AI’s challenges and drawbacks. The last six Evidence Meetings highlighted several of these challenges, including job automation, data privacy, autonomous decision-making, old-fashioned business models, and growing inequality gaps.

Andrew Grant, CEO at Arcostrate and Founder at ThinQStitute, provided written evidence to the APPG AI, sharing how Singapore is addressing the issue of skills. Noting how job automation will disrupt the lives of millions of individuals, he provides a use case of how another country is working to upskill and reskill its workforce.



Andrew Grant
CEO, Arcostrate, Founder at ThinQStitute

Soft Machine Learning – Why Singapore could be a role model for the Future of Work

² Novet, J., (September 2017), “Facebook Opens an AI Research Outpost in Canada,” Bloomberg. <https://www.cnbc.com/2017/09/14/facebook-opens-ai-research-lab-in-canada.html>

AI raises major issues for the future of work and the concept of “employment.” What will people do as AI automates “work” – manual, skilled and professional?

Considering that in future the average job will only last 4.5 years and the “currency” of a skill-set will only last 5 years¹ it’s evident that life-long learning will become essential if workforces are to be employable.³ There also **needs to be an underlying social contract** if we are to avoid mid-career #peakearnings decline and a hollowing out of middle class finances, whilst raising teenagers and caring for elderly parents.

How this brave new world will affect different demographic groups will become critical - for politicians and the electorate. The mid-career lifer may be less easy to retrain for a new career every five years because they have many distractions and are further from formal education than younger groups.

Singapore as a role model

The city-state of 5.5m citizens is addressing the challenge head-on. It has established a **Skills Future initiative 2** (www.SkillsFuture.sg) and publicly committed to ongoing reskilling, with 500 Singaporean dollars per person to be used for additional education/life-long learning.⁴

It is identifying capabilities needed, with industry collaborating to produce **heat maps of capabilities required over time and the gaps to be bridged.**

Despite ambitious goals, Singapore has faced issues with uptake, fraud and lack of providers. However, Ng Cher Pong, Skills Future’s CEO, noted that changing mindsets around continuous reskilling wouldn’t happen overnight.

We should learn from Singapore’s experiment with far-reaching consequences, and also as something bold that may be career-defining for swathes of mid-lifers.

Governments, working alongside industry, regulators, and academics, must address these issues in order for the opportunities of AI to have true social value. As Mayor Yoon highlighted, the solutions we adapt must be human-centric. Catelijne Muller, from the European Economic and Social Committee (EESC), also emphasised this point. She shared with the group EESC’s perspective and how they have embraced the critical issues related to AI. She called for the group to apply a **“human-in-command” approach when drafting policies and creating other types of government structures.**

³ Deloitte, (2017), “Human Global Human Capital and the Future of Work 2017,” <https://www2.deloitte.com/uk/en/pages/human-capital/articles/introduction-human-capital-trends.html>

⁴ “Retraining Low Skilled Workers,” (2017), The Economist Special report. economist.com/news/special-report/21714175-systems-continuous-reskilling-threaten-but-inequality-retraining-low-skilled



We are at a crucial point in time in determining the framework conditions for sustainable advancement of AI. The EESC has identified 11 societal impact domains of AI where AI poses challenges. Catelijne highlighted two of them: (i) quality and responsible use and (ii) the question of legal personhood of AI/smart systems.

(i) Quality and Responsible Use

Much of the AI systems that are already being used turn out to be unfit for purpose. ProPublica investigated a recidivism prediction algorithm that was widely used in US courts and concluded that the system had misidentified black people as a high risk for recidivism and white people as a low risk in a majority of cases.

Algorithmic decisions can be biased. This is most likely the result of the homogeneity of the tech community developing the AI systems (mostly young white men) and the fact that data, from which the systems learn, contain biases. **It is a misconception that data is neutral, or that data are facts.** Data can be messy, incomplete, biased, etc.

These systems are not only deployed in the legal practice, but they more and more decide whether a person gets a loan, a mortgage, or a job. If these systems are affecting our lives so deeply, they must be of high quality.

(ii) Legal Personhood for AI

There is talk about giving AI systems a legal personality in order to hold the system liable if it 'does' something beyond our control or intention. **The EESC is opposed to any form of legal personality for AI or smart systems.**

First of all, the EESC advocates a '**human-in-command approach**' towards AI whereby machines remain machines and humans retain control over those machines at all times.

Secondly, we have strong liability systems in place, that have been around for centuries, that cover situations where a product 'does' something beyond our control or intention. Think of product liability laws and the concept of strict liability for example.

More importantly however, **giving a legal personhood to AI poses an unacceptable moral hazard.** It will undermine the second function of liability law, which is the preventive and corrective function. The threat of liability laws prevents a company from putting a product on the market that potentially has harmful defects. If that threat no longer exists, the company might be less vigilant and feel less responsible for the quality of the AI product it deploys.

2. AI: A national or international issue?

A second prompt for the seventh Evidence Meeting was to discuss whether AI is a national or an international issue. A growing argument is that: **AI, the driver of this technological revolution, transcends conventional geographical boundaries** and, hence, if we wish to address the heart of the issue, the solutions must be at an international scale. Policymakers and other stakeholders need to coordinate in order to champion AI and its implications for society.

Although this is true, the panel agreed that there is still lots to be done on the national level. As Allan Dafoe put it: **'AI is both. It is an issue on the national and international domain.'** International collaboration is necessary to address many of its issues, but each government must be held responsible for setting the right policy frameworks within its own borders.



Allan Dafoe

Research Fellow at Future of Humanity Institute at the University of Oxford and Assistant Professor of Political Science at Yale University

At the Governance of AI Program, University of Oxford, we conduct research and policy engagement to steer the development of AI for the common good, focusing especially on the more transformative possibilities from advanced AI.

Regarding timing of transformative AI, our survey (Grace et al 2017) revealed that AI experts are highly uncertain, within and across experts. However, the community is not confident that general human level capabilities could not emerge in as soon as 10 years; **policy needs to be robust to such possibilities.**

Regarding UK policy, I broadly recommend looking to Canada's "Pan-Canadian Artificial Intelligence Strategy", and Hall and Pesenti's report.

Specifically:

- Build a national research community in AI, through educational opportunities, encouragement, and migration, increasing the number of AI researchers and engineers. Match funding with industry.
- Invest in government AI competency.

- Sponsor economic and politics research on AI policy, to maximize return on policy.

There will be substantial gains from international cooperation. Many policy challenges are common, such as how to build and deploy AI in a way that is safe, transparent, accountable, fair, and serving democracy. **Some issues necessarily cross borders, such as those related to harmonization of regulation and best practices in AI services, and applications in financial markets, cybersecurity, and other domains.**

I recommend that the **UK government retain its leadership developing AI for the common good** (consider that the UK has four groups represented in the Partnership for AI), working with other countries and groups with a similar commitment. The possibilities for world leadership here are substantial, as this commitment could exert a normative influence on the global AI community and the larger AI actors: through **emphasis of the common good, articulation of universally appealing principles, convergence on best practices and recommendations, and leading by example.**

Hence, the UK must view AI through two perspectives. First, through the international perspective, we must seek to position ourselves in the front of the global AI race, to influence and shape coordination efforts that address these important transformations. Second, through the national perspective, we must create a vision of how we want AI to evolve within our borders and, subsequently, set the right frameworks, policies, and investments to turn this vision into reality.

An important policy area for the UK to address, covering both the national and international realms, is that related to taxation. Alenka Turnsek, Co-leader of the UK Value Chain Transformation Tax Network at PwC, discussed this crucial issue with the Parliamentarians and the wider audience. Tax frameworks are evolving globally because of AI technologies, and the UK must act quickly to analyse its current taxing system and reform it if necessary to match the growing digital and AI-commerce trends.



Alenka Turnsek

Co-Leader UK Value Chain Transformation Tax Network, PwC

The EU, OECD, US and UN are all reviewing taxation frameworks and considering how best to address the taxation of the digital/ AI economy. **The current proposals are misaligned, and unless international consensus is reached on a new taxation framework, there is a risk of creating**

disputes, including potentially inequitable allocation of tax receipts, and/or double taxation.

Key areas to focus on:

1. How does a non-resident entity become subject to tax in a jurisdiction? Current domestic and international definitions require a business to have physical presence and trade within a jurisdiction rather than with it. **These definitions catch traditional businesses but not for Digital /AI businesses.** The latter can develop and deploy AI technology remotely and interact or transact with a jurisdiction without local physical presence. Based on the current definition of taxing rights, countries that are net exporters of AI rather than net consumers of AI will be allocated the majority of taxing rights for corporation tax purposes.

2. What are the principles of allocating profits between jurisdictions under the current transfer pricing (TP) guidelines? The current OECD TP framework allocates intangibles (AI) related profits between the capital owners and countries that employ senior talent who manage development and commercialisation of assets (AI). **The current proposals for change are suggesting that some profits derived from AI and the associated data should be allocated to AI consumption countries.** This is creating tensions between countries that develop AI and consume AI.

3. Is corporation tax the right framework to tax MNCs in the digital/ AI driven economy? As the current corporation tax framework is deemed not to be fit for purpose, **a number of governments have already implemented unilateral measures that tax transactions in the digital/ AI economy.** The majority of the measures are taxes based on revenues, not net profits. These are punitive measures that are likely, if sustained for a long period, to have a negative impact on innovation.

Recommendations:

a) **The criteria for taxable presence needs to be reviewed and amended - at the domestic and international level.**

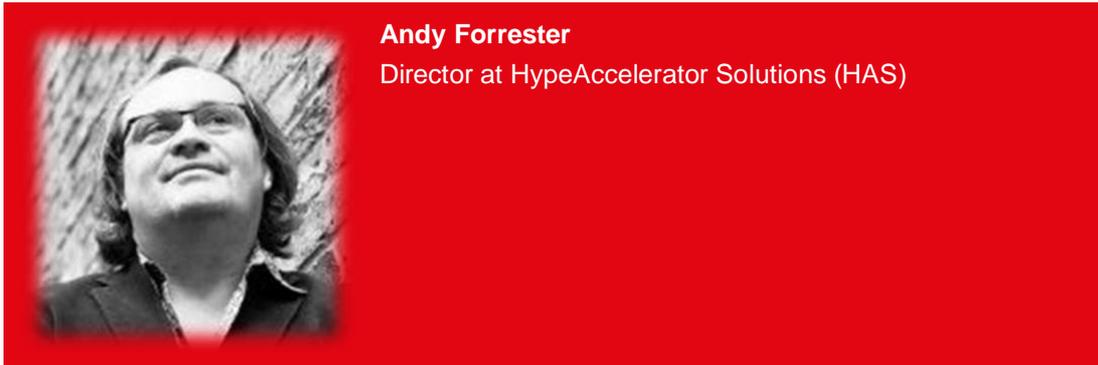
b) International frameworks for the allocation of profits need to be revised based on factors that create value which should address concerns that AI supply and AI consumption countries have.

c) It should be considered whether corporation tax on its own or in conjunction with another tax regime is the most appropriate framework for appropriate taxation of digital/ AI economy. It is important that potentially harmful short term taxation measures are avoided and that international consensus is reached in respect of the long term taxation framework for the digital/ AI economy.

d) **From the UK perspective, we should continue to contribute to the international debate but should also set out a UK strategy in case an international consensus cannot be reached.** The position most appropriate for the UK will depend on whether the UK will be a net exporter or consumer of digital/ AI economy along with a view of what the overall policy to innovation and responding to a digital environment will be - tax policy should not be looked at in isolation.

One of the many ways the national government can help reap the benefits of AI is to apply it to its own governing bodies and public services. Andy Forrester, Director of HypeAccelerator Solutions and Technology Advisory for the Department of Business, Energy, and Industrial Strategy, shared with the group some exemplars of how the UK government is already doing this.

The MET Office, for example, works with the Alexa team to assist decision-making processes. There is also a more sophisticated tool called DASK (dynamic task scheduling) that makes technology infrastructure more efficient, through a powerful ML-driven library that analyses data in Python. At Alder Hey Children's Hospital, IBM Watson is being applied to create the UK's first 'cognitive' hospital by harnessing the power of big data.



Andy Forrester

Director at HypeAccelerator Solutions (HAS)

We were delighted to be invited to present at this session and our evidence relied upon current established applications of AI across UK Government and its Agencies. We focussed on **exemplar projects and applications at Met Office Informatics Lab, AWS and Science & Technology Facilities Council, namely:**

- Met Office Informatics Lab – Alexa weather bot
- DASK Cluster for interactive data analysis
- STFC JADE GPU facility at the Hartree Centre (supporting ML research for UK university consortiums)
- Alder Hey Children's Hospital benefiting from IBM Watson

Of particular interest to HAS was the presentation given by Dr Scott Steedman of BSI. BSI have significant global influence on technology standards and have a leadership role in development of the ISO standards framework. Andy Forrester of HAS has been appointed Chair of the new BSI Committee for Data Standards which launches in January 2018, and this represents a great opportunity for collaborative working between BSI and APPG AI in knowledge transfer, information management, policy setting and governance.

There was **agreement across the panel that AI requirements could be retrospectively addressed in current BSI and ISO technology standards, with a view to its own group of standards, as AI becomes its own industry sector.** Andy Forrester responded to questions on this and made a specific point that it could be a future ambition for all BSI and ISO standards to include AI requirements, irrespective of specialist area or industry sector.

Our perspective is that the UK is a global leader in machine learning and in the top division of AI-centric nations. **UK research and development facilities are globally second to none** and we should be rightly proud of our international achievements, despite much lower levels of public and private investment in AI infrastructure and compute facilities, as compared to the US, Canada and China. We recommend that UK places exponentially greater investment that works toward matching these leading nations and to proceed with such an announcement in the 2017 Autumn Budget

Statement.

The Government must also encourage the deployment of AI across industries. In the fourth Evidence Meeting, the panel had shared how uneven AI adaption has been amongst sectors and companies. Highest AI adoption is seen in telecommunications, automotive/assembly, and financial services. Medium AI adoption is characteristic of the retail, media/entertainment, and consumer packaged goods industries. While low AI adoption is seen in education and travel/tourism.

The UK Government should set incentives to help all companies deploy AI within their organisations in order to start reaping from the benefits. Lisa de Bonis, Executive Digital Director at Havas London, shared with the group use cases of how AI can impact the field of marketing. Noting that technology has turned markets upside down, she recognises AI's ability to help understand consumer needs to provide solutions that are personalised and genuinely useful.



Lise de Bonis
Executive Digital Director, Havas London

In the field of marketing, **technology like AI can help us create more meaningful connections between people, brands and the businesses they represent.** From understanding a customers' needs better than they do by shining a light on dark data, to offering genuinely useful services that grow and evolve with the user.

An example of this is Alvi (<https://educateme.tdameritrade.com/#chat>) a service Havas created for US online broker, TD Ameritrade. Alvi is an AI voice-activated service that uses a personality test to better understand you as a trader. Based on your answers to fun, non-financially related questions, Alvi is able to curate, personalize and give you easy access to the content best suited to your needs to help you become a better trader.

In order to genuinely support businesses in embracing the use of AI in marketing, I believe the government can help in the following 3 ways:

1) Enable businesses to experiment with AI by building confidence and trust around AI.

Show them how AI can work for them, not against them. Demystify the language and humanise the technology. Help give AI a voice that everyone wants to listen to.

2) Invest in academia and drive diversity.

As referenced in the recent AI report for government led by Wendy Hall and Jérôme Pesenti, the UK can be an AI island but only if it attracts a more diverse group of programmers.

3) Walk the walk.

Be open, collaborative and iterative.

Share how government is testing and learning (successes & failures) in the field and commit to finding new applications that will improve society but also how government itself operates.

3. UK's position in the AI global ecosystem

During the Evidence Meeting, there was much debate on the position of the UK in the race to lead the world in AI. Some argued that the UK was far behind countries such as the United States, China, and Russia. On the other hand, others argued that UK's top-notch R&D environment makes the country very well positioned in the world for AI.

Although other countries might be ahead in the technological regards of AI, the entire panel agreed there is **a great opportunity for the UK to lead the international arena in guiding the standards and norms for AI technologies.**

Blay Whitby, a philosopher and technology ethicist specialising in computer science, AI and robotics, spoke about UK's unique opportunity. Advocating the need for international collaboration, he argued that UK can lead the process of regulating AI globally and, also, to set the standards and norms needed to ensure AI benefits all of humanity. The UK can create a safe and healthy ecosystem for AI to evolve.



Blay Whitby

Associate Tutor, Engineering and Design at the University of Sussex

Executive summary

- 1) **It's not too soon to regulate AI.**
- 2) **This has to be done on an international basis.**
- 3) **Civil aviation provides a model of how to regulate which could be followed.**

- 1) The present need for regulation

Previous speakers have given evidence that AI will permeate all of society. Particularly important is the way in which it will directly displace human discretion in professional and advisory jobs.

Highlighting the need for regulation is one problem that has not yet been mentioned in evidence. That is the 'failure mode' of typical AI systems. Unlike previous IT systems which fail in a fairly obvious manner – freezing or producing nonsense – AI fails so as to produce output that is 'nearly right' and usually able to give justification for its wrong decision. This failure mode puts even expert humans in

a very difficult position. Should they override the system? Who will take responsibility in such a situation?

This gives AI system designers and programmers rather more power than the human experts in some critical situations. At present it is very difficult, if not impossible, legally to attribute blame to system designers – except in cases of massive and obvious negligence.

As we have already heard, the public are poorly educated about AI. Unless they are very clever, alert, knowledgeable about AI, and have extensive knowledge of the domain in question, human experts are unlikely to be able to out-guess an AI system. Will they simply be sacked when they do?

A useful technical requirement that regulators could introduce now would be some sort of Lingua Franca (or Nova Latine) for the way in which AI systems explain themselves to users.

2) The need to proceed at an international level

Regulating AI for the UK alone will not work – it will simply drive AI-based industries overseas. If the AI industry follows the current practices of the data-farm industry that will be to third-world countries with little or no regulation.

I don't agree with those previous speakers who have said the UK will be merely a spectator in the AI revolution. In as much as this is true, it is true only of the commercial aspects of the AI revolution. In the pure science and the philosophy of AI the UK is still in a prominent position. **The UK could take on a pioneer or leadership role in the multi-national task of securing international co-operation on AI regulation.**

3) An exemplar – regulation of civil aviation

In 1947 The Chicago Convention on Civil Aviation established most of the necessary rules to enable the world-wide growth of airline travel. Civil aviation is a highly-regulated industry but regulation has not inhibited technical progress nor commercial development. It has also become the safest way (by passenger/seat mile) to travel. There has been a certain amount of political quibbling between countries but surprising little on balance. Now almost states are signatories.

International regulation of AI should follow this model as far as possible. **Regulation should be light-touch and led by technical experts from within the field.** Aviation safety has benefitted greatly from no-blame investigation of accidents. AI could imitate this. Regulation didn't hold back development in aviation: it stimulated development. Aviation benefitted greatly from international standardization of language and measurements. AI could similarly benefit from international standards.

Scott Steedman, Director of Standards at the BSI group, agreed strongly with this point. In his evidence to the Parliamentarians, he encouraged Government to seek ways to promote such initiatives that place UK in the forefront of shaping the standards and norms around AI.

Standards are needed to build trust in these emerging technologies. Looking at best practices across industries and countries, stakeholders can develop standards which will help guide

how AI will impact our economy and societies moving forward. Furthermore, standards will create a common language for all stakeholders to understand and apply.



Scott Steedman

Director of Standards, BSI Group

(excerpt based on the speech given by Dr. Steedman at the seventh APPG AI Evidence Meeting)

Historically, UK standards have always had a major impact on international standard committees. In fact, 95% of global standards (not regulations) are derived from British standards.

The UK has the opportunity to lead the world in standardisation once again. To drive the economy and society forward, UK can provide a vehicle for thought leadership looking into the implications of AI and other emerging technologies.

Standards can help the AI ecosystem have successful commercialisations. Through a common framework and common language, standards can help trade and business transactions across different bodies.

BSI has created standards for smart cities that are now being used by international players around the world. Other organisations like IEEE SA are currently working on creating standards of AI ethics.

These standards are feasible and should follow the principle: "human-in-command." They should reflect the values of society and should be inclusive and diverse. They are not set but dynamic.

If we don't act quick in creating AI standards and a Code of Practice for ethical design, other countries will. UK is well placed at the moment for this challenge, and must take this opportunity.

Action Points

Theme	Action Points
AI Exemplars: A deep dive into international use cases	<ul style="list-style-type: none"> • Commission research or create a forum mapping out the AI global ecosystem and best practices from other countries and intergovernmental organisations.
AI: A National or International Issue?	<ul style="list-style-type: none"> • Apply both a national and international lens when addressing AI issues. • Make the public sector a lead user of AI for delivering public services, just as AI is transforming the knowledge intensive businesses in the private sector to deliver solutions at higher speed and quality at lower costs. On top of the immediate welfare effects, the high demand for AI solutions in the public sector can stimulate growth in innovation and entrepreneurship and AI commerce. • Reform taxing frameworks on intangibles and intangible assets to ensure they align with the international arena and assure UK's global competitiveness in trade.
UK's position in the AI global ecosystem	<ul style="list-style-type: none"> • Clearly define what we mean by AI and create a common language for stakeholders to use. • Find ways to lead the international arena in AI governance, especially (i) with respect to new rules and standardisation when moving from e-commerce to AI commerce, and (ii) when setting ethical norms for AI use and implementation in autonomous systems (from legal systems to health, finance, energy, security, military etc), and (iii) with data use and privacy. • Keep public faith high in these emerging technologies. • Groups such as APPG AI should be used as gateways to generate debate on, and understanding of, the directions in the rules, norms and standards of AI. As the remit here is UK Parliamentarians, another group – such as an AI global governance forum – should lead the wider international dialogue across all stakeholders.

Acknowledgements

The All-Party Parliamentary Group on Artificial Intelligence (APPG AI) was set up in January 2017 with the aim to explore the impact and implications of Artificial Intelligence, including Machine Learning.

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The APPG AI Secretariat is Big Innovation Centre.



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