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FOR WHAT COMES NEXT

A blueprint for UK Digital Trade

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Preface

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A lot has changed in the world since the first version of this report came out. The COVID-19 pandemic has uprooted our economy and society. It has shown the essential role digital technologies play in keeping both functioning. They have kept people connected. They have also helped maintain complex international supply chains even under the greatest of strains.

The pandemic though has also laid bare the stark digital divides that still exist both in the UK and across the world. Not everyone has had a stable internet connection to enable online learning. Not every business has been set up to trade online or enable their workers to work at home. It is more urgent than ever that we work to close this divide.

What is Digital Trade?

"Digital trade is the cross-border transfer of data, products, or services by electronic means, usually the Internet"

Nigel Cory, "Explainer: Understanding Digital Trade", Real Clear Policy, March 2019, https://www.realclearpolicy.com/articles/2019/03/13/explainer_understanding_digital_trade_111113.html

The other major change, of course, has been the UK's exit from the European Union. After four and a half years of negotiations, the Trade and Cooperation Agreement (TCA) has now set the new terms of trade for businesses. This outcome was in doubt at many points and the successful conclusion of negotiations should be applauded. This is especially true given that the TCA includes many things that the tech sector wanted to see.

While the UK's exit will see new checks and paperwork for traders, the TCA is high in its ambition for digital. Indeed, the inclusion of a digital trade chapter goes beyond the usual EU practice, marking the sector's importance to both sides.

Many of the principles for the UK's digital trade policy set out below are met in the TCA. A positive obligation in favour of cross-border data flows, as well as a ban on data localisation, are welcome steps to maintain the UK's role as an important data hub. Ongoing cooperation on emerging technologies will be important to help ensure alignment and access to the UK's biggest market. A framework for cooperation on cybersecurity and the high level of access secured for telecoms are among the other important provisions to facilitate digital trade.

The TCA may mark the end of trade negotiations but it is also the beginning of the UK's future relationship with the EU. The digital sector will continue to evolve and new technologies and business models will come to the fore. The UK and EU are going to need to continue to work together to their mutual benefit.

Further afield, other countries are pushing forward with ambitious digital trade agreements. The UK needs to set its sights on joining that club of the most forward-thinking digital nations.

1. Executive Summary

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We live in a digital world. The COVID-19 pandemic starkly demonstrated the centrality of digital technologies to our social lives and our businesses. It also showed the continuing existence of a deep digital divide both in the UK and internationally. With the pandemic's substantial economic and social fallout, it is going to be ever more essential to have a policy agenda that is fit for our digital world and that includes everyone in it. A digital trade policy should be a central part of that agenda.

The UK has been a major beneficiary of the rise of digital trade with over 67% of service exports worth £190.3 billion being digitally delivered.[1] Early UK trade deals since leaving the European Union, in particular the UK-Japan Comprehensive Economic Partnership Agreement (CEPA), have recognised this importance and established that the UK is serious about an ambitious digital trade policy. But much as technology moves fast, so does trade policy. Already countries such as New Zealand, Australia, Singapore and Chile are moving ahead of the UK in what they are attempting to do in the digital realm. As the UK seeks to recover from COVID-19, it should continue to strive to lead the world in digital trade.

The Rise of Digital Protectionism and the Global Context

While some countries have bold visions of a digital trading world, others have taken a protectionist turn. This stance threatens the economic growth that digital trade has brought and will increase costs for consumers and businesses. An open trading system is in dire need of champions, and the UK should be a strong defender of the importance of reducing barriers to trade, rather than splintering the digital ecosystem. This needs to be modelled both in the UK's engagement in international fora and the tone and direction of the domestic policy agenda on digital.

To do this, it is going to be essential that digital trade is at the heart of the UK's trade policy in all arenas as a champion of multi- and pluri-lateralism. At the World Trade Organization (WTO), ongoing e-commerce negotiations offer the only opportunity to bring in the USA, China and the EU under the same set of rules for the digital economy. The UK should be a leader in these talks to ensure it is as inclusive and ambitious a deal as is possible. Such an agreement would help stem the tide of protectionist measures and set new standards for the digital economy.

The impacts of digital trade will be felt across the world, but its opportunities are not open to all at the moment. COVID-19 has made that especially clear. It is important that the UK recognises the links between digital technologies and their potential in helping solve the UN's Sustainable Development Goals. To achieve global rules, it is essential that digital trade is inclusive to all across the world. The UK should not lose sight of the important role its development policy can play in closing the global digital divide and helping developing nations in their transition into digital economies participating in Global Value Chains.

Much as digital trade will have a substantial impact on development, it will also increasingly affect other policy areas. To ensure that the UK is a leader in Digital Trade, the UK should seek to proactively engage in the wide range of international forums that deal with digital issues, including through its Presidency of the G7, and its membership of the G20 and the OECD.

When negotiating trade agreements, it is essential that the UK continues to include an ambitious digital trade chapter including rules on telecommunications, that build on and go beyond newly established principles of digital trade including those established in the digital chapters of the Comprehensive and Progressive Trans-Pacific Partnership (CPTPP), the US-Mexico-Canada Agreement (USMCA), and the Digital Economy Partnership Agreement (DEPA). The UK should go forward with its ambition to join the CPTPP and seek to join DEPA to enter the group of ambitious countries breaking the newest ground in digital trade.

Digital Principles

Whatever form a trade agreement takes for the UK in the future, it should be based on 14 key digital trade principles in five areas:

I. Data

1. Enable the cross-border flow of data without compromising data protection standards
2. Prevent the forced localisation of data
3. Facilitate regulatory access to data
4. Prevent separate treatment for cross-border flows of financial data

Data is an essential foundation to the entire global economy. Enabling the cross-border flow of data must be a part of future UK trade agreements, as should preventing the forced localisation of data. The definitions of data should include financial data, which should not be treated differently to other categories of data. Concerns around regulatory and law enforcement access can be mitigated both in domestic UK law and through international agreements which the UK should seek to join or replicate.

II. Tariffs

5. Secure the expansion of the Information Technology Agreement in both geographic and product coverage
6. Make the moratorium on customs duties on electronic transmissions permanent

The re-emergence of tariffs as an offensive weapon in economic disputes is a troubling development. The UK's Digital Trade policy should seek to extend the protections offered by the WTO's Information Technology Agreement and entrench those in bilateral UK deals and in the WTO e-commerce work track. It should also discuss the next steps for the ITA, including the role that digital technologies can play for protecting the environment and mitigating climate change. It should also do all it can to protect the moratorium on digital tariffs both at the WTO level and in its agreements. To allow the imposition of customs duties on electronic transmissions would undermine a key enabler of the digital economy.

III. Intellectual Property

7. Prevent the mandatory transfer of source codes, algorithms, or encryption keys as a condition of market access
8. Support the development of AI through enabling open government data and text and data mining while respecting intellectual property rights

Intellectual property rights are an enabler of innovation. Yet some states have sought to demand intellectual property as a condition of market access. The UK should work through its trade agreements to prevent the mandatory transfer of source codes, algorithms, and encryption keys. In other areas, new technology is transforming traditional notions of intellectual property. The UK's trade policy can enable the development of innovative AI by supporting the use of open government data and text and data mining.

IV. Regulatory Cooperation

9. Establish cooperation on the regulation of AI, fintech and other emerging technologies
10. Establish cooperation on cybersecurity issues with an emphasis on a risk-based approach
11. Work towards internationally interoperable digital identities
12. Use trade policy to further measures to protect online safety

While tariffs are an important issue for digital trade, the reality is that the primary barriers are those behind the border. Non-tariff barriers, like differing approaches to regulation, will be the main block to digital trade and the export of innovative UK technologies such as AI or fintech products. The UK's digital trade policy should look to establish cooperation between regulatory bodies, expand promising new approaches such as 'fintech bridges', and look to make digital identities interoperable between countries.

V. Trade Facilitation

13. Standardise minimum de minimis thresholds to facilitate e-commerce

14. Secure recognition of e-signatures and expansion of paperless trading

Digital trade policy can also play a role in facilitating the flow of other goods and services. E-commerce platforms have opened global markets in goods for SMEs. The UK should seek to standardise de minimis thresholds to help the cross-border trade of small packages. Working with international bodies and other partners, the UK should secure the recognition of e-signatures and expand paperless trading, helping to bring all aspects of trade into the 21st Century.

Supporting Digital Trade

UK free trade agreements that are built on these principles would set a new gold standard in Digital Trade. They would firmly establish data flows as an essential foundation to all trade and would break new ground in supporting innovative technologies like AI in trade agreements. But the digital trade chapter alone is not enough to support the international growth and expansion of the UK tech sector. Reducing barriers to the export of services and the movement of talent across borders are important areas, as is increasing access to telecommunications markets. The principle of limited liability has been an important part of the growth of the online economy, helping safeguard important principles of expression and protect supply chains. Governments are important buyers of technology and expanding procurement opportunities will do a lot to support the UK's thriving GovTech sector. Protecting the UK's approach to standards-setting processes will be important to maintain the UK's lead in their development. Finally, given the complexity of modern tech products and the supply chains that go into producing them, it should be an aim to include reasonable local content requirements in rules of origin.

Digital Trade and the Environment

It should not be forgotten that the ability to trade digitally is dependent on billions of electronic devices and the energy required to power them. These devices are not without their environmental costs. However, digital technologies also have great potential in our actions to combat climate change.

Trade policy has an important role to play in these efforts. It can help smooth the path to adoption of carbon mitigating technologies through ensuring they are tariff free and that there is regulatory cooperation in place to enable their use. As UK companies increase their efforts to disclose corporate climate impacts and emissions, provisions in trade agreements can hold our trading partners to similarly high standards.

The data centre sector is an essential one to the functioning of the digital economy, as well as a highly competitive UK export, and an important factor in a climate orientated trade policy. Recent years have seen an explosion in internet traffic and data centre workloads. However, this has not been accompanied with a rise in data centre energy use thanks to much greater efficiencies in process technology and other new approaches. In addition, data centres have become key purchasers of renewable power and are ideally positioned to become anchor customers of technologies such as green hydrogen and battery storage. Digital trade policies such as enabling cross-border data flows and preventing data localisation requirements support the growth and success of the sector by allowing customers to store their data with the most energy and efficient providers compared to keeping IT functions in inefficient on-premises infrastructure.

Finally, trade policy can support the transition to a circular economy and help reduce electronic waste. This is a global problem, requiring global cooperation. By encouraging regulatory cooperation and harmonisation relating to electronic waste, as well as removing barriers to the import and export of waste and scrap where there are regulatory protections in place, UK trade policy can help reduce the environmental impacts of our end-of-life technologies.

The UK has a unique opportunity to set a new course in its trade policy and design its approach from the ground up. In all arenas, the UK should seek to place digital issues at the heart of its trade policies. This will be a digital century and the UK needs to have a clear vision in the digital trade policy sphere.

2. The State of Digital Trade

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The Growth of Digital Trade Digital technologies have transformed international trade. In the space of three decades, an analogue world has been wiped away by information communication technologies (ICTs). These have upended traditional goods supply chains and created entirely new industries and services through the internet which can be traded across borders with ease.

The mass adoption of personal computers, mobile phones and broadband internet, as well as the software that underpins them, defined the ICT Revolution. Now Industry 4.0 brings automation into the mix, with the industrial IoT, machine learning, additive manufacturing and autonomous robots along with other technologies already taking on a major role in innovative economies.[2]

If the pace of change was already quick, the COVID-19 pandemic has accelerated it even further. With large parts of the economy forced to shutter and individuals told to stay home, business operations and social lives moved online. Digital connectivity proved itself to be essential to the continuing functioning of society far beyond any narrow definition of the tech sector.

This much was clear even before the pandemic. Across the economy, industries are benefiting from emerging technologies and digital trade. Mining companies now expect to employ more data scientists than mining engineers[3] and already use autonomous machinery extensively in their operations.[4] Retail stores are deploying IoT technology to help with predictive equipment maintenance in refrigeration units and automating warehouses to fulfil orders.[5] Digital transformation is present in all parts of the economy. Indeed, 75% of the value created by the internet has been captured by companies in traditional industries.[6]

The impact on the global economy by digital technologies has been huge. The UN Conference on Trade and Development (UNCTAD) has estimated that the value of e-commerce sales reached almost US$26 trillion in 2018, up 8% on the previous year. Of this, the vast majority (US$21 trillion) was in business-to-business (B2B) e-commerce comprising both sales over online market platforms and electronic data interchange transactions. Business-to-consumer (B2C) value increased by 16% compared to 2017, and cross-border B2C sales amounted to $404 billion. 1.4 billion people made purchases

online in 2018, a number that has likely grown significantly thanks to pandemic lockdowns.[7]

Other elements of digital trade have also established themselves as major engines of the economy. Since 1996 the trade in the physical IT goods that the digital economy depends on has tripled to reach $1.6 trillion in 2016.[8] Though hard to measure their economic impact accurately,[9] data flows themselves have been estimated to have increased global GDP by $2.8 trillion in 2014.[10]

These changes are underpinned by the globalisation of goods, services, people and ideas. When intangible goods and services, such as online banking, predictive analytics, or the designs for a 3D printed item, can flow across borders at ease, then it is important to approach digital technologies with a global mindset.[11] Global Value Chains (GVCs) are now an essential component of modern trade and have seen the diffusion of intermediate services (such as design, marketing, or logistics), as well as component manufacturing, across borders.[12]

The UK has been a pioneer and a beneficiary of this growth in digital trade. The UK is the third largest B2C market with sales worth US$266 billion, ranking only behind China and the US.[13]

Beyond e-commerce, recent experimental statistics from the Office for National Statistics have better measured for the first-time the trade in services actually delivered digitally. According to this new methodology, in 2018 the UK exported £190.3 billion in digitally delivered services, amounting to 67.1% of total UK services exports. In turn it imported £91.1 billion (51.7% of total UK services imports) with a trade surplus of £99.2 billion.[14] While this doesn't capture all of the UK's digital trade, or digital's role in enabling other non-digital trade, these statistics nonetheless demonstrate the potential economic importance of the UK's digital trade policies.

Going forward it is clear that this trade policy must be digital by default. The technologies of Industry 4.0 are essential to all sectors of the economy, are enablers of the goods trade and now a primary means of delivering services. A failure to get digital right would mean that the UK would not reap the full advantages from trade across a huge range of sectors.

COVID-19 and its Impact on Digital Trade

Since the first version of this report was published in January 2020, the COVID-19 pandemic has caused immense health, social and economic damage across the globe. The urgent need to reduce the spread of the virus led to an unprecedented shutting down of the UK. Whole sectors of the economy ceased to operate with the result that the UK's GDP shrank by a record 19.8% in the second quarter of 2020.[15]

Without digital technologies, this drop in would have been even more. While streaming, remote working, and video conferencing have all been around for years, the pandemic saw them become the only way to conduct many types of social and business interactions. The early weeks of the pandemic saw total internet hits surge between 50% to 70%.[16] Companies that had already been preparing themselves for Industry 4.0 were better able to pivot into the new reality. Those who hadn't been preparing found that they quickly had to catch up. One survey found that COVID-19 caused companies to accelerate their digital communications strategy by over 5 years in the UK, with 1 in 3 organizations dramatically increasing their budgets for digital transformation to enable that.[17]

E-commerce has similarly seen massive growth during the pandemic as people's shopping has been forced online. In the UK, e-commerce's share of total retail sales grew from 19% in February 2020 to a peak of 32.8% in May 2020 – almost a decade of market share growth in three months.[18] Despite the disruption, cross-border

e-commerce supply chains have held up well on the whole. Many logistics firms have maintained their services, and while there have been delays for some carriers due to lack of commercial flights, others have seen their commercial flights converted for cargo.[19] This resiliency has underpinned a 63% year on year growth in cross-border e-commerce across the festive season as fresh lockdowns forced Christmas shoppers online again.[20]

However, the move to digital services during the pandemic has also highlighted the continuing existence of a deep digital divide. As of 2018 there were still 5.3 million adults (10% of all adults) in the UK defined as internet non-users. 4.3 million people in 2018 were estimated to have zero basic digital skills with a further 6.4 million adults estimated to have only limited abilities.[21] The rapid shift of life online thanks to COVID-19 has left many of these people stranded, with the Lancet reporting on how "the lockdown strategies in the UK […] are actually increasing digital inequality".[22] Researchers from the University of Cambridge describe digital exclusion as "yet another manifestation of the profound inequality which casts in shadow over the UK" with many of the country's most disadvantaged people set to suffer the most in the fallout from the pandemic.[23]

The pandemic has also brought the global digital divide into stark relief. As of 2019, 3.6 billion people globally still did not have access to the internet and in 40 of the 84 countries where data is available, less than half of the population has basic digital skills.[24] The existence of this digital chasm has not only exacerbated inequalities during the pandemic but will weaken the ability of countries to recover from it. In many countries across the world, local economies are based on traditional SMEs – restaurants, bars, corner stores and mom-and-pop shops. With business conducted face-to-face, and without the physical infrastructure needed to switch to digital, the digital divide in these countries could imperil the livelihoods of millions of people.[25]

COVID-19 has demonstrated the power and importance of digital technologies as essential infrastructure of modern life. Digital trade has enabled business to continue, and people to still connect with others around the globe, even when much of the world has been under some form of lockdown. But COVID-19 has also laid bare the continuing existence of deep digital divides, both in the UK and across the world. We will not have as quick a recovery as is possible unless steps are taken to quickly close that. We will also not have the resiliency that digital technologies can bring unless those steps are taken. **The UK should make closing the digital divide, both domestically and in developing nations, a central part of its COVID-19 recovery strategy. This strategy should include steps to provide access to digital technologies, economic development to support SMEs adopt digital technologies, and education to individuals of all ages, as well as business owners, in how to use digital technologies.**

Digital Protectionism

A rise in digital protectionism puts the need for an effective UK digital trade policy in a starker light. Over recent years a growing number of countries have introduced measures that seek to either shelter their domestic markets from international competition or shelter their citizens from outside services by restricting trade or discriminating foreign firms.[26] The OECD's Digital Services Trade Restrictiveness Index shows that seven G20 nations have more restrictiveness measures in place in 2018 compared to 2014, while only three countries have lowered their restrictiveness.[27]

Digitally protectionist policies take different forms. These include measures such as, but not limited to:

- Web censorship
- Restriction of data flows (including data localisation)
- Tariffs on goods and intangible products
- Conditions for market access
- Forced transfer of intellectual property[28]

The implications of these types of policies are stark. The Swedish Board of Trade has said that the rising restrictions on the movement of data "threatens to fragment the global

digital economy and raise the costs of goods and services".[29] The European Centre for International Political Economy (ECIPE) has argued that a "restrictive regulatory environment for digital trade will weigh down many non-digital sectors".[30]

Economic analysis by ECIPE has quantified the losses that result from data localisation requirements and related data privacy and security measures that discriminate against foreign suppliers of data. It found that the impact of proposed or enacted legislation on GDP was to the tune of -1.1% in China and -1.7% in Vietnam. The impact on domestic investments by measures of data localisation was -4.2% in Brazil and -3.9% for the EU. Exports of China and Indonesia decrease by -1.7% due to loss of competitiveness. The welfare losses are substantial: up to US$63 billion for China and US$193 billion for the EU thanks to higher prices and displaced domestic demand that cannot be met by supply.[31]

Protectionist policies can also have other effects, such as undermining internet stability and interoperability, with a growing risk that this will end in a balkanisation of isolated country specific webs.[32] Reductions to internet openness can reduce technology diffusion, affect global value chains and weaken growth.[33] The implications can be even more extreme when protectionism evolves in to forms of cyberwarfare, as in the case of China who has allegedly used distributed denial of service attacks and other methods to disrupt information flows and impede online access.[34]

While China is at the forefront of implementing digitally protectionist measures, they are by no means the only country to do so. Notable recent provisions from 2018 include those by Indonesia that allow it to impose tariffs on digital products and steps by India to enact discriminatory local data storage requirements and target foreign e-commerce firms and user platforms.[35] The UK itself has followed France and Italy in introducing its own digital services tax that specifically targets businesses that provide a social media service, search engine or online marketplace, and essentially acts as a non-tariff barrier to trade in these particular digital activities.[36]

Globalisation raises legitimate questions about the appropriate way to tax multinational corporations operating in multiple countries. As techUK has argued previously, digital services taxes directly cut across the OECD/G20 efforts to establish common approaches to taxation of multinationals and address the tax challenges arising from digitalisation.[37] Indeed, the OECD has said that without a consensus-based solution there could be "a proliferation of unilateral digital services taxes and an increase in damaging tax and trade disputes, which would undermine tax certainty and investment". Under their worst-case scenario of a global trade war triggered by these unilateral measures, "the failure to reach agreement could reduce global GDP by more than 1% annually".[38]

The trade war between the USA and China has further complicated the digital trade landscape. The disagreement is fuelled by a growing

competition between the two countries in the technologies of Industry 4.0. This has manifested in two main ways: US objections to protectionist measures implemented by the Chinese such as the forced transfer of technology,[39] and from security concerns, for example around social media, an area long-dominated by US firms.[40] The costs of this trade war are already immense. One September 2019 analysis estimates that it had cost the US economy nearly 300,000 jobs, another that the cost to US GDP is around 0.7%, while research from the Federal Reserve Bank of New York and Columbia University has found that US companies lost at least US$1.7 trillion in the price of their stocks thanks to US tariffs.[41]

Post-Brexit, the UK has entered a world buffeted by protectionist currents and adverse trade winds. The UK's digital trade policy needs to grapple with a situation that is less open than it has been in a long time. **In multilateral forums and through bilateral and regional trade agreements, it is important that the UK is a strong and consistent voice in favour of combatting protectionism which costs businesses and consumers and threatens economic growth. It should be a firm advocate of removing restrictions to trade and preventing the rise of new barriers as the global economy adapts to the digital world.**

Trends in Digital Trade Policy

The UK is not charting a lone course in being an advocate of digital trade. Instead, it can build off the best practices established by other countries. Ever since Australia and Singapore concluded the first FTA to contain a dedicated e-commerce chapter in 2003, various countries have embarked on an iterative process to develop deeper commitments in the digital space.[42] These initiatives in FTAs have happened in the absence of overarching rules on digital trade. Early post-Brexit agreements that the UK has negotiated, notably the UK-Japan Comprehensive Economic Partnership Agreement (CEPA), show an iterative approach building on these existing agreements. Other recent ground-breaking digital agreements show though that further ambition is needed to make new gold-standard agreements.

Multilateral Efforts

A lack of shared definitions and norms for digital trade have helped create the conditions where protectionism can spread, and FTA provisions are necessary. The rules governing international trade, as set out in the General Agreement on Tariffs and Trade (GATT) and the General Agreement on Trade in Services (GATS), which together are the foundational documents of the WTO, predate the commercialisation of the internet. Though GATS has provisions for telecommunication services, there are no agreed provisions for, or definitions of, digital trade. So far, efforts to update these rules to take account of the shape of the 21st century digital economy have failed. A work programme was started on e-commerce at the WTO in 1998, but aside from agreeing the renewal of the moratorium on customs duties on electronic transmissions, it has been without notable successes.[43]

More recent efforts have also failed to yield results. The Trade in Services Agreement (TiSA) set out to update the rules around services, with a focus on bringing in digital trade provisions. 23 WTO members took part in negotiations, including the UK through the EU, but talks have been stalled since 2016.[44] **While it is unlikely TiSA will be revived any time soon, should talks restart then the UK should join the negotiations.**

A more promising avenue to update global rules is through the Joint Statement Initiative on e-commerce (JSI). Informal talks that staked out the key areas began following the 11th WTO Ministerial Conference in Buenos Aires in 2017. On the margins of the World Economic Forum in Davos in January 2019, 76 WTO members announced the formal start of negotiations to reach a plurilateral agreement on the "trade-related aspects of electronic commerce".[45] Notably, participating members include China as well as the USA, EU and a range of developing nations, though India is a notable omission.

There are decades of multilateral inertia on digital trade and deep divides remain between China and the USA in particular. Despite this though, the JSI talks are progressing towards producing a consolidated text in time for the next WTO Ministerial Conference in 2021, a timeline slowed down by the COVID-19 pandemic.

The JSI is the only forum where it is going to be possible to reach an agreement between the USA, China and the EU, even if only on parts of the digital economy. **It is important the UK is an active participant in the JSI and works towards an ambitious and inclusive outcome.**

Digital Trade and Development

Bringing on board developing nations and ensuring it is an inclusive agreement will be key to the success of the JSI. For the agreement to have as much legitimacy as possible then it needs to be based on a wide range of WTO members. Furthermore, to be commercially significant then it will be important that it includes developing countries, who are experiencing rapid growth in internet and mobile penetration, and who are also often more protectionist in the digital realm.[46]

As the negotiations progress, and **as the UK embarks on its own trade policy, it is important that the UK recognises the links between its digital aspirations and international development.** While Industry 4.0 poses challenges and opportunities to countries such as the UK, for example around the future of work, these can be magnified in the context of developing countries. There is a risk that the digital divide could increase, with developed countries adopting cutting edge technology, such as AI and robotics, while other countries lack the capital or the skill base to make use of them, thus widening global inequality.[47] Worries over other pressing problems, such as food security or the effects of climate change, mean that digital issues can be seen as a distraction.

Yet technology can play a crucial role in helping meet the UN's Sustainable Development Goals and addressing global challenges.[48] The UK can play an important part in this process through its aid budget. The 2018 "Digital Strategy 2018-2020: Doing Development in a Digital World" provided a foundation for the use of technology in improving digital outcomes, though is focused on internal processes.[49] This work should not be lost in the transition to the combined Foreign, Commonwealth & Development Office. **Building off the former Department for International Development's "Digital Strategy 2018-2020", the UK should help support transitions into participation in GVCs and the digital economy.** Furthermore, the UK should go beyond just incorporating digital into its own development practices. Instead it should be a leader in supporting developing countries enter the global digital economy. Steps to do this can include building the physical infrastructure requirements needed for participation in the digital economy, such as stable power supplies, providing data from UK sources, for example satellite imagery of soil erosion to help farmers, support the teaching of digital skills in schools, and facilitate capacity building in regulatory agencies such as secondments from the Information Commissioner's. Doing this will not only support the development of recipient countries but also help enable more people to participate in value chains, eventually supporting UK digital exports. **The UK should use its international development work to support developing countries' entry into the global digital economy and help them establish themselves in global value chains.**

Digital Trade in Trade Agreements

In the absence of global digital trade rules, many nations have worked towards establishing provisions on digital trade through bilateral and plurilateral trade agreements. As of 2017, 69 FTAs included a standalone e-commerce chapter or articles dedicated to e-commerce issues, with a further 21 agreements including some kind of provision relating to issues such as paperless trading or digital rights management. Around half of the members of the WTO have signed at least one FTA including an e-commerce chapter, from a range of developed and developing

countries.[50] It is in these trade agreements that the UK will have the greatest opportunity to craft a leading digital trade strategy.

The number of agreements that include digital provisions is growing rapidly. Recent years have seen an ambitious digital chapter included in the updated NAFTA, the United States-Mexico-Canada Agreement (USMCA).[51] This in turn builds off the Comprehensive and Progressive Trans-Pacific Partnership (CPTPP), an agreement between 11 developed and developing Pacific nations and which the USA participated in negotiating, but did not ultimately join.[52]

Up until 2020, the USMCA and CPTPP set the gold standard in digital trade provisions.[53] They include clauses on crucial issues such as data flows, data localisation and the moratorium on digital tariffs, as well as being the first to include new areas such as cybersecurity and regulatory cooperation.

In its first major post-Brexit trade deal, the UK-Japan Japan CEPA,[54] the UK negotiated an admirably comprehensive e-commerce chapter by building on these existing agreements and the EU-Japan Economic Partnership Agreement.[55] The structure closely follows the EU-Japan agreement but it goes beyond it in some areas. The new deal in particular leans heavily on clauses from CPTPP, that Japan is party to and that the UK has formally applied to join.[56] These additions cover areas that techUK has identified as important for the UK tech sector in the first version of this report, including on cross-border data flows, commitment to high standards of data protection, and provisions protecting source codes. It also incorporates some language from USMCA relating to open government data. These additions will benefit the UK tech sector looking to serve the Japanese market, and compete with companies who already have similar access through CPTPP. **The UK should build off the UK-Japan Comprehensive Economic Partnership Agreement and the EU-Japan Economic Partnership Agreement and ensure that all future agreements also include robust digital trade chapters.**

While the UK-Japan CEPA represents a promising step in the evolution of the UK's digital trade policy, other recent agreements have been the ones to set new and higher bar on digital trade. The Digital Economy Partnership Agreement (DEPA) between Chile, New Zealand and Singapore, signed in June 2020, is the first digital only trade agreement.[57] It has broken new ground in digital trade, complementing the multilateral efforts detailed above while going further for those countries willing to take that step. The agreement itself is open for new members to join wholesale, or for them to opt into various modules in the agreement. These modules include a number of areas that have never before formed a part of trade agreement, such as digital identities or digital inclusion.[58]

Following shortly after DEPA, Singapore went on to sign a further Digital Economy Agreement (DEA) with Australia in August 2020.[59] This agreement replaced the older e-commerce chapter in the Singapore-Australia Free Trade Agreement. The DEA goes further than any comparable bilateral digital chapter, including provisions not only in areas covered by CPTPP but also breaks new ground in areas such as

creating a safe online environment, cooperation on competition policy, and clauses on submarine telecommunication cable systems. The agreement is notably also accompanied by a number of MoUs on digital economy topics. These include on data innovation, AI, trade facilitation and cooperation on digital identity, among others.[60] Given the fast-moving nature of technology and the regulatory challenges that can arise from it, these additional MoUs provide a flexible and adaptive framework to advance the interests of both countries in cooperation with each other. **The UK should follow the example of the Digital Economy Agreement and utilise new gold standard digital trade provisions in future agreements, and accompany these with additional means of cooperation such as MoUs.**

Between them DEPA and DEA mark the cutting edge of what an ambitious digital trade policy can be. However, these agreements are not pure innovations. They instead reflect decades of commitment by the signatory countries to push the boundary of what trade agreements can do for the digital sector. Each step of that process has involved building on what has come before rather than revolutionary changes of approach. This is essential as trade policy still needs to be accessible to industry to enable them to take advantage of its provisions. As the UK establishes its own digital trade policy, it should take a similar iterative approach and seek to join other leading nations to build on and take advantage of existing best practice as well as push the envelope of an ambitious digital trade policy. **The UK should go forward with its ambition to join the CPTPP and seek to accede to the Digital Economy Partnership Agreement to help establish its leadership on digital trade.**

Digital Trade in Other Forums

Trade agreements and the WTO are not the only forums relevant to digital trade. The growth of the digital economy has created vast new policy questions requiring international cooperation to deal with. Examples include the work of the OECD on "Going Digital" which seeks to help equip policy makers with the tools they need to deal with digital transformation, including through the development of AI principles.[61] In 2019, the G20 under the presidency of Japan held the first joint Trade and Digital Economy ministerial meeting to reflect the important interlinkage between the two areas.[62] In 2020, the Saudi Arabian G20 presidency continued this work by convening a G20 Digital Economy Task Force.[63] Likewise, the 2019 G7 had a major focus on digital issues[64] and digital technology featured heavily in the G7 Finance Ministers meeting, though in this case the momentum was not maintained into the US presidency, in part thanks to COVID-19 related postponements.[65] Nevertheless, forums such as these can play a significant role in shaping the wider policy questions around digital trade. **The UK should ensure it is a proactive leader in international forums such as the G20 and OECD in pushing for steps that facilitate and enable digital trade, and should utilise its Presidency of the G7 to advance these ends.**

3. Digital Trade Principles

3. Digital Trade Principles

As a leading digital economy, with high rates of internet penetration and use, a skilled workforce, and sophisticated academic and financial ecosystems well placed to leverage new ideas, the UK is already one of the best places in the world to establish and grow a tech company. Going forward, it is essential that the UK uses all of the tools at its disposal to cement its leadership in this space.

It is imperative that the UK makes the most of its newly independent trade policy to chart a course as a leading digital nation, utilising it to advance its digital agenda.

There are a number of areas where any international agreement can set a new bar for digital trade. This could be through a traditional FTA, i.e. a wide ranging multi-sectoral agreement that covers 'substantially all trade' as required by the WTO. The UK-Japan Comprehensive Economic Partnership Agreement is an example of this. Alternatively, sector specific deals such as the Digital Economy Partnership Agreement could offer interesting new avenues to pursue digital trade with like-minded nations. Large plurilateral talks like the JSI on e-commerce are a further avenue where the UK seeks to raise the bar on digital trade and help set new global standards.

Whatever form future UK agreements take, they should ensure they have strong commitments on digital trade across five key areas. In these areas, we are putting forward fourteen specific recommendations:

Data

1. Enable the cross-border flow of data without compromising data protection standards
2. Prevent the forced localisation of data
3. Facilitate regulatory access to data
4. Prevent separate treatment for cross-border flows of financial data

Tariffs

5. Secure the expansion of the Information Technology Agreement in both geographic and product coverage
6. Make the moratorium on customs duties on electronic transmissions permanent

Intellectual Property

7. Prevent the mandatory transfer of source codes, algorithms, or encryption keys as a condition of market access
8. Support the development of AI through enabling open government data and text and data mining while respecting intellectual property rights

Regulatory Cooperation

9. Establish cooperation on the regulation of AI, fintech and other emerging technologies
10. Establish cooperation on cybersecurity issues with an emphasis on a risk-based approach
11. Work towards internationally interoperable digital identities
12. Use trade policy to further measures to protect online safety

Trade Facilitation

13. Standardise minimum de minimis thresholds to facilitate e-commerce
14. Secure recognition of e-signatures and expansion of paperless trading

Data

1. Enable the cross-border flow of data without compromising data protection standards
2. Prevent the forced localisation of data
3. Facilitate regulatory access to data
4. Prevent separate treatment for cross-border flows of financial data

The global economy runs on data. Across sectors and borders, data is an essential component of innovation, productivity growth and economic expansion. The use of data in the global economy will only become more ubiquitous as technologies such as cloud computing and AI become more embedded in value chains.

The extent to which the flow of data is the modern engine of global economic growth should not be underestimated. Global flows of data were estimated to have increased global GDP by US$2.8 trillion in 2014 alone - a larger contribution than was made by the trade in goods.[66] Indeed, the proliferation of digital technologies has helped the growth in global services trade outstrip that in goods,[67] with just the trade in services over the internet now representing more than 20% of total trade worldwide.[68]

The global transformation of businesses and trade by the flow of data can be characterised in four ways:

- The use of the internet to export goods
- The purchase and consumption of services online
- The use of data collection and data analytics to allow new services, adding value to goods
- Data flows underpinning global value chains, opening up opportunities for participation.[69]

Despite the importance of data flows many countries have sought to restrict them. Recent research has shown that restrictive regulatory barriers have had “a negative and significant impact on trade in services”, both from sector-specific and economy-wide barriers. The result is that “policies restricting data flows across borders are likely to impede countries to reap the efficiency gains stemming from services imports” and that, in addition, “exports of data-intensive services would, in turn, decrease towards countries that impose strict data policies”.[70]

In terms of the impact on businesses, barriers to data flows can result in higher costs to store and process data - often between 30-60% more than if they were able to go outside their country.[71] Restricting digital trade between countries with equivalent data protection standards can also prevent the transfer of day-to-day data needed for activities such as human resources leading to duplicative processes and incur higher compliance costs - a greater weight on smaller firms. Specific requirements that financial data should be localised adds greater costs and restricts digital banking options for one of the most data intensive sectors of all.[72]

It is essential then to reach a sensible balance between measures that address legitimate public concerns, for example the protection of personal data or the need for regulators to access financial data, while not unduly erecting barriers to trade. In its trade negotiations the UK should seek to do this in four different ways to ensure it has a world leading digital trade policy.

1. Enable the Cross-Border Flow of Data without compromising data protection standards

Ensuring that data can flow across borders is the essential bedrock of digital trade. The UK should ensure that it enables the cross-border flow of data in future trade agreements by taking five steps.

Include a Data Protection Framework

Strong and robust data protection frameworks are a crucial prerequisite to ensuring enduring public trust and support in the cross-border flow of data. Data protection is a fundamental right in UK law and the UK's trade policy should reflect this.

Future UK trade agreements should ensure that all parties are encouraged to adopt or maintain a legal framework providing for the protection of personal information. These should take into account the principles set out by the General Data Protection Regulation (GDPR) and enshrined in the UK Data Protection Act 2018:

- Lawfulness, fairness and transparency
- Purpose limitation
- Data minimisation
- Accuracy
- Storage limitation
- Integrity and confidentiality (security)
- Accountability[73]

Future agreements should also **ensure that parties must publish clear and accessible information and guidance available online on how businesses can comply with the legal requirements of the data protection frameworks and how individuals can pursue remedies.**

Include an Onward Transfer Mechanism

Where differences may arise between different data protection frameworks, it is important to ensure that there are mechanisms to allow businesses to continue to transfer personal data provided they meet the required level of protection. GDPR allows this through mechanisms such as standard contractual clauses and binding corporate rules. Future trade agreements should include provisions to oblige the existence of onward transfer mechanisms for personal data in full compliance with applicable data protection rules.

Commitment to Allow the Cross-Border Flow of Data

Future UK trade agreements should include a strong commitment that parties shall not prohibit or restrict the cross-border flow of data and information. Measures that restrict it for legitimate public policy objectives would be allowed, in a manner that is consistent in all trade agreements, provided that measures are not a means of arbitrary or unjustifiable discrimination or a disguised restriction on trade, and does not impose restrictions that are greater than are necessary to achieve the objective.

Dispute Resolution

Given the increasing centrality of data flows to the all sectors of the UK economy, **the UK should ensure that provisions and commitments on the cross-border flow of data are subject to dispute resolution.** These commitments can then be properly enforced and the UK and its businesses would have a means of redress if trade distorting measures are imposed or commitments on onward transfer not honoured.

Protection of UK-EU Mutual Adequacy

Finally, **the UK should ensure that any commitment it makes in future trade agreements does not jeopardise a UK-EU Mutual Adequacy Agreement.** 75% of the UK's cross-border data flows are with EU countries and preventing any barriers to UK-EU data flows should be the UK's priority.[74] The above steps should not risk a Mutual Adequacy Agreement. Japan, for example, has such an agreement with the EU and has signed up to similar commitments through its participation in CPTPP and APEC's Cross-Border Privacy Rules and its key underlying concept of the Osaka Track "data free flow with trust".

2. Prevent the Forced Localisation of Data

The case is often made that keeping data within a country's borders is more private and secure, both from risks of hacking and from government surveillance. However, in most cases the reverse is true and localisation requirements do not increase commercial privacy or data security.[75] Data transferred overseas is not exempt from the home country's laws and contracts between consumers and businesses are an effective and enforceable means of ensuring data is protected.

Not only do localisation requirements fail to meet their own policy objectives but they then impose significant costs on a country's economy. A 2016 study by the Centre for International Governance Innovation and Chatham House demonstrated that data intensive sectors such as communications and financial services suffered relatively high productivity losses but the impacts were even felt in other sectors such as manufacturing. They concluded that data localisation regulations "tend to cause an economy's production structure to shift (back) toward less innovative and relatively volatile sectors such as agriculture, raw materials and natural resources".[76]

As stated above, it is important that the UK requires its trade partners to ensure they have a strong and robust data protection framework, which is an essential enabler of trust in other parties' treatment of data and facilitator of allowing data to be stored in other jurisdictions.

The UK should ensure it includes a reciprocal commitment in future trade agreements that ensures that no party shall require the use of computing facilities or their location in a Party's territory as a condition of market access.

3. Facilitate Regulatory Access to Data

One of the accompanying arguments for the forced localisation data is centred on concerns over regulatory and law enforcement access to data which brought about changes to the US's approach to data localisation. This has its roots in the difficulty US regulators faced in accessing data from Lehman Brothers in the wake of the financial crisis and their bankruptcy

in 2008. As the company unravelled and overseas subsidiaries were sold off, there were numerous hurdles and practical difficulties in the way as the Federal Reserve and Federal Deposit Insurance Corporation tried to access Lehman's 26,000 servers scattered across various jurisdictions.[77]

These are genuine concerns but ones that can be addressed both through domestic steps and in international agreements. In the former case, for "systemically important financial institutions" (SIFIs) oversight has been introduced in the US into how they manage their IT systems through the Dodd-Frank Act. This requires that SIFIs prepare "resolution plans" that ensure that there is an orderly winding down of the business in the case of bankruptcy to ensure regulators can access any information they need.[78] A similar system is in place in the UK through the amended Banking Act 2009.[79] While these measures are limited to large financial institutions and there may be a case to extend its requirements to other financial companies, they demonstrate that it is in the gift of domestic authorities to ensure that they have the ability to access important data regardless of the location it is stored in.

Outside of the realm of finance, there are other examples of international cooperation to ensure that regulators can access data and investigations can be conducted. APEC has been a leader in this area. In 2010 it created the APEC Cross-border Privacy Enforcement Arrangement (CPEA) to aid in the enforcement of privacy laws. It is designed to help facilitate information sharing, providing mechanisms to promote effective cross-border cooperation and encourage information sharing and cooperation on investigations and enforcement with regulators outside of APEC.[80]

The APEC arrangement has been used effectively in aiding regulatory investigations. One notable example is the joint investigation by the Privacy Commissioner of Canada, the Australian Privacy Commissioner and Acting Australian Information Commissioner into the hack of Ashley Madison. This took place thanks to the APEC CPEA.[81]

For law enforcement, the growth of the digital realm has created new challenges in accessing evidence that may be stored on servers across the globe. Traditionally Mutual Legal Assistance Treaties have provided the means to access evidence in different jurisdictions but these have not proved capable of meeting the needs of law enforcement authorities when seeking the timely acquisition of e-evidence.[82] International cooperation is needed to provide a coherent and consistent multinational approach to law enforcement access to data.

The UK should ensure that it complements trade negotiations with talks on new mechanisms of cooperation between the Parties, or on the UK's accession to existing mechanisms. A trade agreement should include, where a separate agreement is not already in place, a clause that Parties will: endeavour to promote compatibility between regulatory regimes relating to access to data; exchange information on mechanisms within their jurisdictions; and explore ways to extend these or other suitable arrangements to promote compatibility between them.

4. Prevent separate treatment for cross-border flows of financial data

Financial data is an essential component of the functioning of the digital economy and the lifeblood of cross-border e-commerce. Yet, partly out of the experience of the Lehman Brothers bankruptcy, it has been subject to separate carve outs in trade agreements. This is despite the provisions for regulatory access for data that have been discussed, and the existence of prudential exemptions for the banking and financial system.[83]

The imposition of additional data localisation requirements on financial institutions and their data specifically has impacted them in a number of ways. One study found it has limited their competitiveness; raised direct costs, for example by imposing the need to build dedicated data centres in each jurisdiction they operate in; and has potentially slowed the expansion of financial services in developing countries.[84]

The UK's financial services sector was worth £119 billion in 2017 employing 1.1 million people.[85] The fintech sector is an increasingly central part of the UK's financial and tech offering - already accounting for around £6.6 billion in revenue in 2015[86] and attracting $2.3 billion in investment in 2018.[87] **It should be a key UK priority to ensure that financial data is not subject to separate carve outs in future trade agreements to increase competitiveness and growth in this area.**

Tariffs

5. Secure the expansion of the Information Technology Agreement in both geographic and product coverage
6. Make the moratorium on customs duties on electronic transmissions permanent

Tariffs are a drag on a nation's economy and raise costs for consumers. A study by economists from the Federal Reserve Bank of New York, Princeton University, and Colombia University found that the imposition of tariffs by the USA in 2018 resulted in a reduction of the country's real income of $1.4 billion per month.[88] With smartphones containing components from up to 2,200 suppliers and other tech products similarly dependent on complex supply chains, tariffs can hit the sector very hard.[89] Indeed, analysis by the Consumer Technology Association found that the new US tariffs would cause the price for mobile phones in the US (imported from all countries) to rise by 14%, laptops and video game consoles by 19% and toy drones by 15% – costs that will eventually be passed onto consumers.[90]

Fortunately, the trend over recent decades has been to exempt technology products from tariffs, and in the case of electronic transmissions, to prevent their imposition to begin with. The WTO has been central to this effort. The Information

Technology Agreement, which entered into force in July 1997 and was expanded in 2015, eliminated tariffs on a large number of technology products with an annual value of approximately $1.7 trillion. 82 WTO members have signed up to the ITA, and the agreement covers 97% of world trade in IT products.[91]

The other key achievement of the WTO in supporting the digital economy was the introduction of a moratorium on customs duties on electronic transmissions. Since 1998, the moratorium has been a key plank of the multilateral trading system, and a vital enabler of the growth of the internet as we know it today. By preventing the development and imposition of tariffs and customs duties on electronic transmissions, the moratorium has facilitated the development of the $27.7 trillion global e-commerce market.[92]

Yet both the ITA and the moratorium are not be-all and end-all solutions to the questions of tariffs. Even setting aside the imposition of tariffs on ITA covered products by the USA in its trade dispute with China, which opens the USA to the possibility of dispute settlement for contravening WTO rules, the ITA has been relatively inflexible to the swift advance of technology. The 18 years it took to update the product coverage of the ITA, which itemizes specific products for inclusion meant that entire waves of innovation have been, and are continuing to be missed. Already, widely used products such as smart TVs are not covered under the ITA's positive list, nor are other emerging products such as 3D printers and alternate and virtual reality technologies.

As for the moratorium, it has only ever been a temporary measure, subject to renewal at every WTO Ministerial Conference. Though it was renewed at the last meeting, in 2017, it has since come under renewed attack. India and South Africa have called for a "re-think" of the moratorium, citing the potential revenue lost due to the expansion of items electronically transmitted.[93] In fact, goods that are readily digitizable of the kind that India and South Africa cite, such as books or DVDs, make up less than 1% of the total goods trade in both developed and developing countries, yielding only around 0.25% of all customs revenues in 2014.[94]

Other countries have a different protectionist take on the moratorium, with Indonesia arguing that the moratorium "applies only to the electronic transmissions and not to products or contents which are submitted electronically".[95] It has consequently introduced tariff lines on intangible products such as software.[96]

Ending the moratorium, or defining it in such a way as to open up the contents of electronic transmissions to the imposition of tariffs, would mark the single biggest reversal of trade liberalisation in living memory. With the global sales of the top 10 software companies coming to over $250 billion in 2019, new digital tariffs could threaten entire digital business models, and increase costs for other rapidly digitizing sectors.[97] More importantly, recent research has shown that the imposition of tariffs on electronic transmissions in developing countries would fail to increase revenue and be "fiscally counter-productive" as it would result in "higher prices and reduced consumption, which would in turn slow GDP growth and shrink tax revenues".[98]

Indeed, in a scenario of reciprocal digital tariffs, India, for example, would lose 49 times more in GDP than it would generate in tariffs, while Indonesia would lose 160 times more, meaning their policies on the moratorium would yield incredibly negative consequences on their economy.[99]

5. Secure the expansion of the Information Technology Agreement in both geographic and product coverage

An ambitious UK digital trade policy should look to primarily focus on increasing product coverage for the ITA while also focusing on expanding the geography of the agreement. Though some large countries like Mexico and Brazil have not signed onto the agreement yet, it is worth noting that 97% of trade in IT products under the purview of the ITA is already covered.[100] **In the medium-term the UK should work to invoke the review mechanism for the ITA as part of the JSI on e-commerce at the WTO to ensure that it is not another 18 years before the ITA is again updated. In the short-term, the UK needs to complement this approach with efforts to diffuse the current tensions placed on the ITA by the current US-China trade dispute and ongoing dispute settlements at the WTO**

Within future UK trade deals, it is important to ensure that widespread and emerging technologies is included as part of tariff liberalisation. Items such as, but not limited to, 3D printers (HS Code 847780, 1.7% 3rd country duty), Smart TVs (HS Code 852859, 14% 3rd country duty) and lithium-ion batteries (HS Code 850760, 2.7% 3rd country duty) should be tariff free. **To prevent the imposition of tariffs on future technologies, tariffs should be dealt with using a negative list in future UK trade agreements.** This way, only the items that are specifically listed are subject to duties and everything else that is currently being created or imagined, will remain tariff free unless specifically added to that list. This approach will help protect future technologies and emerging industries from the imposition of tariffs by the UK's trading partners.

In addition, **the next steps for the ITA should include addressing non-tariffs barriers for the ICT sector and discussing the role of digital technologies for supporting the protection of the environment and mitigating climate change. A relaunch of the WTO plurilateral Environmental Goods Agreement negotiations with an extension to services should be explored in parallel.**

6. Make the moratorium on customs duties on electronic transmissions permanent

The UK should make it a central tenant of its digital trade policy to make the moratorium a permanent feature of the multilateral trading system. This should primarily be done through the WTO by working with likeminded countries to secure a consensus on making it permanent. The e-commerce negotiations offer an unprecedented opportunity to reach an agreement and finally secure a tariff free future for cross-border electronic transmissions.

In this process, **the UK should advocate for a broad definition of electronic transmissions and include the content of those transmissions (i.e. e-books, video, software, etc.). The UK should continue to resist attempts to characterize the moratorium as only covering the transmissions themselves.**

Furthermore, **the UK should follow best practice in digital trade policy and include a strong commitment in future trade deals to ban the imposition of customs duties in connection with the import or export of digital products transmitted electronically.**

This commitment should extend to all digital products regardless of source rather than being limited to just the signatories of the agreement, thus helping embed the moratorium in international law. As Mark Wu has argued, 'This approach is highly practicable. In a world where the data necessary to create a digital product can be stored in and flow through various jurisdictions, determining the origin of a digital product can be complicated'.[101] In trying to establish a world-leading digital trade policy, extending an obligation to impose no tariffs on digital products to any country is an important marker of that ambition and commitment to free trade principles.

Intellectual Property

7. Prevent the mandatory transfer of source codes, algorithms, or encryption keys as a condition of market access
8. Support the development of AI through enabling open government data and text and data mining while respecting intellectual property rights

Recent years have seen a transformation in the use of intellectual property, bringing with it many challenges and opportunities. The protection of proprietary knowledge, to ensure creators of new products are duly rewarded needs to be an important ongoing element in the UK's trade policy. As the Information Technology and Innovation Foundation has argued, the protection of intellectual property rights (IPR) has a number of positive benefits by:

- creating powerful incentives for domestic innovation
- inducing knowledge spillovers that help others to innovate
- ensuring a country's companies can focus on operating productively and innovating, instead of having to devote an undue amount of their time and resources to protecting their IP in an environment where it's at risk

- promoting the international diffusion of technology, innovation, and knowhow
- boosting a country's levels of research and development, inbound foreign direct investment (FDI), and exports of goods and services.[102]

The UK already has a robust IP framework and it is important this is protected, including in relation to patents. **Any future trade deal should seek to build on the UK's high standard of IP protection and should not threaten the UK's membership of the Unified Patent Court and the European Patent Convention.** These are highly valued by the UK tech sector and continued membership should be a key priority.

However, the impact of the digital economy has widened IPR issues far beyond patents. Issues such as the protection of source codes and the enabling of AI through the use of open data should also be central elements of a future UK digital trade policy.

7. Prevent the mandatory transfer of source codes, algorithms or encryption keys as a condition of market access

While innovations in working practices have led to much more intellectual property being co-created via open source software, the reality is that for many businesses their products are a mix between proprietary content and open source.[103] It is therefore worrying that the forced transfer of technology is demanded in certain jurisdictions as a condition of market access.

This is notably the case in China, who was subject to a Section 301 investigation by the Office of the United States Trade Representative into its "Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation".[104] Indeed, as the Peterson Institute for International Economics summarises: "China has adopted policies deliberately designed to force foreign multinational to transfer strategically sensitive technologies to indigenous Chinese firms".[105]

It is important that the UK's digital trade policy is used to protect the IP of innovative UK firms. **The UK should work with likeminded countries to ensure the JSI e-commerce negotiations include robust provisions to prevent the mandatory transfer of source codes, algorithms, or encryption keys as a condition of market access.**

Likewise, **future trade agreements should include a clause stating that no party shall require the transfer of, or access to, source code of software, algorithms, or encryption keys owned by a person of another party, as a condition for the import, distribution, sale or use of such software, or products containing such software, in its territory.** Such wording would not prevent the provision of source code in commercially negotiated contracts, nor would it prevent requiring the modification of software to comply with a party's laws and regulations. The clause should seek to include an agreement that such laws and regulations will not lead to arbitrary or unjustifiable discrimination, or be a disguised restriction on trade, and do not impose restrictions that are greater than are necessary to achieve their objectives.

8. Support the development of AI through enabling open government data and text and data mining while respecting intellectual property rights

The development of AI has also had implications for intellectual property rights. Access to large data sources are crucial to train AI programs. With 27 MB of data set to be created every second for every human on the planet by 2020, and 90% of all data ever created in the last two years, the ability to analyse and harness that data relies on innovative AI.[106] The results of doing this will be transformative – one estimate is that AI could deliver a $13 trillion of additional economic output by 2030, boosting global GDP by about 1.2% a year.[107]

Unlike the major trading powers of the US, EU, and China, the UK does not have a domestic market of hundreds of millions of people as a foundation. To continue to scale the UK's AI sector and export its innovations then access to global data will be essential. If the UK aspires to have a world leading digital trade policy, then it needs to ensure that it calibrates it to helping the UK's most innovative emerging sectors.

One way that the UK government can facilitate the development of AI technology is to build on the gold standard set by the USMCA in future trade deals that commit parties to make government data available to the public in machine-readable and searchable open formats, and allow it to be searched, retrieved, used, reused, and redistributed. Facilitating the provision of accessible, organisable public data will help allow innovative UK AI companies to develop and train their products and deploy them readily in foreign markets. It is positive to see that the UK has set a precedent of including this provision in the UK-Japan CEPA.

An additional step that the UK should take to break new ground on digital trade would be to include mutual commitments to facilitate the use of text and data mining in the training of AI programs and artificial neural networks by providing greater access to data, where that material is lawfully accessed. This would help drive the development of technologies that can find previously unknown patterns and possibilities in vast data sets, helping to develop predictive analytics.[108] Copies of works and content that are made should only be retained as long as necessary for the text and data mining to train AI and artificial neural networks. Such a commitment should also only apply to works and content that has not been expressly reserved by IP holders in the appropriate manner, such as by machine-readable means in the case of content made publicly available online.

Regulatory Cooperation

9. Establish cooperation on the regulation of AI, fintech and other emerging technologies
10. Establish cooperation on cybersecurity issues with an emphasis on a risk-based approach
11. Work towards internationally interoperable digital identities
12. Use trade policy to further measures to protect online safety

The reality of technological change today means that it will not be tariffs that are the main barrier to digital trade, but regulatory divergence. Across a huge range of areas, Governments are scrambling to understand the implications of new technologies and business models. From what cryptocurrency and fintech mean

to banking systems, to the ethical and legal implications of AI and autonomous vehicles, to the impact of social media on elections, the regulatory landscape for emerging technologies is going to get more complex very soon.

The UK has often been at the forefront of developing new innovation-friendly regulation that maintains public trust and safety. The development of Open Banking under the leadership of the Competition and Markets Authority has played a significant role in fostering the growth of UK fintech companies. [109] As of November 2020, the Financial Conduct Authority's Regulatory Sandbox has already helped 140 companies over six cohorts test innovative technologies and products actually in the market with real consumers.[110] This kind of steps have clearly demonstrated the role that regulators can play in encouraging innovation.[111] In the AI sphere, the creation of the Centre for Data Ethics and Innovation as the world's first body to be dedicated to fostering the UK's use of data and AI, will help cement the UK's leadership in this field.[112]

But if these innovative regulatory approaches are not replicated elsewhere, then UK tech firms will find themselves unable to export their products abroad without significant modification. A trade agreement is not the appropriate avenue to attempt substantial alignment of regulation. However, it can provide a framework for constructive engagement and cooperation between governments. This can be valuable in enabling the effective and enforceable regulation of emerging areas in a way that both helps innovative businesses navigate international regulatory regimes while maintaining public trust and safety in all parties.

9. Establish cooperation on the regulation of AI, fintech and other emerging technologies

In future UK trade agreements, **it should be an aim to support the growth of emerging technology companies by establishing frameworks for cooperation in the development of regulation.** These should include specific provisions to maintain an ongoing regulatory dialogue including the sharing of information, experience, laws, regulations, implementation, compliance and best practices. There should be a commitment highlighting both the specific regulatory bodies that should be in dialogue, for example privacy commissioners, as well as across technologies where they may not be a specific regulator in place. The Singapore-Australia DEA provides a model for doing this with its accompanying MoUs.[113] It is welcome that the UK-EU TCA includes positive obligations to cooperate on the development of emerging technologies, however, greater ambition is required on the scope of cooperation, regulators included within it, and the technologies included within it.

Trade agreements should also include commitments to cooperate and maintain a dialogue on the promotion and development of mechanisms that facilitate the interoperability of regulatory regimes and on other multilateral regulatory efforts. Examples of this include OECD principles on AI[114] and the development of the G20/OECD Policy Guidance on Financial Consumer Protection Approaches in the Digital Age.[115]

The UK should also seek other means to expand the access for innovative UK firms. One example of this can be seen through the UK "Fintech Bridges", agreed with Hong Kong,

South Korea, Singapore, China and Australia.[116] These agreements help secure access of UK fintech companies into the regulatory sandboxes of other countries, helping them establish an international footprint at an early stage.[117] They also help facilitate common approaches to the regulatory challenges raised by emerging financial technologies, helping ensure that non-tariff barriers will not be erected at a later point. **The UK should continue to negotiate "Fintech Bridges" with other important and emerging markets and explore ways this approach could be expanded into other sectors.**

10. Establish cooperation on cybersecurity issues with an emphasis on a risk-based approach

In a complex, interconnected world, good cybersecurity plays a central role and this importance is beginning to demonstrate itself in digital trade policy. The cost of cybercrime is significant – over 60% of large businesses reported having cyber security breaches or attacks in 2018.[118] The most recent National Crime Agency and National Cyber Security Centre report on cybercrime notes that between 2016 and the end of 2017 there were 34 significant cyber-attacks (i.e. those requiring a cross-government response) with a further 762 less serious incidents. They further note an expectation that "the race between hackers' and defenders' capabilities will increase in pace and intensity".[119]

Meanwhile, the UK has a leading cybersecurity sector, with annual revenues of £5.7 billion and a total GVA contribution of £2.3 billion in 2015-16.[120] The Government's 2016 National Cyber Security Strategy committed £1.9 billion over five years to both help make the state more resilient to attacks and to promote the growth of the domestic sector through measures such as cyber innovation centres on allocated innovation procurement funds.[121]

The UK should seek to help support the development of the domestic cybersecurity sector and promote common approaches to cyber issues through its digital trade policy. To this end it was very welcome to see that the UK-EU TCA included ambitious and detailed cybersecurity provisions.[122] **UK digital trade policy should build on the standard set in the UK-EU TCA for cybersecurity cooperation and that in USMCA that recognises that risk-based approaches relying on consensus-based standards and risk management best practices are the most effective way to deal with cybersecurity threats and encouraging enterprises within the jurisdiction of the parties to take that approach.**

Furthermore, **future trade agreements, including the WTO e-commerce work track, should include provisions to strengthen collaboration and cooperation in the identification and mitigation of cybersecurity threats and enable the sharing of information and best practices.**

11. Work towards internationally interoperable digital identities

Without a verifiable identity, individuals can find themselves facing systemic barriers to accessing justice, opening bank accounts, registering to vote as well as more widely being locked out of the digital economy. Research from the World Bank has found that just under 1 billion people globally lack any official proof of identity in 2018.[123] The residents of low-income countries, in particular women and those in the lowest 40% of income are the most impacted by lack of IDs.[124] That one of the targets of the UN Sustainable Development Goals is to ensure that everyone has a legal identity by 2030 reflects the importance of identity in increasing inclusion.[125]

Well designed and governed digital identities can have a big impact on the economy. Analysis from McKinsey estimates that countries could unlock significant economic value from implementing digital identity programs. For the

UK specifically, if it were to adopt an advanced identity system, one designed with principles of data minimization, owner agency, and privacy protection, then gains could be in the range of 3% of GDP in 2030.[126]

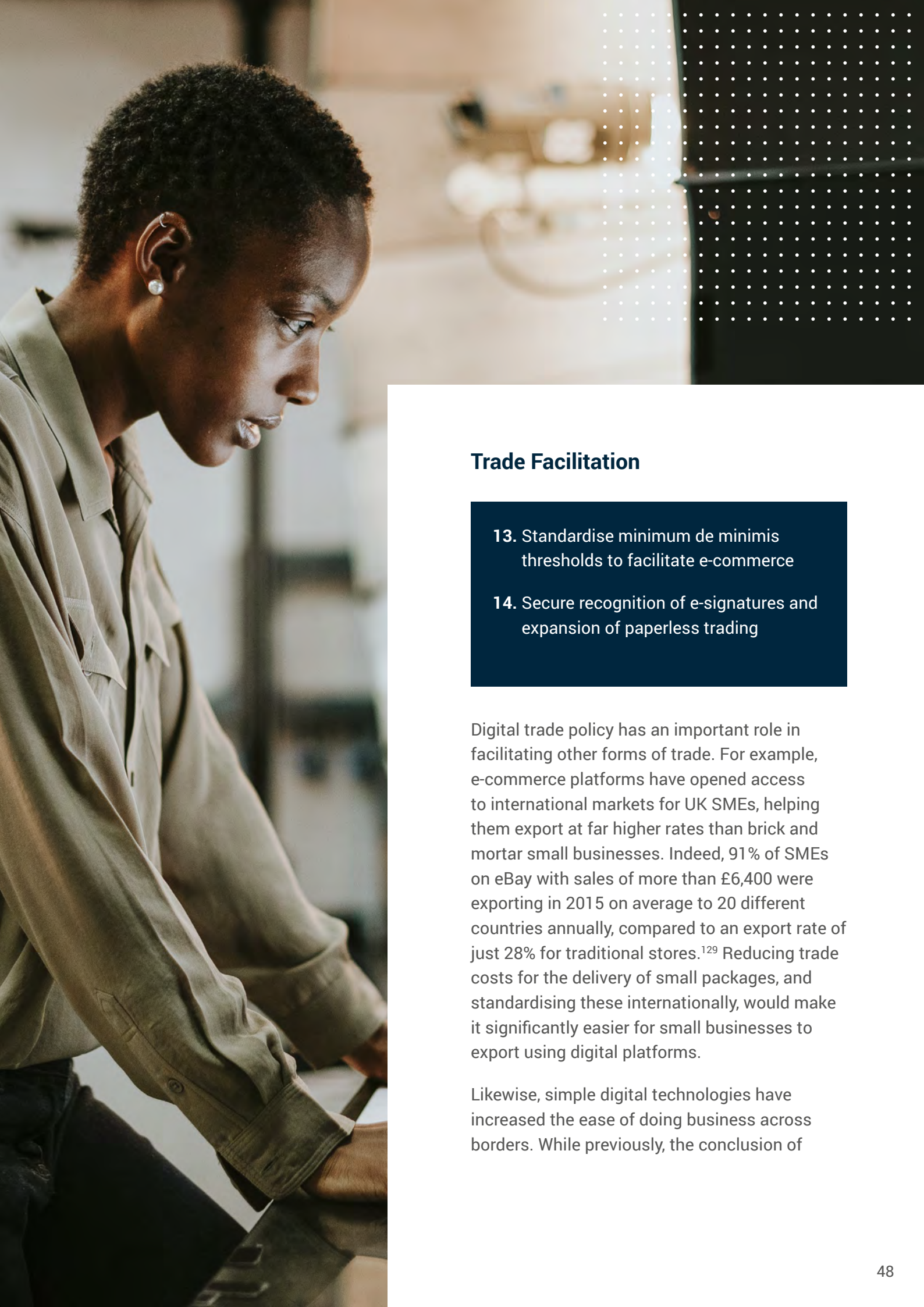
As techUK have argued, identity is not something bound by borders. National identities must be recognised in other jurisdictions for the smooth functioning of business.[127] **The UK should use its trade policy to advance the interoperability of digital identities internationally, ensure the comparable protection of digital identities in other jurisdictions, and further support their development through regulatory dialogues.**

12. Use trade policy to further measures to protect online safety

For all that the internet has opened up opportunities for individuals and businesses, the online world has also exposed many avenues for harm. Whether that is criminal and extremist content, grooming of children, cyberbullying, or misinformation, there is an array of threats and problems that threaten children, individuals, businesses, governments, and society in general the world over.

The line between illegal content and legal but harmful content is not always clear cut, and how to respect freedom of speech while ensuring a safe online environment is not one amenable to easy solutions. As techUK's engagement with the UK Government's Online Harms White Paper shows, the complexity involved in regulating and enforcing this area requires deep thought and scrutiny to get right.[128]

Furthermore, the very nature of the internet means that online threats and harms are not constrained by international borders. International cooperation will be at the heart of addressing them. The Australia-Singapore DEA and Singapore-New Zealand-Chile DEPA have broken new ground by moving beyond online consumer protection and specifically addressing online harms in the context of a trade agreement. **The UK should follow the best practice set in the DEA and DEPA, and include provisions in future trade agreements that commit parties to working together and within international fora to advance online safety.**



Trade Facilitation

13. Standardise minimum de minimis thresholds to facilitate e-commerce

14. Secure recognition of e-signatures and expansion of paperless trading

Digital trade policy has an important role in facilitating other forms of trade. For example, e-commerce platforms have opened access to international markets for UK SMEs, helping them export at far higher rates than brick and mortar small businesses. Indeed, 91% of SMEs on eBay with sales of more than £6,400 were exporting in 2015 on average to 20 different countries annually, compared to an export rate of just 28% for traditional stores.[129] Reducing trade costs for the delivery of small packages, and standardising these internationally, would make it significantly easier for small businesses to export using digital platforms.

Likewise, simple digital technologies have increased the ease of doing business across borders. While previously, the conclusion of

contract negotiations often meant they had to be physically signed and sent to other parties, now it is possible to use e-signatures and digital signatures to massively cut the times required to seal a deal. One company reduced the turnaround time for sales contracts by five days, and another reduced it by 83% from 23.5 days to 4 days and 2 hours.[130] Yet e-signatures are not universally recognised and they are often subject to divergent regulatory approaches. The lack of uniformity makes "cross-border digital activities more complex and raise[s] the cost of doing business in multiple markets".[131]

Going beyond e-signatures and extending paperless trading across global value chains offers further savings in time and money. From purchasing orders, inventory reports, sanitary and phytosanitary certificates, the digitisation of trading documents has played a significant role in the development of "just-in-time" supply chains yet paperless trade measures are far from universally adopted.[132]

DEPA broke new ground with its comprehensive module to business and trade facilitation and its interaction with the digital economy. The inclusion of new provisions to encourage cooperation and the sharing of best practices on logistics and electronic invoicing established a new standard on these topics that the DEA then replicated. **The UK should ensure that its future trade agreements take a comprehensive approach to business and trade facilitation building on the DEPA example.**

13. Standardise minimum de minimis thresholds to facilitate e-commerce

The UK boasts the third largest B2C market with sales worth US$266 billion as of 2018.[133] The cross-border flow of parcels is an ever more essential component of this market - total volumes reaching 284 million items in 2017-18, an increase of 30% year on year.[134] Not only is the UK a major importer of small items via e-commerce platforms but it is also a significant exporter. Across the EU and EEA, a market that is experiencing significant e-commerce growth, the UK was either the first or second most common origin of the most recent online purchase of shoppers in 17 countries.[135]

De minimis thresholds (DMT) remain one of the key costs for this trade in small items. The DMT is the valuation ceiling for imports, below which there is no duty or tax charged and other procedures are minimal.[136] DMTs have two key objectives – balancing the costs of assessing and collecting duties and taxes compared to the amounts raised, and promoting digital trade and the express delivery of low-value shipments, a major plus for businesses and consumers.[137] Too low a threshold could end up costing a country more than it makes in revenue, increasing costs to importers in the process, as was the case in Canada, which had the lowest DMT of any industrialised nation until it committed to raising it as part of USMCA.[138]

As part of its digital trade policy, **the UK should seek to ensure that other countries' DMT are at a comparable level to the UK's to ensure a level playing field for UK e-commerce exporters and that these thresholds are periodically reviewed to take into account relevant factors**

including rates of inflation, effect on trade facilitation, administrative cost of collecting duties compared to the amount of duties, and the impact on SMEs. The UK currently charges no customs duty on any goods under £135 and no VAT for goods under £15 (rules differ for gifts).[139] Furthermore, **the UK should work with international partners at the WCO and WTO to seek an alignment on DMTs and related customs declarations for small items to reduce trade costs for consumers and businesses.**

14. Secure recognition of e-signatures and expansion of paperless trading

The UK should seek to use its digital trade policy to advance the recognition and adoption of paperless trading and e-signatures, helping reduce trade costs across global supply chains. This should include specific provisions in future trade agreements that ensure:

- Non-discrimination and functional and legal equivalency for trade administration documents submitted electronically;
- Non-discrimination and functional and legal equivalency for contracts concluded electronically and those using e-signatures and electronic authentication;
- Technological neutrality in legislation in the use of e-signatures and electronic authentication;
- A commitment to the use or introduction of electronic single windows for trade processes and that trade administration documents should be available to the public electronically; and
- A regulatory dialogue between trade administration bodies encouraging cooperation in the implantation of paperless trading.

Additionally, **the UK should build off the WTO Trade Facilitation Agreement and seek to encourage countries to implement its provisions, especially relating to paperless trade. The UK should also work with international partners at the WTO and WCO, as well as through the United Nations Commission on International Trade Law (UNCITRAL) and UN Centre for Trade Facilitation and Electronic Business (UN/CEFACT) to continue to push for the development of new best practices in paperless trading and develop new innovation friendly model regulations.**

4. Supporting Digital Trade

4. Supporting Digital Trade

Trade agreements include more than the digital trade chapter and, likewise, the UK's digital sector rely on a range of different provisions if they are to successfully trade. Whether it is the right to establish in a country without onerous conditions or the ability to move workers from the UK to be part of a local team, and many things in between, future UK trade agreements should include comprehensive provisions to support its businesses. These should include reference to:

- Services
- Telecommunications
- Limitations to Liability
- Government Procurement
- Standards
- Rules of Origin

Services

The technology sector in the UK is dominated by services. As Frontier Economics' report for techUK, "The Digital Sectors After Brexit" found, 96% of the sector's output and 81% of its exports are spread across services activities.[140] Getting services right in trade agreements is going to be essential if the UK tech sector is going to benefit from the country's trade policy.

The most digital heavy exports, (telecommunication, computer and information services), were worth over £21 billion to the UK in 2019.[141] However, the scale of digital dependent exports is far greater when digitally delivered services are included. In 2018 these amounted to exports worth £190.3 billion – 67.1% of total UK services exports.[142]

In addition to the many digitally specific barriers to trade in services, such as data localisation requirements or regulatory divergence that are dealt with above, there are a range of other non-sector specific barriers as well. These include requirements for local presence, a highly restrictive measure for online-only businesses. Similarly, local content requirements, most often used for manufactured goods such as cars, are in some jurisdictions applied to software, in particular as part of procurement processes. These local content requirements can also oblige firms to use local engineering and installation services.[143]

A UK digital trade policy should ensure that local presence and local content requirements are eliminated in future trade deals. It should ensure that UK services exporters are dealt with under the principles of National Treatment and Most Favoured Nation.

Mobility

Mobility is a key barrier to the export of services. While many services can be delivered over the internet, these are often underpinned by the need for staff to be on the ground either short-term or long-term. For example, a cloud computing service provider may need to send engineers into a country to repair its servers. Restrictions and bureaucratic requirements directly lead to increased costs and delays for businesses.

In a competitive and fast-moving sector, the ability to recruit talent easily and move them within a business is critical and, as techUK has previously argued, there is much space to improve the UK's immigration system.[144]

Facilitating the movement of people (both short-term movement and long-term migration) should be an objective of future trade agreements. The UK should look to secure more generous visas as part of UK trade agreements, for example building on provisions that allow for short term mobility, such as those allowed under CETA,[145] and carving out new pathways for long-term migration.

Mutual recognition of qualifications is another barrier that is increasingly going to affect

the tech sector in a variety of ways. The first is as tech roles receive greater professional recognition. For example, the Department for Digital, Culture, Media and Sport in 2018 ran a consultation into developing the UK cyber security profession, including on proposals to create a new chartered body for cyber professionals.[146] As other countries pursue similar initiatives it will be important to ensure that these are mutually recognized and align with international standards otherwise it will not be possible for UK chartered cyber professionals to provide services in other jurisdictions.

Tech is also impacted by the need for the mutual recognition of other professions. As new technology transforms established professions, through areas like medtech, fintech and legaltech, ensuring that the qualifications of the specified person behind the technology is recognized will be crucial to enable the product to be used in other countries, both for individuals coming into the UK and UK citizens going elsewhere. **Provisions on the mutual recognition of qualifications should be a central objective of any future UK services chapter.**

Finally, **it is important that any services chapter should be in the form of a negative list.** This approach, as taken in the EU-Japan Economic Partnership Agreement, ensures that liberalisation is universal to all service sectors, unless specifically exempted.[147] For a fast-developing sector, where key UK digital exports, such as those in fintech, did not exist even a decade ago, the use of a negative list will enable innovative new companies to be able to benefit from liberalisation immediately, and will help ensure that the FTA supports the UK economy of the future. To not use a negative list, or to use one but with large carveouts reserving the right to impose trade-distorting regulations in emerging areas, will directly limit the value of future trade agreements to the tech sector.

Telecommunications

Improving access of UK companies to international telecommunication markets should be an aim of future trade agreements. Telecommunication services provide the backbone to the digital economy yet they are subject to some of the most protectionist requirements and anti-competitive policies.[148] The UK's telecommunications sector is highly competitive, with exports of £6.4 billion in 2017 of which 58.6% was to non-EU countries.[149] The intention of the EU to review and sharpen existing WTO telecommunications rules as part of the WTO e-commerce negotiations is to be welcomed.

Future UK trade agreements should seek to liberalise telecommunications trade in a number of ways:

- ensure that the definitions of public telecommunications networks and/or services must **include an explicit reference to business to business supplies;**
- **enhance non-discrimination clauses for wholesale access,** including an obligation on domestic suppliers not to discriminate in favour of their own downstream business, to ensure consistent, pro-competitive regulation of business grade wholesale access;

- **ensure that UK providers enjoy the same rights to offer services and trade on equivalent terms as domestic providers,** including not facing additional licensing or domestic ownership requirements;
- **remove geo-blocking restrictions,** allowing the transfer of content across borders;
- **include direct, indirect and common costs, as well as a reasonable rate of return, where cost-oriented rates are applied.** Such rates shall not include costs not related to the provision of public telecommunications services; and
- **ensure that competent regulatory authorities should be fully independent and impartial, with appropriate enforcement powers and appeal mechanisms.** Their powers and standing should be mutually recognised and **there should be mechanisms in place for ongoing regulatory dialogue to exchange best practice with a view to ensuring consistency of approach.**

Future UK trade agreements should not jeopardise the light touch regulatory approach which has helped position the UK as an enabling regime for digital and which is particularly important for emerging services, such as IoT and 5G. This approach should apply to telecommunication services.

Limitations to Liability

The principle of limited liability for online intermediary activities was established in the UK under the European Union e-Commerce Directive (Directive 200/31/EC (ECD)) and implemented in the UK under the Electronic Commerce (EC Directive) Regulations 2002.[150] This directive forms a long-standing, core component of the legal framework that underpins the internet and has been fundamental to the growth of the UK's digital economy. It has allowed a diversity of intermediaries to become established and grow, and has provided previously unimaginable opportunities for people and businesses to access new markets.

Under these regulations, there is no blanket exemption from liability stemming from online services. Instead liability is limited and conditional. Crucially, the regime is activity based, not business-model specific, so where a limitation to liability exists, it applies to a specific activity, not the entity as a whole or economic sector.

Future UK trade agreements must adopt provisions that commit parties to principles on intermediary limited liability equivalent to those set out in the USMCA.

UK consumers and small businesses increasingly leverage a wide array of comparison websites, customer support tools, and marketing platforms to reach far beyond their local markets. For these trade-enabling online services to function, UK firms need some level of assurance that they will not be held liable for communications that arise between businesses and consumers using these tools, particularly where firms take appropriate action upon notice of illegal content. **The UK should work through bilateral agreements and the WTO JSI proceedings to establish predictable non-IP safe harbours that allow online services to serve this trade-enabling function, while at the same time encouraging firms to work with public authorities to ensure a safe online environment. Domestically, the UK should continue to maintain a viable, clear liability framework for online services.**

Government Procurement

Governments are key customers of digital technologies. From traditional areas such as communications equipment and database services, through cybersecurity products and CRM systems to emerging areas like the use of AI in decision making or diagnostic healthcare, Governments increasingly need a huge range of tech products.

This is an area where the UK is a leading player. The UK Government has been a pioneer in the development of e-procurement, for example through its Digital Marketplace. This saw sales of £2.03 billion in 2018/19, with almost 40% through SMEs.[151] Initiatives like NHSX, which seeks to drive the digitisation of healthcare in the UK, help to chart a course of public and private collaboration that can deliver improved services through the use of digital technologies. [152]

There is a major opportunity for UK businesses in opening up foreign procurement markets. A recent report estimated that the UK Govtech market will be worth £20 billion by 2025.[153] Expanding export opportunities will further

support the growth of this sector. Already, the UK Government has secured its continued membership of the WTO Government Procurement Agreement (GPA) after it left the European Union. This secures UK firms' access to a procurement market worth $1.7 trillion annually in 48 countries.

If the UK negotiates its own free trade agreements, then it can secure deeper access to government procurement contracts. For example, while the USA opens up procurement contracts worth $837 billion to foreign competition through the GPA, there is a further $898 billion that is not currently included.[154] But through an FTA, the UK could receive exemptions to these restricted areas to enable firms to bid into these contracts.

The UK's digital trade policy should follow the following principles to ensure that the UK tech sector can benefit from future procurement opportunities:

- Non-Discrimination - **UK firms offering goods and services should receive treatment no less favourable than those of a supplier from the other Party.** This should include treating a locally established supplier no less favourably than another locally established supplier on the basis of UK ownership or affiliation. Nor should another Party discriminate against a locally established supplier on the basis that the goods or services offered by that supplier for a particular procurement are goods or services of the UK.
- Broad Definitions - **Definitions should include goods and services, ensuring subscription services, for example to software or cloud storage, are included as well as just one-off procurement costs.**
- Access to different levels of public procurement - **As well as national/federal public procurement, future trade deals should provide access to local, municipal and regional (State, Province, Devolved Authority etc.) procurement.**
- Single Window Portals - **Agreements should encourage all covered procurement to be accessible online through single window portals, including the publication of procurement information, notices, and tender documentation, and for the receipt of tenders.** These IT systems and the software behind these portals should be generally available and interoperable with other generally available IT systems and software.

- Lower Threshold Limits - **The thresholds for procurement that is covered by an agreement should be set at such a level as to open further opportunities for SMEs to bid for.**
- No Separate Rules of Origin - **For the purposes of covered procurement, a Party shall not apply rules of origin to goods or services imported from or supplied from the other Party that are different from the rules of origin the Party applies at the same time in the normal course of trade to imports or supplies of the same goods or services from the same Party.**

Standards

Voluntary, industry led product standards play a significant role in the technology sector, helping provide security, interoperability and management amongst many others. The result is a significant value added from product standards amounting to £2.1 billion per year.[155] Furthermore product standards play an important role in helping ensure that UK technology exports are compatible with those in other international markets, helping to facilitate exports.

Through the BSI, the UK participates in the European standards bodies CEN and CENELEC and international bodes the ISO and IEC. These systems mirror each other and international product standards are often in turn adopted as European standards. In total 95% of UK standards are international or European standards.[156] **It is important that the approach to product standards, regulation and certification adopted in future UK trade agreements should not jeopardise the UK's continued membership through the BSI in CEN and CENELEC.**

Future UK trade agreements should include measures to expand the mutual recognition of conformity assessment bodies, certifications and regulatory standards (as opposed to product standards) to minimise burdens on businesses.

Rules of Origin

Technology products are incredibly complex and draw on a wide supply chain. A typical tech company can have upwards of 2000 suppliers in its supply chain.[157] Many of the components featuring in a laptop or a smartphone would have crossed international borders many times, especially when their raw materials are taken into account. With more traditional sectors, such as the automotive industry, now also including more tech components such as chips, screens and sensors, this picture has gotten more complex.

For goods to be subject to preferential tariffs, it needs to be demonstrated that they were either substantially made or substantially altered in the country they are being exported from. The rules governing this are known as Rules of Origin and these can be complex and costly in either time or money to comply with. The result can sometimes be that companies choose to pay a higher tariff to avoid the compliance costs, especially if a product's supply chain was particularly complex.[158] A recent example was the UK-EU TCA where exports of TVs on both sides were at risk of a 14% tariff without a change of tariff heading.

Given that often very few countries produce key components – over 75% of the market share of semiconductors was split between the USA, South Korea, and Japan in 2019 – it can sometimes be hard to meet Rules of Origin thresholds.[159]

It is crucial that the Rules of Origin in future UK trade agreements are flexible, notably via product-specific rules, allow for bilateral cumulation and are subject to reasonable local content thresholds to enable technology products to make use of them. The UK should also consider, where possible, to reach agreement on diagonal cumulation with third countries to facilitate the growth of supply chains, such as the Pan-Euro-Mediterranean Rules of Origin Convention.

5. Digital Trade and the Environment

5. Digital Trade and the Environment

The digital world is not without impact on the physical world. The ability to trade digitally is reliant on the production and use of billions of electronic devices across the globe. Smartphones and computers, servers and sensors, robots and fibreoptic cables – all are physical products that are the vital underpinnings of our digital world. These products are not without their environmental costs. They are also not without significant advanta ges that can be turned towards facing the challenge of climate change. Neither aspect can be ignored when exploring the role of digital technologies in UK's future trade policy.

While the COVID-19 pandemic has rightly been a central focus for policymakers and business, it is not the only systemic challenge facing the UK. Climate change remains an urgent issue - one in need of both technological solutions and political willpower to get under control. Research conducted by Dassault Systèmes with Tech-Clarity has shown that the pandemic has "caused 38% of organisations globally to decrease attention on environmental sustainability, while 18% put it on hold completely". Meanwhile, 46% of organisations have increased their focus on digitalisation.[160] This cannot be a zero-sum game. Addressing climate change has to be an urgent priority. Digitalisation itself can be a powerful tool in reducing the carbon footprint of companies and systems and advancing climate action, but it can also come with a major environmental cost if it is not done thoughtfully and in line with best practices.

The environmental potential and impacts of digital technologies should not be absent from the digital trade agenda. Emissions don't recognise borders and neither do the environmental costs. **The UK should look to use digital trade provisions to support effective climate action and smooth the path to the adoption of climate mitigating technologies. International collaboration must also be at the forefront of UK policy to cut down electronic waste and mitigate other negative impacts of technology. This should include playing a leading role in any future WTO plurilateral negotiations on trade and the environment.**

Digital Climate Tech

The potential role of digital tools and technologies in supporting climate action has never been clearer. Following a year-long inquiry into digital technologies and the planet, the Royal Society recently concluded that "while digital technology is just one part of the solution, it is absolutely central to the net zero future we must build."[161] With the right incentives in place, the greater use of digital technologies could allow a "transformation towards a data-enabled net zero economy" that "promises to create many local jobs".[162]

These technologies are not ones that are awaiting invention – what we have now if deployed at scale can make huge inroads into reducing emissions. In 2020, techUK research with Deloitte confirmed that existing digital technology uses already in the field can enable 15% of the carbon emissions reductions needed in the UK by 2030 whilst delivering £13.7 billion Gross Added Value to the UK.[163]

Further compelling use cases continue to be trialled. Smart charging of electric vehicles can help manage demand on the grid and machine learning is being used to manage the increasingly complex energy system. Even more ambitious projects include the creation of a digital twin of the earth to monitor planetary health, support dynamic modelling and analytics as well as policy assessment and development. [164]

This emerging "climate tech" market has significant potential to grow. **techUK's report with Deloitte outlined a series of policy interventions required to support UK growth including calling for the forthcoming National Data Strategy to have a focus on net zero, for the UK to lead the establishment of an International Centre for AI, Energy and Climate, and called for more challenge-led climate innovation, among other recommendations.**

The tech sector's impact on the environment

As with all anthropogenic activity, the digital sector has an impact on the environment. The sensors and equipment that gather data, the equipment that relays and transmits data, and the electronics that store, analyse, display and allow us to interact with data are powered by electricity and require a range of highly complex manufactured electronics to function. This in turn gives rise to carbon emissions, typically reflecting the energy mix of the grid that energy is drawn from, and electrical waste.

Carbon & Energy

The carbon footprint of the tech sector is estimated to be approximately 700 million tonnes of carbon dioxide a year, equivalent to 1.4% of global emissions and 4% of global electricity use.[165]

While total electricity consumption has increased by approximately 5% since 2015, the carbon emissions of the sector have dropped from around 730 Mt CO_2e due to higher levels of renewable electricity use both globally and from specific investments by ICT companies.[166]

This is a trend that is expected to continue.

In 2020, a new international standard for the ICT sector was published that outlines the pathway needed to meet the commitments outlined in the Paris Agreement. These guidelines are the first targets specific to the ICT sector that have been approved by the Science-Based Targets Initiative. It requires the sector to make global cuts of 45% by 2030 and sets out a roadmap for meeting net zero carbon emissions by 2050.[167]

A shift to renewable energy is expected to account for most of the sector's carbon reductions over the next decade. Indeed, if the ICT industry, ICT suppliers and end users all switch to using renewable energy then the carbon footprint of the ICT sector would be cut by more than 80%. The sector is already a significant buyer of renewables. ICT companies operating large data centres are leaders in corporate procurement of renewables, accounting for about half of global procurement of renewables in recent years (IEA) and driving renewable deployment across the world through Power Purchasing Agreements (PPAs).[168] The top six off-takers of renewables in 2019 were all ICT companies, led by Google.[169]

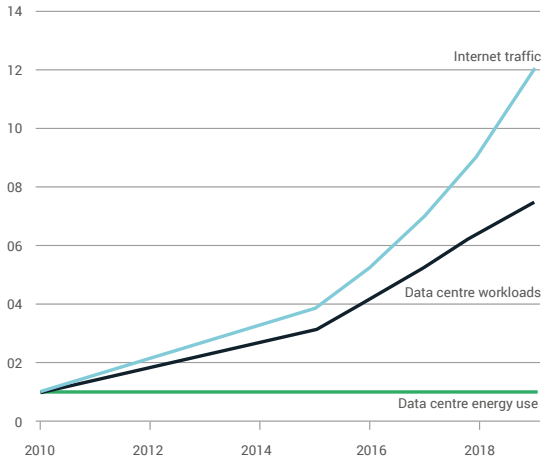
To date, more than 50 mobile operators, which together account for around two thirds of mobile connections globally – are now disclosing their climate impacts, energy and GHG emissions via the internationally recognised CDP global disclosure system. The GSMA, the mobile industry association, is working with operators to help them commit to targets aligned to the new net zero pathway for the sector.[170] Globally, 29 network operators representing more than 30% of global mobile connections and 50% of mobile industry revenues have committed to setting Science-Based Targets, along with 35 hardware manufacturers and the very major global data centre operators.[171]

Science-based targets are in turn leading to companies to deepen relationships with suppliers to drive down emission reductions through the supply chain. The latter is vital, especially for digital devices, as supply chain emissions can represent two thirds of a companies' full footprint.[172]

The UK Government should continue to support global efforts to mandate disclosure of corporate climate impacts and emissions and look to ensure that its trading partners are doing the same.

Data Centres: minimising the energy impacts of digital data growth

Data centres play a central role in the functioning of a digital economy. They are essential infrastructure that underpins every sector of the UK through the transmitting,



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"Global trends in internet traffic, data centre workloads and data centre energy use, 2010-2019", IEA, December 2020, https://www.iea.org/data-and-statistics/charts/global-trends-in-internet-traffic-data-centre-workloads-and-data-centre-energy-use-2010-2019

receiving, processing, storing and managing of digital data.[173]

Data centres also help position the UK as a provider of low carbon digital services and a premier global destination for green data – enabled by trade policy provisions facilitating cross-border flows of data. The UK's excellent digital infrastructure has won the UK 22% of Europe's data centre market share, with the sector expected to grow to be worth £7.6 billion in 2024, driven in part by the switch to digital thanks to the pandemic.[174]

Expanding our digital services offering involves significant growth in those data processes. However, an explosion in data volumes will not necessitate a parallel explosion in energy use.

In addition to purchasing renewable power and funding additional utility scale low carbon generation through PPAs, data centres are ideally positioned as anchor customers of technologies like green hydrogen and battery storage as soon as these are market-ready.[175]

Furthermore, developments in processor technology mean that the energy needed to process a given amount of data has diminished by over six orders of magnitude during the last three decades. Combined with approaches like virtualisation and advances in cooling technology, the energy consumption of data centres has remained remarkably flat.

This has been assisted by outsourcing existing inefficient on-premises IT functions and consolidating them into purpose-built facilities. These take advantages of economies of scale, reducing energy consumption by at least two thirds – and by more than 90% in cloud environments.[176]

Trade policy can play an important role in facilitating the growth of energy efficient data centres, by enabling the cross-border flow of data and banning localisation requirements, enabling organizations to use the most energy efficient facilities available.

The UK should support the growth of the data centre sector through its trade policy by working for cross-border data flows and against data localisation provisions that would restrict the use of energy efficient data centres in favour of localised facilities.

Electronic waste and the transition to a circular economy

A key environmental challenge for the sector is the design, reuse, remanufacture and recycling of electronics and smart devices. The scale of this problem is huge. With the world rapidly digitising, there has been an astronomical growth in the number of connected devices. This shows no signs of slowing down with IDC estimating that by 2025 there will be 41 billion connected devices across the world.[177]

Electronics are a complex waste stream, hazardous and expensive to treat responsibly. In the UK and the EU, a strong producer responsibility regime requires producers to pay for the collection and recycling of electronics at the end of life. The UK's system is set to be revised, with a consultation expected in Summer 2021.

However, not everything that is used here, is recycled here. Often secondary markets will see devices being shipped to developing countries where robust legislation is lacking. Concerns, which are also shared by producers, have been raised around illegal shipments of waste to these countries too, which is banned under the Basel Convention.[178]

A key opportunity to tackle electronic waste is through circular economy design and business models. These aim to design out waste and pollution by keeping materials and products in use for longer through reuse, repair, refurbishing and remanufacturing, and related business models.

While it is difficult to get a clear idea of the full extent of secondary markets for electronic devices, there is evidence it is significant. As Green Alliance put it "a circular economy for consumer electronics is already here".[179] For example, the market for second-hand smart phones is fast-growing, driven by rising trade-in values.[180] In the B2B sector, established hardware companies are moving to PaaS (Product as a Service) models and adopting circular business models but even here it is difficult to get clear data on its scale and size.[181]

What is clear is there are some significant UK market and policy interventions coming which will create strong circular economy design incentives for manufacturers, including:

- The government's recent ICT and digital services strategy which confirms that procurement will only be from ICT suppliers with circular design strategies in place. The strategy additionally commits government to buy more leased and remanufactured/ refurbished electronics in future.[182]
- The UK's forthcoming update to its eco-design policy framework is expected to set minimum standards for both energy efficiency and circular design.[183] Already circular design requirements have appeared for eco-design requirements for servers and display.
- The forthcoming review of the UK's Waste Electrical and Electronic Equipment regulations will be exploring how to encourage circular design and business models by varying end of life fees for producers, with producers of "good" products paying less than the producers of "bad" products.[184]

Electronic waste is not a problem restricted to the UK however, and will not be reduced by UK action alone. Trade policy is fundamentally linked to global efforts to create a circular economy. Import and export restrictions on waste and scrap can hinder the safe sorting and processing of these materials and differing standards for materials and recycling can create incompatible frameworks that harm efforts to reduce waste, to take two examples.[185]

Trade policy implications for a circular economy are not just tied to physical goods and the regulations that govern them, however. Services play a crucial role too. Research from the Ministry for Foreign Affairs of Finland and the International Institute for Sustainable Development has emphasised the important part that services play in the transition to a more sustainable economy. They found that "a very wide number of services were relevant to [firms] circular economy activities" with the most common services bought or sold being "recycling services, R&D, and other professional services, including IT services". Furthermore "over half of the circular economy service providers exported services related to the circular economy digitally".[186] Diverging regulations again form a key barrier to the trade in services. Additionally, digitally protectionist policies are cited as important obstacles affecting companies working in the circular economy.[187] These types of policies and the trend towards them are explored further below.

The UK should incorporate circular economy principles in its trade policy, including through encouraging regulatory cooperation and harmonisation relating to electronic waste products. The UK should also seek to remove barriers to the import and export of waste and scrap in cases where sufficient regulatory protections are in place.

6. Summary of Recommendations

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COVID-19 and its Impact on Digital Trade

- The UK should make closing the digital divide, both domestically and in developing nations, a central part of its COVID-19 recovery strategy. This strategy should include steps to provide access to digital technologies, economic development to support SMEs adopt digital technologies, and education to individuals of all ages, as well as business owners, in how to use digital technologies.

Digital Protectionism

- In multilateral forums and through bilateral and regional trade agreements, it is important that the UK is a strong and consistent voice in favour of combatting protectionism which costs businesses and consumers and threatens economic growth. It should be a firm advocate of removing restrictions to trade and preventing the rise of new barriers as the global economy adapts to the digital world.

Multilateral Digital Trade Policy

- While it is unlikely TiSA will be revived any time soon, should talks restart then the UK should join the negotiations.
- It is important the UK is an active participant in the JSI and works towards an ambitious and inclusive outcome.

Digital Trade and Development

- As the UK embarks on its own trade policy, it is important that the UK recognises the links between its digital aspirations and international development.
- Building off the former Department for International Development's "Digital Strategy 2018-2020", the UK should help support transitions into participation in GVCs and the digital economy.
- The UK should use its international development work to support developing countries' entry into the global digital economy and help them establish themselves in global value chains.

Digital Trade in FTAs

- The UK should build off the UK-Japan Comprehensive Economic Partnership Agreement and the EU-Japan Economic Partnership Agreement and ensure that all future agreements also include robust digital trade chapters.
- The UK should follow the example of the Digital Economy Agreement and utilise new gold standard digital trade provisions in future agreements, and accompany these with additional means of cooperation such as MoUs.
- The UK should go forward with its ambition to join the CPTPP and seek to accede to the Digital Economy Partnership Agreement to help establish its leadership on digital trade.

Digital Trade in other Forums

- The UK should ensure it is a proactive leader in international forums such as the G20 and OECD in pushing for steps that facilitate and enable digital trade, and should utilise its Presidency of the G7 to advance these ends.

Enable the Cross-Border Flow of Data without compromising data protection standards

- Ensure that all parties are encouraged to adopt or maintain a legal framework providing for the protection of personal information.
- Ensure that parties must publish clear and accessible information and guidance available online on how businesses can comply with the legal requirements of the data protection frameworks and how individuals can pursue remedies.
- Include provisions to oblige the existence of onward transfer mechanisms for personal data in full compliance with applicable data protection rules.
- Include a strong commitment that parties shall not prohibit or restrict the cross-border flow of data and information.
- The UK should ensure that provisions and commitments on the cross-border flow of data are subject to dispute resolution.
- The UK should ensure that any commitment it makes in future trade agreements does not jeopardise a UK-EU Mutual Adequacy Agreement.

Prevent the Forced Localisation of Data

- The UK should ensure it includes a reciprocal commitment in future trade agreements that ensures that no party shall require the use of computing facilities or their location in a Party's territory as a condition of market access.

Facilitate Regulatory Access to Data

- The UK should ensure that it complements trade negotiations with talks on new mechanisms of cooperation between the Parties, or on the UK's accession to existing mechanisms. A trade agreement should include, where a separate agreement is not already in place, a clause that Parties will endeavour to promote compatibility between regulatory regimes relating to access to data, will exchange information on mechanisms within their jurisdictions and explore ways to

extend these or other suitable arrangements to promote compatibility between them.

Prevent separate treatment for cross-border flows of financial data

- It should be a key UK priority to ensure that financial data is not subject to separate carve outs in future trade agreements to increase competitiveness and growth in this area.

Secure the expansion of the Information Technology Agreement in both geographic and product coverage

- An ambitious UK digital trade policy should look to primarily focus on increasing product coverage for the ITA while also focusing on expanding the geography of the agreement.
- In the medium-term the UK should work to invoke the review mechanism for the ITA as part of the JSI on e-commerce at the WTO to ensure that it is not another 18 years before the ITA is again updated. In the short-term, the UK needs to complement this approach with efforts to diffuse the current tensions placed on the ITA by the current US-China trade dispute and ongoing dispute settlements at the WTO.
- Within future UK trade deals, it is important to ensure that widespread and emerging technologies are included as part of tariff liberalisation
- To prevent the imposition of tariffs on future technologies, tariffs should be dealt with using a negative list in future UK trade agreements.
- The next steps for the ITA should include addressing non-tariffs barriers for the ICT sector and discussing the role of digital technologies for supporting the protection of the environment and mitigating climate change. A relaunch of the WTO plurilateral Environmental Goods Agreement negotiations with an extension to services should be explored in parallel.

Make the moratorium on customs duties on electronic transmissions permanent

- The UK should make it a central tenant of its digital trade policy to make the moratorium a permanent feature of the multilateral trading system.
- The UK should advocate for a broad definition of electronic transmissions and include the content of those transmissions (i.e. e-books, video, software, etc.). The UK should continue to resist attempts to characterize the moratorium as only covering the transmissions themselves.
- The UK should follow best practice in digital trade policy and include a strong commitment in future trade deals to ban the imposition of customs duties in connection with the import or export of digital products transmitted electronically.
- This commitment should extend to all digital products regardless of source rather than being limited to just the signatories of the agreement, thus helping embed the moratorium in international law.

Intellectual Property

- Any future trade deal should seek to build on the UK's high standard of IP protection and should not threaten the UK's membership of the Unified Patent Court and the European Patent Convention.

Prevent the mandatory transfer of source codes, algorithms, and encryption keys as a condition of market access

- The UK should work with likeminded countries to ensure the JSI e-commerce negotiations include robust provisions to prevent the mandatory transfer of source codes, algorithms, or encryption keys as a condition of market access.
- Future trade agreements should include a clause stating that no party shall require the transfer of, or access to, source code of software, algorithms, or encryption keys owned by a person of another party, as a condition for the import, distribution, sale or use of such software, or products containing such software, in its territory.

Support the development of AI through enabling open government data and text and data mining while respecting intellectual property rights

- One way that the UK government can facilitate the development of AI technology is to build on the gold standard set by the USMCA in future trade deals that commit parties to make government data available to the public in machine-readable and searchable open formats, and allow it to be searched, retrieved, used, reused, and redistributed.
- An additional step that the UK should take to break new ground on digital trade would be to include mutual commitments to facilitate the use of text and data mining in the training of AI programs and artificial neural networks by providing greater access to data, where that material is lawfully accessed.

Establish cooperation on the regulation of AI, fintech and other emerging technologies

- It should be an aim to support the growth of emerging technology companies by establishing frameworks for cooperation in the development of regulation.
- Trade agreements should also include commitments to cooperate and maintain a dialogue on the promotion and development of mechanisms that facilitate the interoperability of regulatory regimes and on other multilateral regulatory efforts.
- The UK should continue to negotiate "Fintech Bridges" with other important and emerging markets and explore ways this approach could be expanded into other sectors.

Establish cooperation on cybersecurity issues with an emphasis on a risk-based approach

- UK digital trade policy should build on the standard set in the UK-EU TCA for cybersecurity cooperation and that in USCMA that recognises that risk-based approaches relying on consensus-based standards and risk management best practices are the most effective way to deal with cybersecurity threats and encouraging enterprises within the jurisdiction of the parties to take that approach.
- Future trade agreements, including the WTO e-commerce work track, should include provisions to strengthen collaboration and cooperation in the identification and mitigation of cybersecurity threats and enable the sharing of information and best practices.

Work towards internationally interoperable digital identities

- The UK should use its trade policy to advance the interoperability of digital identities internationally, ensure the comparable protection of digital identities in other jurisdictions, and further support their development through regulatory dialogues.

Use trade policy to further measures to protect online safety

- The UK should follow the best practice set in the DEA and DEPA, and include provisions in future trade agreements that commit parties to working together and within international fora to advance online safety.

Trade facilitation

- The UK should ensure that its future trade agreements take a comprehensive approach to business and trade facilitation building on the DEPA example.

Standardise minimum de minimis thresholds to facilitate e-commerce

- The UK should seek to ensure that other countries' DMT are at a comparable level to the UK's to ensure a level playing field for UK e-commerce exporters and that these thresholds are periodically reviewed to take into account relevant factors including rates of inflation, effect on trade facilitation, administrative cost of collecting duties compared to the amount of duties, and the impact on SMEs.

- The UK should work with international partners at the WCO and WTO to seek an alignment on DMTs and related customs declarations for small items to reduce trade costs for consumers and businesses.

Secure recognition of e-signatures and expansion of paperless trading

- The UK should seek to use its digital trade policy to advance the recognition and adoption of paperless trading and e-signatures, helping reduce trade costs across global supply chains.
- The UK should build off the WTO Trade Facilitation Agreement and seek to encourage countries to implement its provisions, especially relating to paperless trade. The UK should also work with international partners at the WTO and WCO, as well as through the United Nations Commission on International Trade Law (UNCITRAL) and UN Centre for Trade Facilitation and Electronic Business (UN/CEFACT) to continue to push for the development of new best practices in paperless trading and develop new innovation friendly model regulations.

Services and Mobility

- A UK digital trade policy should ensure that local presence and local content requirements are eliminated in future trade deals. It should ensure that UK services exporters are dealt with under the principles of National Treatment and Most Favoured Nation.
- Facilitating the movement of people (both short-term movement and long-term migration) should be an objective of future trade agreements. The UK should look to secure more generous visas as part of UK trade agreements, for example building on provisions that allow for short term mobility, such as those allowed under CETA, and carving out new pathways for long-term migration.
- Provisions on the mutual recognition of qualifications should be a central objective of any future UK services chapter.
- It is important that any services chapter should be in the form of a negative list.

Telecommunications

- Include an explicit reference to business to business supplies.
- Enhance non-discrimination clauses for wholesale access.
- Ensure that UK providers enjoy the same rights to offer services and trade on equivalent terms as domestic providers.
- Remove geo-blocking restrictions.
- Include direct, indirect and common costs, as well as a reasonable rate of return, where cost-oriented rates are applied.
- Ensure that competent regulatory authorities should be fully independent and impartial, with appropriate enforcement powers and appeal mechanisms.
- There should be mechanisms in place for ongoing regulatory dialogue to exchange best practice with a view to ensuring consistency of approach.

Limitations to Liability

- Future UK trade agreements must adopt provisions that commit parties to principles on intermediary limited liability equivalent to those set out in the USMCA.
- The UK should work through bilateral agreements and the WTO JSI proceedings to establish predictable non-IP safe harbours that allow online services to serve this trade-enabling function, while at the same time encouraging firms to work with public authorities to ensure a safe online environment. Domestically, the UK should continue to maintain a viable, clear liability framework for online services.

Government Procurement

- UK firms offering goods and services should receive treatment no less favourable than those of a supplier from the other Party.
- Definitions should include goods and services, ensuring subscription services, for example to software or cloud storage, are included as well as just one-off procurement costs.
- As well as national/federal public procurement, future trade deals should provide access to local, municipal and regional (State, Province, Devolved Authority etc.) procurement.
- Agreements should encourage all covered procurement to be accessible online through single window portals, including the publication of procurement information, notices, and tender documentation, and for the receipt of tenders.
- The thresholds for procurement that is covered by an agreement should be set at such a level as to open further opportunities for SMEs to bid for.
- For the purposes of covered procurement, a Party shall not apply rules of origin to goods or services imported from or supplied from the other Party that are different from the rules of origin the Party applies at the same time in the normal course of trade to imports or supplies of the same goods or services from the same Party.

Standards

- It is important that the approach to product standards, regulation and certification adopted in future UK trade agreements should not jeopardise the UK's continued membership through the BSI in CEN and CENELEC.
- Future UK trade agreements should include measures to expand the mutual recognition of conformity assessment bodies, certifications and regulatory standards (as opposed to product standards) to minimise burdens on businesses.

Rules of Origin

- It is crucial that the Rules of Origin in future UK trade agreements are flexible, notably via product-specific rules, allow for bilateral cumulation and are subject to reasonable local content thresholds to enable technology products to make use of them. The UK should also consider, where possible, to reach agreement on diagonal cumulation with third countries to facilitate the growth of supply chains, such as the Pan-Euro-Mediterranean Rules of Origin Convention.

Digital Trade and the Environment

- The UK should look to use digital trade provisions to support effective climate action and smooth the path to the adoption of climate mitigating technologies. International collaboration must also at the forefront of UK policy to cut down electronic waste and mitigate other negative impacts of technology. This should include playing a leading role in any future WTO plurilateral negotiations on trade and the environment.
- techUK's report with Deloitte outlined a series of policy interventions required to support UK growth including calling for the forthcoming National Data Strategy to have a focus on net zero, for the UK to lead the establishment of an International Centre for AI, Energy and Climate, and called for more challenge-led climate innovation, among other recommendations.
- The UK Government should continue to support global efforts to mandate disclosure of corporate climate impacts and emissions and look to ensure that its trading partners are doing the same.

- The UK should support the growth of the data centre sector through its trade policy by working for cross-border data flows and against data localisation provisions that would restrict the use of energy efficient data centres in favour of localised facilities.
- The UK should incorporate circular economy principles in its trade policy, including through encouraging regulatory cooperation and harmonisation relating to electronic waste products. The UK should also seek to remove barriers to the import and export of waste and scrap in cases where sufficient regulatory protections are in place.

Endnotes

1 Michael Lee et al., “Understanding and measuring cross-border digital trade: Final Research Report”, Cambridge Econometrics for the Department for International Trade and Department for Digital, Culture, Media & Sport, May 2020, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/885174/Understanding-and-measuring-cross-border-digital-trade.pdf

2 “Embracing Industry 4.0 and Rediscovering Growth”, Boston Consulting Group, https://www.bcg.com/capabilities/operations/embracing-industry-4.0-rediscovering-growth.aspx

3 Ry Crozier, “Rio Tinto faces big shortfall of data scientists”, IT News, March 2018, https://www.itnews.com.au/news/rio-tinto-faces-massive-shortfall-of-data-scientists-487404

4 Cecilia Jamasmie, “Rio Tinto autonomous trucks now hauling a quarter of Pilbara material”, Mining.com, January 2018, https://www.mining.com/rio-tinto-autonomous-trucks-now-hauling-quarter-pilbara-material/

5 Dan Mitchell, “5 IoT applications retailers are using today”, SAS, https://www.sas.com/en_ca/insights/articles/big-data/five-iot-applications-retailers-are-using-today.html

6 Matthieu Pélissié du Rausas et al., “Internet matters: The Net’s sweeping impact on growth, jobs, and prosperity”, McKinsey Global Institute, May 2011, https://www.mckinsey.com/industries/high-tech/our-insights/internet-matters

7 “UNCTAD Estimates of Global E-Commerce 2018”, United Nations Conference on Trade and Development, April 2020, https://unctad.org/system/files/official-document/tn_unctad_ict4d15_en.pdf

8 “World Trade Report 2018: The Future of world trade: How digital technologies are transforming global commerce”, World Trade Organization, October 2018, https://www.wto.org/english/res_e/publications_e/world_trade_report18_e.pdf

9 David Nguyen and Marta Paczos, “Measuring the Economic Value of Data and Cross-Border Data Flows: A Business Perspective”, OECD Digital Economy Papers, August 2020, https://www.oecd-ilibrary.org/science-and-technology/measuring-the-economic-value-of-data-and-cross-border-data-flows_6345995e-en;jsessionid=vTlmG0IpJJGsC7wxkPx6f1V9.ip-10-240-5-34

10 James Manyika et al., “Digital Globalization: The New Era of Global Flows”, McKinsey Global Institute, March 2016, https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/McKinsey%20Digital/Our%20Insights/Digital%20globalization%20The%20new%20era%20of%20global%20flows/MGI-Digital-globalization-Full-report.ashx

11 Danielle Goldfarb, “How the internet has completely altered global trade”, Borderlex, June 2019, https://borderlex.eu/2019/06/13/how-the-internet-has-completely-altered-global-trade/

12 See Richard Baldwin, The Great Convergence: Information Technology and the New Globalization (Cambridge, Mass., 2016).

13 “UNCTAD Estimates of Global E-Commerce 2018”, United Nations Conference on Trade and Development, April 2020, https://unctad.org/system/files/official-document/tn_unctad_ict4d15_en.pdf

14 Michael Lee et al., “Understanding and measuring cross-border digital trade: Final Research Report”, Cambridge Econometrics for the Department for International Trade and Department for Digital, Culture, Media & Sport, May 2020, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/885174/Understanding-and-measuring-cross-border-digital-trade.pdf

15 David Milliken and William Schomberg, “UK GDP collapsed nearly 20% in second quarter in historic COVID hit”, Reuters, September 2020, https://www.reuters.com/article/us-britain-economy/uk-gdp-collapsed-nearly-20-in-second-quarter-in-historic-covid-hit-idUSKBN26L0SB

16 Mark Beech, “COVID-19 Pushes Up Internet Use 70% and Streaming More Than 12%, First Figures Reveal”, Forbes, March 2020, https://www.forbes.com/sites/markbeech/2020/03/25/covid-19-pushes-up-internet-use-70-streaming-more-than-12-first-figures-reveal/?sh=68b09be23104

17 “COVID-19 Digital Engagement Report”, Twilo, July 2020, https://pages.twilio.com/rs/294-TKB-300/images/UPDATE_Aug_Twilio_COVID-19_Digital_Engagement_Report.pdf

18 “Internet sales a percentage of total retail sales (ratio) (%)”, Office for National Statistics, October 2020, https://www.ons.gov.uk/businessindustryandtrade/retailindustry/timeseries/j4mc/drsi

19 “COVID-19: The Impact on Cross-Border Ecommerce”, GlobalE, https://www.global-e.com/resource/covid-19-cross-border-ecommerce/

20 Lizzy Hillier, “Stats roundup, coronavirus impact on marketing, ecommerce & advertising”, Econsultancy, November 2020, https://econsultancy.com/stats-roundup-coronavirus-impact-on-marketing-ecommerce-advertising/

21 “Exploring the UK’s digital divide”, Office for National Statistics, March 2019, https://www.ons.gov.uk/peoplepopulationandcommunity/householdcharacteristics/homeinternetandsocialmediausage/articles/exploringtheuksdigitaldivide/2019-03-04

22 Geoff Watts, “COVID-19 and the digital divide in the UK”, The Lancet Digital Health, August 2020, https://www.thelancet.com/journals/landig/article/PIIS2589-7500(20)30169-2/fulltext

23 Hannah Holmes and Gemma Burgess, “‘Pay the wi-fi or feed the children’: Coronavirus has intensified the UK’s digital divide”, University of Cambridge, https://www.cam.ac.uk/stories/digitaldivide

24 “New ITU data reveal growing Internet uptake but a widening digital gender divide”, International Telecommunication Union, November 2019, https://www.itu.int/en/mediacentre/Pages/2019-PR19.aspx

25 Carlos Brito, “COVID-19 has intensified the digital divide”, World Economic Forum, September 2020, https://www.weforum.org/agenda/2020/09/covid-19-has-intensified-the-digital-divide/

26 Hosuk Lee-Makiyama, “Will Asia’s Digital Integration be derailed?”, East Asia Forum, April 2019, https://www.eastasiaforum.org/2019/04/07/will-asias-digital-integration-be-derailed/

27 Janos Ferencz and Frédéric Gonzales, "Barriers to trade in digitally enabled services in the G20", OECD Trade Policy Papers, October 2019, https://www.oecd-ilibrary.org/trade/barriers-to-trade-in-digitally-enabled-services-in-the-g20_264c4c02-en

28 See Martina Francesca Ferracane et al., "Digital Trade Restrictiveness Index", European Centre For International Political Economy, April 2018, https://ecipe.org/wp-content/uploads/2018/05/DTRI_FINAL.pdf

29 "Protectionism in the 21st Century", Swedish National Board of Trade, February 2016, https://www.kommers.se/Documents/dokumentarkiv/publikationer/2016/Protectionism%20in%20the%2021st%20Century_webb.pdf

30 See Martina Francesca Ferracane et al., "Digital Trade Restrictiveness Index", European Centre For International Political Economy, April 2018, https://ecipe.org/wp-content/uploads/2018/05/DTRI_FINAL.pdf

31 Matthias Bauer et al., "The Costs of Data Localisation: Friendly Fire on Economic Recovery", European Centre For International Political Economy, May 2014, https://ecipe.org/wp-content/uploads/2014/12/OCC32014__1.pdf

32 Keith Wright, "The 'splinternet' is already here", TechCrunch, March 2019, https://techcrunch.com/2019/03/13/the-splinternet-is-already-here/

33 Susan Ariel Aaronson, "What Are We Talking about When We Talk about Digital Protectionism?" World Trade Review, December 2018, http://www2.gwu.edu/~iiep/assets/docs/papers/2018WP/AaronsonIIEP2018-13.pdf

34 Susan Ariel Aaronson, "What Are We Talking about When We Talk about Digital Protectionism?" World Trade Review, December 2018, http://www2.gwu.edu/~iiep/assets/docs/papers/2018WP/AaronsonIIEP2018-13.pdf and

35 Nigel Cory, "The Ten Worst Digital Protectionism and Innovation Mercantilist Policies of 2018", Information Technology & Innovation Foundation, January 2019, https://itif.org/publications/2019/01/28/ten-worst-digital-protectionism-and-innovation-mercantilist-policies-2018. For the UK Digital Services Tax see also "Proposals for a Digital Services Tax in the draft Finance Bill", techUK, July 2019, https://www.techuk.org/insights/news/item/15704-proposals-for-a-digital-services-tax-in-the-draft-finance-bill

36 Michael Alliston and Judy Harrison, "The UK's digital services tax: what's new", Norton Rose Fulbright, May 2020, https://www.nortonrosefulbright.com/en/knowledge/publications/24da19c2/the-uks-digital-services-tax-whats-new

37 "Digital Services Tax", techUK, https://www.techuk.org/component/techuksecurity/security/download/14261?file=techUK_Digital_Services_Tax_briefing_report_14261.pdf

38 "International community renews commitment to address tax challenges from digitalisation of the economy", OECD, October 2020, https://www.oecd.org/tax/beps/international-community-renews-commitment-to-address-tax-challenges-from-digitalisation-of-the-economy.htm

39 "Findings of the Investigation into China's Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation Under Section 201 of the Trade Act of 1974", Office of the United States Trade Representative, March 2018, https://ustr.gov/sites/default/files/enforcement/301Investigations/301%20Draft%20Exec%20Summary%203.22.ustrfinal.pdf

40 Shirin Ghaffary, "Do you really need to worry about your security on TikTok? Here's what we know", Recode, August 2020, https://www.vox.com/recode/2020/8/11/21363092/why-is-tiktok-national-security-threat-wechat-trump-ban

41 Ryan Hass and Abraham Denmark, "More pain than gain: How the US-China trade war hurt America", Brookings, August 2020, https://www.brookings.edu/blog/order-from-chaos/2020/08/07/more-pain-than-gain-how-the-us-china-trade-war-hurt-america/

42 Mark Wu, "Digital Trade-Related Provisions in Regional Trade Agreements: Existing Models and Lessons for the Multilateral Trade System", RTA Exchange, November 2017, http://e15initiative.org/wp-content/uploads/2015/09/RTA-Exchange-Digital-Trade-Mark-Wu-Final.pdf

43 "Electronic commerce", World Trade Organization, https://www.wto.org/english/tratop_e/ecom_e/ecom_e.htm

44 "Trade in Services Agreement", European Commission, http://ec.europa.eu/trade/policy/in-focus/tisa/

45 "Joint Statement on Electronic Commerce", WT/L/1056, World Trade Organization, January 2019, https://trade.ec.europa.eu/doclib/docs/2019/january/tradoc_157643.pdf

46 "New ITU statistics show more than half the world is now using the Internet", ITU News, December 2018, https://news.itu.int/itu-statistics-leaving-no-one-offline/

47 Karishma Banga and Dirk Willem te Velde, "Digitalisation and the Future of Manufacturing in Africa", Supporting Economic Transformation, Overseas Development Institute, March 2018, https://set.odi.org/wp-content/uploads/2018/03/SET_Digitalisation-and-future-of-African-manufacturing_Final.pdf

48 Leah Samberg, "How new technology could help to strengthen global food security", World Economic Forum, March 2018, https://www.weforum.org/agenda/2018/03/food-security-s-social-network

49 "Digital Strategy 2018-2020: Doing Development in a Digital World", Department for International Development, January 2018, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/701443/DFID-Digital-Strategy-23-01-18a.pdf

50 Mark Wu, "Digital Trade-Related Provisions in Regional Trade Agreements: Existing Models and Lessons for the Multilateral Trade System", RTA Exchange, November 2017, http://e15initiative.org/wp-content/uploads/2015/09/RTA-Exchange-Digital-Trade-Mark-Wu-Final.pdf

51 "Agreement between the United States of America, the United Mexican States, and Canada 05/30/19 Text", Office of the United States Trade Representative, May 2019, https://ustr.gov/trade-agreements/free-trade-agreements/united-states-mexico-canada-agreement/agreement-between

52 "Comprehensive and Progressive Agreement for Trans-Pacific Partnership text and resources", New Zealand Foreign Affairs & Trade, https://www.mfat.govt.nz/en/trade/free-trade-agreements/free-trade-agreements-in-force/cptpp/comprehensive-and-progressive-agreement-for-trans-pacific-partnership-text-and-resources/

53 "Australia, Canada, New Zealand Ratify CPTPP, Setting Stage for Trade Deal's Entry into Force", International Centre for Trade and Sustainable Development, November 2018, http://www.ictsd.org/bridges-news/bridges/news/australia-canada-new-zealand-ratify-cptpp-setting-stage-for-trade-deals

54 "UK-Japan Comprehensive Economic Partnership Agreement", HM Government, November 2020, https://www.gov.uk/government/collections/uk-japan-comprehensive-economic-partnership-agreement

55 "EU-Japan Economic Partnership Agreement: texts of the agreement", European Commission, April 2018, http://trade.ec.europa.eu/doclib/press/index.cfm?id=1684

56 https://www.gov.uk/government/news/uk-applies-to-join-huge-pacific-free-trade-area-cptpp

57 "Digital Economy Partnership Agreement (DEPA)", Ministry of Trade and Industry Singapore, https://www.mti.gov.sg/Improving-Trade/Digital-Economy-Agreements/The-Digital-Economy-Partnership-Agreement

58 Deborah Elms, "Unpacking the Digital Economy Partnership Agreement (DEPA)", Asian Trade Centre, January 2020, http://asiantradecentre.org/talkingtrade/unpacking-the-digital-economy-partnership-agreement-depa

59 "Australia-Singapore Digital Economy Agreement", Department of Foreign Affairs and Trade, Australian Government, https://www.dfat.gov.au/trade/services-and-digital-trade/Pages/australia-and-singapore-digital-economy-agreement

60 "MOUs signed in connection with the Australia-Singapore Digital Economy Agreement", Department of Foreign Affairs and Trade, Australian Government, https://www.dfat.gov.au/trade/services-and-digital-trade/Pages/australia-and-singapore-digital-economy-agreement#mous

61 "Going Digital", OECD, https://www.oecd.org/going-digital/

62 "G20 Ministerial Statement on Trade and Digital Economy", G20 Research Group, http://www.g20.utoronto.ca/2019/2019-Ministerial_Statement_on_Trade_and_Digital_Economy.pdf

63 "Ministerial Declaration, G20 Digital Economy Ministers Meeting", G20 Research Group, July 2020, http://www.g20.utoronto.ca/2020/2020-g20-digital-0722.html

64 "Building Digital Trust Together", G7 France, January 2019, https://www.elysee.fr/en/g7/2019/01/01/building-digital-trust-together

65 "G7 Finance Ministers meeting: what are the outcomes", G7 France, https://www.elysee.fr/en/g7/2019/07/20/g7-finance-ministers-meeting-what-are-the-outcomes

66 James Manyika et al., "Digital Globalization: The New Era of Global Flows", McKinsey Global Institute, March 2016, https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/McKinsey%20Digital/Our%20Insights/Digital%20globalization%20The%20new%20era%20of%20global%20flows/MGI-Digital-globalization-Full-report.ashx

67 "World Trade Report 2019: The future of services trade", World Trade Organization, October 2019, https://www.wto.org/english/res_e/booksp_e/00_wtr19_e.pdf

68 Martina Francesca Ferrancane & Erik van der Marel, "Do Data Policy Restrictions Inhibit Trade in Services?", European Centre for International Political Economy, October 2018, https://ecipe.org/wp-content/uploads/2018/10/Do-Data-Policy-Restrictions-Inhibit-Trade-in-Services-final.pdf

69 Joshua P. Meltzer & Peter Lovelock, "Regulating for a Digital Economy: Understanding the Importance of Cross-Border Data Flows in Asia," Global Economy and Development at Brookings, March 2018, https://www.brookings.edu/wp-content/uploads/2018/03/digital-economy_meltzer_lovelock_web.pdf

70 Martina Francesca Ferrancane & Erik van der Marel, "Do Data Policy Restrictions Inhibit Trade in Services?", European Centre for International Political Economy, October 2018, https://ecipe.org/wp-content/uploads/2018/10/Do-Data-Policy-Restrictions-Inhibit-Trade-in-Services-final.pdf

71 "Quantifying the Cost of Forced Localization", Leviathan Security Group, 2015, https://static1.squarespace.com/static/556340ece4b0869396f21099/t/559dad76e4b0899d97726a8b/1436396918881/Quantifying+the+Cost+of+Forced+Localization.pdf

72 Nigel Cory & Robert D. Atkinson, "Financial Data Does Not Need or Deserve Special Treatment in Trade Agreements", Information Technology & Innovation Foundation, April 2016, http://www2.itif.org/2016-financial-data-trade-deals.pdf?_ga=2.118468617.1212979197.1562597151-327068853.1559758621

73 "Guide to the General Data Protection Regulation (GDPR)", Information Commissioner's Office, May 2019 https://ico.org.uk/for-organisations/guide-to-data-protection/guide-to-the-general-data-protection-regulation-gdpr/principles/

74 "The UK Digital Sectors After Brexit: An independent report commissioned by techUK", Frontier Economics, January 2017, https://www.techuk.org/insights/news/item/10086-the-uk-digital-sectors-after-brexit

75 Nigel Cory, "USITC Post-Hearing Written Submission", Information Technology and Innovation Foundation, April 2017, http://www2.itif.org/2017-usitc-global-digital-trade.pdf

76 Matthias Bauer et al. "Tracing the Economic Impact of Regulations on the Free Flow of Data and Data Localization", Global Commission on Internet Governance, Centre for International Governance Innovation and Chatham House, May 2016, https://www.cigionline.org/sites/default/files/gcig_no30web_2.pdf

77 Nigel Cory & Robert D. Atkinson, "Financial Data Does Not Need or Deserve Special Treatment in Trade Agreements", Information Technology and Innovation Foundation, April 2016, http://www2.itif.org/2016-financial-data-trade-deals.pdf

78 "Living Wills (or Resolution Plans)", Board of Governors of the Federal Reserve System, July 2019, https://www.federalreserve.gov/supervisionreg/resolution-plans.htm

79 "The Bank of England's approach to resolution", Bank of England, October 2017, https://www.bankofengland.co.uk/-/media/boe/files/news/2017/october/the-bank-of-england-approach-to-resolution

80 "APEC Cross-border Privacy Enforcement Arrangement (CPEA)", APEC, https://www.apec.org/Groups/Committee-on-Trade-and-Investment/Digital-Economy-Steering-Group/Cross-border-Privacy-Enforcement-Arrangement

81 "Ashley Madison joint investigation", Office of the Australian Information Commissioner, August 2016, https://www.oaic.gov.au/privacy/privacy-decisions/investigation-reports/ashley-madison-joint-investigation/

82 Mark D. Cole & Teresa Quintel, "Transborder Access to e-Evidence by Law Enforcement Agencies", University of Luxembourg Law Working Paper, No. 2018-010, May 2018, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3278780

83 Nigel Cory & Robert D. Atkinson, "Financial Data Does Not Need or Deserve Special Treatment in Trade Agreements", Information Technology and Innovation Foundation, April 2016, http://www2.itif.org/2016-financial-data-trade-deals.pdf

84 James M. Kaplan & Kayvaun Rowshankish, "Addressing the Impact of Data Location Regulation in Financial Services", Global Commission on Internet Governance, Centre for International Governance Innovation and Chatham House, May, 2015, https://www.cigionline.org/sites/default/files/no14_web_0.pdf

85 Chris Rhodes, "Financial services: contribution to the UK economy", House of Commons Library, Briefing Paper No. 6193, April 2018, https://researchbriefings.parliament.uk/ResearchBriefing/Summary/SN06193

86 "UK FinTech On the cutting edge: An evaluation of the international FinTech Sector", EY, February 2016, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/502995/UK_FinTech_-_On_the_cutting_edge_-_Full_Report.pdf

87 "UK FinTech: State of the Nation", Department for International Trade, April 2019, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/801277/UK-fintech-state-of-the-nation.pdf

88 Mary Amiti et al., "The Impact of the 2018 Trade War on U.S. Prices and Welfare", Centre for Economic Policy Research, March 2019, https://www.princeton.edu/~reddings/papers/CEPR-DP13564.pdf

89 "Responsible Management of Supply Chain", Samsung, https://www.samsung.com/uk/aboutsamsung/sustainability/supply-chain/

90 "Estimated Impacts of Proposed Tariffs on Imports from China: Cell Phones, Laptops and Tablets, Video Game Consoles and Toy Drones", Consumer Technology Association, June 2019, http://www.cta.tech/CTA/media/policyImages/China301Tariffs_Laptops_-Toy-Drones_Cellphones_VideoGameConsoles-FINAL.pdf

91 Xiaobing Tang & Roberta Lascari, "20 Years of the Information Technology Agreement: Boosting trade, innovation and digital connectivity", World Trade Organization, 2017, https://www.wto.org/english/res_e/booksp_e/ita20years_2017_full_e.pdf

92 "World Trade Report 2018: The Future of world trade: How digital technologies are transforming global commerce", World Trade Organization, October 2018, https://www.wto.org/english/res_e/publications_e/world_trade_report18_e.pdf

93 "Moratorium on Customs Duties on Electronic Transmissions: Need for a Re-think", Communication from India and South Africa, World Trade Organization, July 2018, https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S009-DP.

94 "Fiscal Implications of the Customs Moratorium on Electronic Transmissions: The Case of Digitisable Goods, JOB/GC/114", World Trade Organization, December 2016.

95 Statement by Indonesia: Facilitator's Consultation on Electronic Commerce, MC11 Declaration and Other Relevant Plenary Sessions", WT/MIN(17)/68, World Trade Organization, December 2017, https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S009-DP.aspx? language=E&CatalogueIdList=241800,241722,241679,241684,241595,241460,241096,241141,241097,241078& CurrentCatalogueIdIndex=8&FullTextHash=&HasEnglishRecord=True&HasFrenchRecord=True&HasSpanishRecord=True

96 Riza Buditomo, "Intangible Goods are Now Subject to Import Duty", BakerMcKenzie, March 2018, https://www.bakermckenzie.com/en/insight/publications/2018/03/intangible-goods-import-duty-indonesia

97 "Global 2000: The World's Largest Public Companies", Forbes, May 2019, https://www.forbes.com/global2000/list/#header:position_industry:Software%20%26%20Programming

98 Hosuk-Lee Makiyama and Badri Narayanan, "The Economic Losses from Ending the WTO Moratorium on Electronic Transmissions", European Centre for International Political Economy, August 2019, https://ecipe.org/wp-content/uploads/2019/08/ECI_19_PolicyBrief_3_2019_LY04.pdf

99 Ibid.

100 "Map of ITA participants", World Trade Organization, https://www.wto.org/english/tratop_e/inftec_e/ita_map_e.htm

101 Mark Wu, "Digital Trade-Related Provisions in Regional Trade Agreements: Existing Models and Lessons for the Multilateral Trade System", RTA Exchange, November 2017, http://e15initiative.org/wp-content/uploads/2015/09/RTA-Exchange-Digital-Trade-Mark-Wu-Final.pdf

102 Stephen Ezell and Nigel Cory, "The Way Forward for Intellectual Property Internationally", Information Technology and Innovation Foundation, April 2019, https://itif.org/publications/2019/04/25/way-forward-intellectual-property-internationally

103 Gideon Myles, "Balancing open source and proprietary IP – they can co-exist", Dropbox, December 2017, https://blogs.dropbox.com/tech/2017/12/balancing-open-source-and-proprietary-ip-they-can-co-exist/

104 "Findings of the Investigation into China's Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation Under Section 201 of the Trade Act of 1974", Office of the United States Trade Representative, March 2018, https://ustr.gov/sites/default/files/enforcement/301Investigations/301%20Draft%20Exec%20Summary%203.22.ustrfinal.pdf

105 Lee G. Branstetter, "China's Forced Technology Transfer Problem – And What to Do About It", Peterson Institute for International Economics, June 2018, https://www.piie.com/system/files/documents/pb18-13.pdf

106 "Big Data: Big Challenge or Big Opportunity", IBM, https://www.ibm.com/watson/infographic/discovery/big-data-challenge-opportunity/

107 Jacques Bughin et al., “Notes from the AI Frontier: Modeling the Impact of AI on the World Economy”, McKinsey Global Institute, September 2018, https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Artificial%20Intelligence/Notes%20from%20the%20frontier%20Modeling%20the%20impact%20of%20AI%20on%20the%20world%20economy/MGI-Notes-from-the-AI-frontier-Modeling-the-impact-of-AI-on-the-world-economy-September-2018.ashx

108 “Data Mining: What it is and why it matters”, SAS, https://www.sas.com/en_ca/insights/analytics/data-mining.html#dmusers

109 Hamish Thomas et al., “How regulation is unlocking the potential of open banking in the UK”, EY, March 2019, https://www.ey.com/en_gl/banking-capital-markets/how-regulation-is-unlocking-the-potential-of-open-banking-in-the-uk

110 “Regulatory sandbox”, Financial Conduct Authority, April 2019, https://www.fca.org.uk/firms/regulatory-sandbox

111 David Strachan et al., “A journey through the FCA regulatory sandbox”, Deloitte and Innovate Finance, October 2018, https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/financial-services/deloitte-uk-fca-regulatory-sandbox-project-innovate-finance-journey.pdf

112 https://www.gov.uk/government/organisations/centre-for-data-ethics-and-innovation

113 “MOUs signed in connection with the Australia-Singapore Digital Economy Agreement”, Department of Foreign Affairs and Trade, Australian Government, https://www.dfat.gov.au/trade/services-and-digital-trade/Pages/australia-and-singapore-digital-economy-agreement#mous

114 https://www.oecd.org/going-digital/ai/principles/

115 “G20/OECD Policy Guidance on Financial Consumer Protection Approaches in the Digital Age”, OECD, 2018, https://www.oecd.org/finance/G20-OECD-Policy-Guidance-Financial-Consumer-Protection-Digital-Age-2018.pdf

116 “Fintech Sector Strategy: Securing the Future of UK Fintech”, HM Treasury, March 2018, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/692874/Fintech_Sector_Strategy_print.pdf

117 “UK-Australia FinTech Bridge”, The Treasury, Australian Government, https://treasury.gov.au/sites/default/files/2019-03/UK-Australia-FinTech-Bridge_7.pdf

118 Rishi Vaidya, “Cyber Security Breaches Survey 2019”, Department for Digital, Culture, Media and Sport, July 2019, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/813599/Cyber_Security_Breaches_Survey_2019_-_Main_Report.pdf

119 “The cyber threat to UK business: 2017-2018 Report”, National Crime Agency and National Cyber Security Centre, 2018, https://nationalcrimeagency.gov.uk/who-we-are/publications/178-the-cyber-threat-to-uk-business-2017-18/file

120 Sam Donaldson et al. “Department for Digital, Culture, Media and Sport UK Cyber Security Sectoral Analysis and Deep-Dive Review”, RSM, June 2018, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/751406/UK_Cyber_Sector_Report_-__June_2018.pdf

121 “National Cyber Security Strategy 2016-2021”, HM Government, November 2016, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/567242/national_cyber_security_strategy_2016.pdf

122 “EU-UK Trade and Cooperation Agreement”, HM Government, December 2020, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/948119/EU-UK_Trade_and_Cooperation_Agreement_24.12.2020.pdf, pp. 363-4.

123 Anna Metz and Julia Clark, “Global ID Coverage, Barriers, and Use by the Numbers: An In-Depth look at the 2017 ID4D-Findex Survey”, World Bank Group, March 2019, http://documents1.worldbank.org/curated/en/727021583506631652/pdf/Global-ID-Coverage-Barriers-and-Use-by-the-Numbers-An-In-Depth-Look-at-the-2017-ID4D-Findex-Survey.pdf

124 Vyjayanti T Desai et al., “The global identification challenge: Who are the 1 billion people without proof of identity?”, World Bank Group, April 2018, https://blogs.worldbank.org/voices/global-identification-challenge-who-are-1-billion-people-without-proof-identity

125 “UN Sustainable Development Goals: 16”, United Nations, https://sdgs.un.org/goals/goal16

126 Olivia White et al., “Digital identification: A key to inclusive growth”, McKinsey Digital, April 2019, https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/digital-identification-a-key-to-inclusive-growth

127 “Digital identities: the missing link in a UK digital economy: A techUK white paper”, techUK, August 2020, https://www.techuk.org/images/programmes/Digital_ID/digital_identities.pdf

128 Ben Bradley, “Government Online Harms response: more questions than answers?”, techUK, February 2020, https://www.techuk.org/insights/opinions/item/16818-government-online-harms-response-more-questions-than-answers

129 “UK Small Online Business Trade Summary 2015”, eBay Public Policy Lab, May 2015, https://www.ebaymainstreet.com/sites/default/files/policy-papers/uk_emea_growthreport_1.pdf

130 “Transform business processes with electronic and digital signatures: A White Paper”, Adobe, August 2018, https://acrobat.adobe.com/content/dam/doc-cloud/en/pdfs/adobe-transform-business-processes-with-electronic-and-digital-signature-solutions.pdf

131 Luca Castellani et al., “Making Deals in Cyberspace: What’s the Problem?”, World Economic Forum, October 2017, http://www3.weforum.org/docs/WEF_White_Paper_Making_Deals_in_Cyberspace.pdf

132 Kimberley Botwright et al., “Paperless Trading: How Does It Impact the Trade System”, UNECE & World Economic Forum, October 2017, http://www3.weforum.org/docs/WEF_36073_Paperless_Trading_How_Does_It_Impact_the_Trade_System.pdf

133 “UNCTAD Estimates of Global E-Commerce 2018”, United Nations Conference on Trade and Development, April 2020, https://unctad.org/system/files/official-document/tn_unctad_ict4d15_en.pdf

134 "Annual monitoring update on the postal market, Financial year 2017-18", Ofcom, November 2018, https://www.ofcom.org.uk/__data/assets/pdf_file/0027/128268/Annual-monitoring-update-postal-market-2017-18.pdf

135 "Assessment of EU Parcel Delivery Markets: Preliminary results from a study for DG GROW", WIK-Consult, November 2018, https://www.wik.org/uploads/media/wik_GROW_ParcelsStudy_ERGP.pdf

136 "State of de minimis threshold (DMT) globally – VAT and customs duties", International Post Corporation, https://www.ipc.be/services/markets-and-regulations/e-commerce-market-insights/e-commerce-articles/de-minimis-overview

137 Gary Clyde Hufbauer et al., "The Case for Raising de minimis Thresholds in NAFTA 2.0", Peterson Institute for International Economics, March 2018, https://www.piie.com/system/files/documents/pb18-8.pdf

138 Daniel Schwanen, "Maximizing de Minimis in NAFTA", C.D. Howe Institute, March 2018, https://www.cdhowe.org/intelligence-memos/daniel-schwanen-maximizing-de-minimis-nafta

139 "Tax and customs for goods sent from abroad", HM Government, https://www.gov.uk/goods-sent-from-abroad/tax-and-duty

140 "The UK Digital Sectors After Brexit: An independent report commissioned by techUK", Frontier Economics, January 2017, https://www.techuk.org/insights/news/item/10086-the-uk-digital-sectors-after-brexit

141 "The Pink Book 2020: Trade in Services", Office for National Statistics, October 2020, https://www.ons.gov.uk/economy/nationalaccounts/balanceofpayments/datasets/3tradeinservicesthepinkbook2016

142 Michael Lee et al., "Understanding and measuring cross-border digital trade: Final Research Report", Cambridge Econometrics for the Department for International Trade and Department for Digital, Culture, Media & Sport, May 2020, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/885174/Understanding-and-measuring-cross-border-digital-trade.pdf

143 Martina Francesca Ferracane et al., "Digital Trade Restrictiveness Index", European Centre For International Political Economy, April 2018, https://ecipe.org/wp-content/uploads/2018/05/DTRI_FINAL.pdf

144 "An Immigration System that Supports the UK Tech Sector", techUK, September 2018, https://www.techuk.org/insights/reports/item/13919-an-immigration-system-that-supports-the-uk-tech-sector

145 "Canada-European Union (EU) Comprehensive Economic and Trade Agreement (CETA) – Business visitors (work permit exempt under R186(a)/R187)", Government of Canada, September 2017, https://www.canada.ca/en/immigration-refugees-citizenship/corporate/publications-manuals/operational-bulletins-manuals/temporary-residents/foreign-workers/international-free-trade-agreements/canada-eu/business-visitors.html

146 "Developing the UK cyber security profession", Department for Digital, Culture, Media & Sport, July 2018, https://www.gov.uk/government/consultations/developing-the-uk-cyber-security-profession?_cldee=dGhvbWFzLmhhcnJpc29uQGJzaWdyb3VwLmNvbQ%3d%3d&recipientid=contact-e2c4ade60d23e81181155065f38be571-3f285c1e18da40508bc31084ec54ed41&esid=e1e61900-067a-4535-aca9-f8241453c4ec&urlid=0

147 "EU-Japan Economic Partnership Agreement: texts of the agreement", European Commission, April 2018, http://trade.ec.europa.eu/doclib/press/index.cfm?id=1684

148 Martina Francesca Ferracane et al., "Digital Trade Restrictiveness Index", European Centre For International Political Economy, April 2018, https://ecipe.org/wp-content/uploads/2018/05/DTRI_FINAL.pdf

149 "Telecommunications Sector Report", Exiting the EU Committee, House of Commons, December 2017, https://www.parliament.uk/documents/commons-committees/Exiting-the-European-Union/17-19/Sectoral%20Analyses/37-Telecommunications-Report.pdf

150 "The Electronic Commerce (EC Directive) Regulations 2002", Legislation.gov.uk, http://www.legislation.gov.uk/uksi/2002/2013/contents/made

151 "Digital Marketplace Sales", Crown Commercial Service, July 2019 https://app.powerbi.com/view? r=eyJrIjoiNTEyMTZhZDAtZGNiNi00OWQxLWI5ODYtMjg1ZWNlMmNkODVhIiwidCI6Ij lmOGMwZDc5LTNlODctNGNkMy05Nzk5LWMzNDQz MTQ2ZWE1ZSIsImMiOjh9

152 "Driving forward the digital transformation of health and social care", NHSX ,https://www.nhsx.nhs.uk/

153 Justine Desmond and Bhavin Kotecha, "State of the UK Govtech Market", Public, August 2017, http://www.public.io/wp-content/uploads/2017/07/Public_GovTech_market.pdf

154 "Government Procurement: United States Reported Opening More Opportunities to Foreign Firms Than Other Countries, but Better Data Are Needed", United States Government Accountability Office, February 2017, https://www.gao.gov/products/GAO-17-168

155 Oliver Hogan et al., "The Economic Contribution of Standards to the UK Economy", Cebr, June 2015, https://www.bsigroup.com/LocalFiles/en-GB/standards/BSI-standards-research-report-The-Economic-Contribution-of-Standards-to-the-UK-Economy-UK-EN.pdf

156 "What Brexit means for industry standards", BSI Group, March 2017, https://www.bsigroup.com/Documents/about-bsi/Brexit%20papers/bsi_what-brexit-means-for-industry-standards_march-2017.pdf

157 "Responsible Management of Supply Chain", Samsung, 2021, https://www.samsung.com/uk/aboutsamsung/sustainability/supply-chain/

158 Peter Holmes and Nick Jacob, "Certificates and Rules of Origin: The Experience of UK Firms", UK Trade Policy Observatory, January 2018, http://blogs.sussex.ac.uk/uktpo/publications/certificates-and-rules-of-origin-the-experience-of-uk-firms/

159 Thomas Alsop, "Share of the global semiconductor industry by country in 2018 and 2019", Statista, May 2020, https://www.statista.com/statistics/510374/worldwide-semiconductor-market-share-by-country/

160 Jim McClelland, "The true climate cost of going digital", Raconteur, October 2020, https://www.raconteur.net/digital/digital-transformation-sustainability/

161 "Digital technology and the planet: Harnessing computing to achieve net zero", The Royal Society, p. 5, December 2020, https://royalsociety.org/-/media/policy/projects/digital-technology-and-the-planet/digital-technology-and-the-planet-report.pdf

162 Ibid, p. 7.

163 "Making the UK a digital clean tech leader", techUK & Deloitte, September 2020, https://www.techuk.org/resource/techuk-report-making-the-uk-a-digital-clean-tech-leader.html

164 Paul Voosen, "Europe is building a 'digital twin' of Earth to revolutionize climate forecasts", Science, October 2020, https://www.sciencemag.org/news/2020/10/europe-building-digital-twin-earth-revolutionize-climate-forecasts

165 Jens Malmodin and Dag Lundén, "The Energy and Carbon Footprint of the Global ICT and E&M Sectors 2010–2015", Sustainability, vol. 10, no. 9, https://www.mdpi.com/2071-1050/10/9/3027

166 Ibid.

167 "ICT industry to reduce greenhouse gas emissions by 45 per cent by 2030", International Telecommunications Union, February 2020, https://www.itu.int/en/mediacentre/Pages/PR04-2020-ICT-industry-to-reduce-greenhouse-gas-emissions-by-45-percent-by-2030.aspx

168 George Kamiya and Oskar Kvarnström, "Data centres and energy – from global headlines to local headaches?", IEA, December 2019, https://www.iea.org/commentaries/data-centres-and-energy-from-global-headlines-to-local-headaches

169 Veronika Henze, "Corporate Clean Energy Buying Leapt 44% in 2019, Sets New Record", BloombergNEF, January 2020, https://about.bnef.com/blog/corporate-clean-energy-buying-leapt-44-in-2019-sets-new-record/

170 "World's Leading Mobile Operators to Disclose Climate Impacts as Part of New GSMA-Led Climate Action Roadmap", GSMA, September 2019, https://www.gsma.com/newsroom/press-release/worlds-leading-mobile-operators-to-disclose-climate-impacts-as-part-of-new-gsma-led-climate-action-roadmap/

171 Steven Moore et al. "An introduction to Setting Science Based Targets", CDP, GSMA & The Carbon Trust, https://www.gsma.com/betterfuture/wp-content/uploads/2020/06/GSMA-Webinar-Setting-SBTs.pdf

172 "CDP Supply Chain: Changing the Chain, Making Environmental action in procurement the new normal", CDP, 2019, https://6fefcbb86e61af1b2fc4-c70d8ead6ced550b4d987d7c03fcdd1d.ssl.cf3.rackcdn.com/cms/reports/documents/000/004/811/original/CDP_Supply_Chain_Report_Changing_the_Chain.pdf?1575882630

173 "The UK Data Centre Sector: The most important industry you've never heard of", techUK, September 2020, https://www.techuk.org/resource/uk-data-centre-sector-overview-2020.html

174 Shahriar Zakaria and Chris Moore, "Data Centres Sector Proposition", Department for International Trade, January 2021, available at https://www.thamesvalley.co.uk/download/data-centres-sector-proposition-january-2021/

175 "Data Centre Energy Routemap", techUK, November 2019, https://www.techuk.org/resource/data-centre-energy-routemap.html

176 "Lost in Migration? Attributing carbon when outsourcing to data centres and cloud", techUK, November 2019, https://www.techuk.org/resource/lost-in-migration-attributing-carbon-when-outsourcing-to-data-centres-and-cloud.html

177 "The Growth in Connected IoT Devices is Expected to Generate 79.4ZB of Data in 2025, According to a new IDC Forecast", Business Wire, June 2019, https://www.businesswire.com/news/home/20190618005012/en/The-Growth-in-Connected-IoT-Devices-is-Expected-to-Generate-79.4ZB-of-Data-in-2025-According-to-a-New-IDC-Forecast

178 Alice Tidey, "EU e-waste 'illegally' exported to developing countries: Report", Euronews, February 2019, https://www.euronews.com/2019/02/07/eu-e-waste-illegally-exported-to-developing-countries-report

179 Dustin Benton et al., "A circular economy for smart devices: Opportunities in the US, UK and India", Green Alliance, January 2015, https://www.green-alliance.org.uk/resources/A%20circular%20economy%20for%20smart%20devices.pdf

180 "IDC Forecasts Worldwide Market for Used Smartphones to Reach 351.6 Million Units with a Market Value of $65 Billion in 2024", IDC, January 2021, https://www.idc.com/getdoc.jsp?containerId=prUS47258521

181 See for example Dell and Microsoft: "Circular design", Dell, https://corporate.delltechnologies.com/en-us/social-impact/advancing-sustainability/sustainable-products-and-services/circular-design.htm; "2020 Environmental Sustainability Report: A Year of Action", Microsoft, https://query.prod.cms.rt.microsoft.com/cms/api/am/binary/RE4Mxso, pp. 45-56.

182 "Greening government: ICT and digital services strategy 2020-2025", Department for Environment Food & Rural Affairs, September 2020, https://www.gov.uk/government/publications/greening-government-ict-and-digital-services-strategy-2020-2025/greening-government-ict-and-digital-services-strategy-2020-2025

183 "Draft Ecodesign and Energy Labelling Regulations 2021", HM Government, September 2020, https://www.gov.uk/government/consultations/draft-ecodesign-and-energy-labelling-regulations-2021

184 See "Resources and waste strategy for England", HM Government, December 2018, https://www.gov.uk/government/publications/resources-and-waste-strategy-for-england; and Mark Hilton et al., "Electrical and Electronic Equipment: Ingredients for Successful Extended Producer Responsibility, Final Report for DEFRA", Eunomia, January 2020, https://www.eunomia.co.uk/reports-tools/electrical-and-electronic-equipment-ingredients-for-successful-extended-producer-responsibility/

185 Shunta Yamaguchi, "International Trade and the Transition to a More Resource Efficient Circular Economy: A Concept Paper", Trade and Environment Working Papers, OECD, March 2018, https://www.oecd.org/environment/waste/policy-highlights-international-trade-and-the-transition-to-a-circular-economy.pdf

186 Saara Tamminen et al., "Trading Services for a Circular Economy", International Institute for Sustainable Development, October 2020, https://www.iisd.org/system/files/2020-10/trading-services-circular-economy.pdf p. v.

187 Ibid., pp. 41-43.

About techUK

techUK is a membership organisation that brings together people, companies and organisations to realise the positive outcomes of what digital technology can achieve. We collaborate across business, Government and stakeholders to fulfil the potential of technology to deliver a stronger society and more sustainable future. By providing expertise and insight, we support our members, partners and stakeholders as they prepare the UK for what comes next in a constantly changing world.

linkedin.com/company/techuk

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youtube.com/user/techUKViews

info@techuk.org

Author, Dr Thomas Goldsmith, B.A., M.A., Ph.D.

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