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UK - China Global Issues Dialogue Centre

White Paper

Multilateral Solutions for Global Governance of the Information and Communications Technology Industry

Foreword

The white paper sets out some of the critical issues that are emerging in the area of global governance of the digital economy and begin to develop some policy proposals to address these challenges. Given my own long interest and research in aspects of global governance and related law, I am especially pleased to acknowledge this initiative of the UK-China Global Issues Dialogue Centre at Jesus College in the University of Cambridge from which this white paper is the first fruit.

The fourth industrial revolution is accelerating with the growth of the Internet of Things (IoT), Fifth Generation (5G) mobile communications, big data, and artificial intelligence (AI). While promising major opportunities this revolution is also creating new and challenging global issues as the needs of geopolitics, security and commerce collide.

It is currently unfashionable in a world of increasing bi-lateral tensions to focus on the potential of multilateral governance solutions. I believe, however, that it is only with discussion and implementation of creative, multilateral solutions that we can hope to properly address these major governance gaps. I also believe the need is becoming urgent, because our governance arrangements and tools are lagging behind advances in technology and its impacts. The process of forging a new governance system can no longer only be centred on the United States and Europe because the fourth industrial revolution is progressing at equal, if not greater, pace and impact in emerging countries as well as the developed world. Among these China will play a prominent role, given the size of her digital economy, technological capabilities, and the rapid pace at which new, digital technologies are transforming both the Chinese economy and society.

The University of Cambridge has had a long and proud tradition of engaging with China going back to the pioneering work of Joseph Needham and beyond. Likewise, we see ourselves very much as part of the global, connected community, cooperating closely with other universities, institutes of higher learning, policy makers, and business to push forward our understanding of major issues of concern to the world and help develop innovative solutions.

I am therefore delighted that the UK-China Global Issues Dialogue Centre at Jesus College hosted this dialogue, with such a rich mix of discussants drawn from academia, business, policy institutes, and international organisations has examined the growing challenges associated with the governance of international communications and data infrastructures and develop proposals for innovative, multilateral solutions outlined in this white paper.

Professor Stephen J Toope
Vice-Chancellor of the University of Cambridge

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Executive Summary[1]

Just as communications infrastructure has become even more central to daily life and to the economy, and just as their capabilities are being amplified by AI and other technologies, we are also becoming much more aware of its vulnerability. It is threatened by direct attacks; by the risk of splintering; and by distrust. Against this background, our dialogue focused on four main questions:

- What are the key threats to a shared global data and communications system?

- What are the possible responses and initiatives already underway that we might build upon?

- What actions might be taken in the short term?

- What longer term initiatives might be effect, including building new global governance institutions?

The challenges identified can be classified into two main categories:

- Specific issues arising from the rapid development of information and communications technologies including issues associated with the transfer, trading and storage of data (freedom of data flows, privacy, consumer protection), maintaining an environment conducive to competition and innovation, cybersecurity, election tampering, child protection the impacts of adopting artificial intelligence and innovations in Fintech.

- Challenges associated with growing geopolitical conflicts arising from differences in value systems around the world and concerns about future national competitiveness in the global market that

may results in the barriers to global data flows and fragmentation of communications systems and the Internet which may, in turn, risk of higher costs; more friction; less integration; less innovation, and reduced ease of use for consumers.

Our dialogue identified a number of responses that could be adopted in the short term, including:

- Building in initiatives already under way through the United Nations, the International Telecommunication Union (ITU), the European Union, the G20, the OECD) the European Telecommunications Standards Institute (ETSI), Global Commission on Internet Governance and the Global Commission on the Stability of Cyberspace (GCSC), International Competition Network (ICN), standards alliances such as 3GPP, and Industry-led initiatives. These should be focused on facilitating trade and trust building with the aim of fostering a common understanding among negotiating members; making use of the expertise on data flows and on the digital economy from other international organisations; and promoting holistic policy discussions on the opportunities and challenges arising from growth in the digital economy.

- Accelerating the development of a global "Cyber Security Standards Agreement".

Over the longer we recommend pursuing a series of practical initiatives aimed at building a new set of institutions to help govern the emerging digital economy. Specifically:

- Creating a global communications observatory, similar to the Inter-governmental Panel on Climate Change, to provide a shared picture of issues, threats and opportunities,

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1   This executive summary and the overall structure of the white paper was prepared Professor Peter Williamson, Chair of the UK-China Global Issues Dialogue Centre and co-host of this digital economy dialogue.

based on deep technical expertise, and possibly act in a certification role. Such a body would need to be designed in a way that ensured it had high visibility, including to the world's publics helping to raise the understanding and literacy of decision-makers.

- Designing open protocols to support self-governance, which can be consistently updated as new, more secure and effective "building blocks" emerge, and to which any member of the community can contribute, will ensure buy-in from a larger range of actors, and pre-empt some issues and further harms by design. This would require collaboration between governments (as funder, overseer and potentially also procurer) and the open source community in designing not just the legal but also technical framework for data portability.

- Building on moves towards AI global governance, creating standards that embed a version of the golden rule – 'do unto others what you would have them to you' – to ensures action to constrain predatory, harmful and exploitative uses of technology.

- Establishing a Global Communications Infrastructure Integrity Commission, that would accredit and certify the integrity of infrastructures. It would need rights of inspection of software and hardware; a high level of technical expertise; and support from governments and business. In return for opening themselves to inspection, countries and companies would be accredited as trustworthy.

Part I: Options for Data and Communications Infrastructure Governance[2]

Preface

In October 2019 Jesus College in Cambridge brought together leading figures from across the world involved in government, politics, business, academia and global institutions to look at the potential for solving some of the dilemmas of global communications governance.

We did not expect consensus. But the discussion showed a significant convergence of thinking, and suggested that, with the right leadership, progress could be possible in the next 5-10 years to protect and grow one of the world's unique shared resources: communications infrastructures that are open, free, safe and reliable.

There were specific proposals both short-term and long-term – described at the end of this report – but also a shared feeling that these issues now need better ways of being discussed, engaging academia, media and the world's publics.

The traditional models of largely invisible expert decision-making worked well for many decades. But they may no longer be sustainable given the importance of communications, the intense pressures of geopolitics and the degree of public interest in the issues. Also, a key feature of our discussion was the much more prominent role now taken by China, and Chinese companies, in global communications, and the need for new approaches that fully include them.

The last three decades have brought a transformation in how the world thinks, and talks, about the environment. What was once a largely invisible discussion amongst experts has become far more engaged and inclusive. We now need a comparable shift in how we think, and talk about, our other vital, shared resource, the communications systems on which we all depend.

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2   Part I of this report was written by Dr Geoff Mulgan CBE, co-host of the dialogue and former Chief Executive of the National Endowment for Science Technology (Nesta).

Introduction: The Threats to a Shared Communications System

The global communications system – including the Internet and WorldWideWeb, smart phones and the Internet of Things – is an extraordinary shared good. It is a common property that allows near-universal communication. At its best it provides a safe and private space for citizens, as well as supporting almost every aspect of the modern economy.

But just as communications infrastructure has become even more central to daily life and to the economy, and just as their capabilities are being amplified by AI and other technologies, we are also becoming much more aware of its vulnerability. It is threatened by direct attacks; by the risk of splintering; and by distrust.

The result is the emergence of a series of novel challenges involving data and communication. These appear not to be easily soluble at a national or bilateral level and are prompting a debate about the need for new forms of transnational governance.

These issues sit at the interface of trade, infrastructure, technology and governance. They potentially threaten free and open trade, easy and reliable communication, data flows and connectivity. They are feeding into, and sometimes fuelling, the broader trend towards 'decoupling', as the US and China intensify their competition with each other, a trend that may continue whichever party wins the next US Presidential election.

The fields they involve include:

- Infrastructure integrity and trade restrictions
- Data and privacy
- Cybersecurity
- Global Internet governance
- AI governance/regulation
- Internet of Things

The issues are complex. The 21st century economy and society are utterly dependent on communication. If the UN was being created in the 2010s rather than the 1940s, it's possible that the multilateral governance of communications might have been as central to its institutions as the arrangements designed after WW2 to govern and influence flows of money (the IMF, World Bank and others).

Instead, with the exception of the International Telecommunications Union (the ITU, originally created in 1865 to handle telegraph communications), there are none.

The many past attempts to start a global debate about more systematic design of new governance arrangements all ran into the sand. These include the debates over the New World Information and Communication Order in the 1970s and 1980s (which prompted the US and UK to leave UNESCO).

More recently the rise of the Internet prompted the World Summit on the Information Society in 2003-5 and the Internet Governance Forum. Arguments about the role of ICANN and treatment of issues such as spam and illegal content, or whether Internet governance should be restricted to management of names and addresses, have remained unresolved through the WSIS+10 meetings and continuing dialogues on the role of ICT in development.

So far, none of these debates have led to the creation of any new global institutions comparable to those in finance, health, development or refugees, and there is no obvious locus for negotiations over issues such as data privacy or cybersecurity.

But although current conditions look unfavourable for new multilateral initiatives, history suggests that the creation of new global institutions could happen quite suddenly when there is the right alignment of interests and ideas. Moreover, standards bodies like ETSI continue to be quietly successful in creating common rules.

Specific Governance Challenges

A flurry of different governance challenges are now pushing these issues higher up political agendas. These are just a few of them:

- **Trade/infrastructure conflicts** (e.g. over Huawei, and arguments over whether national intelligence services are creating backdoor/trapdoor access through commercial companies). Various countries – notably the US and Australia – have blocked Huawei, citing intelligence concerns, but there is currently no independent institution able to adjudicate whether these concerns are valid.

- **New requirements are being introduced on data location**, with many countries requiring localisation of data (e.g. India's recent e-commerce proposals), imposing significant additional costs on business, and ultimately on consumers. It is estimated that at least 45 countries now have some data localization requirements in place (including many authoritarian states, but also democracies including Australia, Canada, New Zealand, South Korea and Switzerland).

- **The lack of global common standards on security**, despite a greater quantity and intensity of cross-border cyberattacks. As the 'attack surface' of systems grows we are seeing ever more crises, from denial of service attacks on Estonia to Stuxnet and Wannacry, prompting growing concerns about the weakness of global capacities to respond.

- **Anxieties over AI and trade**, including potentially dangerous applications of AI in the military field, or the spread of algorithms embedding biases of all kinds in traded goods and services.

- **The challenge posed by new forms of money** – including blockchain-based currencies (bitcoin to Libra) which bring to the surface issues at the interface of financial and monetary regulation on the one hand and communications/data regulation on the other.

- Ongoing, and very high profile, concerns about **the influence of communications in social media and messaging on children** (which has dominated the debate about Internet governance in the UK).

- High levels of **cross-border interference in democratic elections** (which has become a primary concern in the EU).

- Continuing challenges over **terrorism and data sharing,** and pressures for better response mechanisms connecting governments and the major platforms, including to reduce use of social media to promote terrorist acts.

- Intensive debates about **future Internet governance,** partly prompted by the corrosion of the hope of its pioneers that the Internet would remain free, open and universal; and partly by challenges to the existing arrangements (including ICANN). Russia for example this year passed a "sovereign internet bill" that would set up a self-sufficient Runet and include a "kill switch" which would shut off the global Internet to Russian users.

- **Widespread fears that next generation technologies may be 'balkanised'**, with significantly different standards and rules in different parts of the world. So, whereas 5G mobile communications has developed with common standards, 6G may not.

All of these challenges pose the risk of higher costs; more friction; less integration; less ease of use for consumers; as well as harms of all kinds, from harms to children to harms to democracy.

The issues are very diverse. But one of the challenges of this field is that they often overlap (which is also why we are bringing them together in this conversation). Moreover, it is increasingly hard to separate management and governance of communications from governance of other fields (e.g. finance). It is also increasingly hard to sustain the traditional distinctions between governance of content and governance of information flows and underlying networks.

A Typology of Possible Responses

Governance responses can take many forms, from the modest and incremental to the more strategic. Sometimes there are good reasons to do nothing; to fear that cures may be worse than the disease; or to add new roles onto existing bodies, including the WTO on e-commerce and the ITU on internet regulation, rather than creating new ones. In our discussion there was scepticism about whether the formal global bodies – the UN – were well-placed to provide new solutions.

In principle, these are some of the options, the potential 'toolkit' for future governance:

- **Protocols and standards** governing the operation of networks, like GSM standards or 5G (helped by the important work of 3GPP), ISO/IEC, and potential standards for interoperability for components in smart cities or for design features of AI.

- **Use of customary law, existing treaties and UN charters** and applying them to new fields.

- **Crisis mechanisms** (as exist in finance, health and other fields) that can be rapidly set up in response to urgent problems, like cyberattacks. These are beginning to be put in place for handling terrorist incidents.

- **Treaties** (for example, a treaty extending the EU's GDPR rules to other jurisdictions linked to trade access).

- **Competition policy** – aligned action on dominant companies (primarily EU and US).

- **New regulatory bodies** (with powers ranging from inspection to enforcement), like the IAEA in nuclear energy.
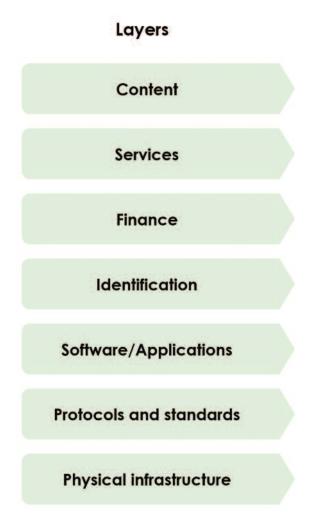
- **Mediation arrangements** to handle conflicts.

- **Voluntary, industry-led initiatives**, such as joint commitments to higher cybersecurity standards, or equivalents to the many global arrangements around aviation.

- **Observatories** that aim to provide a common global picture of key trends (like the Intergovernmental Panel on Climate Change).

We could add to this list the potential for **more experimental methods.** Within national regulation there is growing interest in what we call 'anticipatory regulation' methods that use experiments, testbeds and sandboxes; open data; and more active public engagement to deal with ethical and other dilemmas. These methods haven't yet been much used at the transnational level but may become part of the response; they offer a more flexible, adaptive approach than is possible with the formality of treaties and international law. The OECD's AI Principles (adopted by 42 countries) and the G20 AI Principles drawn from the OECD AI Principles, are examples of moving in this direction.

The field can also usefully learn from other examples in global governance – from the Montreal Protocols that galvanised global action on the ozone layer, linking governments and business, to more recent common action on issues like HIV and Malaria through hybrid partnerships.

These various options apply to the layers which together make up a global communications system, from physical infrastructures at the bottom through software and applications to services and content, each of which requires rather different regulatory and legal responses.

A rough version of the communications stack

Layers

Content

Services

Finance

Identification

Software/Applications

Protocols and standards

Physical infrastructure
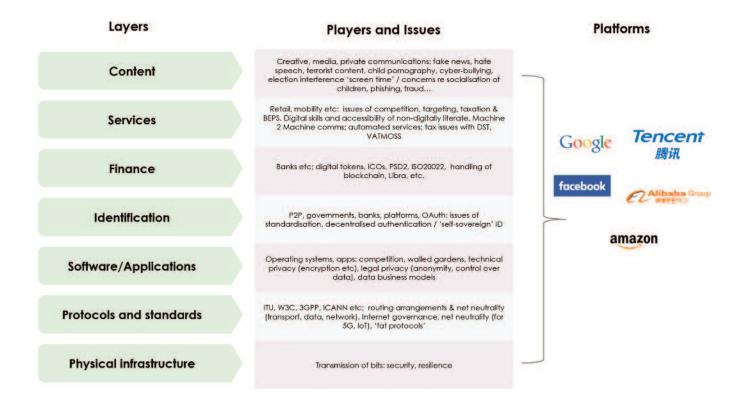
Emerging Initiatives – What can be built on?

There are many initiatives and debates already underway in this broad space, that could in time bring together both the political will for action and better options. These include:

- Transnational moves on AI, and in particular the announcement of the International Panel on Artificial Intelligence (IPAI) – now renamed the Global Partnership for AI – which aims to ensure some common standards over issues such as future of work, commercialisation, ethics and data governance and avoid a race to the bottom on ethical standards. Canada and France have committed to leading this work, while the new European Commission President has also promised EU-wide action on AI ethics.

- The Internet Governance Forum which continues to organise annual gatherings of stakeholders (most recently in November 2019 in Berlin).

- Various EU initiatives post-GDPR, including work now underway on the design and R&D for the 'Next Generation Internet'.

- ITU initiatives and other UN initiatives, including the work of the high-level group brought together by the Secretary General and their recent report on digital cooperation, and the recommendation of a Global Commitment on Digital Trust and Security. The Secretary General has promised to appoint a Technology Envoy 'to work with governments, industry and civil society to help advance international frameworks, and nurture a shared digital future that puts people first and helps bridge the social divide'.

- Japan and the G20 'Osaka track' to promote new action on governance for digital issues (discussed further below), following discussion of AI at every G7 since 2016.

- The many initiatives underway now on cybersecurity including the Paris Call for Trust and Security in Cyberspace.

- Corporate unilateral and multilateral initiatives, like the Digital Geneva Convention proposed by Brad Smith of Microsoft, and Facebook's proposals for regulation of harmful content, privacy, portability and election interference. Huawei's recent offer to sell all of its underlying 5G technologies was another particularly bold move relevant to these discussions.

- Citizen-led initiatives such as Tim Berners-Lee's proposals for a 'contract for the web'.

- Philanthropic initiatives to support citizen-led programmes and bodies like the W3C, or current work on cyber trust by Hewlett and Carnegie.

A more detailed version of the communications stack – and its key issues

Layers	Players and Issues	Platforms
Content	Creative, media, private communications: fake news, hate speech, terrorist content, child pornography, cyber-bullying, election interference 'screen time' / concerns re socialisation of children, phishing, fraud...	
Services	Retail, mobility etc: issues of competition, targeting, taxation & BEPS. Digital skills and accessibility of non-digitally literate. Machine 2 Machine comms; automated services; tax issues with DST, VATMOSS	Google, Tencent 腾讯, facebook, Alibaba Group, amazon
Finance	Banks etc; digital tokens, ICOs, PSD2, ISO20022, handling of blockchain, Libra, etc.	
Identification	P2P, governments, banks, platforms, OAuth: issues of standardisation, decentralised authentication / 'self-sovereign' ID	
Software/Applications	Operating systems, apps: competition, walled gardens, technical privacy (encryption etc), legal privacy (anonymity, control over data), data business models	
Protocols and standards	ITU, W3C, 3GPP, ICANN etc; routing arrangements & net neutrality (transport, data, network), Internet governance, net neutrality (for 5G, IoT), 'fat protocols'	
Physical infrastructure	Transmission of bits: security, resilience	

Short-term Options and Potential Alignments

What might be done in the short-term to address some of these challenges? Could these initiatives develop fast enough to be commensurable with the scale of the challenges?

Opinion at the seminar was divided on how hopeful we should be in the short-run, against a backdrop of trade war and the rising tide of nationalism.

But there was some optimism that a few key areas could advance despite the climate. Here we highlight two.

Cybersecurity Standards

One important example of action that could be taken quickly would to accelerate the development of a global "Cyber Security Standards Agreement" that would be truly international and would build on existing approaches to standards.

If such standards can be agreed they would aim to be technology neutral and apply to all companies and networks and in all regions. They would be fully public and transparent, with a neutral certification procedure that couldn't be distorted by any individual nation state or business.

As with other standards processes there would need to be direct involvement of the main commercial players as well as nation states in both design and decision-making. Design decisions would be based on objective evidence and, where possible, any decisions should make it easy to adapt and evolve the standards in response to technological change and problems that arise.

Trade and Trust

A second key area is the Osaka track launched at the G20. This aims to promote 'free data flows with trust' and has been put under the World Trade Organization (WTO) which is the primary space for global e-commerce discussions.

The Osaka Track consists of three elements: fostering a common understanding among negotiating members; making use of the expertise on data flow and on the digital economy from other international organisations; and, promoting holistic policy discussions on the digital economy. As well as the WTO and other international organisations such as the Organisation of Economic Co-operation and Development (OECD), business is already playing an important part in the discussions, and there is input from organised labour and civil society into the Committee of Digital Economy Policy at the OECD. However, for obvious reasons, business has far more capacity to engage in shaping these debates that other stakeholders.

Some countries are agreeing open data trade (e.g. US and Japan renewed their cross-border data flow agreement by signing a digital trade agreement stating that "neither party shall prohibit or restrict the cross-border transfer of information, including personal information, by electronic means, if this activity is for the conduct of the business of a covered person"). But other countries are taking a very different direction.

The big risk is that decisions are made without careful attention to public acceptability and therefore unravel. Past arrangements often ignored the tensions between trade and trust. Recent years have seen big shifts in attitudes to data, with much less acceptance of data harvesting without consent, and opaque processes of decision-making. A minimum step would be to ensure some civic engagement in these debates – and a clearer vision of what values and vision these new arrangements are meant to serve.

Longer-term Possibilities

The more strategic, and difficult, possibilities look further out, to a 5-15 year time horizon. The key overall conclusion was that the ways in which communications issues have been debate in past decades are no longer fit for purpose. As has happened in other fields – notably the environment – the debate needs to be opened up.Here we identified four main avenues to explore that could contribute to such a shift:

Create a Global Communications Observatory

There was wide agreement that the world would benefit from better orchestrating knowledge about communications infrastructures, providing a shared picture of issues, threats and opportunities, based on deep technical expertise. The Intergovernmental Panel on Climate Change (IPCC) provides a useful model, and has hugely influenced intergovernmental processes of negotiation and action around climate change. It could become a model for the GPAI mentioned above.

A parallel body for communications – A Global Communications Observatory (GCO) – would in a similar way provide regular reports on key trends and emergent issues. It would use techniques pioneered by the IPCC for large-scale expert participation in analysis and assessments. It would also provide accessible visualisations of the state of networks at many of the key levels of the stack. We now take these for granted for the weather but the infrastructures we depend on deeply are opaque and largely invisible.

Such an observatory would be able to draw on existing processes. For example, the ITU collects wireless communication requirements for the next 10 years from each country, then leaves it to 3GPP to work on the detailed standard. After 3GPP finishes the standard, ITU approves it, and each country builds its next generation wireless network based on the unified international standard. The proposed Observatory would enable this whole process to become more open, with international industry organisations offering their own 10-20 year predictions, and contributing to a synthetic view of likely scenarios, and of challenges that would require multilateral responses.

Achieving this goal would require engagement of the main telecommunications companies, mobile providers and platforms, sharing relevant data on network performance and patterns. It could in time become a condition of public licenses, and use of spectrum, that they share key data on the state of networks.

Such an observatory would be likely to need joint funding by the main nations involved in global communications, with contributions from the main businesses (operators, platforms and manufacturers), so that it could offer a living picture of the state and prospects of the infrastructures on which we all depend. It would act as a meta-observatory – drawing together a wide range of existing initiatives which provide part of the picture (from governments, academia, consultancies etc). There would clearly be advantage if it could gain a formal status and a duty to report into the G20 and G7.

Such a body would need to be designed in a way that ensured it had high visibility, including to the world's publics (as the IPCC has managed), helping to raise the understanding and literacy of decision-makers (as has happened in relation to carbon emissions).

Design Open Protocols to Support Self-governance

The second key issue we discussed potentially provides important new answers to the challenges of governance.

Here the key idea is that the underlying design of networks can make them better able to withstand threats and guarantee resilience. This was always part of the logic of the Internet and its TCP/IP protocols. But new technological options make it possible to take this a step further, building on the many moves towards more open source technologies.

Many of the internet's key protocols were developed in an open and collaborative manner. But the recent centralisation across all layers of the stack, has also extended to the protocol setting stage. Opaque, jargon-heavy processes, driven by those with the highest stakes in the game and the necessary resources to participate have meant that many of the internet's future infrastructures are being designed by just a handful of the most powerful actors. Vested powers have few incentives to open up their processes or level the playing field in this standard-setting phase, which risks further concentration.

Open, modular, transparent protocols and standards, which can be consistently updated as new, more secure and effective "building blocks" emerge, and to which any member of the community can contribute, will ensure buy-in from a larger range of actors, and pre-empt some issues and further harms by design.

SCION (Scalability, Control, and Isolation On Next-Generation Networks) is an example of this kind of approach, designed to enable packets to be communicated even in the presence of malicious interventions, that is now being implemented in Switzerland. Governments and other institutional actors can help support this kind of model through providing funding for development and continued maintenance, but should also consider creating independent auditing and support bodies, which can oversee continued security and upkeep, and support solutions developed on top of these protocols – so aiding the development of a more distributed, open marketplace.

An example discussed by the group was interoperability and data portability. Legislation such as the GDPR sets out that companies that collect substantial amounts of (personal) data need to make this data available to users and allow them to carry it with them, which helps prevent lock-in and level the playing field. The group agreed that the intention here is the right one, but that the lack of definition of what data portability means in practice (in principle even a PDF with a users' data could legally already suffice) means that impact will be limited.

This is where a collaborative exercise between governments (as funder, overseer and potentially also procurer) and the open source community in designing not just the legal but also technical framework for data portability, could be particularly powerful. Neutral governance bodies can then be established to test resilience; provide accreditation and audit (which would need to be financed both by governments and by the major private sector players). The key however is that important principles, for example on the handling of personal identity, would be designed into the technology itself to reduce the need for classic governance.

The European Commission is beginning to consider options of this kind, including prioritising R&D to develop appropriate technology tools, which will need to become at least part of a future approach to ensuring the integrity of networks.

Build on Moves Towards AI Global Governance

The third broad direction of change which we agreed would be important for this field is the evolution of new governance institutions for AI, which could be used as a platform for addressing some of the broader issues.

There was widespread agreement that the world will need some standards and accreditation of AI, including for trade, e.g. of driverless cars, drones, or IoT applications of all kinds.

These standards may have to design in rules for treatments of data and privacy; transparency of algorithms; legal duties related to potential harms.

The EU and US are beginning serious work on the common standards that might support more ubiquitous Autonomous Vehicle systems – as an alternative to a proliferation of competing standards created by car companies, computer companies and individual cities. Clearly if common standards can be created – including standardised ways of handling insurance, liability, or the division of labour between upgraded physical infrastructures (ie smarter roads) on the one hand and smarter vehicles on the other – this will greatly assist with the viability of AVs.

These decisions will be unavoidably bound up with public perceptions and ethics. There are some useful parallels with how regulation and law around human fertility evolved, involving open processes, engagement of ethics, and an iterative approach to decision-making that involved the public. These aimed to embed a version of the golden rule – 'do unto others what you would have them to you' – which will also be vital for future AI governance, since it ensures action to constrain predatory, harmful and exploitative uses of technology. The space industry and the regulation of airlines provide some useful pointers to how the world can create coherent, and strong, systems for accelerating learning and common standards in advanced industries.

The Canadian/French initiative which came out of the G7 (and OECD) provides one source of energy as does the Osaka Track mentioned earlier.

A Global Communications Infrastructure Integrity Commission

Finally, we discussed the case for creating new institutions with a narrower remit to accredit and certify the integrity of infrastructures. One model is the International Atomic Energy Agency. Since the 1950s, the IAEA has been the global watchdog for the peaceful use of nuclear science. Acting as an independent organisation, not under the direct control of the United Nations, it has worked to ensure the safe, secure and peaceful use of nuclear science and technology.

An equivalent Global Communications Infrastructures Integrity Commission - would play a similar role, assuring that infrastructures are reliable and don't have trap doors or backdoors for security agencies. It would need rights of inspection of software and hardware; a high level of technical expertise; and support from governments and business.

The IAEA carries out inspections of country's nuclear programmes to monitor illicit behaviour – primarily developing atomic energy for military use. When IAEA inspectors are prevented from doing their work or expelled, as in North Korea in 2009, the agency uses the best available technology including open-source information and satellite imagery to monitor activities. It then verifies that agreements and commitments are being implemented – as recently with the promises Iran made in 2015.

A new body for communications would need a comparable array of rights and capabilities. In return for opening themselves to inspection, countries and companies would be accredited as trustworthy.

Next Steps

This discussion and paper have mapped out a potential territory for further work involving more detail, ideally with a core group of countries willing to drive forward progress in these areas.

In some cases it will be possible to design blueprints. But much of this work is bound to be iterative, involving experiment and adaptation, in tandem with rapidly changing technologies. One participant reminded us of the old saying which is an apposite point to end on: 'traveller there are no paths; paths are made by walking'.

Part II: The Dialogue[3]

Background

On 10 October 2019, The United Kingdom-China Global Issues Dialogue Centre at Jesus College, the University of Cambridge hosted a symposium entitled Digital Economy Governance Dialogue: Multilateral Solutions for Information and Communications Technology Industry Governance. The dialogue was led by Professor Peter Williamson, Professor of International Management at the Cambridge Judge Business School, Fellow of Jesus College and Chairman of the United Kingdom-China Global Issues Dialogue Centre, and his co-host, Dr Geoff Mulgan, then Chief Executive of Nesta. Thirty-three participants representing various disciplines in academia as well as representatives from the private sector and regulatory bodies discussed the challenges presented by the growth of the digital economy.

The conference was divided into different sessions, in each of which three contributors introduced a topic for no more than five minutes in a single roundtable. After this introduction, all participants were invited to contribute to the discussion. In addition, during two of the sessions, participants were divided into four, small groups, each group discussing a different as aspect of digital governance. A summary of each group discussion was then shared with the rest of the attendees.

Participants identified various challenges around the new information and communications technologies including data, competition and innovation, cybersecurity and AI. Moreover, Internet companies are global, and users are located around the world; consequently, it would be difficult to solve these challenges either at the national level or through bilateral agreements.

These challenges prompted a debate about the need for transnational governance. Transnational governance needs to consider differences in the normative standards accepted by different countries and other stakeholders. For example, the British focus on the importance of ensuring child protection, compared to the Chinese Government's stance on the importance of ensuring social stability by limiting certain types of information available over platforms.

However, the current geopolitical environment is politicised and fragmented. Participants agreed that effective action needs to be taken, or a crisis of governance and accountability could be precipitated, threatening free and open trade, easy and reliable communication, data flows and connectivity.

Before proposing further solutions, however, it was agreed that the initial step would be to develop a deeper understanding of what governance initiatives are already underway and where these were falling short. The conference then went on to develop initial options for global digital governance solutions and identified some of the actors who might play key roles in addressing them. Many participants agreed that, for action to take place, it is necessary to develop a sense of urgency, and it was believed that many small and multi-stakeholder forums could provide effective solutions.

Analysis of Existing Governance Challenges

In this first morning session, contributors described multi-disciplinary challenges in the global situation that are affected either by geopolitical conflict or lack of transparency.

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3   Part II of this report was written under Lauterpacht Rules, not directly attributing statements to individual participants by Carolina Onate Burgos J.D., LL.M is a Chilean Lawyer specialising in Competition Law and Data Protection.

For practical reasons this was divided into two topics:

(i) multi-disciplinary challenges in subtopics such as data (freedom of data flows, privacy, consumer protection), competition and innovation, cybersecurity, election tampering, artificial intelligence (AI), Fintech, and child protection;

(ii) inter-governmental challenges embedded in a geopolitical conflict created by differing systems around the world that often pull in competing directions (e.g. current policy directions of the United States, China, Russia).

Maintaining a fertile environment for competition and innovation were regarded as an essential challenge by private-sector stakeholders, while there was wide agreement that cybersecurity and national security were highlighted as areas where there was a pressing need for solutions in the short term.

As one contributor explained, there are asymmetries in power between the largest technology companies and leading governments that mean different actors need to be involved, which leads to a lack of transparency in the decision-making process of creating norms.

The challenge consists in finding a common set of values between different countries which prioritise values such as domestic stability, national security, individual freedom and privacy in a different order.

Clear rules and ethical considerations must be discussed to avoid a crisis of governance and accountability, which could threaten free and open trade, easy and reliable communication, data flows and connectivity.

Multidisciplinary Challenges

a) Data and privacy across borders

The first set of challenges discussed were associated with data. Data is dealt with locally within an individual country which has its own

stance and values. These can be generalised as follows:

(i) national data sovereignty for domestic stability in China and Russia;

(ii) national security (as has recently been centre stage in India and Turkey);

(iii) individual freedom in the United States (US) and the European Union (EU);

(iv) privacy and child protection in the United Kingdom (UK).

A problem emerges when data moves across borders and each country wants to maintain their individual principles and position. Recently, the amount of data and its quality have been controlled through location, focusing on where data is stored or to where it is permitted or restricted to travel (data location). A drawback of restricting data access is that companies would have to buy data storage space in every country in the world before accepting customers from those countries. This in turn would create a barrier to entry that would raise the cost for everyone and/or diminish innovation. The only advantage is that countries such as India and Turkey can build data centres to attract investment.

The challenge, therefore, involves finding a balance. Some contributors advocated for broader data availability. Representatives from the private sector explained that data is what makes platforms highly valuable, and a lot of its value is in aggregation rather than the individual data points. Therefore, this challenge can be addressed by regulating platforms through the importance of aggregating data.

b) Competition and innovation

A second set of concerns raised by multiple contributors concerned the competition between companies, including problems of monopoly, of state subsidy, or other forms of state interference. These issues were magnified by a geopolitical environment in which governments and their citizens were increasingly concerned about the potential impacts of new

technologies for the global competitiveness of individual countries and their companies, entrepreneurs and economies.

There is an awareness that if competition is blocked in the information and communication market, there will be a cost to consumers, such as a slower roll out of 5G or higher telecoms bills. On the one hand, China monitors content and decides what is available to society, because for the Chinese government social stability presents a higher value than competition. Therefore, Google, Facebook and Twitter have been blocked. China has non-western traditional standards on intellectual property protection. A contributor explained that in the eyes of Xi Jinping, President of the People's Republic of China, it is essential for China to make strides in technology, especially in areas such as AI, to secure pre-eminence for China's economy on the global market. On the other hand, the US has blocked some Chinese companies, and companies have increasingly reacted to this by leaving the US to supply non-US technology vendors (for example, Ericsson is moving their 5G manufacturing from Texas to China).

Contributors proposed that one way to solve these issues may be to create a competitive ecosystem among the existing vendors. For example, to stimulate competitors, all intellectual property associated with 5G has been made freely available by the CEO of Huawei, making this a fruitful time to be a European technology company working on these issues.

A key challenge when talking about regulation is to ensure that there is still an environment for innovation at a local level. Contributors agreed that unnecessary regulation could create a barrier to entry and prevents small start-ups from competing. Therefore, regulation should apply only in particularly critical domains. However, another contributor added that regulation can help innovation rather than hinder it.

c) Other challenges such as AI, cross-border cyberattacks, interference in democratic elections and child protection

A third set of challenges were associated with a miscellaneous set of subtopics related to technology, which although more specific than questions of overall global governance, participants felt warranted discussion.

Regarding AI, the decision-making process, responsibility and accountability were identified as the main issues. For example, in the case of autonomous vehicles in the US, defined parameters are required to determine questions such as who should bear responsibility in crashes and which forms of licensing would be required. Another example from the US are drones that can use big data to make a decision as to whether to take the life of a human being: should humans be liable for this?

Following on from this subject, a central question animated the discussion: is AI a unique issue and does it therefore require different regulation to other technologies? Contributors advanced the idea of learning lessons from telecommunications not to overregulate AI because future investment could be affected. However, more risk-averse approaches to algorithms and AI may be necessary given the potentially far-reaching and risky impacts of this technology, such as algorithms being in control of immediate response mechanisms for missile batteries (for example on China's Fujian coast).

Regarding child protection, some contributors suggested that legislators in the UK were leading the way in regulating the protection of children when interacting with AI online, far ahead of other western countries, but this is a challenge that should be tackled on a global scale.

Regarding cybercrime, contributors unanimously agreed that cyberspace presents an environment of potential conflict, confrontation and attacks, creating new challenges in security for companies and states. There was no overall

agreement about the grade of threat that the world is facing at the moment; however, one contributor stated that 'if these things were kinetic, we could consider ourselves in a state of war'. Another softened this and explained that the code to maintain infrastructure was very old and weakness in the system could leave countries open to cyberattacks.

Inter-governmental Challenges

Inter-governmental challenges are created because Internet companies are global and users are distributed in specific locations around the world. At the same time, normative stances and values vary within different systems and often pull in opposing directions.

Representatives from the private sector explained this point further, stating that there is technological and jurisdictional asymmetry in the regulation of the digital landscape. Most regulations are local, rather than global. Most Internet and social media services have are nationally rooted even if they now have almost global reach. As a result, they tend to be governed by a "home" jurisdiction. For example, Facebook in the US, We Chat in China, Daily Motion in France. It is true that some adjustments can be made when looking at the location of the user, for example with intellectual property and Netflix, but this has not been the general rule.

As one contributor explained, this asymmetry leads to tensions between privacy, security, human rights, intellectual property and trade. The largest existing tension today is between trade and security. Another contributor stated that the US-China political conflict regarding the security risk of 5G could be an opportunity for serious regulatory reform. After a brief discussion, contributors concluded that US governments, political parties and presidents have leaned towards a more aggressive stance in their policy towards China. However, these same party members and leaders also hold similar views towards, and share suspicions concerning Silicon Valley.

There is no uniform view of the degree of tension. For some contributors there is clear geopolitical conflict, also called the 'polarisation of technology'. In fact it was mooted that there could potentially be a new 'cold war' in five years' time, not just because of trade, but also in view of the prospect of decoupling between the US and China in foreign direct investment (FDI) and capital markets and through to tech disengagement.

The challenge, according to participants, is to build a global governance system that embodies multi-national rules and standards, while still being informed by national values that arise from the demands and priorities of local communities, nation states and national ideologies. This could then be implemented successfully in the global marketplace.

Typology of Governance Responses and the Emerging Initiatives in Response to the Governance Challenges

Some of the rules are extremely local and not intended for the international market. Therefore, when the rules have a trans-border effect there are challenges and complications. The typology of governance will depend on the character of the technology itself, the political context, and who are the rule makers and who are the rule takers.

Before proposing further solutions, however, it was agreed that the initial step would be to obtain a deeper understanding of what governance initiatives are already underway and where these were falling short. The group then went on to develop initial options for global digital governance solutions and identified some of the actors who might play key roles in addressing them.

Contributors analysed different international and regional initiatives including formal organisations such as the United Nations (UN), the International Telecommunication Union (ITU), the European Union (EU), the G20, Organisation for Economic Co-operation and Development (OECD) treaties, as well as standards bodies such as the European Telecommunications Standards Institute (ETSI), Global Commission on Internet Governance and the Global Commission on the Stability of Cyberspace (GCSC). This discussion also included the International Competition Network (ICN) and Industry-led initiatives.

Many participants agreed that for action to take place it is necessary to develop a sense of urgency, and it was believed that having a large number of small and multi-stakeholder forums could provide effective solutions.

United Nations
The UN is an international organisation founded in 1945. It is currently made up of 193 Member States.[4] Some contributors considered that the UN could be a forum for new forms of governance. There are already three initiatives regarding this topic:

(i) Opening Groups on Cybersecurity, including some private sector involvement;
(ii) the UN Global Compact adopted on 12 August 2005, which is dedicated to working directly with the private sector;
(iii) the Secretary-General's High-level Panel on Digital Cooperation, established in July 2018; its report 'The age of digital interdependence'[5] was published in June 2019. These initiatives show that member states can turn these discussions into agreements.

However, as one contributor argued, it is important not to let Russia take over the UN's processes and exert its influence, blocking non-governmental experts. If Russian interference cannot be prevented, geopolitical animosity could block any agreement.

A few contributors were categorical in saying that a UN approach (or another similar multilateral approach) will not working because by the time these institutions reach a decision, it is often too late, considering that the pace of change is now so rapid.

The International Telecommunication Union
The International Telecommunication Union (ITU) (founded in 1865) is the UN's specialised agency for information and communication technologies (ICTs), which allocates global radio

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4   https://www.un.org/en/about-un/
5   https://digitalcooperation.org/wp-content/uploads/2019/06/DigitalCooperation-report-web-FINAL-1.pdf

spectrum and satellite orbits and develops the technical standards that ensure networks and technologies interconnect seamlessly.[6] Alongside its recommendations, it issues mandatory International Telecommunication Regulations (ITRs).

Contributors explained that the radio frequency spectrum is a resource still managed by governments by means of treaties, to ensure active participation and proper allocation of permits.

Despite this, the ITU brings together private sector actors, academics, member states and international and regional organisations. Contributors stated that this forum can deal efficiently with technical issues; however, they had some doubts regarding its capability to deal with ethical concerns.

The European Union

The European Union is an economic and political union of 28 member states. A couple of contributors argued that the EU can set a basic standard for the rest of the global community, as it did with the General Data Protection Regulation (GDPR). Europe could lead the way in encouraging the US upgrade to its governance standards, followed by large parts of Africa and Latin America, along with some parts of Asia. However, other contributors doubted that this would happen in practice, pointing out that (i) the EU is often still reactive in these areas; (ii) the US often has profoundly different beliefs and approaches; (iii) historical precedent is not encouraging: in the case of The Convention on Cybercrime of the Council of Europe (also known as the Budapest Convention in 2001), for example, the EU had the support of member states but other countries did not follow suit.

G20

The G20 Summit (formed in 1999) is formally known as the 'Summit on Financial Markets and the World Economy' and the participants are the leaders of 19 countries and the European Union.[7] Some contributors considered that the G20 can achieve consensus in areas of global economic governance for two reasons: (i) the number of members is lower than the UN's 193 member states; (ii) there have already been agreements to some binding AI principles; (iii) the G20 includes relevant actors that have differing views and opinions such as China, India and Russia. However, to work more effectively, the G20 might need to create a proper secretariat.

Organisation for Economic Co-operation and Development (OECD)

The OECD is an international organisation established in 1961 that works together with governments, policy makers and citizens.[8] The OECD can bring about agreements through its Development Committee, in which Europe and the US work together.

Treaties

Canada and France are calling for the creation of a new International Panel on Artificial Intelligence (IPAI) as a multi-stakeholder international study group. Although currently only France and Canada are involved, the will is there, and it is at least a starting point for understanding and sharing research results on AI in human rights, inclusion, diversity, innovation and economic growth. The goal is to narrow the gap in technological and policy development, and through such bilateral collaboration IPAI is proof of a promising window of opportunity.

Bilateral agreements are types of global governance that have worked for areas such as law enforcement and privacy, for example, the UK-US agreement signed on 3 October 2019 under the 'Cloud Agreement' on Cross-Border Data Access Agreement to Combat Criminals and Terrorists Online.

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6   https://www.itu.int/en/about/Pages/default.aspx
7   https://g20.org/en/summit/about/
8   http://www.oecd.org/about/

European Telecommunications Standards Institute (ETSI)

ETSI is a European Standards Organisation (ESO) created in 1988 that deals telecommunications, broadcasting and other electronic communications networks and services.[9] When ETSI emerged, European standards started to take prominence over national standards, so it is possible for the EU to set standards that national regulators need to implement.

In 1991, ETSI developed The Global System for Mobile Communications (GSM), a second-generation digital cellular radio access technology for Europe that became a worldwide success and is still operating today.[10] GSM started in Finland, was later adopted by the US and China and became profitable worldwide. Something similar could be replicated in future for the information and communication industry.

One limitation could be the absence of a big player, such as Russia. This can be overcome by encouraging Russia to participate more actively in standards setting, as previously occurred with The European Conference of Postal and Telecommunications Administrations (CEPT).

Whilst ETSI defines the technical standards for 'how' data should be transmitted to law enforcement agencies it is not their remit to define a standard for "when" data should or should not be transmitted.

Global Commission on Internet Governance

The Global Commission on Internet Governance is an initiative launched at the World Economic Forum in January 2014 to articulate and advance a strategic vision for the future of internet governance.[11] The commission is sponsored by the Netherlands and includes stakeholders from the private sector, government and academia. The idea is to develop a framework of commitments, that countries could sign up to: for example to ensure that no state agents are able to disrupt the technical infrastructure of elections or referendums.

The Global Commission on the Stability of Cyberspace (GCSC)

The Global Commission on the Stability of Cyberspace (GCSC) is helping to promote mutual awareness and understanding among the various cyberspace communities working on issues related to international cybersecurity,[12] and focusing on consistency of policy and norms relating to the security and stability in and of cyberspace. One contributor stated that this commission has come up with a series of norms and is looking at organisations to be champions in setting norms. This forum presents an opportunity to discuss future governance models.

An advantage of the GCSC is that it represents a wide range of geographic regions as well as government, industry, technical and civil society stakeholders with the legitimacy to speak on different aspects of cyberspace. A second advantage is that it will be linked to existing initiatives, such as the Global Commission on Internet Governance and the London Process, through special representatives.

The International Competition Network (ICN)

The ICN provides competition authorities with an informal venue for addressing practical competition concerns.[13] One contributor explained that this network might also be able to provide a useful foundation for the development of a much more comprehensive approach to deal with the problem of how to adapt competition and consumer law to deal with digital platforms. To some degree, if major competition authorities (such the European Union, the US and China) were willing to adopt

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9   https://www.etsi.org/about
10   https://www.etsi.org/technologies/mobile/2g
11   https://www.chathamhouse.org/about/structure/international-security-department/global-commission-internet-governance-project
12   https://cyberstability.org/about/
13   https://www.internationalcompetitionnetwork.org/about/

a similar approach, then this would have an enormous positive impact.

Industry-led Initiatives
Some contributors promoted the idea of reliance on corporate regulation along with national regulation to govern digital platforms.

The Open Data Initiative from Microsoft provides a platform for a single, comprehensive view of data, bringing together and enriching data from all lines of business, across all systems, to deliver real-time intelligence back to applications and services.[14]

One contributor explained that Huawei have embarked on something similar, after having analysed gaps in global standards and policy. An example of this is a $2 billion, five-year Global Transformation Programme to become a leader in safe software engineering.

Another positive experience comes from China, where dialogue was opened between the government and Alibaba. The government initially sought to collect taxes, but a later dialogue with Alibaba identified another relevant value to protect, that of 'job creation'. This was seen as more important than tax collection and was therefore prioritised. Similarly, other initiatives in areas such as child safety and counterterrorism have emerged in dialogues between industry and government.

Short-term Options
The group set out a range of potential responses that could be implemented over the next 2-3 years, suggesting that, rather than designing new structures or institutions, there is a need to focus on problems that require solving such as geopolitical conflict and lack of transparency. Contributors agreed that at this point no single forum alone can deal with technological governance.

The first proposal consisted of dividing up different issues into much smaller slices and dealing with them separately – the smaller the problem, the better the prospect of progress. This style of formulation can help to set priorities, and although there will be inconsistencies and fragmentation at the beginning, agreed norms can then move towards homogenisation with a formal, multilateral action.

The second proposal consisted of enhancing institutions that already exist, rather than trying to create new ones, by promoting small and diverse discussion groups that can bring forth innovative and creative solutions.

One contributor noted that all these solutions might overlap and represent a much deeper consensus and agreement moving forward, with one particular strand moving towards implementation: 'This is like innovation, you never know which one is going to kick off.'

Enhance Institutions that Already Exist
Contributors agreed on sending a strong message regarding the importance of bolstering institutions as opposed to attempting to create new ones. The opinions of participants were divided on which would be the best group to take on this task. The UN and EU saw some opposition for potentially being susceptible to Russian influence and for having a lack of representativeness, while the G20, OECD and newly created groups received more support.

After a brief discussion it was agreed that solutions cannot be solely be placed in the hands of the US and Europe, because their impacts are felt both in emerging countries and in the developed world. Powerful countries in the past presented a good method of global governance that later spread around the world because technology was only accessible to large nation states who committed first to treaties, but this paradigm has changed. However,

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14   https://www.microsoft.com/en-us/open-data-initiative

a centralised world where networks create nodes of political and economic power no longer exists in the same way, and these networks are increasingly shifting to a new distributed and decentralised world, where China and global companies can play a key leadership role along with other actors.

When focusing on the strengthening of current institutions rather than the creation of new ones, these organisations need to emphasise features such as smaller groups that include a diverse group of people, with contributions from private companies, data experts, academia, civil society and journalism.

One contributor was emphatic in proposing the idea that this group should be small. A small group of stakeholders can help to analyse if there is enough common interest to promote any form of collective understanding on these issues. If an increasing number of stakeholders are included, the group's efficiency would diminish.

Facilitate Small and Diverse Discussion Groups

How different groups are adequately represented in discussions about global governance is one of the hardest problems to overcome in this debate.

a) The Government

For some contributors, governments have a responsibility to respond to the negative side of the Internet. However, the people making decisions often lack an understanding of the technology and base their judgements purely on perceived political considerations. It seems that very few know how AI should best be handled within the policy community (the umbrella often encompasses everything from 5G to IOT). Many contributors explained that politicians need to become adequately informed of either the technical or ethical challenges and opportunities.

There is therefore a need to develop capacity and technological understanding among diplomats, government officials and politicians

through training and knowledge sharing. Given that there may be some resistance among more senior politicians to engage with these issues and recognise the limits of their understanding, one contributor proposed focusing on young people who are more open and accepting of change.

Another model proposed was to use one government to build communications, in particular for the UK to build a communications bridge between China and America. As one contributor argued, the UK could become a data container and a developer of solutions and certifications. The US and China could therefore benefit from this external source.

b) Companies

Some of the contributors stated that political tensions should not distract from lack of transparency as the main problem facing global governance. It is important to consider every technical proposal carefully and make it available on an open-access website, so the world at large can be informed of what exactly is taking place.

The entrepreneurial sector itself can then help to consider whether the market will want to follow a particular standard. Products are being constructed, especially in mobile communication and roaming, and to some extent in 5G, that use international standards irrespective of their origin.

c) Other Potential Participants

Some companies – and countries – also have disproportionate power in establishing the agenda for what standards should be set. Instead, these standards and solutions should be multi-layered and give equal weight to all stakeholders. In other words, involving only nations and companies is not enough. Governments representing their own interests do not have their own internal technical capability. Companies do not represent citizens, consumers, parents or children. Before any standards are defined, it is therefore necessary to build an ecosystem in which private entities

can participate and invest money in research and see how the markets behave, while considering the impact on people's lives.

An observatory platform can support discussions and offer some solutions. This conference was widely praised as a first step, because it enabled conversations to take place in a neutral space by allowing participation with a degree of protection from regulator intervention, IP consideration and political interference.

Citizens, and journalists in particular, can uncover the negative externalities of new technologies. As several contributors noted, the return on investment of the social and financial benefit in uncovering these negatives is enormous. Monetary benefits often return to the government and not to the civil society, as occurred with the Panama papers, therefore, a better solution would provide better incentives and returns to the civil society. For example, this could mean creating a similar model to the ACC in the US, where a whistle-blower could get 20% of the money as return. Academia can also play an important role in clarifying the issues, defining priorities and proposing solutions regarding AI and big data.

Underinvestment in Experts and Diversity
The current system, however, is underinvested and there are too few experts and limited diversity. There was agreement among participants from a think tank, IOs and academia that it is necessary to create a group with diversity in terms of countries and people (professions, ethnicity, and gender) represented, and to engage civil society to a much larger degree to find international solutions. Some concerns were raised due to the inaccessibility of such debates for some stakeholders because of its expense and also because the incentives are sometimes unclear.

Contributors proposed making it easier for people to participate, educating stakeholders, offering resources and including groups such as the civil society. Another contributor explained that there are already initiatives on this.

The Netherlands and the UK have jointly funded an initiative through the Global Forum on Cyber Expertise (GDFC) to increase the representation of women from developing countries in these debates.

There is an opportunity to change incentives and create pressure for politicians and companies through pressure from both their voters and consumers. The contributors noted that in Asia there is a great focus on peer pressure to enhance good practice and that this could be replicated in other parts of the world, through creating and publicising rankings and social hierarchies.

The Necessity of Urgency
The digital economy, technological capabilities and the rapid pace of development of digital technologies are transforming both economies and societies. Current systems of governance often cannot keep up and there is a clear absence of any coordinated approach. Facebook's Cambridge Analytica scandal shows people are often observing the 'car crash' after it has already occurred, rather than noticing the risk building up right before.

For some contributors, the need to regulate is becoming urgent, as all aspects of governance are lagging behind advancements in technology. Others believe that the systems will respond as technology changes, but whenever a standard is set, people will try to work around it, creating a constant race between private actors and regulators. For example, blockchain started as a crypto currency to take away the power of the central banks, but now central banks are looking at crypto currencies to avoid economic sanctions.

Although it may not be advisable to move ahead with regulation that anticipates future developments, this may be hard to avoid because of the unpredictable nature of technological development. Moreover, the speed of innovation is currently so fast that regulation may not be responsive enough. Therefore, at the moment digital creation comes

first and then the government has to respond and try to come up with rules.

Participants representing the private sector remarked that a clearer definition of normative stances and values is needed. Otherwise, a crisis of governance and accountability could be precipitated, threatening free and open trade, easy and reliable communication, data flows and connectivity. However, it seems that just in the aftermath of such crises it is possible to reach an agreement, although the dominant actors will then set the standards, resulting in other stakeholders' participation being limited. Therefore, participants were supportive of the idea that creating a sense of immediacy and urgency would be advantageous in order to reach agreement on core values without losing representation.

Finding a Common Ground

Attendees stated that it is possible to achieve a degree of consensus if a core value is defined first. The ethical debate on many of the questions that might illuminate the emergence of social norms, and provide a platform for government policy, law and regulation, is rudimentary at best. There are also double standards across jurisdictions that need to be addressed on an ethical level. For example, Apple removed the Hong Kong iMap from the Hong Kong App store; this map had allowed protesters in the current anti-government uprising to track on-call police movements. However, the map remained in the UK App store.

It was explained that the core values must be based on structures of trust at any level of governance. Contributors went on to define core value with the analogy that the right to life is a fundamental right (the core value), although there can be some disagreement on subjects such as capital punishment and abortion.

One contributor explained that in relation to AI there are three different groups, the West, the East and the Catholic South, that consider as their core values dignity, responsibility, externality and autonomy. Another contributor agreed, but added that safe communications

between citizens, privacy and protection from cyber-attacks are also of core significance.

However, why not use Chinese values for Europe? Some contributors supported this idea, showing that China has moved forward with the future of internet governance, particularly with reference to Alibaba and the Chinese online payment system. One contributor explained that, in China, businesses see themselves as part of a larger system while in Western cultures businesses often see themselves as separate entities in conflict with the government. However, other contributors disagreed, as some of China's core value approaches contradict Western values, in particular regarding human rights.

One contributor proposed starting to build a commonality of values by focusing first on non-controversial issues such as scientific engineering in areas in which agreement is feasible (5G for example), even if these issues can then be tied to complex problems when translated back to the national level. At a later stage, there can be no reconciliation of value differences (as can be seen in encryption models). This approach has been useful in the past, such as in genetics and embryology where there are few international laws but important norms. As yet, it is not clear if it would be convenient to apply the same principles to the governance of AI and new technologies.

Longer-term possibilities

The group then looked at longer-term options in the 5-15-year time horizon.

There is a need for more innovative and creative solutions, while successful past experience can give guidance in what practices to adopt to reach common ground. Government and private companies are already highly networked and the infrastructure is already installed; therefore, retrofitting will take time.

Several times during the conference, there was a call to learn lessons from other technologies, particularly in the field of space exploration.

The first goal of any new body is to develop trust.

There are many initiatives and debates already underway within this broad space, some of which could, in time, increase both the political will for action and other improved options. Standards bodies for internet regulation already exist (as was covered in the morning session). Two international processes can have impact in the longer term: the Global Commission on Internet Governance and the Global Commission on the Stability of Cyberspace (GCSC).

In the implementation process, flexibility is important in this fast-moving world of technology. It is necessary to set out responsibilities clearly, without affecting innovation. Therefore, rather than focusing on law and regulation, it may be much more effective to focus on confidence building, knowledge sharing and accepted values and normative approaches. Where whole communities agree about a certain type of behaviour, such as using AI for traffic control for example, the relevant laws can then be created and used to set up guidelines that can be adapted according to the prevailing conditions.

Successful Examples in other technologies
One contributor also noted that it would be good idea to examine digital economics research over the past 25 years, to establish whether the research will have had a positive impact, to learn from regulatory mistakes (made previously in the telecommunications sector) and to ensure that these issues are not made worse in the future.

A continuing theme during the conference was the need to learn lessons from other types of technologies, to show that other governance models operating in different domains may be instructive. Therefore, the contributors considered that an equivalent body can work in

the information and communication industry. Examples of these bodies are the following:

- The Financial Stability Board (FSB) is an international body that monitors and makes recommendations about the global financial system by coordinating national financial authorities and international standard-setting bodies.[15] This can be replicated with open data like metadata;

- The International Energy Agency (IEA) was initially designed to help countries co-ordinate a collective response to major disruptions in the supply of oil, such as the crisis of 1973-4;

- In the UK, embryology is a good example, as there is no international treaty governing it and we are seeing an unregulated 'Wild West' in various countries. The UK Report from the Committee of Inquiry into Human Fertilisation and Embryology, commonly called the Warnock Report, of 1984 includes the participation of experts, the public and UK parliament to come up with a set of standards for other countries to adhere to.[16] Similar examples in the US include US states and companies' commitments to climate change and the American Traffic Safety Services Association; the Australia-New Zealand Counter-Terrorism Committee which works to set rules for blocking access to domains hosting terrorist and abhorrent violent material. Working in conjunction with the industry, governments can manage a crisis by quickly blocking access during an attack;

- The European Space Agency's rules to manoeuvre satellites to prevent the thousands of satellites now being put into orbit by companies such as Space-X satellite crashing into existing satellites.

Additionally, these bodies share a strong expertise and can work in a monitoring capacity in the validation or certification of data or

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15   https://www.fsb.org/about/
16   https://embryo.asu.edu/pages/report-committee-inquiry-human-fertilisation-and-embryology-1984-mary-warnock-and-committee

communication infrastructure to help avoid abuse and misuse.

Global Governance and Trust

The communications infrastructure is a valuable shared resource which has remarkably rapidly become embedded in every aspect of daily life. This is about to be amplified in its capability by the likes of AI and IOT, which in turn also increases the risks of predation, exploitation and attack. Building trust, reliability and safety into that infrastructure is a large and shared global task.

The Japanese Prime Minister Shinzo Abe told an audience at the World Economic Forum in Davos that it was time to 'rebuild trust' in global trade. Contributors agreed that it is paramount to re-establish trust in a market environment where there is great suspicion and rampant exploitation from companies.

Permission-less innovation in many cases has led to permission-less exploitation. There is little doubt that technology advances are heavily driven by massive commercial investment, and therefore standards are promoted by the industry for their own benefit. These standards cover issues like how to operate in the marketplace and how companies deal with cyber-security issues. This happens at the same time as nations states find themselves in a wild scramble to catch up with the governing of cyberspace.

There are two main factors holding back the necessary trust: (i) industrial era-based policies: economic policies are constructed around the concept of finite capital assets and we are trying to apply them in a world where there are infinite capital assets; (ii) government agencies are based on management concepts that were applied to companies that the agencies were created to regulate in the first place.

For businesses there is a very strong case for agreeing on common standards. This could be achieved by means of:

- Voluntary, market-based approaches, where industries such as the automotive and banking industry have strong interest in facilitating new solutions. Agreeing a common standard for the car industry, for example, would mean that goods can be sold across national borders;

- Government incentives used to encourage business initiatives to tackle issues like terrorism, the abolition of child slavery and the dark web.

Interoperability/data portability. If Facebook open up their data (as per Cambridge Analytica) for anyone to use, then that can have serious consequences; there are therefore many trust issues.

Civil society requires the agreement of certain standards. Facebook and the media are processing information through their algorithms and this has a couple of consequences: first, nobody knows what information goes in and what comes out, and second, everybody does not receive the same news and information, and sometimes this can exclude affected people. This is different to how traditional media works; if a newspaper publishes a story it makes an editorial judgement based on evidence explained in the report, which is published and accessible to all.

Contributors proposed establishing a procedure using an open Application Programming Interface (API) that can show what's coming in and going out. This will allow for the protection of privacy. A third party can then build their own public interest algorithm, take a look at the consequences of what goes in and what comes out and can draw their own conclusions based on those considerations.

The implementation

If a new body is to be created, then it needs to be flexible with a capacity to evolve. It must also remain experimental and include public engagement from the start. To maintain and ensure its independence and resilience this body

would need funding from a source like the European Commission.

In the near future, big data is going to introduce a new form of governance. A recent forum on AI detailed what was referred to as 'distributed participatory democracy', where every citizen of a future democracy can have a personal vote on any issue (from how to construct a new bridge to a declaration of war on another country). This complex task would not be undertaken by the individual, but by AI, which would know the individual's political predisposition.

Contributors stated that the way to implement standards effectively would involve creating them in a commercially rational fashion to attract investment and with transparency and participation from civil society in the decision-making process.

Protocols can be used to set standards, rather than top-down regulation of companies. They are mentioned by the GDPR, and the European Commission has been pushing to mandate protocols for platforms.

An independent body could audit the protocol layer and interoperability of data, and set an open source standard as to how interoperability and data portability should work that covers online identity systems.

Concluding Comments

The Fourth Industrial Revolution is progressing at a great pace in the developing and emerging world and applies to a range of aspects of life from trade to AI.

Contributors described multi-disciplinary challenges in different areas such as data, competition, innovation and cybersecurity. They explained that when local rules have a

trans-border effect, challenges and complications arise. Currently, there is a geopolitical conflict created by differing systems around the world that often pull in competing directions (the US, China, Russia), particular in tensions between privacy, security, intellectual property and human rights.

The contributors in general started off quite pessimistic about the scale of the challenges faced. However, throughout the symposium, this pessimism was tempered through realism and a move toward more practical solutions.

Contributors analysed different international and regional initiatives, ranging from the UN to standard-setting bodies and concluded that this can be helpful in a short-term basis if they comply with some features such as the following:

- Embody multi-national rules and standards, while still being informed by national values that arise from the demands and priorities of local communities, nation states and national ideologies, that can be implemented successfully in the global marketplace;

- Develop a common core/value in which all the players that have an interest can create agreement and cooperation;

- Accept that no single forum can deal with these global challenges alone;

- Empower small and diverse groups to take on the challenges collectively;

- create a sense of urgency to reach agreement.

In the long term, values should be agreed, and trust built. If international bodies are to be created, they should be flexible and inclusive, representing a range of perspectives from companies to civil society.

Part III: Participant Biographies

RICHARD ALLAN
Director of Policy, Facebook Europe

Lord Richard Allan joined Facebook in June 2009 to lead the company's public policy work in Europe, Middle East and Africa. In March 2018, he moved to a new role developing solutions across a portfolio of global policy issues. Richard's current focus areas include the conduct of politics online, the digital economy, messenger services, and global connectivity. Prior to joining Facebook, Richard was European Government Affairs Director for Cisco Systems from September 2005. He has also been an academic visitor at the Oxford Internet Institute. From 2008 to 2009 Richard was Chair of the UK Cabinet Office's Power of Information Task Force working on improving the use of government data. Richard was an elected Member of the UK Parliament between 1997 and 2005, and was appointed to the House of Lords in 2010. In the early part of his career Richard was an archaeologist and created software for the UK's National Health Service – he remains equally fond of Latin and SQL.

ALESSANDRO ARDUINO
Co-Director, Security & Crisis Management International Centre, Shanghai Academy of Social Sciences

Dr Alessandro Arduino is the co-director of the Security & Crisis Management International Centre at the Shanghai Academy of Social Science (SASS-POLITO) and external affiliate at the Lau China Institute, King's College London. Dr Arduino two decades of experience in China encompasses risk analysis and crisis management. His main research interests include, Belt & Road Initiative security, private military security companies, sovereign wealth funds, China's political economy in Central Asia and the MENA region. He is the author of several books and he has published papers and commentaries in various journals in Italian, English and Chinese languages. Dr Arduino consults several organizations on security, risk assessment and mitigation including UNDP, EBRD and AIG. His latest books are: *Securing the Belt and Road Initiative* (Palgrave 2018) – *China's Private Army. Protecting the New Silk Road* (Palgrave 2017). He has been appointed Knight of the Order of the Italian Star by the President of the Italian Republic.

AZEEM AZHAR
Chief Editor, Exponential View

Azeem Azhar is a strategist, analyst, and investor. Azeem is on the board of the Ada Lovelace Foundation, is a venture partner at Kindred Capital and an advisor to Fabric Ventures. He is a member of the World Economic Forum's Global Future's Council on the Digital Economy and Society and co-curates, CogX, Europe's largest festival of AI and emerging technologies. Through his widely praised newsletter, ExponentialView, he brings a unique background to explain the intersection of breakthrough technologies and the economies and societies in which we live. Subscribers include investors, academics, and journalists around the world. Azeem has been an award-winning entrepreneur and an investor in many technology startups, especially in the Artificial Intelligence sector and speaks regularly on television and radio (BBC, Sky, CNN amongst others) and is a worldwide speaker.

KATJA BEGO
Principal Researcher, National Endowment of Science, Technology and the Arts

Katja Bego is a principal researcher and data scientist in Nesta's technology futures team. Her work focuses on studying the impact of emerging technologies such as AI on our societies, and how these new innovations can be harnessed for social good and for the benefit of everyone. Katja is the coordinator of the European Commission-funded NGI Forward project, tasked with helping shape the strategy and policy agenda of the Next Generation Internet initiative, the EU's ambitious new flagship programme which seeks to build a more democratic, inclusive and resilient future internet by 2025, and previously also led the EU Engineroom project, also under the NGI umbrella. She regularly comments on topics relating to the future internet in outlets such as *Wired*, the BBC, *Financial Times* and *The Guardian*. Before joining Nesta, Katja worked as a data scientist in the private sector and as a researcher at the MIT Media Lab. She has a degree in economics and political science from Wellesley College in the US.

EYAL BENVENISTI
Professor of Law, the University of Cambridge

Professor Eyal Benvenisti is the Whewell Professor of International Law at the University of Cambridge, and the Director of the Lauterpacht Centre for International Law. He is also CC Ng Fellow in Law at Jesus College and Visiting Professor of Law at The Hebrew University of Jerusalem and Global Visiting Professor at New York University School of Law. Benvenisti's areas of research and teaching are international law, constitutional law and administrative law. He is Member of the Institut de Droit International and of the Israeli Academy of Sciences and Humanities. He is a Co-Editor of the *British Yearbook of International Law,* and was on the Editorial Board of the *American Journal of International Law* (2009-18).
He was Project Director for the "GlobalTrust – Sovereigns as Trustees of Humanity" research project, funded by an ERC Advanced Grant (2013-18). He was Visiting Professor at Yale, Harvard, Toronto, Columbia, Pennsylvania, Michigan, gave special courses at The Hague Academy of International Law (2013) and the Xiamen Academy of International Law (2017). Significant publications include: *Between Fragmentation and Democracy: The Role of National and International Courts* (Cambridge University Press, 2017, with George W. Downs); *The Law of Global Governance* (The Hague Academy of International Law "pocket book" series, 2014); *EJIL Foreword: Upholding Democracy amid the Challenges of New Technology: What Role for the Law of Global Governance?*, 29 *European J. Int'l L.* 9 (2018); *Sovereigns as Trustees of Humanity: On the Accountability of States to Foreign Stakeholders*, 107 American Journal of International Law 295 (2013).

ANDREW CAINEY
Associate, Chatham House

Mr Andrew Cainey is an experienced advisor on China and the opportunities and challenges that China offers for foreign companies and governments, combining both commercial and policy/political perspectives. He first visited China in 1981 and has lived for most of the past twenty years in China, Korea and Singapore. He now splits his time between the UK and Asia.
He is Co-Founder of Asiability Ltd, an advisory firm; an Associate Fellow in Chatham House's Asia-Pacific Programme; and a Senior Fellow in the International Centre (Security and Crisis Management) of the Shanghai Academy of Social Sciences. He is a frequent writer and speaker on China's Belt and Road Initiative; its integration into the global economy; and the implications for international economic governance. Mr Cainey was previously the managing partner of Booz & Company's Greater China consulting business; the partner leading the Rt Hon Tony Blair's Asian government advisory practice; and the partner in charge of Boston Consulting Group's Asian financial institutions practice. He was also a Senior Fellow, researching Chinese finance, in the Fung Global Institute, a Hong Kong-based think tank and a Founding Fellow at the Hong Kong Institution for International Finance. Mr Cainey has an First Class MA (Hons) in Economics from Clare College, Cambridge; an MBA with Distinction from Harvard Business School; and is proficient in Mandarin Chinese.

FRANÇOIS CANDELON
Senior Partner and Managing Director, Boston Consulting Group, Shanghai

François Candelon has over 26 years of service at BCG. Since 2012, he has been working with the most advanced technology companies based out of BCG's Shanghai office. He is now also partially based in Europe where he leads BCG GAMMA, the Data Science and AI arm of BCG, for BCG's Technology, Media, & Telecomommunications clients. As a Fellow with the BCG Henderson Institute, BCG's global think tank, François focuses his research on the impact technology will have on society and its implications on geopolitics, national competitiveness, and social stability. François is a frequent speaker on these themes, including giving a TED talk, and has contributed numerous articles on the topic, including in outlets such as the Harvard Business Review and MIT Sloan Management Review. François received his predoctorate degree in industrial economy while a research assistant for CERNA (Centre d'Économie des Ressources Naturelles) and holds a degree in engineering from École Polytechnique and MINES Paris Tech. Previously, François lead BCG's Telecom sector globally.

MARTIN CAVE
Professor of Law, London School of Economics

Martin Cave is an economist specialising in competition law and the regulation of network industries, including telecommunications. He has held professorial positions at Brunel University, Warwick Business School, and the London School of Economics, where he is now a visiting professor. From 2012 to 2018 he was an inquiry chair at the UK Competition and Markets Authority, and now chairs Ofgem, the UK energy regulator. He is the author of many books in the communications field, including Spectrum management, Cambridge University Press 2016, now translated into Chinese, Korean and Spanish. He has written academic papers in the fields of access regulation, universal service, fixed and mobile competition, broadcasting policy, spectrum management and two-sided platforms. He has undertaken independent advisory work for regulators in Africa, Asia, Australasia, Canada, Europe, and Latin America, and prepared sectoral regulatory reviews for the UK Government in the fields of spectrum management, airports, social housing and water.

SEÁN CLEARY
Strategic Adviser, World Economic Forum

Seán Cleary is Chairman of Strategic Concepts (Pty) Ltd; and Executive Vice-Chair of the FutureWorld Foundation. He serves on the Advisory Boards of EIT Climate-KIC, the WLA-Club de Madrid, Institute of Advanced Studies, Kőszeg and Stichting Para Limes (Netherlands). Seán is Senior Adviser and Senior Fellow of the Salzburg Global Seminar; Special Advisor to the Global Solutions Initiative, Executive Consultant to the UAE Prime Minister's Office, and a member of the World Economic Forum's Global Future Council on Geopolitics. He studied social sciences and law at the Universities of Cape Town and the South Africa and has an MBA from Henley Management College. He served on the staff of the Commander Maritime Defence in South Africa, before diplomatic service in Iran (1970-75), South Africa (1976-1978), and the USA (1978¬83); and as Chief Director in Namibia (1983-85), where he initiated negotiations between Namibia's political parties, effected the release of political prisoners, and the adoption of a Bill of Rights before independence. He served on the Facilitating and Preparatory Committees of the South African Peace Accord, chairing the Working Group on the Code of Conduct for Political Parties and Organizations; the Executive of the NEPAD Business Group; and as Senior Adviser to the WEF's Arab Business Council. He chaired the Advisory Board of the Global Economic Symposium, and served on the Boards of LEAD International, Carbon War Room, Rocky Mountain Institute; Operation Hope, the International Foundation for Electoral Systems, and Salzburg Global Seminar. He teaches corporate strategy and enterprise risk management at business schools, and strategy and global trends at Defence Staff Colleges. He has received academic and public service awards, been published in academic and policy journals, and co-authored Resilience to Risk (2006), and Global Risks (2007).

DIANE COYLE
Professor of Public Policy, the University of Cambridge

Diane Coyle was previously Professor of Economics at the University of Manchester and has held a number of public service roles including Vice Chair of the BBC Trust (2006-2014), member of the Competition Commission (2001-2009), and member of the Migration Advisory Committee (2009-2014). She is currently a member of the Natural Capital Committee, an expert adviser to the National Infrastructure Commission and a member of the Council of Economic Advisers. She was awarded a CBE for her contribution to the public understanding of economics in the 2018 New Year Honours.

MISCHA DOHLER
Professor of Wireless Communication, King's College

Mischa Dohler is full Professor in Wireless Communications at King's College London, driving cross-disciplinary research and innovation in technology, sciences and arts. He is a Fellow of the IEEE, the Royal Academy of Engineering, the Royal Society of Arts (RSA), the Institution of Engineering and Technology (IET); and a Distinguished Member of Harvard Square Leaders Excellence.
He is a serial entrepreneur; composer and pianist with 5 albums on Spotify/iTunes; and fluent in 6 languages. He acts as policy advisor on issues related to digital, skills and education. He has had ample coverage by national and international press and media. He is a frequent keynote, panel and tutorial speaker, and has received numerous awards. He has pioneered several research fields, contributed to numerous wireless broadband, IoT/M2M and cyber security standards, holds a dozen patents, organized and chaired numerous conferences, was the Editor-in-Chief of two journals, has more than 200 highly-cited publications, and authored several books. He was the Director of the Centre for Telecommunications Research at King's from 2014-2018. He is the Cofounder of the Smart Cities pioneering company Worldsensing, where he was the CTO from 2008-2014. He also worked as a Senior Researcher at Orange/France Telecom from 2005-2008.

MARTIN FRANSMAN
Professor of Economics, Edinburgh University

Martin Fransman is Professor Emeritus of Economics at the University of Edinburgh, now living in London. He is an authority on innovation and competitiveness. He won the 2008- 2010 Joseph Schumpeter Prize for his book *The New ICT Ecosystem* (Cambridge University Press). His other book prizes include the Wadsworth Prize for the best business book published in the United Kingdom for *Telecoms in the Internet Age – From Boom to Bust to ...?* (Oxford University Press), and the Japanese Prime Minister's Masayoshi Ohira Prize for *The Market and Beyond* (Cambridge University Press). His latest book is *Innovation Ecosystems – Increasing Competitiveness* (Cambridge University Press) which examines two questions: How does innovation happen? and Who makes innovation Happen? He is now working on the question: How should innovation ecosystems be designed to achieve objectives such as increasing competitiveness and productivity and meeting social challenges in areas such as climate change and health?

IAN GOLDIN
Professor of Globalization and Development, Oxford University

Ian Goldin is the Oxford University Professor of Globalisation and Development, the Director of the Oxford Martin Programme on Technological and Economic Change and the founding Director of the Oxford Martin School. Ian previously was World Bank Vice President and the Group's Director of Policy, after serving as Chief Executive of the Development Bank of Southern Africa and Economic Advisor to President Nelson Mandela. He has served as Principal Economist at the EBRD and Director of Programmes at the OECD Development Centre. Ian has a BA (Hons) and BSc from the University of Cape Town, an MSc from the London School of Economics, and a MA and DPhil from the University of Oxford. He has been knighted by the French Government and has published 21 books, including: *Age of Discovery: Navigating the Storms of Our Second Renaissance; Development: A Very Short Introduction; The Butterfly Defect: How Globalisation Creates Systemic Risks and What to Do; Divided Nations: Why Global Governance is Failing and What Can Be Done; Exceptional* People: How Migration Shaped our World and Will Define our Future; and, *Is the Planet Full?* He presented the BBC Series *After the Crash* and documentary *Will AI Kill Development?* Ian has been a non-executive Director on numerous boards, is the Chair of the CORE-Econ initiative to modernise the teaching of economics and advises governments and leading global companies.

LIYING GUO
Deputy Director, UK-China Global Issues Dialogue Centre, Jesus College, the University of Cambridge

Liying Guo is the Deputy Director of UK-China Global Issues Dialogue Centre at Jesus College of the University of Cambridge and is the key founding person of the Centre. Liying has been reading as PhD Student at the Centre of Development Studies, the Department of Politics and International Studies, the University of Cambridge with research subject "Critical Success Factors Through the Process of Cross-Border Mergers and Acquisitions: a Comparative Study of Chinese Companies and Their Western Peers". Liying received her Master of Business of Administration from the Judge Business School, the University of Cambridge. Liying did her Bachelor of Economics and Master of Arts at the University of International Business and Economics in China. Liying has recent investment advisory experience advising Chinese companies on their cross-border mergers and acquisitions especially in infrastructure related projects. Ms Guo earlier worked as a senior executive for the University of Cambridge's executive education program development and management. Liying also has over four years of strategic management consulting experiences with A.T. Kearney and three years of political and business news reporting as a TV field correspondent at the International Channel of China Central Television.

JULIAN HORN-SMITH
Former Deputy Chief Executive of Vodafone Group

Sir Julian Horn-Smith was a member of the founding management team of Vodafone Group Plc and is considered to be one of the principal architects in the development of Vodafone's International Strategy. He retired from the Vodafone Board in July 2006, where he held the title Deputy Chief Executive Officer and Group Chief Operating Officer. Sir Julian remains in the global telecom and banking sectors. He is a Senior Advisor to UBS Investment Bank (since 2007), in London. In 2006 he joined the Board of Digicel Group (the leading Caribbean, Central American and Pacific Operator). Since 2014 he has been a Board Director of Veon. Sir Julian is an Advisor to The Chairman and CEO of SmarTone, a public company based in Hong Kong. Since 2015 he has been The Chairman of eBuilder and its subsidiary Marakanda AB (a Swedish software company based in Kista, nr Stockholm). Sir Julian founded and Co-Chairs The TATLIDiL Conference (Between the UK and Turkey with the Rt Hon Jack Straw, former Foreign Secretary. The conference is one of the cornerstones in the relationship between the UK and Turkey. Sir Julian received a knighthood from HM The Queen in the 2004 Queen's Birthday Honours List for his services to international telecommunications. He was instrumental in the foundation of mobile networks in several countries, including Egypt, South Africa, Kenya, The Netherlands, Greece, Turkey, Australia, New Zealand, Sweden, Germany, Ireland and others. Sir Julian served three terms as a Pro-Chancellor at Bath University and Chaired the School of Management's Advisory Board. In recent years, he has served as a Director on a number of well known Company Boards, including; Lloyds Banking Group plc (post The GFC), Smiths Group, eAccess in Japan (now Softbank), Acer Inc and De la Rue plc. Also, during his career at Vodafone he was a member of a number of publicly quoted Telecom Companies, including Verizon Wireless in The US, China Mobile, SFR in France and Chairman of the Mannesmann Management Board and subsequently, the Mannesmann Supervisory Board in Germany.

PAUL KILLWORTH
Deputy Director, Strategic Policy of Government Communications Headquarters

Dr Paul Killworth is the Deputy Director Strategic Policy in GCHQ. He joined the organisation in 1998, following an academic career as a Social Anthropologist, and has since worked in varied operational and policy areas. He headed GCHQ's Cyber strategy for several years and was closely involved in the Investigatory Powers Act (2016). He has also worked for the Ministry of Defence in Iraq and the Balkans, for the Foreign and Commonwealth Office as a Political Counsellor in British Embassy Kabul and was a member of the 2015 Strategic Defence and Security Review team in the Cabinet Office. Paul is married, with three children. In his limited spare time he studies medieval history, writes and talks on emerging technology, privacy and security issues, and occasionally still codes software.

TOM KING
Practice Lead of Political Due Diligence, Global Counsel

Tom King leads on political due diligence at Global Counsel, a boutique political risk consultancy. He previously served as a researcher and speechwriter for MPs over two parliaments, before helping to establish specialist political due diligence as a key service for UK investors. Tom has advised on over 120 private equity deals across diverse sectors. At Global Counsel, Tom continues to provide investment-focused expertise, guiding clients seeking to understand international and domestic policy frameworks and the political and regulatory initiatives that can shape markets. He also provides strategic counsel to a number of our major digital technology clients. Tom also has a background in digital technology and its use in the public interest, having worked with leading investigative journalists at the Organized Crime and Corruption Reporting Project. In that role he had responsibility for building partnerships with technology firms in Silicon Valley, policy-makers involved in open data and open government, and anti-corruption advocacy groups across the globe. He has also founded two organisations concerned with the same ideas: Aviso Advisors, which has worked with several civil society groups aiming to grow and scale their work via digital means, and 22nd Century Democracy, which aims to focus minds on the long-term needs of liberal democracies struggling to adapt to a rapidly changing information environment.

XIAODONG LEE
Adjunct Professor, School of Public Policy and Management of Tsinghua University

Dr Xiaodong Lee is the Founder and Chief Executive Officer of Fuxi Institution, a non-profit organization which is focusing on Internet innovation and development. He is Research Professor and Director of Laboratory for Internet Infrastructure in Institute of Computing Technology (ICT) of Chinese Academy of Sciences (CAS), and the Adjunct Professor and Director of Center for Internet Governance in Tsinghua University. He serves as Vice Chairman of Internet Society of China, Member of Global Future Council of World Economic Forum, Commissioner of the Global Commission on the Stability of Cyberspace and, Commissioner of Global Information Infrastructure Commission. Formerly CEO of China Internet Network Information Center (CNNIC, 2013-2017), Vice President of ICANN (2011-2013), Founder CEO of National Engineering Laboratory for Naming and Addressing Technologies (2013-2017), Member of the Multistakeholder Advisory Group (MAG) of Internet Governance Forum (IGF) of United Nations (2014-2017), Member of the IANA Stewardship Transition Coordination Group (ICG, 2014-2016). He received his PhD in Computer Architecture from the Institute of Computing Technology of CAS. Dr Lee has contributed to the establishment of several international and domestic technology standards in the fields of domain name and email, the application of "dotChina", as well as the research and development of the first system of domain name services in China.

PATRICIA LEWIS
Research Director, Chatham House

Dr Patricia M. Lewis is the Research Director, International Security at Chatham House in London. Her former posts include: Deputy Director and Scientist-in-Residence at the Center for Nonproliferation Studies at the Monterey Institute of International Studies; Director of the United Nations Institute for Disarmament Research (UNIDIR); and Director of VERTIC in London. Dr Lewis served on the 2004-6 WMD Commission, chaired by Dr Hans Blix, the 2010-2011 Advisory Panel on Future Priorities of the OPCW, chaired by Ambassador Rolf Ekeus, and was Senior Advisor to the 2008-10 International Commission on Nuclear Non-proliferation and Disarmament (ICNND) chaired by Gareth Evans and Yoriko Kawaguchi. She was a Commissioner on the 2014-2016 Global Commission on Internet Governance chaired by Carl Bildt and is on the EEAS Space Advisory Board as a Senior Space Advisor to the EU Special Envoy for Space. Dr Lewis publishes widely on all aspects of international security including: chemical, biological, radiological and nuclear weapons; conventional forces; cyber security; space security; internet governance; terrorism; and conflict prevention. She holds a BSc (Hons) in physics from Manchester University, a PhD in nuclear physics from Birmingham University and an Honorary Doctor of Laws from the University of Warwick. She is a dual national of the UK and Ireland. Dr Lewis is the recipient of the American Physical Society's 2009 Joseph A. Burton Forum Award recognizing "outstanding contributions to the public understanding or resolution of issues involving the interface of physics and society".

MARK LEWISOHN
Group Managing Director, UBS

Mark is one of the most senior bankers at UBS Investment Bank with over 30 years' experience at the firm. He is a Group Managing Director and has acted for many years as Global Head of TMT (Technology, Media & Telecommunication) Investment Banking. Mark is Deputy Chair of the Council of the University of Cambridge. Mark was educated at Christ's College, Cambridge.
He graduated with a first class degree in History in 1984. Mark qualified as a Chartered Accountant with Price Waterhouse.
In 1989 he joined the corporate finance department of S.G. Warburg; his early career was based in Tokyo and New York and since 1995 in London, specialising in advising companies in the global telecoms sector. Mark has advised clients in relation to some of the most significant M&A transactions and equity raisings around the world. M&A experience includes advising Vodafone on its €200 billion acquisition of Mannesmann (the largest M&A transaction in the world to date), as well as Vodafone's ¥1.1 trillion acquisition of Japan Telecom (the largest foreign investment and involving the largest public offering in Japan to date). Capital markets experience includes leading the privatisation IPOs of Belgacom (Belgium), Telia (Sweden) and Swisscom (Switzerland), in each case the then largest IPO in the respective country to date. He has extensive experience of transactions in emerging markets, including advising on the largest investments to date in Africa (Bharti's $10.7 billion acquisition of Zain Africa) and India (Vodafone $11.1 billion acquisition of Hutchison Essar).

JU LIU
Deputy Director, 3GPP Account Department, Huawei

Ju Liu, Deputy Director of 3GPP Account Department of Huawei, has been involved in research, standard, product, business in the telecommunications Industry for more than 20 years. Now, he is responsible for Huawei 3GPP Domain Strategies Insight & Planning, help to build a healthy standardization ecosystem for the mobile industry. Prior to that, he was Technology Planning Director of Wireless Research Network, Vice Director of Huawei GUL Small Cell Product Line, Director of Huawei DT Mobile Innovation Center. Before Ju joined Huawei, he was responsible for Mobile Radio Specification Department in Alcatel-Lucent China, and System & Specification Department in LinkAir. He graduated from Harbin Institute of Technology, China, with a Master's Degree in 1998.

PREETAM MALOOR
Head, Emerging Technologies Division of Strategic Planning and Membership Department, ITU

Preetam Maloor is the Head of the Emerging Technologies Division, ITU, and an expert on Artificial Intelligence and international cyber-related public policy matters. He has been a key member of the ITU Secretariat at several major conferences including the 2012 World Conference on International Telecommunications (WCIT), 2010, 2014 and 2018 ITU Plenipotentiary conferences, the 2009, 2013, and 2021 World Telecommunication/ICT Policy Forums (WTPF), and the annual AI for Global Good Summit. He also serves as the Secretary of the ITU Council Working Group on international Internet-related public policy issues and the Expert Group on the International Telecommunication Regulations. Prior to joining ITU, Preetam spent nearly 10 years in the private sector, working primarily at research organizations such as Intelligent Automation Inc, a Rockville, Maryland-based research think-tank focusing on Artificial Intelligence-based applications, and at AT&T Research Labs, Florham Park, New Jersey in its Speech & Natural Language Research Group. He holds Master's degrees in Computer Science from Texas A&M University, College Station, and in Engineering and Public Policy from the University of Maryland, College Park. He has a Bachelor's degree in Computer Science and Engineering from the University of Mumbai.

ANDREW MITCHELL
Member of Parliament, UK House of Commons

Andrew Mitchell is the Member of Parliament for Sutton Coldfield. He was Secretary of State for International Development in the British Government from May 2010 until he became Government Chief Whip in September 2012. He was a member of the National Security Council in Britain and a Governor of the World Bank between 2010 and 2012. He was appointed to the Privy Council in 2010. Prior to joining the Cabinet in 2010, he also held numerous junior positions in Government (1992-1997) and in opposition (2003-2010). Andrew Mitchell is a Senior Adviser to Investec (since 2013) and Ernst & Young (since 2016). In 2017 he was appointed as a Senior Adviser to the African Development Bank (AfDB). Previously he served in the Army (Royal Tank Regiment) as a UN Peacekeeper before joining the international Investment Bank, Lazard where he worked on and off for 30 years. He was a Director of Lazard Asia and Lazard India as well as of Lazard London. He is a Fellow at Cambridge University; a Visiting Fellow at Harvard University and an Honorary Professor in School of Social Sciences for the University of Birmingham. Andrew was educated at Rugby School and Cambridge University, where he was elected as President of the Cambridge Union.

GEOFF MULGAN
CEO, National Endowment for Science, Technology and the Arts

Geoff Mulgan CBE is Chief Executive of Nesta, the UK's innovation foundation. Between 1997 and 2004 Geoff had roles in the UK government including director of the Government's Strategy Unit and head of policy in the Prime Minister's office. He has been a visiting professor at LSE, UCL and Melbourne University and senior visiting scholar at Harvard University, a regular lecturer at the China Executive Leadership Academy and president of the Innovation Design department of the Italian University of Design. He became a World Economic Forum Schwab Fellow in 2019. He advises many governments around the world on issues of strategy, innovation and policy. He is the co-founder of many organisations, including Demos, Action for Happiness, the Social Innovation Exchange and Uprising. His most recent book is *Big Mind: how collective intelligence can change our world* (Princeton); other books include *The Art of Public Strategy* (Oxford University Press) and *Good and Bad Power* (Penguin). His next book is *Social Innovation: how societies find the power to change* published by Policy Press in November 2019. His books have been translated into many languages.

JUSTIN POY
President and CEO, Dealer AIBOT Ltd, Toronto, Canada

Justin Poy has more than 30 years of experience in journalism, broadcasting and advertising. He is president and CEO of Dealer AIBOT Ltd and CEO of InnovaThree. He is President and Creative Director of The Justin Poy Agency, a full service award-winning marketing and advertising agency based in Toronto. Justin is also very active in charitable and community efforts, establishing himself early on as a leader and role model in the Chinese Canadian community. He sits on more than 20 boards and committees and participates in many philanthropic causes. He is a recipient of the Chinese Canadian Legend Award and received the Queen's Golden and Diamond Jubilee Medals for his outstanding community service and philanthropy.

KEVIN RUDD
Former Australian Prime Minister; President, Asia Society Policy Institute

The Honourable Kevin Rudd served as Australia's 26th Prime Minister (2007-2010, 2013) and as Foreign Minister (2010-2012). He led Australia's response during the Global Financial Crisis – he only major developed economy not to go into recession – and co-founded the G20. Mr Rudd joined the Asia Society Policy Institute in New York as its inaugural President in January 2015. Mr Rudd is Chair of the Board of the International Peace Institute, and Chair of Sanitation and Water for All. He is a Senior Fellow at Harvard University's John F. Kennedy School of Government, a Distinguished Fellow at Chatham House in London, a Distinguished Statesman with the Center for Strategic and International Studies in Washington DC, and a Distinguished Fellow at the Paulson Institute in Chicago. Mr Rudd is a member of the Comprehensive Nuclear Test-Ban Treaty Organization's Group of Eminent Persons. He serves on the International Advisory Board of the Schwarzman Scholars program at Tsinghua University, and is an Honorary Professor at Peking University. Mr Rudd is proficient in Mandarin Chinese. He remains actively engaged in indigenous reconciliation.

ADRIAN SCRASE
CTO, European Telecommunication Standards Institute; Head, Mobile Competence Centre of the 3rd Generation Parternship Project (3GPP)

Adrian Scrase is CTO within ETSI with operational responsibility for all of ETSI's standards production activities. He has more than 35 years' experience in the telecommunications field, which includes 30 years of experience in international standardization. He played a central role in the creation of the "3rd Generation Partnership Project" (3GPP) and is responsible for the operations of the 3GPP Project Co-ordination Group. He heads 3GPPs' Mobile Competence Centre (MCC) which is an International team of 20 experts who provide comprehensive support to the Project. He was also principally involved in the formation of the "oneM2M" Partnership Project and oversees ETSI's support to that initiative.

JEONGMIN SEONG
Deputy Director, McKinsey Global Institute

Jeongmin Seong is Senior Fellow at the McKinsey Global Institute, McKinsey & Company's business and economics research arm. He leads MGI research teams in China, working on global as well as emerging market-focused themes. Jeongmin's recent research has focused on globalization, technology, innovation and economic development. He has co-authored several MGI reports and discussion papers, including China and the World: Inside a changing economic relationship; Globalization in transition: The future of global trade and value chains; China's digital economy: Powering the economy to global competitiveness; The China Effect on Global Innovation; China's digital transformation; Artificial Intelligence: Implication for China; Notes from the AI frontier: Modeling the impact of AI on the world economy, Outperformers: High-growth emerging economies and the companies that propel them; China's choice: Capturing the $5 trillion productivity opportunity; China's role in the next phase of globalization. Prior to joining MGI, Jeongmin worked with companies around the world focusing on consumer facing industries including consumer electronics, retail, and automotive. Jeongmin also led McKinsey's emerging market growth service line. Prior to joining the McKinsey Shanghai office, Jeongmin was responsible for product marketing at Dell. Jeongmin is a graduate of Harvard Business School where he received his MBA degree.

DAVID SKELTON
Public Policy Manager, Google UK

David Skelton has worked at the forefront of politics, policy development and public service reform for over a decade and has been at Google for four years. He worked extensively in the private sector and with senior politicians and decision makers. Prior to joining Google, David was Deputy Director and Head of Research at Policy Exchange between 2011 and 2013. After leaving Policy Exchange, David founded 'Renewal', with the aim of broadening the appeal of the Conservative Party and pushing the policy concerns of the "left-behind". Renewal was described by *The Economist* as the "brains trust" of the modern Tory Party and by *The Times* as "tearing up the definitions of left and right". He was Head of Public Affairs at Weber Shandwick and worked as a senior adviser at Fishburn, working with a number of blue-chip clients. He also spent seven years as a management consultant, providing strategic advice to Police Forces, universities, local authorities and CEOs. He recently published a book called *Little Platoons,* described by the *New Statesman* as "fascinating and essential". David has written regularly for a number of publications, including *The Guardian, New Statesman, The Daily Telegraph, Prospect, Conservative Home* and *The Spectator*, as well as appearing on BBC Radio and TV and Sky News.

JEREMY THOMPSON
Chief Security Officer, Huawei UK

Jeremy Thompson is Executive Vice President Huawei UK and Ireland and overseas the development of Huawei's UK and Ireland business. Jeremy is also Cyber Security Officer (CSO) for Huawei UK and Ireland. Jeremy joined Huawei UK and Ireland in 2012 as Deputy Managing Director with specific responsibility for carrier strategy, business change and the key customers. In 2015 Jerry was based in Shenzhen, China. This role included supporting the development of Huawei's carrier strategy globally and involved operations and strategy development in Asia, Europe and South America. Prior to Huawei, Jerry worked for 20 years in senior management roles for BT Group in the UK and other parts of Continental Europe, including Spain and the Nordics. Jeremy previously worked in the USA and UK for an IBM Software company and consulting businesses. Jerry attended London University, London Business School and Greenwich University.

WILLIAM WANG
Former HR Director, Alibaba Group

Mr Wang is the former vice President of organizational development of Alibaba group. He is an expert on organizational governance and has extensive experience in organizational governance issues in the digital economy. In the process of Alibaba's transformation from a corporate governance model to a platform governance model, he participated in the design of dialogue mechanism with multiple goals and the value reconstruction among multiple stakeholders on the platform.

In the process of further transforming Alibaba into an ecological governance model of deep collaboration among multiple platforms, he creatively designed an organizational governance method called "co-creation", which provided a new path for the inclusive coexistence of multiple modes. Mr Wang has been working in the forefront of the communications and Internet industries for the past 25 years. He has personally experienced the development process of China's digital economy and has a unique understanding of the process, challenges and deep structure of Chinese society digitization. At present, Mr Wang is doing a research about the impact of different ways of thinking and generative paths on governance models when Chinese and western cultures deal with organizational governance issues. Mr Wang is also focusing on the education of the next generation, including how creativity, social responsibility and global vision can really become the core competence of the next generation of young people. His research project, consciousness and entrepreneurship, is trying to refine the DNA structure of entrepreneurship as a model for future humanities education.

TOM WHEELER
Visiting Fellow, Brookings Institution, Senior Fellow, Harvard Kennedy School

Tom Wheeler is a businessman, author, and was Chairman of the Federal Communication Commission (FCC) from 2013 to 2017. Presently, he is a Visiting Fellow at the Brookings Institution, and a Senior Fellow at the Harvard Kennedy School. During the Obama-Biden Transition of 2008-09 Mr Wheeler led activities overseeing the agencies of government dealing with science, technology, space and the arts. Among his many activities as an entrepreneur, he co-founded SmartBrief, the Internet's largest curated information service for vertical markets. He was President and CEO of the National Cable Television Association (NCTA) from 1979 to 1984 . He served as CEO of several high-tech companies, including the first company to offer high-speed delivery to home computers and the first digital video satellite service and from 1992 to 2004, of the Cellular Telecommunications & Internet Association. He is CEO of the Shiloh Group, a strategy development and private investment company specializing in telecommunications services. Mr Wheeler's newest book is F*rom Gutenberg to Google: The History of Our Future* (Brookings Press, 2019). His commentaries on current events have been published in numerous leading publications. Presidents Clinton and Bush each appointed him a Trustee of the John F. Kennedy Center for the Performing Arts. He is a proud graduate and recipient of an Alumni Medal of The Ohio State University. He also received an Honorary Doctor of Humane Letters from Rochester Institute of Technology.

PETER WILLIAMSON
Professor of International Management & Chair, UK-China Global Issues Dialogue Centre, Jesus College, the University of Cambridge

Peter Williamson is Professor of International Management at Judge Business School and Fellow of Jesus College, University of Cambridge. He divides his time between research and consulting on global strategy, M&A, and business ecosystem innovation and serving as non-executive director of several companies spanning financial services through to green energy. He has held professorships at London Business School, Harvard Business School and INSEAD (in Singapore). Formerly with Merrill Lynch and The Boston Consulting Group, he earned his PhD in Business Economics from Harvard University. Peter has been visiting China since 1983 and has authored two of Asia's bestselling business books: *Dragons at Your Door: How Chinese cost innovation is disrupting global competition* and *Winning in Asia.*

DAVID WILLETTS
President, Resolution Foundation's Advisory Council and Intergenerational Centre

The Rt Hon Lord Willetts FRS is the President of the Resolution Foundation. He served as the Member of Parliament for Havant (1992-2015), as Minister for Universities and Science (2010-2014) and previously worked at HM Treasury and the No. 10 Policy Unit. Lord Willetts is a visiting Professor at King's College London, a Board member of UK Research and Innovation (UKRI), a Board member of Surrey Satellites and of the Biotech Growth Trust. He is the Chair of the Sanger Institute and the Chair of Foundation for Science and Technology. He is an Honorary Fellow of Nuffield College, an Honorary Fellow of the Royal Society and the Chancellor of the University of Leicester. Lord Willetts has written widely on economic and social policy. His book *A University Education* is published by Oxford University Press. A second edition of his book on the Boomers and the young generation, *The Pinch,* will be published in November.

ANDREW WYCKOFF
Director, OECD Directorate for Science, Technology, and Innovation

Andrew W. Wyckoff is the Director of the OECD's Directorate for Science, Technology and Innovation (STI) where he oversees OECD's work on innovation, business dynamics, science and technology, information and communication technology policy as well as the statistical work associated with each of these areas. His experience prior to the OECD includes positions at the US Congressional Office of Technology Assessment (OTA), the US National Science Foundation (NSF) and The Brookings Institution. He has served as an expert on various advisory groups and panels which include joining the Global Board of Trustees of Digital Future Society (DFS), being a member of the Research Advisory Network for the Global Commission on Internet Governance, the International Advisory Board of the Research Council of Norway and Head of OECD's Delegation at the G20 and G7 meetings on ICT and Digital Economy.

JAMES ZHAN
Director of Investment and Enterprise, UNCTAD

James Zhan is senior Director of Investment and Enterprise at the United Nations Conference on Trade and Development (UNCTAD). He also leads the preparation of the annual UN World Investment Report. Dr Zhan has directed extensive research and policy analysis on key emerging issues, facilitated the formulation of outcomes at various summits (e.g. UN, G20, G7, APEC, ASEAN, BRICS, etc), and provided technical assistance to governments and institutions (including cabinets and parliaments) in 160 countries. He led the formulation of global guidelines for the new generation of investment policies, which have been used by over 100 countries. These include the Investment Policy Framework for Sustainable Development, Roadmap for Reforming International Investment Governance, Global Investment Facilitation Action Menu, Guiding Principles for Global Investment Policymaking, and Entrepreneurship Policy Framework. He initiated the establishment of the UNCTAD World Investment Forum in 2008. He chairs the Governing Board of the UN Sustainable Stock Exchanges Initiative (with all major stock exchanges worldwide as members). He is chief strategic advisor for the World Association of Investment Promotion Agencies. He is also editor-in-chief of the journal *Transnational Corporations.* He has held advisory positions with academic institutions, including Cambridge University, Columbia University, Geneva University, and was research fellow at Oxford University. He was also member of the Advanced Manufacturing Council, and the Trade and Investment Council of the World Economic Forum. He has published extensively on trade and investment-related economic and legal issues. He appears frequently in international media outlets.

Part IV: References

Some Selected Links and Materials

Build a global body to oversee telecoms infrastructure (*The Financial Times*, 2019)

AI ethics and the limits of code(s): Five ways AI ethics needs to be radically reshaped

The global landscape of AI ethics guidelines (*Nature Machine Intelligence*, 2019)

International AI ethics panel must be independent (*Nature*, 2019)

Osaka Declaration on Digital Economy

The joint statement on e-commerce issued in Davos on 25 January 2019 and signed by 76 WTO members

G20 AI Principles

G20 Osaka Leaders' Declaration

G20 Ministerial Statement on Trade and Digital Economy

Cross-border data flows enable growth in all industries (The Information Technology & Innovation Foundation, 2015)

World Bank's World Integrated Trade Solution

The Cost of Data Protectionism (ECIPE, 2018)

Japan plans to stop the global digital economy breaking apart (*FT,* 2019)

Abe heralds launch of 'Osaka Track' framework for free cross-border data flow at G20 (*The Japan Times*, 2019)

India boycotts Osaka Track, says global talks on digital economy should be held within WTO (Medianama, 2019)

India's data localisation remains a key challenge for foreign companies (*Forbes*, April 2019)

Principles and Policies for "Data Free Flow With Trust" (ITIF, 2019)

The Age of Digital Interdependence:The 'UN Secretary-General's High-level Panel on Digital Cooperation' report, June 2019

The High-level Panel on Digital Cooperation

Center for Internet Security – a nonprofit that harnesses the power of a global IT community to safeguard public and private organisations against cyber threats

Global Cyber Alliance

Why the World Needs an International Cyberwar Convention (Philosophy & Technology, 2018)

The NATO Cooperative Cyber Defence Centre

GIPO the EC's attempt at collating developments in the Internet governance

UNCTAD's Digital Economy Report 2019 – lists the advantages of treating data as a commons

The EU Digital Single Market strategy (European Commission)

Internet Society

Lay down rules of engagement for cyber war before it is too late (*The Financial Times*, 2018)

AI and Machine Learning in Cyber Security (*Towards Data Science*, 2018)

The International Telecommunication Union: ICTs for a Sustainable World

The International Telecommunication Union: Leveraging the opportunities of the digital economy

UN Secretary-General's High-level Panel on Digital Cooperation
(including The Age of Digital Interdependence report, June 2019)

Biarritz Strategy for an Open, Free and Secure Digital Transformation

Dinard Declaration on the Cyber Norm Initiative

Facebook vice president Nick Clegg pitches for cross-border data flow (*TechCirle*, Sep 2019)

Facebook calls for new global standard on data sharing (*FT,* Sep 2019)

Google cancels AI ethics board in response to outcry (*Vox*, April 2019)

A summary of international efforts aimed at reducing cyber insecurity: <u>In a world of cyber threats, the push for cyber peace is growing</u> (*The Conversation*, Sep 2019)

<u>U.S. declines to sign declaration discouraging use of cyberattacks</u> (*The New York Times*, Nov 2018)

<u>https://contractfortheweb.org/about/</u> – Tim Berners Lee's initiative on the future of the web

<u>Microsoft Is Right: We Need a Digital Geneva Convention</u> (*Wired*, 2017)

<u>Facebook's Mark Zuckerberg Visits Lawmakers To Discuss Tech Industry Regulation</u> (*Time*, Sep 2019)

About the UK-China Global Issues Dialogue Centre at Jesus College, Cambridge

Established in 2018, at Jesus College Cambridge, the Centre is committed to promoting active dialogue between academics, policy makers and business people around major issues we face in the world today and tomorrow, and in which China has an increasingly important interest. These include the opportunities and impacts associated with new technologies, global governance, international development, health and welfare ecosystems, and changing societal norms and expectations.

Global issues research

Our interdisciplinary research projects examine the dynamics of China's integration into global institutions, business and the global economy, and the changing international role of contemporary China as an important party to emerging global issues including population, the environment, and the implementation of new technologies.

The China-UK Global Issues Dialogue Centre's independent research draws on the expertise of members of Jesus College, the University of Cambridge and the wider global research community.

Innovation alliance

The innovation alliance brings together mainland Chinese and UK companies, innovation centres such as the UK's catapult centres, policy makers, venture capital investors, to explore potential complementarities between innovation occurring in the UK and China. As part of the alliance initiative, we will build a technology exchange platform that will connect researchers working on emerging technologies with Chinese organisations exploring similar fields.

One of our key partners in mainland China is Chinese Academy of Science Holdings, an important part of China's technical innovation system. Particular emphasis will be given to the potential for Chinese partners to help UK innovators achieve the rapid scale-up and commercialisation of new technologies and unlock the huge Chinese market.
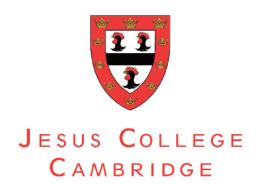
International Development

The UK-China Global Issues Dialogue Centre conducts two, week-long workshops each year, designed to foster 'Building Chinese Capability in International Development' It provides a forum for exchange of views and learning involving experts in the international development field including former ministers, academics, representative of non-government organisations and international development institutions.

Topics for 2020 include: fostering development capabilities along the Belt and Road, social entrepreneurship, new paradigms of international development, governance and development, and the role of international trade in promoting development objectives.

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