Building the Data Economies of the Future

Tomorrow's Data Economies Shaped by the Youth of Today

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Foreword by Lord Tim Clement-Jones, Former Chair, House of Lords Select Committee on Artificial Intelligence

Regardless of the pace of its development, Artificial intelligence (AI), is set to shape and disrupt the future at an unprecedented scale. In fact, the next generation is coming of age in an environment where AI is embedded more and more in their daily lives. The impact of AI for their futures is going to be revolutionary. Governments and organisations must empower these younger generations to play a key role in how this technology is used and how it develops, to ensure those that will be impacted most have a voice in shaping the direction that our world is heading in.

We also need to provide more support for younger generations to acquire a diverse skillset for an uncertain and complex future ahead. The Royal Society in the UK makes a strong case for the cross disciplinary skills young people will need, and to this we should also add cross cultural competency, novel and adaptive thinking and social intelligence. Governments should seek to design new active programmes to develop these skills so that young people will have better information from the very start of their working lives about the growth prospects for different sectors and the corresponding range of opportunities within them.

The education system should reflect the apparent and emerging needs of the future – we must transform the current system to address these and experiment with alternatives so that both can provide in combination a more personalised and diversified approach at each level, whether academic or vocational. Education in data driven economies should also improve digital understanding, enabling young people to navigate an increasingly complex and dynamic digital world. Crucially, it must enable students to inform, in a meaningful way, the debate around how advancements such as AI must, and should not, be used. Governments should collaborate with young people in driving further digital understanding especially in terms of developing tools to mitigate harms such as fake news and misuse of microtargeting. Furthermore, policymakers must work with youth to develop ethical and responsible technology frameworks.

Finally, governments should improve the management and protection of personal data, in particular for young people. Data trusts are a good way of stewarding youth data in terms of protection and control, while using it for data driven policy making and building trust among young people. Using the same approach as for GDP growth rates and employment statistics, governments need to develop specific indicators to measure the degree to which young people are engaged in building the data economies of the future.

Young people should be playing an important part in building our increasingly data-driven economies, where the benefits brought by advancements such as AI are inclusive and shared openly with everyone, not just a select group of countries or individuals. For this we truly need to democratise artificial intelligence and make it equally accessible around the world. Only this way can we ensure our future generations are empowered to reap its full benefits, and remain protected from its potential hazards.

Without a determined and innovative approach by policymakers, the benefits of our new data economies will not be shared equally.

Executive Summary

The world is awash with data. In the past quarter of a century, smartphones, Wi-Fi, robotics, artificial intelligence (AI) and a host of other technological marvels have swept the globe, transforming all societies. Small business loans are booming in sub-Saharan Africa via consumer banking apps; driverless cars are now being road-tested; robots can analyse clinical data in real time and guide surgeons during operations.

It is a world of data abundance and immense promise, yet it is also one of potentially vast inequalities. Without a determined and innovative approach by policymakers, the benefits of our new data economies will not be shared equally. Already, there is an asymmetry in the power of a few global tech giants to harvest and mine data. These companies leverage their immense capital resources, highly skilled workforce and unrivalled access to information to exploit new business opportunities and crush competition.

As a result, regulators and policymakers (not to mention tax and customs authorities) face a dilemma: how to promote equality of opportunity in a data-driven world dominated by a handful of companies; one in which data flows seamlessly across national borders, new technologies are disrupting established industries and the ownership of data remains ill-defined. The challenge is to reconcile two opposing forces: ever-increasing data flow and scarcity of access to its economic potential.

Every government can and should be promoting the promise of data-driven economies.Involving young people should lie at the heart of a nation's response.

By youth, we mean the digitally-savvy generations who have grown up with the internet. These digital natives are at ease with the lightning speed at which new technologies transform our lives, where the stuff of yesterday's science-fiction fantasy – such as driverless cars – is out on the highway tomorrow.

Historically, governments have not been well suited to embrace – or anticipate – rapid technological change. Nor, for that matter, have governments turned to young people for insights or advice. Yet tech companies, from start-ups to the giants of Silicon Valley, have taken a diametrically opposite approach. Apple was founded in 1976 by two college dropouts; Larry Page and Sergey Brin were 24 when they founded Google; Facebook's roots go back to two Harvard room-mates fooling about on the internet. Crucially, those founders have continued to promote youth: Apple's median employee age is only 31 today, as it is at Amazon, founded by Jeff Bezos in 1994 at the age of 30.

It is clear that giving young people a voice in how governments should respond to disruptive technologies is not the entire story.

Governments that ignore the insights of their digital natives risk falling further behind in a race they cannot afford to lose.

Mutual engagement between government and youth will bring mutual benefits. On the one side, young people will be enabled to shape the digitised future they are to inherit; on the other, governments and older public servants will learn new skills and acquire fresh insights from new generations.

Governments that are embracing rather than excluding youth – from Estonia, a country of 1.3mn people, to China, with a population of 1.3bn – have already produced some ground-breaking initiatives. Other governments can follow the same route if they are willing to discard the bureaucratic, hierarchical policy-making of the pre-internet era in favour of an innovative, youth-driven ethos that is far closer to the corporate cultures of private tech companies.

The ultimate goal is a more level digital playing field, where no child or young person is denied the opportunity to benefit from a data-rich world. To achieve this goal, governments will need to address the following urgent policy recommendations:

1. Disrupt the education system
2. Support and empower young people to engage with governments
3. Rehabilitate governments and public servants to become digitally fit
4. Set and monitor youth and data economy national indicators
5. Capitalise and use data
6. Create an AI market and jobs

Given the pace of digital change, time is short. But examples of best practice are proliferating as more governments harness the power of youth to capture the fruits of the data revolution.

The Challenge of Data Economies: Why Governments are Falling Behind

Around the world, a surge of data is disrupting industries, eroding national trade barriers and creating a digitised landscape of immense economic potential. This dramatic increase in data flow has in turn increased the power of the algorithms behind AI and other emerging technologies to exploit the rewards and identify new economic opportunities.

PwC forecasts that AI could add $15.7tn to the global economy by 2030, while in the Middle East, we expect AI to increase annual growth in individual countries by 20-34 percent.[1]

Examples abound of how AI is overhauling the business models of companies across a range of sectors. International Data Corporation (IDC) predicts that global annual spending on AI will reach $57.6bn by 2021, with retail, manufacturing, healthcare and banking accounting for more than half of all worldwide investment.[2] In retail alone, Juniper Research projects that spending on AI will almost quadruple in the next four years to around $7.3bn.[3]

Data economies: winners and losers

Who will reap the benefits of data-driven technologies? The sobering reality for governments is that the disruption has so far reinforced the power of a small number of global firms.

These dominant players have the financial power to kill the competition by swallowing up rivals. YouTube, founded in 2005, was acquired by Google the following year for $1.6bn in stock. Instagram, launched in 2010, was bought by Facebook only two years later for $1bn in cash and stock. Facebook followed up in 2014 by purchasing WhatsApp, founded in 2009, for approximately $19.3bn.

Control of innovation delivers immense network benefits to the dominant players. Tech giants have the resources and know-how to harvest and analyse vast quantities of data that in turn can be used to identify and shape the next major digital breakthrough. The balance of power in emerging data economies is thereby tilted dramatically in favour of a few tech giants. Such companies are magnets for highly skilled young people, reducing the talent pool for potential rivals and governments.

Too little, too slowly: the response of governments to the data challenge

Any government seeking to even things out faces a number of challenges. First is the borderless nature of data networks. The second difficulty relates to the ultimate ownership of data. The AI technology in a driverless car, for example, could be owned by the manufacturer, the supplier of sensors or the person who buys the vehicle.

Meanwhile, there is still only limited public awareness of why data protection and security matter, even following a series of scandals about data breaches at global tech firms. However, a majority of data breaches happen at smaller firms and are so banal that the perpetrators are often unaware they are breaking the law. In a 2018 survey of business start-ups by Mailjet, the French email service provider, 91 per cent of respondents said they collected personal data from customers, not necessarily with the individual's knowledge, while only 29 per cent encrypted the data.[4]

Against this problematic background, the response of many governments has been too little, too late. Mostly they have concentrated their efforts on upgrading their own digital systems to guard against hackers and fraudsters. In 2018, for example, a bill passing through the US Congress proposed establishing a fund to improve information technology and enhance cyber-security across federal agencies.[5]

Europe has gone a step further to address concern about data privacy issues. The EU's General Data Protection Regulation (GDPR), which came into force in May 2018, represents a significant step in strengthening EU citizens' control over their data by requiring companies to obtain explicit consent for how it is used.[6]

Elsewhere, regulators are also adapting their approach to match the strategies deployed by tech firms. One such tactic, proposed by competition-law academics Ariel Ezrachi and Maurice E Stucke, is to operate "tacit collusion incubators" which mimic the effects of the data firms' algorithmic pricing models.[7] In this way, regulators can gain insights into the use of algorithms to undermine fair competition.

Yet despite isolated exceptions, governments have been slow to adapt. The inadequacy of the response is highlighted by a failure to recognise the need to "upgrade" not only government technology hardware, but also the skills of public servants born and educated in a largely pre-digital age.

Why Youth Must be Involved

The future belongs to the youth of today, and instead of leaving them a dying planet, no jobs and increased economic inequality, governments need to make them partners in designing a better future. This partnership needs to be built on the ability to not only understand but thrive with new technologies, and is underpinned by the need for a suitable education model fit for the data economies of the future: one in which students are empowered to capitalise on the opportunities created by constant, unpredictable technological disruption. This is not just a policy imperative; it is also a duty, because what is at stake is the ability of all young people to have access to the rewards of their data-rich future.

Involving young people as partners is an imperative for businesses as well, where unlocking creativity and innovation brought by young people goes hand in hand with personalised training and learning initiatives. Many businesses have acknowledged the value brought by the different perspectives of young people. As a result, they are empowering young people to voice their opinions and play an active part in reimagining and transforming organisations' future. There is also an increase in the number of apprenticeships, fellowships and technology degrees, as a way to bridge the skills gap and create a young digital workforce.

The Baltic state of Estonia has provided an outstanding example in the past 25 years of how youth can both digitise government structurally and culturally, and in doing so, exploit the economic potential of data for the benefit of an entire nation. In the early 1990s, Estonia's youthful government, with an average age of around 35, laid the groundwork for 'e-Estonia', a rolling programme to build an information society from scratch in a country that at the time collected no digital data about its citizens and where most people did not have access to the internet.[8]

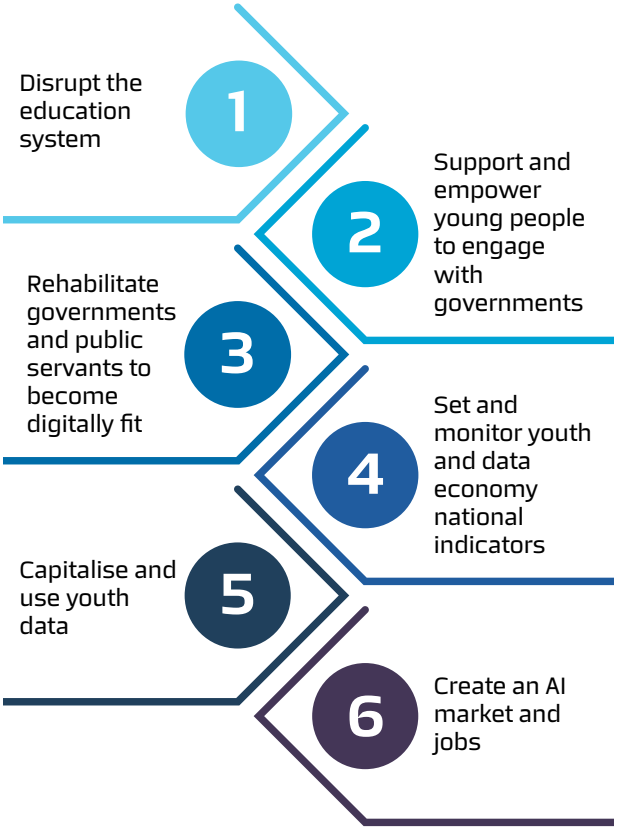
In effect, Estonia became a national hi-tech start-up. Yet the data networks that connected the country were also a source of vulnerability, demonstrating the double-edged nature of disruptive digital technologies. In 2007, Estonia suffered a series of coordinated cyber-attacks that targeted ministries, banks, the national parliament and leading newspapers and broadcasters. A government with a more cautious attitude might have treated the attacks as simply a threat. Instead, Estonia's young leaders reacted like entrepreneurs. Since then, Estonia has leveraged its experience of digital near-catastrophe to become a global cyber-security hub, principally as the base for NATO's Cooperative Cyber Defence Centre of Excellence.

More recently, other forward-looking governments have grasped that to build data economies they must tap into the risk-taking entrepreneurial mentality of young people. In October 2017, for example, the government of the UAE appointed its first Minister of State for AI, at the age of 27, with responsibility for the Gulf state's ambitious AI 2031 strategy. Tellingly, the online mission statement for this youth-led strategy advocates "disrupting our government to explore future risks".[9]

Yet most governments are still lagging behind in this digital race because they are failing to exploit fully the potential of youth. To realise this potential, governments need to pursue a holistic programme of ambitious policies designed to allow youth to shape and exploit tomorrow's data economies.

Six Imperatives to Make Youth the Drivers of Data Economies

Through our research and ongoing conversations with our clients and key government stakeholders, we have identified the six imperatives necessary to empower youth to drive the data economies of tomorrow:



1. Disrupt the education system

As Jonnie Penn, an AI researcher at University of Cambridge and former Google Tech Fellow at the European Youth Forum has observed: "We know now that what is true offline is true online as well: not all young people receive equal access to training or opportunity. The countries that invest to rectify this imbalance will benefit most from the Fourth Industrial Revolution, which will be shaped by many voices."[10]

Governments have recognised the need to move towards innovative educational models. Yet such reforms, generally do not go far enough in disrupting traditional education systems in preparation for a data economy and in providing all young people with the digital skills and opportunities to build and benefit from the data economies of the future.

In the first place, governments should seek inspiration from countries that are pioneering new ways of teaching and learning methods that are adapted to the perpetual tech upheaval of data economies. In Finland, for instance, following a complete overhaul of the national education system, less emphasis is placed in schools on conventional "hard" skills, such as remembering facts and basic calculations, and more on "higher thinking" 21st-century skills, such as setting goals and problem-solving using real-world examples.

In Asia, Singapore, South Korea and Japan have adapted the curriculum to teach young children computer science and robotics. Meanwhile, China's "New Generation Artificial Intelligence Development Plan" is engaging children and students at every educational level in the national goal of building a domestic AI industry worth nearly $150bn over the next few years.[11]

Such initiatives often involve partnerships with the private sector. One such example is PwC's Hive Academy in Northern Ireland, which aims to generate interest and engagement in STEM (science, technology, engineering and mathematics) subjects among six-to-11 year-olds and their teachers by teaching them coding and technology so they can design and code their own games.[12] Older HIVE students learn how to design and develop their own apps, in the process gaining the basic business and financial skills they will need for tomorrow's data economies. In the UAE, the Dubai Future Foundation and Sheikh Mohammed Bin Rashid Al Maktoum Foundation have jointly launched the One Million Arab Coders initiative aimed at empowering Arabs with "the language of the future".[13]

The purpose of any government educational initiative or public/private partnership should be to put young people in the driver's seat, as shapers of their own digitised future. To this end, collaboration rather than competition between government, business and academia will bring mutual benefits. But as Lord Tim Clement-Jones points out, governments should provide more support for younger generations to acquire a diverse skillset to prepare them for an uncertain and complex future ahead.

On top of world-class STEM training made accessible to all, governments must ensure that four varieties of intelligence are fostered: contextual intelligence (i.e. data literacy), emotional intelligence (i.e. social and emotional literacy), physical intelligence (i.e. health and wellness), and creative intelligence (i.e. self-actualisation).

In this context, Massive Open Online Courses (MOOCs) are a particularly fruitful collaboration involving some of the world's leading tech firms and universities. MOOCs offer free online learning programmes that are available worldwide to any student of any age wherever there is an internet connection. In this context a teenager or college student in a developing country can take courses on Python, Java, cloud computing and data analytics, run by the likes of Harvard, MIT, and Microsoft. The Teens In AI initiative, launched at the AI for Good Global Summit at the UN in May 2018, and is set to inspire the next generation of AI researchers, entrepreneurs and leaders. It has had a successful track record of teens taking Coursera programmes on AI and then applying these learning innovations to social good problems.

There is no limit to disruptive educational models that can better prepare all young people for a complex future. This is also true for tech businesses accustomed in the past to use school and university exam results as a crude measure of a young person's potential employability. In Kenya, for example, the digital non-profit US outsourcer Samasource provides cheap AI training courses to local staff, many of them young women living below the poverty line in Nairobi. They come to Samasource already equipped with digital and data skills, not acquired from schools but from the mobile phones they use for a host of everyday transactions.[15]

Such programmes are more difficult to operate in rural areas of developing countries, where access to the internet is either non-existent or patchy. Yet there are other opportunities for government, businesses and organisations to train up even the most remote communities for involvement in data economies. A prime illustration is the US technology firm Cisco's Networking Academy programme, in partnership with United Nations Volunteers. The programme makes information communications technology (ICT) more accessible to underserved populations in Latin America and Asia by training young people in ICT skills at academies and then encouraging them to act as tech mentors and social change digital agents when they return to their communities.[16]

In sum, all successful disruptive educational models are truly borderless, like data, whether crossing national frontiers or social boundaries.

2. Support and empower young people to engage with governments

Jayathma Wickramanayake, the UN Secretary-General's Envoy on Youth, has observed that "it is critical to engage young [people] in discussions on AI governance – they are not just beneficiaries, but essential actors in finding solutions to the issues faced by the world today, and their innovation, energy and leadership has been demonstrated across all sectors".[17]

Involving youth in government policies and planning for data economies requires innovative, participatory tools to engage young people. Engagement, rather than formal recruitment, should be the watchword. Tools like digital field hearings, citizen juries, personal government account managers and online voter registration can all be tailored to draw more young people into debate and decisions about building, exploiting and regulating data economies.[18]

In the UK, the government is piloting "youth juries", convened to improve understanding of how digital platforms impact young people's lives.[19] By learning from them, government can formulate AI and tech policies that reflect the ideas and concerns of the next generation. According to AI researcher Jonnie Penn, a Google Tech Fellow at the European Youth Forum, "such mechanisms, if scaled, could allow the general populace to learn about, engage with and benefit from the digital systems and AI they intersect with".[20]

Citizen juries

Citizen juries involve creating a "jury" a representative sample of citizens (usually selected in a random or stratified manner) who are briefed in detail on the background and current thinking relating to a particular issue or project. The "jury" is presented with a range of possible alternatives and make a judgment as to the most attractive alternative for the community.

Digital field hearings

Virtual field hearings to replace the physical field hearing run by example by US Congress and other governments. One approach might be to build out from an existing social network or existing consultation digital platform.

Personal government account managers

Every citizen will get a personal account manager, expert in navigating complex government websites and getting things done on behalf of the citizens they serve.

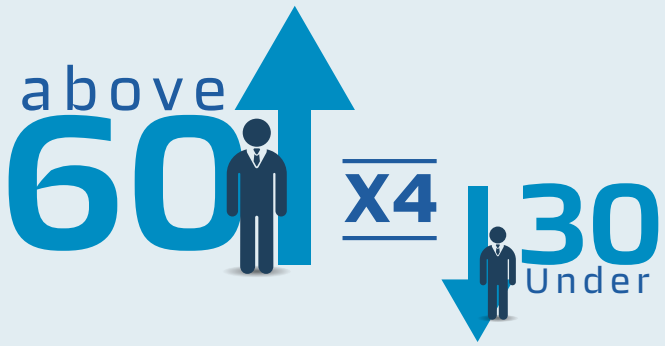
3. Rehabilitate governments and public servants to become digitally fit

It is a cliché that technology is a young person's game. But as with many clichés, it is also true. Moreover, it is undeniable that the demographic profile of senior policymakers and technology workers in the public sector is generally older than their peers in the private sector. In the US, analysis of the federal IT workforce in 2017 by the government technology news service Nextgov found that the number of employees aged 60 or older was more than four times those aged under 30.

Yet this age gap between the private and public tech sectors overlays a more fundamental cultural divide. In too many central and local governments, tech ministries and other public bodies that interact with the tech sector are still culturally and structurally unfit for purpose. Even younger, tech-savvy public servants can be mired in traditional, hierarchical bureaucracies that were designed for a more stable, slow-moving era.

Governments urgently need to invest more in training employees of all ages in the innovative skills required to understand the implications of emerging technologies. The challenge is to make public officials and the politicians they serve think and act more like innovative tech entrepreneurs. This does not mean they should abandon the traditional values of service to society. It does mean discarding work habits and mind-sets that lead to slow decision-making and keep governments a step behind nimbler private tech companies.

In this area, governments can usefully adopt the widespread private sector practice of "reverse mentoring", pioneered by Jack Welch at General Electric in the 1980s, where older executives (including Welch) learnt new tech skills and insights from younger, more junior employees. There is no reason other than outmoded notions of seniority why young entry-level public officials, straight out of university, should not be engaged by older colleagues seeking to acquire the kind of tech savvy which – purely because of their age – they never had the chance to pick up.



In the US, analysis of the federal IT workforce in 2017 by the government technology news service Nextgov found that the number of employees aged 60 or older was more than four times those aged under 30.

4. Set and Monitor Youth and Data Economy National Indicators

For decades, governments have used conventional indicators such as GDP growth rates and employment statistics to measure national economic performance. Yet such yardsticks are far less useful in tracking data economies, which thrive on turbulence and leave trails of destruction in their wake. To take one illustration, in the naturally volatile world of emerging AI technologies, a high employment rate in a sector that is about to become outmoded or even obsolete is a negative rather than a positive indicator.

Assisted by youth, governments need to develop a new range of indicators and targets that can pinpoint the degree to which young people are – or are not – engaged in efforts to build the data economies of the future.

Such indicators could include: the average age of employees in a particular government entity or department; the percentage of young employees within the same body; the amount of data made available online by governments; the percentage of participation of youth in consultation and polls on data related policies; and the proportion of online government data used by youth entrepreneurs.

Within this framework, governments should also make the same data on young people available in a comprehensive, accessible and interactive form. Governments will be able to collect, aggregate and manage youth data related to health, education, skills, employment and other matters. The methodology should be data-driven and collaborative, in line with the "policy lab" approach outlined in a recent paper on electronic participation by Dutch computer science policy specialists Anne Fleur van Veenstra and Bas Kotterink.[21] To reassure young people that their personal information is secure, data trusts should be created as a mechanism to control and protect data on individuals.

Governments have the power to bring their proprietary offline data online and then leverage youth to create opportunities from the expanded data flow.

5. Capitalise and use data

What governments are starting to grasp is that their own data, which are given away for free, offer a potential alternative to the data flows that private companies monetise through their own networks. Furthermore, governments have the power to bring their proprietary offline data online and then leverage youth to create opportunities from the expanded data flow. Examples of this transfer abound in recent years, from the digitisation of census returns and property records to meteorological reports and government-owned maps. Yet in commercial terms, official data are a resource that governments have barely begun to exploit. Governments should also improve ways of controlling and protecting personal data, in particular for young people and children. Lord Clement-Jones makes the case for data trusts[22] as a solution in stewarding youth data in terms of protection and control.[23] The same mechanism can be used in data driven policy making, data exchanges and building trust among young people.

By forming partnerships with young people in building data trusts, governments can maximise the largely unrealised economic potential of their information treasure trove and foster innovation further. Already, state-sponsored hackathons around the world offer a glimpse of this entrepreneurial future, where youth and government collaborate for mutual benefit. In Hawaii, an Annual Code Challenge (HACC), launched in 2016, involves state agencies submitting a problem or challenge for participants to design a solution. Young code crunchers have the opportunity to hone or learn new skills, while in one instance the estimated cost of developing a Hawaii government website in eight different languages was reduced from over $6m to $900,000.

The UAE's rolling Data for Happiness hackathon series organised by the Telecommunications Regulatory Authority seeks to find "creative ways to further happiness, using data". The policy tasks set for hackers include reducing traffic congestion, improving environmental protection and health and safety initiatives.[24] In South Africa, a three-day National Public Service Hackathon held in Johannesburg in September 2018 challenged around 200 young people aged between 14 and 27 to develop innovative solutions to problems that included the improvement of maternal health services, school safety and victim support.

6. Create an AI market and jobs

Tech giants such as Amazon, Uber, Alibaba and Facebook have the ability to visualise how people are moving, how they spend their money, what they spend it on, which causes and projects they donate to, what their skillsets are, where companies are operating from and what their supply chains look like. All of this is distributed across different shared economic and social networking applications, and other digital platforms. Much of this knowledge comes from connecting the dots in terms of the available data and identifying economic potential in data that have not yet come online. A further opportunity lies in connecting the offline and online worlds, whether it is consumer shopping for groceries or a driver using sat-nav for road directions.

Governments can play a significant role in mapping human, commodity and capital flows (HCC), especially in areas where the private sector is not fully driving towards a digital economy.

Even in the developed world, there are still opportunities for governments to become major players in the AI market, because of their own data resources and the extraordinary economic potential of AI. If different governmental entities work together to digitise and exploit their data, they can in some cases gain an advantage in their local market over the private sector, as creators of data and identifiers of the resulting benefits. This is because companies and other private entities can only go as far as their services and networks extend, whereas governments have much greater data coverage and greater power to fill any gaps in data flows.

Innovative governments, working with digital savvy youth, can therefore help create new AI markets and jobs, and in the process, widen and deepen the opportunities available for all young people in the data economies of the future. This does not mean launching head-to-head competition with private tech giants in a fight over the fruits of data. In the regulatory sphere, governments need to move beyond regulating data ownership and make it a win for companies to share their data or to ensure a good part of it remains open source. Governments also need to incentivise and enable youth to take the lead in capitalising on newly-released data; in particular by ensuring that young people inside government can identify and build on these opportunities through data mapping and analytics.

By leveraging youth, AI can thus be woven into the fabric of government, helping decision-makers to maximise the potential of data and predict future economic opportunities.

Conclusion: Building youth-centric data economies in an age of disruption

In building tomorrow's youth-centric data economies there is no silver bullet or single example of general best practice. These policy recommendations and case studies should be regarded holistically and flexibly, with innovative ideas adapted to fit local contexts and then piloted before being rolled out. What they all have in common is a view of young people as partners and advisers of government, working together towards the same goal of inclusive, sustainable and socially-just data economies, where all youth have the opportunity to create and share the benefits.

Time is short and the challenge is urgent, given the speed of technological change in the age of data. Before digitisation, governments could respond to new technologies and then exploit them at a measured pace. For example, the basic technology of the telephone did not alter for a century following Alexander Graham Bell's invention in 1875. Today, governments must learn to think and move as fast as the private tech giants. They can no longer afford to take a steady, step-by-step approach to regulation and putting government data to work.

So far, the response of governments has been uneven. For example, South Korea ranks first for education policies in the Economist Intelligence Unit's Automation Readiness Index (a research report published in 2018), followed by Estonia and Singapore. By contrast, much larger countries measured by GDP lag behind, including the UK (ranked eighth in the overall index).

Yet this is not a race where any government need be a loser. By engaging with youth as present and future drivers of data economies, governments can ensure that the rewards of the data revolution reach everyone in society.

Authors

Mona Abou Hana

Partner at PwC Government Consulting, Innovation & Entrepreneurship

Mona leads PwC's Innovation and Entrepreneurship in the Public Sector and has worked closely with governments on policy formulation, national strategic planning, and programme development and evaluation. Her areas of expertise are centered around innovation, entrepreneurship, youth and socio-economic agendas.

Michael Joseph

Manager at PwC Government Consulting

Michael is part of PwC's Government Consulting practice. He brings over 20 years of experience working in the social, public and private sectors. He has worked with governments on strategy design, planning, and implementation; strategic communication; defence; foresight and innovation; entrepreneurship, social entrepreneurship and international development.

Maria Axente

Programme Driver at PwC Artificial Intelligence, Technology & Investments & AI for Good Lead

Maria is PwC's AI for Good Lead and an evangelist for tech for good and responsible application of technology while promoting ethical issues related to data and algorithms and their impact on businesses. Maria is part of the advisory board of the All-Party Parliamentary Group on AI, member of the IEEE's Working Group on a Standard for Child and Student Data Governance (IEEE P7004), an advocate for children and youth rights in the age of AI, and a Fellow of The RSA.

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