Robin Mansell
Are we losing control?

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ARE WE LOSING CONTROL?

The current path of digital technology innovation is seen as inevitable and good for the economy and citizens. But as **ROBIN MANSELL** writes, there are looming and profound questions about digital divides we cannot ignore

The prevailing view is that connecting the unconnected using digital technologies is necessarily a good thing for society as a whole, for the economy and for the individual. Although the relationship between infrastructure and digital platform development and inequality is complicated, policymakers tend to assume that their interventions will have a direct and positive impact on the take up and use of digital technologies and services, and a consequential beneficial impact on society. The main focus in policy is to reduce the access and literacy divides and, as a result, attention is given principally to the rate of investment in digital infrastructures and in digital skills acquisition.

In Europe, for example, the policy focus is on three pillars in the European Commission's digital single market strategy: the economy; broadband connectivity and access; and skills and employment. Regarding the economy, concern in Europe about the very considerable market power of large platform operating companies leads to measures intended to remove barriers to the growth of the single market. Policy interventions include the lengthy Competition Directorate case against Google that may or may not succeed in altering the company's strategy. They include efforts to remove national market barriers, such as geo-blocking practices that result in less than 4% of all video

on-demand in the European Union being accessible across member state borders. There are initiatives to boost investment in broadband infrastructure, especially in rural areas. Other market interventions are designed to support news content creation, such as a proposed fees levy on digital platforms operated by Google and others, and efforts to tackle the tax base are under discussion, such as the challenge to Ireland's tax concessions for Apple and the introduction of tighter regulations on how platform company revenues are assessed.

European policy in addition requires user consent for the use of personal data to address the absence of corporate transparency in the way consumer information is used. The European Commission's General Data Protection Regulation introduced 'data protection by design' and 'data protection by default' measures with the aim of reducing the risks associated with online interaction.

When the US Federal Communications Commission introduced its new rules for internet service provider use of personal data and certain kinds of metadata, these were greeted by advertisers as 'unprecedented, misguided, counterproductive, and potentially extremely harmful'. In Europe, by contrast, a lengthy set of deliberations on updated policy measures for personal data protection has produced a somewhat more muted response from industry.

ECONOMIC IMPERATIVE

Some of the policy interventions in response to the spread of digital technologies and services are explicitly aimed at achieving fairness in the treatment of citizens and greater transparency with regard to corporate practices. Nevertheless, the dominant theme in policy discussions concerns the prospects for the digital economy, and the highest priority is to promote an increase in the rate of investment in both infrastructure and online services and to do so by ensuring that the economic incentives facing infrastructure and platform providers encourage such investment. Even when policymakers succeed in encouraging shifts in business strategy in an effort to ensure that citizen interests are protected, such policy interventions mainly tinker with the direction of innovation in digital technologies.

Rarely, if ever, do they lead to substantial changes in the pathway or trajectory of digital innovation, which is currently leading to an increasingly more intensely mediated digital environment. As Hannu Nieminen comments, these interventions are aimed at 'patching the gaps' left by global regulators which themselves no longer exercise control over the activities of the providers of digital technologies and services.[1] Each new generation of technology is expected to help to close digital divides; to get more people connected and to boost the use of digital services. This expectation is evident in the enthusiasm in the press and policy circles for 5G

wireless services. At a cost in Europe for 5G rollout of some €57 billion by 2020, the benefit is estimated at some €113 billion for the European single market by 2025.[2] The emphasis is on the economic drivers, with an assumption that the deployment of this technology will bring a new chance to close the digital divides.

With regard to digital skills, the policy focus is increasingly on upskilling. Concern is growing in Europe (and in the US) that a low level of certain skills is preventing major advances in deploying new generations of technology as well as restricting the abilities of citizens to benefit fully from their access to digital networks. Only some 1.7% of European enterprises are reported to make full use of advanced digital technologies and around 41% do not use them at all. Some 47% of the European Union's population does not have appropriate digital skills, but 90% of jobs are forecast to require at least some level of digital skills by 2025. The European Commission's 2016 Skills Agenda for Europe emphasises the need for skills in computer science, nanotechnology, artificial intelligence (AI) and robotics. It also notes the need to strengthen transversal skills such as team work, creative thinking and problem-solving, but it is

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POWER AND TRADITIONS OF DIGITAL DIVIDES

Technological systems are acknowledged as being instruments of power, and an understanding of the way power relations are mediated by digital technologies is essential for the analysis of the cultural, social, political and economic features of society. Digital divides are examined in several generations of research which seek an understanding of relationships between the spread of digital technologies and the factors contributing to the inclusion or exclusion of countries, regions and people in the digitally mediated world. There are three 'traditions':

● The first digital divide tradition investigates the access divide. It is very prominent and is primarily an 'instrumental' research tradition. The main goal in this tradition is to connect the unconnected to digital networks, typically using broadband technology. Numerous reports of this kind are generated by consultancy firms, academics, United Nations agencies and the World Bank. These document the rate of diffusion and take up of digital technologies, networks and services, usually with the aim of ranking performance and assessing whether access gaps are being closed. Research in this instrumental digital divide tradition confirms that a rapid rate of investment in digital technologies and services is strongly associated with declining economic inequality, at least on a global scale.

● A second, deepening digital divide tradition focuses on the skills, literacies and competencies required to make use of digital technologies once access is achieved. In the Netherlands, for instance, only 15% of the population can be counted among the information or digital elite, despite the relatively high levels of connectivity in the country.[11]

● A third tradition in the digital divide literature gives greater attention to the outcomes of connectivity. Alexander van Deursen and Ellen Helsper, for instance, are interested in measuring the differential economic, social, cultural and individual outcomes of internet use.[12] They examine the tangible differences that users associate with their use of the internet and what they can achieve in their lives. Manuel Castells and Pekka Himanen also focus on outcomes.[13] They link indicators of digital access with differences in economic development, human development, ecological sustainability and cultural development to assess the extent to which human dignity is enhanced as a result of internet access and use.

Sometimes other digital divides are discussed in the literature, referring to gaps in internet use between the old and the young, to gender differences, to the exclusion of the disabled or to gaps in access between urban and rural areas. The labels of these traditions and the categories vary, and much of the research in the digital divide tradition focuses on quantitative indicators and is undertaken at a relatively high level of aggregation. However, this work is complemented by numerous case studies, many of which employ qualitative methods to examine access and technology use barriers. For example, exclusionary business practices may be revealed – such as the levying of service fees of as much as 16% of the value of transactions on mobile money transactions in some African countries, which serves as a barrier to use and reinforces economic divides, as Kas Kalba writes.[14]

It is the first and second digital divide traditions that seem to have the most influence in policymaking, despite the fact that these traditions give the least attention to questions about why digital technology innovation yields persistent, unequal outcomes in society.

STEM subjects – science, technology, engineering and mathematics – that receive the highest priority, together with occasional references to the arts in relation to creativity. Changes in education provision at the higher education level are deemed to be urgent to reduce barriers to market growth in big data analytics and the internet of things (IoT). These are expected to contribute some €415 billion to the EU's future gross domestic product.

Should strong growth be achieved, this is assumed to be consistent with greater choice for consumers and with generating new sources of employment. The emphasis in policy initiatives in this context is on investment in R&D to promote faster innovation and to strengthen economic growth in the single European digital market.

Many policy papers addressing these issues embrace a discourse that signals a concern about the disruptive nature of technological change and about the need to ensure that social justice is achieved, together with transparency. However, the main focus is on access and skills and on closing gaps in the relatively short term. Rarely is there a discussion about the implications of the rate and the direction of technological change in the longer term. Yet Martin Goos and colleagues find that it is likely to take "at least 60 years for Europe's lagging regions to close half of their current lack of high-tech employment compared to Europe's high-tech hubs", based on current technologies and expected rates of investment.[3]

The longer term implications for inequality are also signalled by Andrew Keen, who finds that the growing use of digital tools helps to explain the gaps between rich and poor.[4] He observes that "the more we use the contemporary digital network, the less economic value it is bringing to us. Rather than promoting economic fairness, it is a central reason for ... the hollowing out of the middle class."

Similarly, the late Anthony Atkinson's assessment was that, even if full employment could be achieved, a structural shift towards higher skilled labour associated with the types of skills required in the digital economy is likely to result in a more unequal distribution of income.[5] This is partly explained by a growing concentration of rents from technology and trade which are accruing to an increasingly smaller number of companies, by steeper pay hierarchies and by a shift from fixed salaries to other forms of pay, such as zero-hours contracts.

ASSUMPTION OF BENEFIT
These are all factors that fall outside the models used to examine digital divides and their consequences. This suggests that policymakers are focusing on a narrow range of issues informed by the instrumental digital divide traditions and there is little acknowledgement of the need for a debate about the consequences of the direction of change in digital technologies and services. It is recognised that the direction of digital technology innovation is affecting the income distribution of populations as a result of the automation of labour, and some estimates put the jobs at risk from computerisation in the form of sensors, IoT, algorithms and machine learning, and robotics at nearly 50% in as little as three decades. Nevertheless, the underlying assumption is that technological change will bring more benefits than losses for individuals and societies, albeit in the long term.

The evidence suggests at the same time, however, that deep social and economic inequalities are persistent and unlikely to be reduced by tinkering with the rate of technological change or with upskilling in relatively narrowly defined advanced technology fields. Yet persistent inequality undermines commitments to democracy and the capacity of individuals to generate an income to live a decent life; one that is safe, and one that offers them a possibility for improving their wellbeing and regard for their self-worth and that of others.

Economists such as Joseph Stiglitz are calling for progressive income and wealth taxes and a strengthening of the social safety net in the face of threats to people's livelihoods. However, those who propose these kinds of measures also remain oddly committed to the view that there is a natural or inevitable direction to change in digital

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technologies. In addition, because work in the digital divide tradition and policy is focused on access and on the use of the technologies and services that have already been deployed outside the laboratory, there is little discussion about the consequences of the current direction of technological innovation. Debate about how human beings will live and experience their lives when technologies that are still in the laboratory emerge is not the highest priority in policymaking circles concerned with the digital economy.

This commitment to a particular direction of technological change operates as a monopoly of knowledge or, in Charles Taylor's terms, as a dominant social imaginary.[6] The prevailing view when discussion focuses on digital divides treats promoting connectivity and upskilling as the main solutions to economic and social inequality. The logic is that inclusion is likely to be achieved optimally when the competitive market serves as the driver. Social benefits (and costs) are regarded as the derived outcomes of success in the digital marketplace.[7] Political economist Harold Innis warned that "obsession with economic considerations illustrates the dangers of monopolies of knowledge and suggests the necessity of appraising its limitations".[8] This was a trenchant criticism of an obsessive focus on the factors determining economic growth in the 1940s when little attention was being given to distributional issues or to the social and political consequences of unequal wealth accumulation.

In today's context, this monopoly of knowledge is insistent that digital platforms and increasingly sophisticated computerised information processing will bring good things for citizens. Provided through globally competitive markets, these platforms optimise consumer choice and technology suppliers are seen as simply responding to consumer demand. Ultimately – in the long run – there will be no power asymmetries. The main focus is on the rate of investment in technological innovation and on the introduction of more sophisticated digital products and services. In this context, there are references to the need to moderate market developments to achieve the common good, however it is defined. Such moderation generally means only that it is acknowledged that technology itself is not a solution to social and economic problems. Jeffrey Sachs, director of the Earth Institute at Columbia University, says, for example, that technology must be properly deployed – directed towards social purposes – and extended to the poor and to remote regions that markets alone will not serve, at least not in a timely way. Put simply, technology must be combined with a will towards the common good.

Whatever the imagined consensus as to what the common good may be, it is principally associated

with the rate of investment in infrastructure and skills. There is little questioning of the direction of change in digital technologies. The present trajectory is yielding benefits for healthcare, education, financial services, smart agriculture and many other sectors. Investment in experimental research and in bringing new applications to users is reducing the costs of deploying some services and it may enable enhanced public awareness and citizen engagement or contribute to productivity gains and improved market efficiency.

Nevertheless, the longer-term consequences of the direction of technological change go unquestioned because the present pathway for technological innovation is presumed to be the only one available.

CONCLUSION

Is it realistic to envisage a deeper consideration of the consequences of contemporary digital technology innovation? Policy measures are being introduced to limit the damage caused by accidents resulting from experimentation in the laboratory and the excesses of practices in the private sector. Legislation and regulation play important roles in addressing the short-run consequences of contemporary developments and such interventions do alter the incentives of private, state and, indeed, civil society actors, leading to incremental changes in the direction of innovation. Platform operators and infrastructure providers will continue to seek public legitimacy for their practices in order to ensure the financial sustainability of their business models, but these will amount to small shifts in strategy with technological innovation continuing to progress along its current trajectory.

Such tinkering is unlikely to address the principal contradiction – that the more digitally mediated benefits we have, the fewer opportunities there are for humans to exercise their control and authority. The risks that augmented machine intelligence presents for human beings are being addressed through risk-mitigation strategies that involve further progress towards algorithmic complexity. As calculative practices are internalised by citizens, this limits the capacity of human beings to imagine alternative directions for technological innovation.[9]

While it is recognised that developments in AI and robotics "hold the potential to reshape fundamentally the way we live and work"[10] and that there is a need for ethical scrutiny of the societal consequences, the prevailing view is that society must adapt to the current pathway of technological change. A dialogue is needed but this raises the question of what kind of dialogue. Alternative directions for change are themselves mediated by our immersion within the technological system. It is difficult to envisage how citizens without in-depth scientific knowledge can be expected to actively participate in such a dialogue. This is especially so because some 71% of Europeans, for example, report that they believe there is no alternative to disclosing their personal information to obtain products or services, according to the European Commission.

Nevertheless, there is no alternative to

CONTRADICTORY RELATIONS BETWEEN HUMANS AND MACHINES

Once the stuff of science fiction, developments in robotics and artificial intelligence (AI) could bring substantial risks if the view is taken that human beings should retain control of their digital environment. If the trajectory of change is one that is likely to remove human authority over the technological system, it must be asked whether this would destroy the very notion of what it means to be human. These developments are encouraged by the view that there is a natural course of development of digital technology.

The promise is that the benefits will outweigh the risks even though developments in machine learning suggest that the asymmetry between humans and their machines is being exacerbated. Some scholars, activists and policymakers are making efforts to mitigate the risks of underemployment and social and economic exclusion as well as other harms to human beings. Critical scholarship is demonstrating how far the commodity form of online engagement is reaching into citizen's lives and providing increasingly robust evidence of algorithm system biases, whether racial, gendered or income related.[15] Despite such evidence and claims that the direction of innovation is yielding an 'infoglut' and a black-boxed technological system which is not transparent for citizens, the technological development pathway continues to be one where the operations of the algorithmic system are becoming less transparent and accountable.

On the current pathway of technological change in the digital world, the results of data analytics, often in the form of visualisations of patterned associations, are shaping decisions in society.[16]

deliberation. When social and economic inequality persists and digital technologies are implicated, it is crucial to enable a dialogue that may reveal alternative pathways which challenge the presumed natural direction of digital innovation. The obsession with economic growth at the heart of the prevailing monopoly of knowledge may be diluted through attention to the increasingly visible and extreme consequences of economic and social inequality. Any such dialogue must focus on what people will do in their lives and how they will live together with authority and dignity. This must be a dialogue about what people value in their lives when they are mediated by digital technologies, not simply about the values that come to be embedded in technologies as they emerge from laboratory. It is urgent that such a dialogue is undertaken, that it is inclusive and that choices are acted upon.

ROBIN MANSELL is professor of new media and the internet, London School of Economics and Political Science. This article is adapted from the paper, 'Inequality and digitally mediated communication: divides, contradictions and consequences', in Javnost – The Public.

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