HOUSE OF COMMONS

Digital, Culture, Media and Sport Committee

Oral evidence: Impact of Covid-19 on DCMS sectors: The Future of Digital Technology, HC 645

Tuesday 21 July 2020

Ordered by the House of Commons to be published on 21 July 2020.

Watch the meeting

Members present: Julian Knight (Chair); Kevin Brennan; Clive Efford; Julie Elliott; Damian Hinds; John Nicolson.

Questions 1 - 71

Witnesses

I: Richard Piggin, Head of External Affairs, Which?

II: Felicity Burch, Director of Innovation and Digital, CBI.

III: Harry Armstrong, Head of Technology Futures, Nesta.

Examination of Witness

Witness: Richard Piggin, Head of External Affairs, Which?

Chair: This is part of our inquiry into the impact of Covid-19 on DCMS sectors, looking at the future of digital technology. Today we have three witnesses in front of us in turn. The first is Richard Piggin, the Head of External Affairs at Which? Then we have Felicity Burch, Director of Innovation and Digital at the Confederation of British Industry, and Harry Armstrong, Head of Technology Futures at Nesta.

Just before I begin, I am going to ask any of the Members whether they have any relevant interests to declare at this point. Okay, we do not.

I am going to kick off with our first witness, Richard Piggin, Head of External Affairs at Which? Good morning, Richard.

Richard Piggin: Good morning.

Q1 **Chair:** Will you outline for the Committee, please, what have been the main challenges facing broadband and mobile consumers during the Covid-19 lockdown? How have consumers' experiences in the pandemic influenced demand for full-fibre broadband?

Richard Piggin: The last few months has reinforced just how important it is to have good-quality broadband and mobile connections. It has also highlighted that there is still a digital divide across the country. It might seem obvious that those with good-quality broadband will have been able to work from home, will have been able to stay in touch with friends and family, will have been able to home-school. Those without good-quality connections will have struggled to do all of those things and will have struggled to engage in many important day-to-day activities, whether that is shopping for groceries online or banking online.

Having said that, the general consensus is that the broadband network has held up pretty well over the last few months. We did some research with consumers at the end of June and over 70% of them said that their connections had met their needs during lockdown, so that is pretty positive. That is not to say that people still did not experience problems, because they did. A third of those that we surveyed said that using their broadband more led them to experience problems. A quarter of those said that their service was more unreliable, and back at the start of the lockdown, particularly in March and April, we heard from consumers who were struggling to get in touch with their provider. This was not unique to the telecoms sector but it did disproportionately affect those who were having problems, those potentially who were coming to an end of their contract and who were looking to switch providers and struggled to get in touch and speak to anyone about changing their needs.

We might talk a little bit about the harms consumers faced when online using broadband, using the internet, using their mobile phones a bit later. You also asked about whether demand has changed. In short, not really. In the research that we did at the end of June, only a fifth, 18%, of people said that they were more likely to upgrade their broadband since lockdown, and this is one of the barriers that I think we need to address. If we are going to roll out improved connectivity across the country, we need to ensure that there is consumer demand for it and that consumers understand the benefits that improved connectivity would bring. A lot of them normalise service issues. So, while the demand right now perhaps has not increased as people might have expected it to, we do need to understand why that is the case and overcome those barriers.

Finally, the important thing to say is just because consumers think that their current connections are suitable for their needs, that does not mean that they will be sufficient in the future as consumer behaviours and needs change in three, four or five years' time.

Q2 **Chair:** Have you noticed during the period of lockdown when more people have been working from home whether or not there has been a variance in service? At the start there was a feeling that perhaps providers very much pulled out all the stops, and then afterwards perhaps there has been a slow going back to normal with connection speeds and so on. Any thoughts on that?

Richard Piggin: We have not noticed a discernible difference. I think the general consensus is that the network itself has responded well to the increase in demand. That said, as I mentioned before, a quarter of people have said that their service has become more unreliable. One of the big barriers to people in terms of engaging with the broadband market is that they normalise poor service. They think that variations in speed and dropouts are a normal part of service and that that is the same experience they would have regardless of which provider they were on, regardless of which package they were on. They think that is normal.

That is one of the key barriers that we need to overcome—to highlight the benefits of upgrading, highlight the benefits of what gigabit-capable technology will bring, because you should see more reliable connections, you should see faster connections. So, while we have not seen a discernible difference, there are some barriers that we have understood that we need to overcome.

Q3 **Chair:** We are looking towards 2025 and the Government's target in that respect and also the rollout of 5G as part of an ongoing inquiry in this Committee. The Secretary of State told the House last week that the Government's decision on Huawei would mean higher prices for consumers. What do you think of that? Is it a price worth paying and what action do you think should be taken to mitigate it?

Richard Piggin: There are lots of factors for consumers. Obviously, they value their privacy, they value their security, but cost is one of them. The key thing that we might discuss today is the fact that a lot of research indicates that consumers do not fully understand the benefits and the costs. We did the same research; we did some research with consumers to understand what the barriers to adopting gigabit-capable technology would be. As I said before, they think their current package is fine. They do not understand the benefits of upgrading. Even when told that this technology would give them greater speed, greater reliability of connections, three in 10 people still said that they did not really see that that would benefit them in any way. People struggle with the terminology, I think, as well—the general lack of knowledge around it. They do not understand what speeds or reliability they might need for their intended usage.

Critically, price is a massive factor, as you would expect with a lot of consumer decisions: 75% of those people that we surveyed said that they would expect these new, improved connections to be significantly more expensive than the current package they were paying for, and over 40% said that they were not sure that the benefits would outweigh the increased costs.

This is what we need to do: we need to improve consumers' understanding of what those benefits are, what the true costs are as well, because it might not necessarily be more expensive than some people are saying. It is one of the key lessons that we should be learning from the rollout of superfast broadband. Superfast was available to 95% of the country, yet 67% of households have taken it up. This was from Ofcom figures last year. One of the barriers that we found was that people instinctively thought that superfast was much more expensive than the current package they were paying for, even though in some cases what they were paying for—their standard package—was more expensive than they would pay for superfast. That still was a big barrier to them taking it up because they thought it simply was too expensive.

Q4 **Chair:** Is that a result of confusing marketing on behalf of providers?

Richard Piggin: The marketing and advertising terminology is very confusing to consumers. It is one of those barriers. They do not understand the language that is used; I am not sure too many people would understand what gigabit-capable technology meant. We have had the same with superfast and ultrafast. Even download and upload speeds, people do not really necessarily understand what they mean—10 megabits per second, 40 megabits per second, 100 megabits per second. They do not quite grasp what that means in relation to their own behaviour, their own usage. If we were to ask the population, "What sort of download speed or upload speed would you need to be able to have a Zoom conference call?", a group call like this, I am not sure many people would be able to answer that, but there are premises, households, that do not have those download or upload speeds to enable them to have this sort of conversation.

We do need to address that, because the digital divide that I mentioned is critical. It is essential that every consumer, regardless of where they are in the UK, is able to benefit from the ambition of the Government to improve connectivity across the country.

Q5 **Damian Hinds:** Just picking up on that from the experience with superfast, I know you were speaking about it in the past tense, but in constituencies like mine, for some people, I am afraid it is still in the future tense; but for many these days it is, to be fair, potentially at least in the present. It strikes me that there are a couple of connected issues. You mentioned the perception of cost. There is also the problem that quite often people just do not know it is available, because the cabinet gets upgraded and if you are lucky someone might stick a sticker on it with nice colours, but you do not know that in your own home this thing is available. The reason I say the two things are connected is because quite often it is true that you could get a cheaper deal on this better broadband because you have had your existing contract for three years, it keeps running over and running over, and you are paying more than you need to. In a sense, your provider does not have an incentive to tell you that there is something better and cheaper available. Sorry; that was more of a preamble than a question. What do you do about that? How do you make sure that consumers are properly empowered? Yes, they need the knowledge of what the thing can do, but they also need to know that it is there.

Richard Piggin: You are absolutely right. The research that we did last year in terms of lessons from superfast showed that a third of people did not think it was available in their area; that is why they were not interested in taking it up. You are absolutely right; we have to improve that information and there is definitely a role for the regulator here; there is definitely a role for Ofcom. We are talking about broadband, but it is equally applicable to mobile coverage, so that consumers understand what is available to them and then, when we look at rolling out the universal service obligation and rolling out gigabit-capable technology, it is absolutely clear what is available to those consumers in which areas, so they do not make poor choices and, equally, so that we get value for money from these rollouts, so that you do not duplicate the Government introducing the universal service obligation and rolling it out where there could be a commercial investment opportunity and that particular area could be well served by providers that are specialists in providing connectivity to hard-to-reach areas.

Q6 **Damian Hinds:** Yes, absolutely. Usually, the information is available. It is not a secret that the thing is available, it is just not very well known. Perhaps that is to do with the cost economics of marketing for alternative providers or whatever, but how do you make sure that the individual household knows that the thing is available and might be cheaper, as opposed to the information being available and being published?

Richard Piggin: There is a little bit—I do not want to overplay it—of the responsibility on those households, but it needs to be easily found. You could imagine what a regulator or the industry provider might do to create some form of map, to create that form of information, so that if you were looking to understand what was available in your area it would be easily found. Then they could work with organisations such as Which?, the FSB, the CBI and others to communicate, to amplify that information to people who need it most. There are lots of organisations that speak directly to households, to consumers, to small businesses, and can provide that information and amplify, if you like, those messages directly to the people who need it.

Q7 **Damian Hinds:** At a simple level, it is almost always Openreach that is putting in the kits. Should they not just leaflet door to door? Is that too old-fashioned?

Richard Piggin: It might be a bit old-fashioned. I think what we need to understand is there are different ways of reaching different consumers and some people do not respond to a leaflet through the door. Some people would respond to a different form of communication. There are marketing experts better than I who would understand exactly how to reach those people with the right marketing messages, but you are right that they should be trying to do that and it does not appear as though enough is being done because that consumer awareness that we talked about—a third of people did not realise superfast was available in their area when Ofcom figures show that it is available in 95% of the UK—there is a mismatch there. There is more that could be done to get that information to consumers and households.

Q8 **Damian Hinds:** Coming back to the performance of the network and the different providers, the whole system during this crisis, did you say 70% of people surveyed were satisfied with their service? Would you say that was just a nice surprise? It certainly was not what I was expecting.

Richard Piggin: Yes, it was. 72% said that their current package was fine, it met their needs in terms of speed and reliability. That is still 28% who did not say that, but 72% said that it was fine. I think that is surprising. We should consider the fact that people do normalise service issues, that their expectations are not particularly high because lots of them would have experienced dropouts, poor connectivity, unreliability, but overall it has to be said that at the start of lockdown people were concerned that the sheer increase in demand on the network and pressure on the network would cause significant problems and we have not really seen that.

Q9 **Damian Hinds:** You were talking with Julian about the future and whether people understand what sort of bandwidth they will require to do all the snazzy things it will be possible to do in the future. How aware are people of things like the Internet of Things, and what more you might do on gaming and television, and do they care? Is it possible they do not want a fridge that can tell you when things are out of date, or they do not want to have more tellies in more rooms, they do not want to have the kids doing even faster gaming? Maybe they will change their minds later, because this is what happens with human progress, but is it possible that people are largely content with what they have right now?

Richard Piggin: There are certainly some people that would fall into that category. There is a difference. Some of those things that you talked about, the Internet of Things, the fridge that tells you that you have run out of milk or the kettle that you can turn on from upstairs, those sorts of things, we are seeing more and more connected devices in people's homes and there are issues that the Committee might like to explore at a future date about some of the risks with the security behind some of those devices, because some of those devices are not particularly secure and there is a growing problem there as more and more of them come into people's homes.

The critical thing, though, is where there is less of a choice and consumers are being required to engage in online services more and more. This is the sort of thing that you would see with online banking, for example. There is still a significant proportion of consumers who, pre-lockdown, did not use online banking, who had not downloaded their online banking app, but as a result of lockdown we have seen an increase in the number of people who are more reliant on those types of services. Grocery shopping is probably the other obvious one, where there was a significant proportion of people who would not buy their groceries online but because of lockdown were forced into a situation—particularly vulnerable groups—where they needed to shop online for groceries and had never done that before. They did not have the skills, the ability, they were not comfortable doing it, but were forced to do it. In that situation we need to be much better prepared. We need to have the technology behind it so that we can provide those online services, but also provide consumers with more skills, with more information, with more confidence and trust that they can engage with these services online, if that is the direction that we are heading as a society.

Q10 **Damian Hinds:** You said that you were not a marketing professional and that there were better marketing professionals out there. I do not believe that for a moment, but I am going to challenge you to pretend that you are, and tell us what message you think will sell gigabit broadband to the public, so that they do not wait until stuff has come and they realise they needed it after all. Why should people care about it now?

Richard Piggin: What we need to do, and this is the onus on the providers and Ofcom and on the Government, I would say, is to show the benefits of what it will bring and show them in a tangible form to consumers, so that consumers understand it. Let's not talk about the exact speed or the reliability of the network. What does it mean for you in your day-to-day lives? How much easier will it be for you to connect to speak to your friends and your family, how much easier will it be for you to learn online, to home-school? All those things, how much easier would it be, how much better would your life be, if you had a gigabit-capable connection, but just do not use that term.

Q11 **Damian Hinds:** No, clearly, but are you confident that you can fill in the blanks in that sentence, "This is how much easier it would be to communicate, do your online course" and so on, compared to what people typically have today?

Richard Piggin: Absolutely, because there will be consumers out there who experience poor-quality calls; they might want to speak to their friends and their families and it keeps dropping off. People should not have to put up with those sorts of things and they should be ambitious enough to think, "That is how our lives could be better." We can demonstrate that and I am sure we would be able to demonstrate exactly how great that would be. If you look at the advances made as a comparison in terms of television and HD, you see how normalised that improved service has become. That is what we need to get to. We need to get to people thinking that gigabit-capable connections, the speed, the reliability, is normal, not what they have at the moment.

Q12 **Damian Hinds:** Are there other countries that we could learn from?

Richard Piggin: The Broadband Stakeholder Group published a report recently that looked at international comparisons. I would direct you to that because it does a good piece of work at looking at different countries and how they have looked at gigabit-capable technology—the likes of Sweden, for example. We should be looking at lessons from those countries, with one caveat—that just because it worked in that particular country does not mean it would work in the UK. There are differences culturally, demographically, geographically for those countries, so it is not a one size fits all, but we should be looking at international comparisons and the Broadband Stakeholder Group's report on that is pretty good.

Q13 **Clive Efford:** Richard, following on from those questions that Damian was asking you, we have been told that there are 11.9 million people who lack the skills for day-to-day use of the internet. Is that skills divide driving social exclusion? Have you been able to track what is happening to people, for instance, during Covid who cannot readily use the internet?

Richard Piggin: I have to say it is not something that Which? has looked at but it is certainly something that we are aware of. A key point to make, which I am sure you will understand, is that this is not just a DCMS issue. Connectivity and having good-quality connections impacts on so many different parts of people's lives, and this is something that Departments across Government need to be aware of. I mentioned ability to bank online and engage with financial services online. That is something for the Treasury. If you look at the DWP and the way in which Universal Credit is being paid, the way in which we are looking towards having a pensions dashboard, that relies on people being able to connect to the internet and having the confidence and skills to do that. This is not just a DCMS issue, but in answer to your question, it is not something we have particularly focused on, I am afraid.

Q14 **Clive Efford:** Okay. I just wondered if there was any research that

Which? had done on those people who are not necessarily online and linked up. Anyway, your research has shown that there has been little action from tech companies to tackle the issue of fake reviews. Is this a widespread problem and did it get worse during the Covid outbreak?

Richard Piggin: It is a widespread problem: 97% of people consult reviews when purchasing a product online. The CMA has estimated that reviews as such contribute to over £23 billion-worth of consumer spending in the UK. It is widespread and our investigations have shown over the past couple of years that there are significant numbers of fake and misleading online reviews. That undermines the concept and the benefits that reviews can bring to consumers when making purchasing decisions.

We also did some behavioural research recently that, for the first time, proved the impact of fake reviews—that they cause consumers to make worse buying decisions. We gave consumers different options with different fake reviews and showed that consumers were twice as likely to buy the poor-quality product with fake reviews attached. It does negatively influence consumers' purchasing decisions.

Fake reviews are one of those harms that consumers face online. It is not explicitly pertinent to Covid-19 but it is a digital-only harm, if you like. There are other Covid-19-specific harms, like the price-gouging we have seen of essential items on online marketplaces, and there are other online harms that are traditional harms, if you like, that are exacerbated or enabled by online platforms, social media sites. I am thinking of online scams as a particular example of that.

The issue that we have at the moment is that none of these harms are being adequately addressed. None of them would currently fall into the scope of the Government's proposals for their online harms legislation. We think that those proposals are too narrow in scope; that harms like fake reviews, like scams online, like the sale of unsafe or insecure products online, should be covered by an online harms regulator that has the flexibility to identify what types of harms we should be tackling and the most appropriate way to do that.

Q15 **Clive Efford:** Would you say that the platforms have the necessary skills and technical ability to stop this sort of thing? If they do, why don't they?

Richard Piggin: They do not have enough at the moment. We do not think they are given enough responsibility to prevent particularly materials like fake reviews and harmful content from appearing on their site. They do have a responsibility to take it down when it is flagged to them, and we have flagged various forms of harmful, sometimes illegal, content to platforms and they take them down. We think they should have a much greater responsibility to prevent harmful and illegal content from appearing in the first place and more responsibility to proactively identify that sort of material on their sites if it does appear, and then take it down more quickly. We are not seeing swift enough action, but ideally you would want to prevent the material from going online in the first place.

Q16 **Clive Efford:** Would you go as far as saying that self-regulation, which is where we are at the moment, is failing and that we need regulation to put some incentives in the way of the platforms to make them more proactive in this area?

Richard Piggin: Absolutely. We do need greater regulation in this space. The regulation needs to be targeted and it needs to be proportionate as well. That is the key—that it needs to be targeted at those issues that are causing harm and causing the most harm. We would not want to see a blanket imposition, which could have a negative effect on consumer interaction online, but what we want to see is that greater regulation that we have talked about in terms of greater incentives to prevent harmful and illegal material, content and activity that takes place on those sites, but specific to the types of harm that we have identified. We would expect an online harms regulator, whoever that might be, to be able to identify and act as well.

Q17 **Clive Efford:** Your research showed that there are huge incentives there for people to create fake reviews to boost their sales. It is quite shocking, quite stark, the figures that we have seen. That means there is this huge market out there, there is this potential to make money by scamming people in this way, but do the platforms add to their profits by having this activity online? Is that an incentive for them to not really deal with it in the way that we would like?

Richard Piggin: You will be aware that CMA is currently looking at fake reviews. It has a big piece of work on that, and it has started to look at those review-hosting platforms. This is one of the issues that we would like it to look at: what incentives are on those platforms, when you look at some of the endorsements that some platforms have that might be stimulated or driven by types of reviews? What benefit do the platforms get out of those fake reviews, so what incentives do they have? They are very clear in their statements against fake reviews; the actions that they will take have been very clear.

To our mind, given the number of fake reviews, examples of fake reviews, and misleading content that we continue to see and we continue, therefore, to report to get taken down, it does not appear to us as though the measures that are currently in place by those platforms—and it does vary between platforms as well—are sufficient at the moment. There does need to be greater regulation in this space.

Chair: Thank you for your evidence, Mr Piggin.

Examination of Witness

Witness: Felicity Burch, Director of Innovation and Digital, CBI

Chair: We now move on to our second witness, Felicity Burch, Director of Innovation and Digital at the CBI. Good morning, Felicity.

Felicity Burch: Good morning.

Q18 **Chair:** Thank you for joining us today. I am going to kick off with a quick question before handing over to Julie Elliott. We have heard from Which? that it has given a cautious welcome, effectively, to how the digital infrastructure has worked for consumers during the Covid-19 pandemic. What is the story with business? How resilient do you think the digital infrastructure has been?

Felicity Burch: I think we would probably paint a very similar picture to Which? there. Covid-19 has certainly highlighted the crucial need for digital infrastructure across the UK. During the crisis, businesses and their people, often working from home, have relied on digital infrastructure both for work and for their personal lives. The really important point to make is just how much digital infrastructure has underpinned everything that people have been doing online. We have seen things like Microsoft Teams gaining 31 million more active users over the space of a month—completely impossible without good connectivity. We know that businesses are now even more reliant on good connectivity to survive and thrive.

I think really the question for us is more looking to the recovery and making sure that slow internet connections do not place a barrier on the recovery. When we are looking to some of these more future-focused technologies, things like industrial digitalisation, for example, around 45% of manufacturing firms told the Made Smarter Review that poor connectivity would be a barrier to them investing in that technology.

During the crisis we have seen good performance, but we have to think quite carefully about some of the investments we are going to need to make going forward to power the recovery. There we do need to make sure that the Government are pulling out all the stops to make sure that gigabit-capable networks are delivered for firms for the growth of the UK economy.

Q19 **Chair:** On that point of the recovery and future investment, do you think the 2025 figure for gigabit networks is realistic?

Felicity Burch: It is certainly a challenging target, but good Government targets are often challenging targets. We have had the target for about a year now and we have really seen some quite significant progress. We had the £5 billion announced for the outside-in programme. We think it is very important to focus on the hardest-to-reach areas and rural areas. We have seen funding for the industry, Government proposals around the shared rural network to eliminate rural not-spots, and we have seen things like the Telecommunications Infrastructure (Leasehold Property) Bill, which has improved access to tenant properties.

The challenge there is that there is still quite a lot more to do. We do need the Government to really pull out all the stops to achieve the target. Some of the key areas where we would like to see a focus are on legislation to eliminate on the ground challenges—make sure there is a right to entry for broadband delivery in the same way that there is for energy and water, eliminating things like exclusivity agreements on new-build development, making sure that new regulations coming out of Ofcom enable investors to still have a fair bet process so that they know they can make a return on their investment, and, critically, making sure that that £5 billion that the Government have announced starts to get out of the door in 2021, so it can start driving and increasing investment. That means we need to get the procurement mechanism right for that.

Looking beyond what we need on legislation, one of the other key areas we would like to see a bit more action on is business rates. At the moment exemptions for laying fibre are only extended until 2022 but most of the fibre that will need to go into the ground to meet the 2025 target will have to be laid between 2022 and 2025. While we think there will be a wider reform to business rates, we do think that the existing exemptions should be extended to 2029. That would bring England in line with Scotland and it would give internet service providers a stronger case for investment.

The final point I would make is in line with Richard's point—that some of the issues around broadband connectivity are less to do with getting the fibre in the ground and more to do with the demand for fibre. Richard highlighted that very often, even when there is good connectivity, businesses do not take it up—the same with households. The UK is relatively low in the G7 in terms of uptake of superfast broadband as well. We do need to make sure that businesses and households are investing in their own connectivity.

Q20 **Chair:** Thank you for that. That is a wonderful wish list. Just give me a very brief percentage, if you like, 50:50 in 2025 or more, 80:20 or 20:80? Just give us a percentage.

Felicity Burch: I think we can get it if the Government pull out all the stops.

Chair: You are 50:50 basically, if they do it, 50:50?

Felicity Burch: Yes. It will not happen unless additional action is taken.

Q21 **Julie Elliott:** Good morning, Felicity. During the Covid crisis, obviously, infrastructure has been a huge issue, but also digital skills and digital skills gaps have been a huge issue. What digital skills gaps have you found businesses have been facing during the crisis?

Felicity Burch: That is such a huge and important question. We have seen how much the Covid crisis has shone a light on issues around digital inclusion. I think more than anything, where we have seen issues around digital skills gaps, it is more those longstanding gaps coming to the fore.

Clive Efford mentioned that around 11 million people in the UK do not have basic digital skills, and that is a huge challenge for an economy where a lot of the growth can be expected in the digital sector. In many ways the issues are more focused on the recovery. We are looking into a pretty challenging labour market, and in many ways when you look at some of the forecasts for unemployment and combine that with the fact that a lot of people do not have the digital skills they need—

Q22 **Julie Elliott:** If I may interrupt there, what do you think Government need to do to ensure that people do have the digital skills, moving forward, that businesses need for the future?

Felicity Burch: There are a couple of things here. We are doing a fairly major piece of research, looking at the 10-year programme on reskilling people and supporting them, and we will publish that later this year, so we will be happy to share that with the Committee. Looking at the shorter term, one of the things that we would like to see is Government developing jobcentres into some jobs and skills hubs that not only direct people towards work but also to digital training, especially young people, to make sure they do have the digital skills that will help them to succeed in the workplace.

Q23 **Julie Elliott:** May I push that a little bit further? I chair the all-party parliamentary group on digital skills and one of the things businesses have been saying to us is that digital falls into lots of different Government Departments and perhaps it needs to be joined up. Is that an issue you have come across?

Felicity Burch: Whenever you have different Departments you are always going to have issues falling across different buckets. In some ways it is no surprise to me that digital does cross Government Departments because it is such an important economic issue. Broadly speaking, I think the fact that DCMS is a bigger, more powerful Department now is a good thing.

Q24 **Julie Elliott:** It does not seem to have any money for this area.

Felicity Burch: I think we share the view that increased investment in digital skills is important and it will need to happen. It will need to happen across Departments.

Q25 **Julie Elliott:** If we look during the crisis again it was estimated that full fibre would enable 400,000 more people to work from home. How significant a barrier do you think that connectivity has been for business during Covid?

Felicity Burch: I probably share Richard’s reflections, that for most businesses during Covid their connections have held up and it is much more looking towards the future where we want connectivity to be better. I do not think anyone on this call, anyone who is listening in to this right now, has had completely flawless internet connection for the whole time we have been in crisis; I certainly have not. Ultimately, if we do want to facilitate people working from home longer term or just working more flexibly around the country, we need everyone to be able to have those connections that they can rely on.

Q26 **Damian Hinds:** Good morning, Felicity. I was interested in what you were saying about jobcentres. I used to be Employment Minister and it was striking how often one realised that there were two things that were really holding people back. No. 1 was that they lacked confidence to think that they could get a different job, a better job, or just move into employment after a long period. The second thing was really quite a thin layer of missing digital skills—not complicated stuff at all. It strikes me there is a lot of stuff out there, so you can get free online courses from Google, from Microsoft, from Lloyds Bank, from all manner of charities and so on. What do you think is stopping it being taken up?

Felicity Burch: You are right: there is a lot of support out there, and in some ways that proliferation of support and the absence of one clear place to go to access that support is an issue. That is one of the reasons that we think that the jobcentres could be a good route to help individuals find out about the support that is available.

Q27 **Damian Hinds:** There is no shortage of information coming out of jobcentres for those on Universal Credit—the journal, printed materials, stuff in branch. There is no shortage of material identifying the availability of those sorts of opportunities. How would you entice, encourage people to get them to take it up more?

Felicity Burch: I think again, on Richard’s point, some of this is about identifying the kinds of jobs that people can go into with those skills and the opportunities that are available to them. The good news is that the story that we have heard from companies in the technology sector and looking at digital roles more generally is that we do expect to see a lot of growth in those roles. There are quite exciting careers and people are not always aware of the careers that digital skills can offer them, either. It is about painting a picture of the kinds of careers that are on offer, making sure that businesses are working really closely with jobcentres so that they can do that and directing people to the right training that will help them get those jobs. Technology can play a role there as well. We have seen during the crisis that some of the businesses that we have been working with are building platforms that help people not only identify the kinds of jobs that would be a good match for them but exactly what their skills gaps would be, based on their CV and previous experience.

Q28 **Clive Efford:** What is the experience of business in terms of internet connection? Do you get complaints about reliability from businesses? Do we get a good service in this country compared to others? Would you point to another country that has got connectivity right?

Felicity Burch: Businesses do worry about their connectivity. The bigger challenge that we would point to is that businesses do not always know what they need to invest in to improve that. One of the challenges around demand for better connectivity is that it tends to be businesses who are relatively forward-looking, are investing in technology more generally, who have investment in their digital connectivity and improving their digital connectivity as part of their business strategies. In the same way that Richard was making a point about consumers not always being aware of the advantages for them, a lot of businesses do not necessarily know the advantages that increased digital connectivity could have for them, such as what it could mean in terms of developing new business models—although I would say that has probably changed a little bit during the crisis—and particularly when we come to looking at things like 5G. I think relatively few businesses are aware of the kinds of advantages and potential game-changing options that 5G could deliver for them.

There are some problems in terms of rollout that stop businesses investing in greater connectivity as well, particularly where businesses expect a time lag. For example, you put up a building site and you think, "I could do with some better connectivity quite quickly," but there may be regulations or land access requirements that stop providers from getting that fibre to them quickly. In terms of getting businesses to improve their own connections, there is a double-pronged approach. You need to be able to communicate the benefits of better connectivity, but also to make sure that some of those issues that I was talking about around legislation and regulation are moved out of the way.

Q29 **Clive Efford:** Where would you say the responsibility lies in terms of making sure businesses can access the information that they need to make those choices?

Felicity Burch: It is a combination. I think it is a policy area that needs a bit more work. Again, that is why, alongside Which?, we have called for this connectivity taskforce from DCMS. We would like to come together with consumer groups, other business groups and other experts—for example, Be the Business, which has done a lot of work on business technology adoption—more generally to try to work out a really co-ordinated programme, potentially some Government support to help businesses access connectivity, but also to think about the communications campaigns that need to be run as well.

Q30 **Clive Efford:** Apart from perhaps not being aware of what benefits can come from faster broadband, what other barriers are there to businesses taking up faster broadband and better options?

Felicity Burch: The challenges I laid out there are the main ones that we hear. I really think that the key point is just how much investment in broadband fits within a wider digital investment strategy rather than an overall business question. A lot of challenges that affect businesses when it comes to investing in technology that come up time and time again are the same for connectivity. Return on investment is key, being able to make the case inside the business. At the moment things like very tight margins and cash-flow constraints are probably going to make things harder for businesses as well.

Q31 **Clive Efford:** What do you think is the role for Government in improving businesses' knowledge of what is available and the benefits of gigabit technology? What is Government's role in all of that?

Felicity Burch: Like I say, I think it is something that potentially can be explored through this taskforce and we would like sponsorship from DCMS to do that. Sometimes businesses tell us that there is a lot of information out there about technologies they could use and technologies that they could access and they want to hear it from a trusted source. Being able to understand some of the benefits from Government would be helpful as well. Other things that could be explored might be things like gigabit voucher schemes for companies in rural areas, for example, but I think it is one that we would want to look at in the round as a taskforce.

Q32 **Clive Efford:** Would you say that business invests enough in training people and providing them with the skills in the workforce to respond to the challenges of increasing technology, or are they really just sitting around waiting for school leavers, people who have come out of college already trained? What are businesses doing to train the workforce?

Felicity Burch: That is a really good question. Time and time again, when we are talking about technology, digital skills are a key issue that comes up from the business community. Many CBI members are investing quite heavily in their individuals' skills, but what we do see is that for most businesses, their first port of call when it comes to trying to find new digital skills is to look outside the business. It is a bit of a challenge because overall there are limited digital skills in the economy and there is a bit of a risk that all companies end up fishing in the same pool.

We recommend to businesses that they look inside their own company. I call it shopping in your own wardrobe—the idea that you might have a suit that looks a bit dated but if you get it tailored it will look great again. Lots of businesses have lots of people who are highly trained, who really understand the company, really understand the business, and if you redeployed them in another area in the company, help them upskill a little bit, you would have a win-win situation. There are actions that we are encouraging businesses to take to upskill their own workforce as well.

Q33 **Kevin Brennan:** Welcome, Felicity. What did you think of the Government's decision on Huawei?

Felicity Burch: The business community will be guided by the Government when it comes to issues of national security. The challenge, as you will have heard from others, is that this decision will likely delay the rollout of 5G. I think the important thing now is to make sure that the Government are working as closely as possible with industry, both in the short term, so if service providers need to do things to comply with the new decision they have support getting access to land, and we need to think about investing in alternative technologies and investing in home-grown technologies even more. On all of those issues that I laid out earlier in terms of helping the rollout of full fibre, we need to have a crystal-clear focus on making it happen.

Q34 **Kevin Brennan:** In May the evidence that the CBI submitted to the Committee said that any policy change now would have a widespread economic impact, estimated to be between £4.5 billion and £6.8 billion, and, as you just said, would limit the UK's opportunity to be a 5G world leader. Is that a figure that the CBI still believes will be the economic damage caused by this decision—£4.5 billion to £6.8 billion to the UK economy?

Felicity Burch: We have not done a re-estimate since we have had the decision announced. I think what is quite important here—

Kevin Brennan: Sorry, Felicity, can you answer that question? Is there any reason that estimate would have changed? I am trying to establish what the potential impact is of the decision economically. Is there any reason that figure—£4.5 billion to £6.8 billion—might have changed?

Felicity Burch: I think that the impact is likely to be high. I am sorry, we have not redone the full cost yet.

Kevin Brennan: Those figures presumably were well researched before you submitted them to the Committee in evidence, so we can take it that the damage is likely to be in the area of £4.5 billion to £6.8 billion to the economy?

Felicity Burch: I think the damage is likely to be reflective of those numbers, yes.[1]

Q35 **Kevin Brennan:** Have you had any representations from CBI members about the decision regarding Huawei and whether it is likely to have an impact on any of your member businesses?

Felicity Burch: I guess to the extent that it will affect the rollout of digital infrastructure, we have heard that, yes.

Q36 **Kevin Brennan:** I want to ask a couple of wider questions beyond Huawei about the impact of the digital home working we have seen during Covid-19 and its likely economic impact. I know that economics—because I used to teach it—is a semi-respectable form of astrology when it comes to forecasting, but what do you think the impact could be on our city centres of the increased amount of digital home working that we have seen? Is that likely to stick and is it likely to have big economic knock-on effects on our city centre infrastructure, on businesses located in city centres, including ancillary jobs like cleaning, security, sandwich makers, pubs and so on? How do you see this panning out—this sudden

[1] Note by witness: The estimate referred to of £4.5 billion to £6.8 billion from CBI's written evidence was calculated by Mobile UK.

catalyst that has been applied to the economy?

Felicity Burch: In some ways you are right: it is possibly too early to tell the overall impact that increased home working will have on town centres. Some businesses that we have spoken to are looking at the way they locate themselves, whether that is in town centres, whether that is in some of the bigger cities as well. We may see more businesses moving around the country and locating a bit nearer their people and the skills that they are looking to access. The thing that we do know is that this explosion in the use of digital technologies and home working by business will change the way that businesses operate, but it is a little too early to figure out exactly how that is going to impact the world of work at the moment.

Q37 **Kevin Brennan:** Inner-city areas, in the way that they develop over time economically, tend to come in waves. I remember a time when the great worry about city centres in this country was that they would go the way of many in America and become the haunts of criminals, cut-throats and desperadoes, rather than be vibrant places where people want to live and work. I wonder whether there is a danger that if jobs start disappearing from our city centres as a result of this digital catalytic event, we might be entering an era where our city centres will once again be in danger of becoming run down economically.

Felicity Burch: That is a really important question for policy makers to be asking—thinking about what sort of city centres we want to have. If I were to reflect on what we have seen during the crisis, that spirit of innovation from businesses has to me stood out loud and clear. We have seen that local councils have been enabling businesses to act differently. Take my own High Street; they have shut the street so businesses can have their tables and chairs outside, and it looks completely different from how it did three months ago or even longer ago than that.

Q38 **Kevin Brennan:** Do you think you will be working more from home after all of this?

Felicity Burch: I would not be surprised. I have my bookshelf sorted out now.

Kevin Brennan: One slightly frivolous question, and that is I have a business idea to set up a shop called "Analog World" where every device sold cannot be connected to any other device and every device must have a button that says "on" and "off" so there is no intermediate stage. Do you think it might be a successful business?

Felicity Burch: I am sure you would have some customers.

Kevin Brennan: You do not have to answer it, sorry. Thank you.

Q39 **John Nicolson:** Could I follow up on my colleague's question about Huawei? He mentioned your written evidence back in May. One of the things that the CBI said was, were Huawei to be removed it would "... limit the UK's opportunity to be a 5G world-leader." It goes without saying that the result probably now means that we will not, inevitably, be a 5G world leader. What conversations did you have with the UK Government in the run-up to the decision?

Felicity Burch: The CBI was talking to the Government in the run-up to the decision, across a few Departments. I think our view has always been that we do have to be led by the Government on national security but that we remain concerned about the economic impact that this will have.

Q40 **John Nicolson:** The Government did a complete volte-face over this. In February they said that it had no implications for national security whatsoever, but by the time we got to July there were drastic implications for national security. It was not exactly consistent leadership, was it? Were you taken by surprise by the Government's decision, or did you have forewarning?

Felicity Burch: I think we had seen a bit of a changing political situation in the run-up to that decision. There is potentially a bit of a broader point here that the Government's decisions and announcements do affect how businesses invest in infrastructure, in technology more generally, and changing decisions does make it difficult for businesses to invest. I guess that is why we really do hope that the Government will work very closely with industry in mitigating the impact of this decision.

Q41 **John Nicolson:** Why do you think, looking back, that this country so underinvested in 5G? What are the lessons?

Felicity Burch: That is a tricky question. I think there are some quite important lessons right now and a huge moment of opportunity. The UK has just recently published, not in DCMS but over in BEIS, the Research and Development Roadmap and there are some big questions that the UK needs to ask about the sort of technologies that we want to focus investing on. The Government really will have to make some decisions about where they think that the UK can lead and make sure that we do continue to invest over time in research and development. You look back over the last 10, 20, 30 years and typically we have underinvested compared with the rest of the OECD.

Q42 **John Nicolson:** What is that? Is it just short-termism by politicians because the Minister who makes an easy decision now will not be around when the results of that decision are made clear? One of the phrases that the Government keep using is world-beating: we have a world-beating this, we have a world-beating that. The track-and-trace operation was world-beating for about two minutes before we discovered it did not work at all. Is that the problem? Is it short-termism by Ministers and little long-term Government planning?

Felicity Burch: Businesses would love to see more long-term planning around where the Government intend to invest and intend to focus from a research and development perspective.

Q43 **John Nicolson:** There was an interesting discussion on the "Today" programme about whether the UK is going to return to the idea of having a more moral foreign policy, a morally driven foreign policy. We see this—perhaps you can make an argument—in our response to what is happening in Hong Kong or Huawei. Certainly, for some people like me there was a moral imperative in not using slave labour to produce Huawei parts. Were the Government to strike a more assertive position long term to China and its state-subsidised monopolies, what kind of knock-on effect do you think that would have for British businesses?

Felicity Burch: It depends on how the Government would approach that decision and how they communicate with industry about how they are making that decision. It is fair to say that China is a pretty large investor in the UK, so it does matter from an investment perspective. The key thing is that the Government work with industry and communicate with industry in how they are developing that approach and avoid surprises that impact investment certainty in the UK.

Q44 **John Nicolson:** Is it fair competition if you have China as a state that has state-subsidised companies, such as Huawei, for example, which pretended to be independent but, as we saw from the Chinese ambassador's rage when it was removed, it is not an independent company at all? It is an arm of the Chinese state. If businesses in the UK are up against state-subsidised Chinese firms, that is not fair competition, is it?

Felicity Burch: There will always be other countries that are larger than us, able to invest more than us and looking at their technology policy differently from how we do. The UK Government can also look at how we make the UK as competitive as possible and look at where we want to lead. One of the areas where we do think that the UK can have a competitive advantage is in delivering trustworthy, ethical technology and delivering a world-leading regulatory system, but one that leads the world in building trusted technology.

Q45 **John Nicolson:** It sounds a bit as if you have come round to supporting the idea of getting rid of Huawei, because at the start of the year you were warning that it would hold us back and now you are saying it is quite good if we are in a position to offer trustworthy technology.

Felicity Burch: The point is that the way we regulate technology will help the UK to develop the most trustworthy technology here.

Chair: Thank you, John, and thank you, Felicity, for your evidence.

Examination of Witness

Witness: Harry Armstrong, Head of Technology Futures, Nesta

Chair: We are now going to call Harry Armstrong, the Head of

Technology Futures at Nesta, the Innovation Foundation. Good morning, Harry.

Harry Armstrong: Good morning.

Q46 **Chair:** Thank you for joining us today. Could you briefly outline for the Committee how effectively technology has allowed society to respond to Covid-19 and social distancing measures, and what challenges it has presented?

Harry Armstrong: Picking up on what has already been discussed, there has been a huge acceleration in the adoption of digitalisation and technologies, which allow all sorts of different organisations and individuals to be able to continue working and working in new ways.

From the point of view of the public sector and regulators, who we work with quite a lot, there has been a lot of shift to things like doing virtual inspections, trying to make use of new technologies like drones to build air bridges between hospitals, trying to look at other ways in which they can function; with hospitals, using broadband and video services to provide both primary and secondary care options; and, on an individual level, the use of broadband and video technology to do video conferencing, which allows people to continue working.

It has been a huge opportunity and it has enabled a lot of people to continue social distancing. The questions are: what implications are there for this on things like inequality—which has already been mentioned a little bit in terms of a digital divide—but also in the sustainability of some of these things going into the future?

Q47 **Damian Hinds:** What do you think will stick, Harry?

Harry Armstrong: Yes, that is a good question. To answer that, we need to better understand what has worked and what has not worked. From a public sector and regulatory point of view, a lot of these ways of working are fairly new, so virtual inspections as an example. There are lots of opportunities in that space, but there is still a big question about how well that works compared to other more traditional approaches for doing inspections; the same in education; the same in health.

Regionally, and between different organisations and individuals, people are taking different approaches to using technology to overcome some of the problems created by Covid in lockdown. Trying to work out which of those is working and which isn’t is the next stage. Without the evidence on what works and what does not work, we do risk reverting to ways in which we have been doing things in the past, so not making the most of some of the opportunities here.

Also, on the other side, there is the potential to carry on processes or ways of working that do exacerbate inequalities or do cause problems but, because we do not have the opportunity to evaluate, we do not know. For obvious reasons, we are still trying to evaluate this stuff and it is very tricky under the circumstances. From Nesta's point of view, we need to invest in evaluating what has worked and what has not worked.

Q48 **Damian Hinds:** During this period, who has been doing the comprehensive tracking of different households and businesses to be able to do that analysis that you are talking about?

Harry Armstrong: The work that Nesta has been doing is broadly focusing on use of technology within the health sector. We have been working a little bit with NHSX to explore how primary and secondary care is using technology. We have been working with regulators to understand how they are using technology and new ways of working to overcome some of these issues and allow businesses to find new ways of working. We have been looking at the education sector as well, at how teachers and others in the education sector are using technology.

Our focus has not primarily been on individuals. There are others—for example, Which?—that have been looking at that in more detail. From our point of view, we are interested in how innovation is related to these questions, how businesses and the public sector have been able to innovate and what the value of that innovation has been. We have a fairly good, comprehensive view of the areas I have just covered but, beyond that, we have not looked in depth yet.

Q49 **Damian Hinds:** Specifically on education and EdTech—which is a sector in which at first sight it can be very difficult to discern quality but, through usage and tracking effects, obviously it is possible to—do you know who has been doing that work during this crisis? There have been different kids with exposure to different levels of online and technology-enabled learning and different levels of equipment availability but also, within that, different products following different courses of study. Do you know what tracking has been happening specifically in that area?

Harry Armstrong: Not across the whole of the education sector. We have been very involved in the EdTech sector for quite a few years now, and—exactly as you pointed out—one of our key concerns is the quality of the technology that has been created and provided. There are a lot of snake oil salesmen in that sector. It is a very big sector. There is lots of investment in it. Our interest has always been how to understand what works and build the evidence on what works.

We have been developing things, like an education test bed with the Department for Education, to try to build that evidence. I do not think there is much of a difference in that sense with what has happened in lockdown. The lockdown has made it a little bit more difficult to do the analysis of what works and what doesn't. Teachers and others who might be doing the evaluation are more focused on developing their own digital skills and trying to find workarounds to some of the trickier, thornier issues that are related to some of the conversations about businesses adapting to this as well. The ways of doing this are through things like a technology education test bed, which we have been running, and trying to do surveys and engage with the teachers who have used this stuff during lockdown.

Q50 **Damian Hinds:** Presumably, almost all kids are about to do some intensive formative assessment when they return to school in September. In their different school settings, they will have had assessments made of their progress to date. Potentially, you have a massive amount of learning to be derived from what has just happened. Why wouldn't you or others in the sector use that to understand what the differential effect for different children has been?

Harry Armstrong: That is a good question. This is something that we might do. I cannot guarantee it is something we will do. It would potentially require a significant amount of investment from the Department for Education, because you are talking about having to collect a huge amount of information from a variety of different sources to ensure that you can have some sort of semi-experimental way of analysing the data.

There is a lot of variation between what different schools have been doing, so there is a question about whether you have big enough sample sizes for each of the different approaches. How much can you be able to take into account the existing inequalities between children, even within the same class, who have been using technology—

Q51 **Damian Hinds:** Data exists, Harry. The education sector is awash with such data. You could run a survey analysis of what technology, for how long and so on, kids have been exposed to during this period, and then look at the difference between the stage of progress at the start of the period and at the end.

Harry Armstrong: Yes. Some of that is starting to be done. It is definitely something that we would seriously consider doing. As you say, there is a large amount of data. It still may be tricky to control all the variables on that but, yes, it is definitely something we would consider doing.

Q52 **Damian Hinds:** Looking to the future, we have been doing an inquiry here on online harms and some of the controversies around social media platforms and so on. We are on the precipice of something even bigger in the form of artificial intelligence. There is this nascent infrastructure of regulatory authorities and ethical standards, and you now have the Global Partnership on Artificial Intelligence and here the Centre for Data Ethics and Innovation, and we have the AI Barometer. Fundamentally, what these organisations and initiatives tend to discover is a lack of public trust in how data will be used. You can see how it could be misused or used in a worrying way; for example, in healthcare, insurance and these days in employment in deciding who to interview and so on. How are we going to find a way through this and build public trust to enable us to reap the potential rewards from artificial intelligence?

Harry Armstrong: To answer that question, you need to also first ask why we want to build trust. What is the purpose of doing that? We can think about building trust for the sake of delivering something we already want to deliver, or we can think about building trust by working with the public and working with a very wide range of stakeholders to understand what kind of future we want to build and where AI is going to fit into that. That would be the way that Nesta would strongly push Government to proceed on this.

One of the things that we have pushed a lot in terms of our work with regulators and a little bit with CDEI and others who have a digital data-related portfolio is the importance of that public engagement and understanding where the public values are on this. As you say, those are developing as the technology is developing, so it is important to have that discussion looped in.

Added to that, there is a second way in which regulators can help deliver technology and innovation that is valuable and trusted—and Felicity was pointing to this—and that is through acting in a way in which you use regulation for innovation. There are different non-regulatory approaches, activities and interventions that regulators can do to support market-led innovation that is directed towards particular societal goals or things that are valuable to society.

One of the projects that we have been working on with the Solicitors Regulation Authority is exploring the use of AI within the legal advice service, but not just for them to understand. The way that we have gone about that is through a challenge prize methodology: setting a goal and outcome that the SRA wants to achieve through exploring these technologies.

The SRA wants to look at AI-enabled legal advice systems that can open up legal access to lots more people, that is going to be fair, that is going to be transparent but is going to be privacy-protective. Setting the goal through the challenge prize methodology allows technology companies to come and test those innovations and to work out what works in achieving those goals.

At the same time, the SRA gets to see underneath the bonnet of all of these technologies, to understand how they work, how these innovators are creating these technologies, where there might be important issues that could arise but where the opportunities are. Therefore—

Q53 **Damian Hinds:** Sorry to interrupt, Harry. Do you think we should draw some solid lines somewhere? For example, identifying people who might be criminals in the future, which is something that AI can do—and apparently in some cases is being deployed, we are told—is that something that should just be banned? That is a public sector example. To give a private sector example, companies using artificial intelligence to do CV sifts, and even in some cases to do first round interviews, to identify people who would be a better fit with the company, is that something, as a private sector example, that should just be beyond the pale?

Harry Armstrong: On your first example, I think the question is not necessarily doing that activity. If you were going to identify anybody as a criminal before they have committed a crime, that goes against the way our legal system works. But if you are trying to identify those who are more likely—

Q54 **Damian Hinds:** I did not say convict them. I do not think that is what the systems do, but they do purport to be able to predict who is more likely to be susceptible to criminal activity.

Harry Armstrong: Yes. I think the question there is: what are you doing with that information? Secondly, how good a quality is the data and how biased is that data?

There are some really good uses of technology that might predict who is more likely to commit a crime or, in child services for example, which families might be more likely to need child services. The question there is: what are you going to do about it? If you are going to respond in a way that, through police action rather than through interventions, might help rectify the underlying issues that might be leading to a greater likelihood of committing a crime, that is hugely valuable for society and for those Government Departments.

I do not think there should be a red line under not doing that. I think the point is making sure that, whether it is the Government or the public sector that is doing it, they are doing it in an open and transparent way and they are clear what they are using the data for and what interventions they are making, at the same time making sure that the quality of that data is good and unbiased and, where possible, that they are being transparent about it.

On your second example, a lot of the evidence right now says that the use of AI in employment settings—particularly for CVs—again is fairly biased. It uses proxies for all sorts of things around race or socioeconomic status. If you were able to show very well with evidence that an AI system was able to overcome those biases, then I do not see why that would not necessarily be an all right thing to use, but there are probably red lines around where AI might impinge on certain human rights or certain fundamental rights issues.

Q55 **Clive Efford:** I take it you were listening in on questions earlier on and you heard reference to 11.9 million people who lack the skills to use the internet on a day to day basis. Is there a technological solution to that problem—upskilling those people—that people like you could address?

Harry Armstrong: I do not think there is a sole technological solution to anything. I am not an expert on digital skills, but from what I know it is quite a complex issue—like any skills development area—and it requires action in lots of different places: in schools, experience outside of schools, experience at home. There are cultural aspects to valuing certain types of skills over other skills. There are socioeconomic disparities between those who have access to the tools or even, let's say, somebody that they can look up to, to value the skills. It is hugely complex and I do not think there would be a technological solution to that.

Q56 **Clive Efford:** It intrigues me that we identify these particular groups, we identify behaviours and we find technological solutions or ways to engage with those people. It just struck me: is it the technology itself that is excluding these people? Is there a way around that that can engage these people and give them the access? The danger is that these people get left further and further behind as technology advances rapidly.

Harry Armstrong: There is always a point about the way that technology is designed and how people-centric or how user-centric it is built. From our reflection in terms of working with lots of different organisations, public and private, and looking at lots of different technology areas, that is always an issue that comes up, whoever you talk to.

The people who create a piece of technology or an innovation are not necessarily the ones who understand the users, particularly all those who might use it. That is why you have seen lots of organisations, some in Government like Policy Lab, who have grown up in terms of trying to spur the use of user-centric design and design thinking to ensure that technology is more user-friendly and people are more likely to use it.

Q57 **Clive Efford:** You have set out four actions at Nesta, one of which is to enhance people's work rather than replace it. Isn't the problem that a lot of the investment in technology is driven by people who are looking to replace employees and cut employment costs?

Harry Armstrong: This is a really difficult area. It is quite complicated for something that outwardly can seem quite simple. A lot of jobs are a mixture of different skills and tasks, some of which can be automated and some of which cannot. In the vast majority of cases, what you tend not to see is automation of a whole job; you see automation of a significant number of tasks within that job. The question is: how do we respond, or how does a business, or how does Government respond to that? You are talking about shifting people not completely out of a job but into slightly new skills or task areas, to complement some of the skills and tasks that they already have that have not been automated.

One thing that I think is worth remembering is when you look at automatability, one of the key things that comes up is how many high-performance work practices you have as part of your job. These are things like autonomy to make decisions, how much you mentor or teach, these kinds of things within a role.

We as employers and we as companies and Governments have a huge amount of control over what a job is—that bundle of skills and that bundle of tasks. It is easier than we give ourselves credit for to shift some of those skills into areas of these high-performance work practices, which are much less automatable and require more human skills in the way that we think about human skills now. It is easy to a certain degree to shift some of these roles into a direction in which they are less automatable.

Q58 **Clive Efford:** I want to go back to the point: is it a problem, though, that we see a lot of investment from companies that have an interest in cutting their employment costs, that is, the number of their employees, and aren't they putting a lot of money into technology, and isn't that skewing it in favour of people losing a number of jobs in the workforce rather than enhancing people's place in work?

Harry Armstrong: Historically, where you have seen this kind of investment in automation—whether that is physical labour automation or white collar jobs—it has created other jobs, often at a higher rate than the rate at which jobs have been lost. That may be the key answer.

I do not think that companies are automating whole jobs. They are automating specific tasks that are easily automatable. For some people, where the majority of their job might be made up of tasks that are automatable—it will not be the whole job—that poses a significant risk of redundancy and job loss, but there are opportunities that are opened up as well. If you save money in one space, you can spend money somewhere else.

Therefore, the question for Government in terms of skills investments and curriculum, and for companies in terms of, again, skills investments, organisational structures and investment, is: how do you make sure you shift those people who are highly likely to be automated out of a job into an area where they can provide additional benefits for a company or for a public service, do more of the things that are less automatable, these high-performance work practices, and, therefore, you keep the job and you add benefit and resource to the company in a different area?

Q59 **Clive Efford:** What barriers to technological innovation do you think the Government should address and be encouraging or investing in as we come out of the Covid lockdown?

Harry Armstrong: That is a good question. I come back to my previous answer. To keep some of these new approaches and new ways of working there does need to be investment in evaluation of these new work practices and building some skills and learning from that. My fear a little bit here is that Covid is going to reduce public spending at some point. Evaluating what works and what does not work tends to be what the Government do not invest in compared to other things. That is one area, one role that Government should play.

Another role—a more general role, I think—from our work with regulators and with the UK and Canadian Governments, is on the use of regulation to support innovation. I think regulators have an important role to play and they should be continuing to play this supportive role, taking up innovation-enabling approaches to regulation. But there are issues here and Government can help support them. I think the new Regulatory Horizons Council is going to play an important role in helping shift regulators to that more proactive approach to innovation and regulating and—sorry, yes?

Clive Efford: Sorry, I did not mean to cut across you. I thought you had finished.

Harry Armstrong: No, that is good.

Q60 **Clive Efford:** Are there specific areas of regulation that you would look to and you would hope would come forward?

Harry Armstrong: The focus seems like it is going to be to some extent on a red-tape-cutting exercise, maybe partly because of Covid and partly because of Brexit. Our response would be that is not where you should focus, because red tape cutting does not create benefit for innovators. Sometimes clarity on regulation is more important.

We think it is more the way in which regulators interact with innovators using sandboxes and other approaches, which have been hugely successful. That has given investors confidence—that is a point that Felicity was making earlier—when they know that regulators and innovators are talking, so that is one way.

Another way is being more proactive in helping drive innovation in a direction that creates social value. The SRA example there is good, and the work the FCA has been doing on sustainability and green financial mechanisms is really important. Those are two key ways in which regulatory action can help. The third one is taking a more future-facing approach, so not just thinking about issues as they are now.

Q61 **Clive Efford:** Are there any sectors that you would say are being left behind, that need more investment or more assistance, that would concern you?

Harry Armstrong: There are lots of sectors that are a little bit more behind, especially in terms of digital innovation. That is for a variety of reasons, some of which are investment, some of which are cultural. The area that I think Government and DCMS should be focusing on is the sustainability of digital infrastructure going forward. That is an area that obviously fits in between several different regulatory mandates but is going to become hugely important. We are looking at energy use of digital infrastructure, which is about 5% to 9% at the moment of world energy use. That could go up to between 20% and 25% in the next 10 years, so that is a huge jump.

If we look at everything that has happened now, greater use of digital technologies for video conferencing and so on, 5G is going to open up new opportunities. This is a big space that we need to consider. How do we make that infrastructure energy-efficient? How do we change behaviours to ensure that people are not overusing technology in a way that is detrimental to the environment and energy use?

This is something in a big project that we are doing called the Next Generation Internet initiative. This is a big interest of ours and we think an area that the UK Government need to invest in and focus on a bit more.

Q62 **Clive Efford:** How do we compare in the UK to other countries in terms of levels of investment in research and development in this area?

Harry Armstrong: In that area, I do not have a specific answer. More generally, I think the UK has always fared fairly well. Recent announcements about potentially a massive increase in R&D investment would be a huge boost to the UK economy, but that needs to be spent in the right way. That needs to be spent in the right areas.

At the moment, there is huge regional inequality and much greater regional inequality than other, say, European countries in where that R&D investment goes. That could have further serious implications post rexit, depending how money is carved up and which areas are impacted. Trying to make sure that there is less regional disparity in terms of R&D investment is going to be important.

Q63 **Clive Efford:** A last question: would you say that that should inform how we prioritise the rollout of 5G in order to try and address some of those issues?

Harry Armstrong: Potentially, yes. Investment in the infrastructure that is going to support some of that regional development, that regional innovation, is definitely a key consideration, yes.

Q64 **Kevin Brennan:** What is a smart city?

Harry Armstrong: There are different definitions of what a smart city is, but using technology to ensure that a city is more efficient in the way that it runs, that it is more intelligent, so there is greater understanding of what is happening in the city at any one time, allowing a greater flexibility of service provision or greater efficiency in, for example, managing road use or a particular service use at any one time.

Q65 **Kevin Brennan:** Are there any smart cities in the UK?

Harry Armstrong: I think there are lots of cities—London, Manchester, to a certain extent Bristol and bits of Milton Keynes—that are investing and leading on elements of smart city development. The use of data in London is quite advanced, even compared to some other cities in the world.

Where Nesta would say the development of smart cities has been lacking, or has not fulfilled its full potential, is in the involvement of citizens and the overly deterministic focus on technology. We would argue there are lots of ways in which cities can be smart without necessarily having to rely on technology, but by using technology to enable people to engage with each other and be smarter. This is—

Q66 **Kevin Brennan:** Is there a practical example of how that might work?

Harry Armstrong: Yes. Some good examples would be the use of smartphone data and people to track air pollution, to understand which bits of the city are more polluted. Not just to track that, but then people using that information to make physical changes or specific changes to bits of the city to try to alleviate those issues.

It is partly about collecting and understanding data and making the most of individuals, people, in doing that and directing the question to something that is important for them, but also then using people as a form of collective action to make change. Because it is all well and good identifying an issue, but if you do not make change, then the issue is going to continue.

Q67 **Kevin Brennan:** I want to return a little bit to the question of AI, which we were discussing earlier on, and the ethics around all of that. You were talking about legal services, and already with customer services you often deal with a bot rather than a human when you are dealing with services online and so on. Do you think that people ought to have the right to know that they are talking to a robot?

Harry Armstrong: I would say it is always better to have greater transparency on how a piece of technology or a system you are interacting with works, whether that is—

Q68 **Kevin Brennan:** If you are interacting, for example, with one of these online travel agents, they will do anything, obviously, to avoid actually talking to you as a human being and will direct you away from the telephone—even these days away from e-mail and so on—towards a chatbot, but they will pose as a human in that conversation. Is that ethically acceptable?

Harry Armstrong: In some ways that is by design, because trying to engage with something you think is human is easier for that kind of discursive way of interacting with a person or a system. Whether it is ethical or not is a question that should be given to the public. My answer is going to be a personal one as much as anything. The point here is that when new technologies emerge and they create potential ethical issues, they need to be decided through a continuing discussion with the public and key stakeholders. That is obviously part of what the new Ada Lovelace centre will be doing, but I think that is where that question should be answered.

Q69 **Kevin Brennan:** You might be quite savvy to all of that but there might be customers and citizens out there who, in all good faith, are entering into a conversation with a machine believing that they are interacting with another human being who calls them by their name. I wonder whether it should be a requirement that, at the outset, it is made clear to the citizen/consumer that they are interacting with a computer and not with another human being.

Harry Armstrong: Your point about a lot of the public potentially not knowing is definitely something that comes through in public engagement exercises that we and others have performed. When undertaking that broader consultation about what is okay and what is not okay, there is a big education piece there.

In terms of the requirement, again I think transparency is always better, but it is a question that should be given to the public in public discourse because the answer may be, "Yes, we want transparency," but the way in which you do that may be very different from your suggestion there. It may be another way.

Q70 **Kevin Brennan:** All right. In that rather interesting and quite wide-ranging conversation that we had earlier on about automation and how that is going to affect jobs and so on, it struck me that some people have said about Covid that its impact has been very based on social class, if you like, in that if you are a bus driver or a shop worker or a postal worker or a nurse, you would be required to go to work and take risks and be at risk during the crisis, but if you were an office worker who could do their job through technology from home these days, that you were protected. You were talking about the jobs that are likely to be automated. Whose jobs out of those sorts of categories are likely to be automated in the future and whose jobs are likely to remain, in your opinion?

Harry Armstrong: That is a very difficult question to answer. We have done a piece—

Kevin Brennan: Look around the corner a bit.

Harry Armstrong: Yes. We have done a piece of work to look at what skills might be important into the future, looking at more than just automation—this was a few years ago now—but looking at a whole different range of factors and trends. The things that came out of that work were the importance of these high-performance work practices, but also interpersonal skills and how much interactions and things were part of a job.

A lot of the jobs that you have just mentioned, so a lot of the jobs that tend to be lower-paying and particularly badly affected by Covid, are not necessarily automatable or a lot of the tasks that are contained within them are not automatable because they contain those high-performance work practices and high requirements for interpersonal skills: carers, bus drivers even, depending on how much you believe automated cars are coming down the line soon.

Q71 **Kevin Brennan:** Okay. Finally, going back to my original question, if I were to type in in my customer service interaction the question, “Are you a robot?” what answer should I receive back?

Harry Armstrong: If you received an answer that was not true, then that would hugely disrupt your trust in that system and would probably mean that you would not use that system again in the future.

Kevin Brennan: You might have no choice.

Harry Armstrong: Again, I think transparency is key there.

Chair: Thank you, and thank you for your evidence today, Mr Armstrong.