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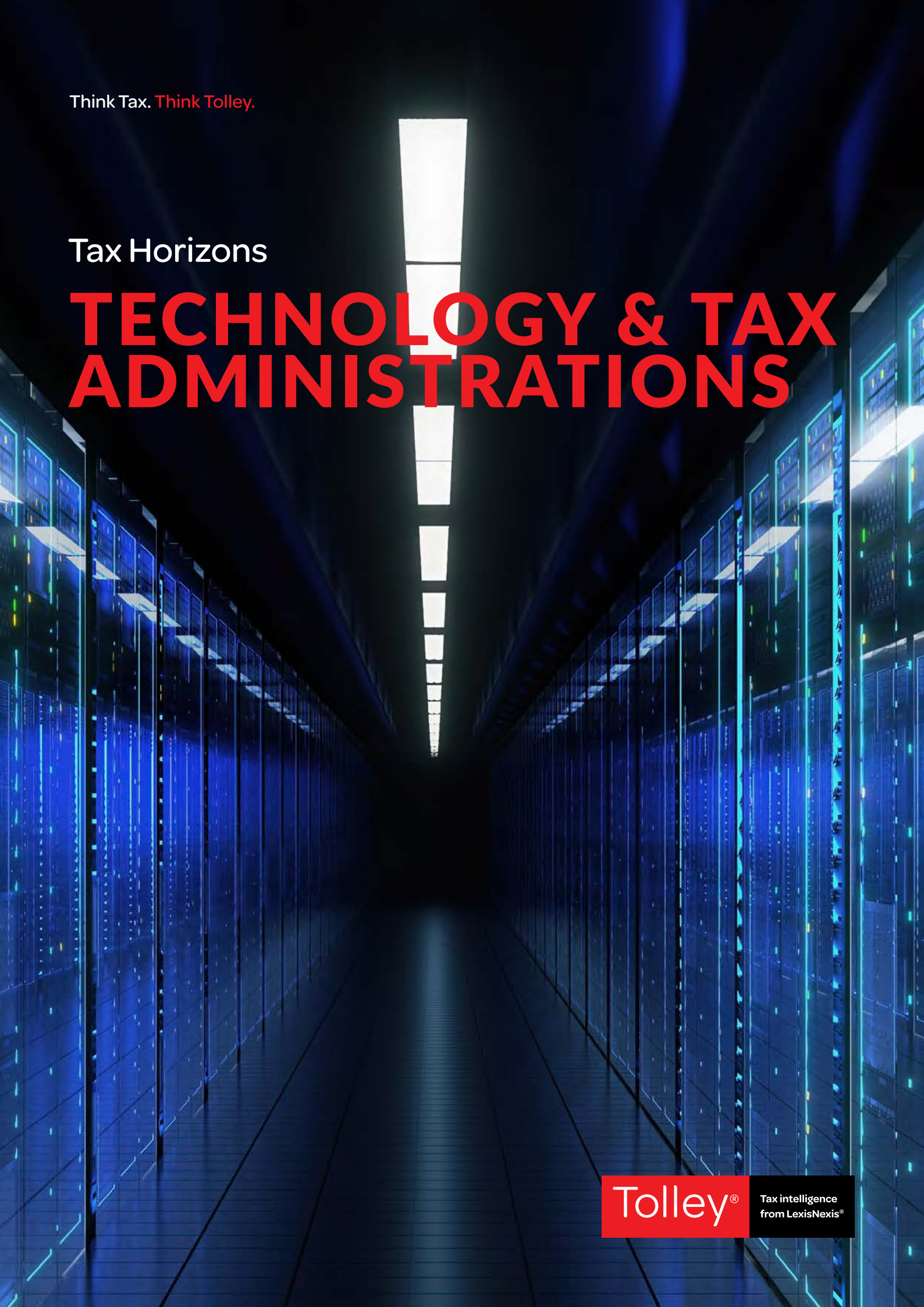
Tax Horizons

TECHNOLOGY & TAX ADMINISTRATIONS



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CONTENTS

About the Author

Paul Aplin was, for many years, a tax and IT partner with an independent West Country firm. In 1997 he filed the UK's first electronic self-assessment tax return and has stayed closely involved with digital developments in tax ever since. He was a member of HMRC's Carter Project Board which oversaw the implementation of Lord Carter's proposals for digitalisation of tax returns. He currently sits on HMRC's Administrative Burdens Advisory Board and the Board of the Office of Tax Simplification. A former Chair of the ICAEW Tax Faculty, he was ICAEW President in 2018/19 and now sits on the Tax Faculty Board, CIOT Council and the Tax Technology Committee of CFE. In 2009 he was appointed OBE for services to the accountancy profession and for public service.

About Tolley

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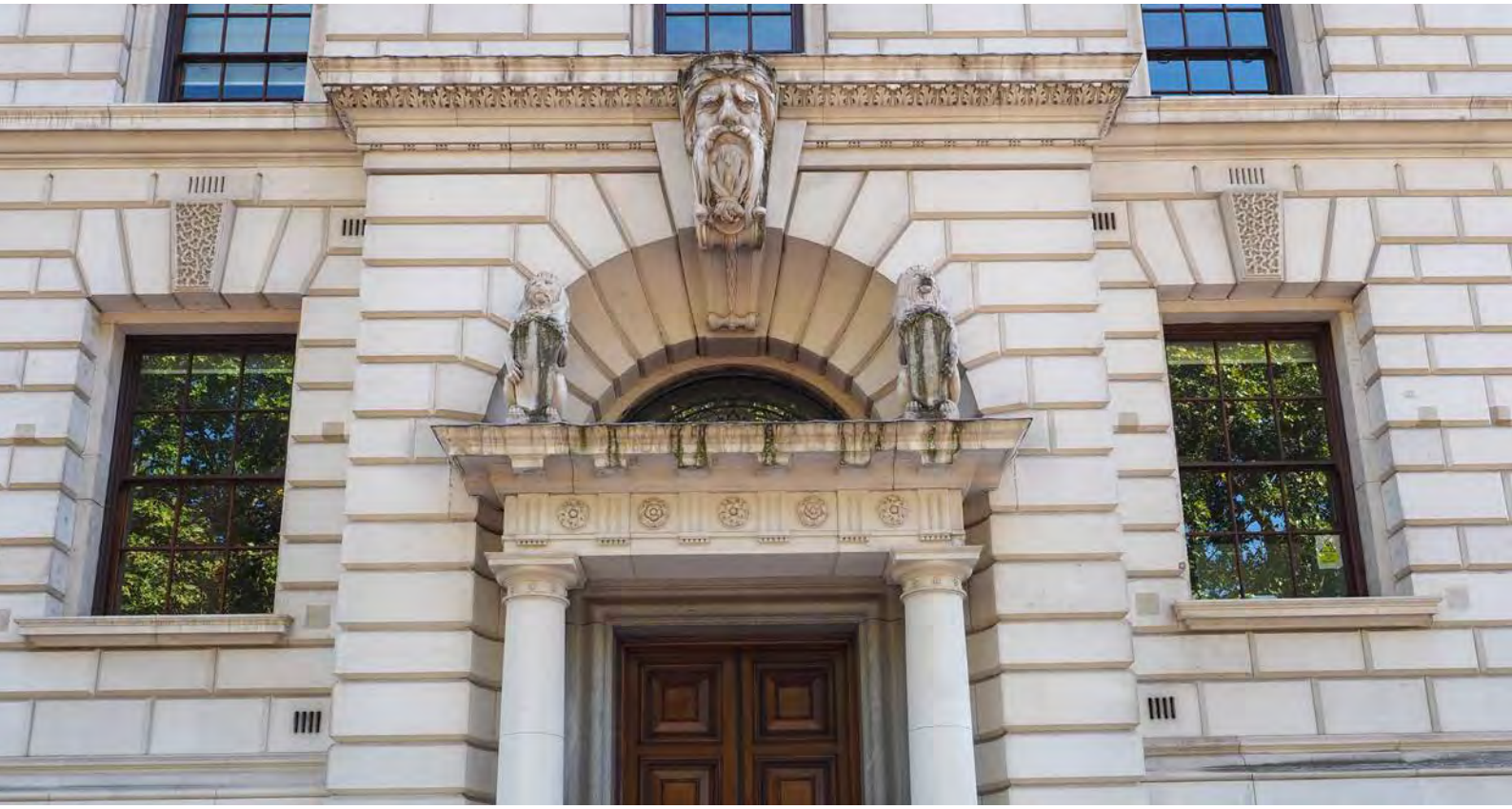


Foreword

Once again, I would like to start by thanking Paul Aplin OBE, and all the contributors who have given up their time to speak with Paul, for sharing their insights and expertise with us. Producing a report of this nature is a herculean task and I am truly grateful to Paul for putting such a huge amount of effort into it.

In the first Tax Horizons report we explored the boundaries of Tax Technology and how practitioners are making use of the rapidly evolving technology landscape to enhance the way they work. In this report we go a step further and look at how tax administrations are using technology and reacting to emerging technologies to evolve the regimes themselves and start to imagine how that will continue to develop into the future.

After reading the first draft of this report I was left with an overwhelming feeling that we are standing on the precipice of great change. Tax regimes have always been built on the foundation of what is possible. We taxed windows because we could easily count how many windows were on a building. But as technology evolves and we get an ever more forensic view of transactions, the art of the possible changes exponentially. With the digitisation of people's affairs everything is visible… and taxable. And the concept of an annual reckoning of someone's tax liability a year in arrears seems utterly incongruent with a world where financial systems are all working in real time. With cryptocurrency the concept of programmable money, which expires, or can only be used to purchase certain items also now becomes possible, so the question isn't going to be so much about if we can do something but what we want our financial systems and tax regimes to achieve. Suddenly the art of the possible seems unlimited and it is up to all of us to define what future we want to build for ourselves and the society that we are going to leave behind as our legacy.

I hope you all take as much from this report as I have. It is a truly fascinating piece of work and I am indebted to all who have contributed.

Nicholas Byrne, Market Development Director, Tolley

A Second Horizon

The Tax Technology Horizon, published in 2021, looked at how technology is transforming tax planning and compliance. This second report explores the digital interface between taxpayer and tax authority and how it is likely to develop in the UK over the next few years.

In July 2020, HMRC set out a broad ten-year plan, with Making Tax Digital (MTD) and plans for the Single Customer Record (SCR) and Single Customer Account (SCA) at its heart. That plan will have to continuously adapt to accommodate new ways of working and doing business. It will have to keep pace with constantly changing technology, offering faster and more efficient ways to do familiar things as well as opportunities to do entirely new things. It will, as the Covid 19 pandemic demonstrated, have to react to the completely unexpected.

"We need a shared understanding of what is possible and a collective vision of how far we want to go."

What are the benefits of tax digitalisation for HMRC, businesses & citizens? Could technology change what we tax and how we tax it? How much data should be shared and with whom? How "citizen-centric" can technology make the tax system? What possibilities do Open Banking, Blockchain and digital currencies offer? What lessons can we learn from other jurisdictions? What is possible, achievable, or desirable?

The Tax Administration Horizon is not simply about HMRC's own vision for a world-class tax administration system; it is about the vision different stakeholders have of what could be achieved if we embrace the collaborative approach HMRC's ten-year strategy advocates. It is based on interviews with over 50 policy makers, businesses, professional bodies, advisory firms, software developers, tax charities, economists, experts overseas and HMRC.

Sir Edward Troup, former Chair of HMRC sums up the challenge perfectly:

"We need a shared understanding of what is possible and a collective vision of how far we want to go."

This report tries to capture the elements of such a vision. It is split into four parts designed to be read separately rather than at one sitting: the first looks at the main drivers of digital tax administration, the second at how digitalisation is set to transform the taxpayer experience, the third at data and transformative technologies and the fourth at how changing working patterns and new technologies could change what and how we tax.

The opportunities are huge: which should – and will – we embrace?

Tax Horizons: Technology & Tax Administrations

PART ONE: WHY DIGITAL?

- The digital advantage
- Tax Administration 3.0
- 2020 (digital) vision
- Catalysts for change

Part One: Why Digital?

The digital advantage

Tax authorities face a common challenge: how to minimise tax gaps and maintain efficient tax administration systems, while under constant pressure to do more with less. Channel shift – moving from face-to-face contact and paper-based systems to call centres and digitalisation - has been a common response. It has delivered cost savings, but at the price of diminished personal interaction. As we move beyond the first phase of digitalisation – the digitalisation of existing forms and processes – technology opens opportunities to create a more personalised experience for taxpayers.

The OECD report *Tax Administration 2021*, based on data from 59 tax authorities confirms that the pace of digitalisation is accelerating. Most tax authorities are now either using or planning to use data analytics, Artificial Intelligence and Machine Learning to improve compliance. Digitalisation gives access to more and better data and offers new ways to detect non-compliance and to power business support schemes. It allows greater and more effective information exchange between tax authorities internationally.

Technology is opening up new possibilities for what and how we tax:

"Another driver for digital change is to open up new policy options based on insight from the additional information."

David Gauke, Head of Public Policy at Macfarlanes

"Technology can help us do what we are already doing better, but also creates the opportunity to completely reimagine the tax system. What we can tax depends to some extent on what we know – window taxes were popular once because windows were easy to count – more information and the technology to process that information gives us the opportunity to step back and ask the question "what is it that we want to tax?"

Helen Miller, Deputy Director at the Institute for Fiscal Studies

Different priorities have to be balanced however, as **Praveen Gupta, National Head of Tax at Azets** points out:

"Creating a system centred on the citizen means you have to look at things in the round, at the whole digital landscape and not just HMRC's vision. You have to deliver this kind of change holistically and in a joined-up way."

Dame Teresa Graham CBE, Chair of HMRC's Administrative Burdens Advisory Board makes a similar point:

"A modern digital tax system will support small business growth if implemented in the right way, at the right pace, and if it is acknowledged that MTD is just one part of the digital journey businesses need to take to remain competitive; tax should never be the only driver."

"What we can tax depends to some extent on what we know – window taxes were popular once because windows were easy to count – more information and the technology to process that information gives us the opportunity to step back and ask the question "what is it that we want to tax?"

Tax Administration 3.0

In December 2020 the OECD Forum on Tax Administration (FTA) published *Tax Administration 3.0: The Digital Transformation of Tax Administration*. The FTA believes that digitalisation calls for a new model of tax administration "co-created" by tax authorities, taxpayers, private sector partners and other parts of government, a concept central to HMRC's ten-year strategy.

The FTA envisages that tax laws will in future be written in formats enabling them to be incorporated into the systems taxpayers use, with quality assurance built in at the transactional level. The focus will shift from periodic, historical, aggregated data to making better, faster use of real-time data; from systems driven by forms to systems driven by data; from disconnected ecosystems to interoperable ones. The necessary building blocks will include secure digital taxpayer identifiers, data management standards, better taxpayer "touchpoints" and new skills – supported by AI - to deliver this vision of the future.

"Our goal is a tax data model which can serve as a single, global, source of truth, to meet both existing and future requirements."

A more cohesive, co-created system making better use of data could, the FTA believes, help to reduce compliance burdens. Extracting and adapting information to meet the requirements of tax authorities currently carries a significant compliance cost, a cost magnified for businesses operating in multiple jurisdictions.

Eleanor Macdonald, Tax Technology and Transformation Lead at Anglo American:

"What we have to do for tax in the UK is completely different to what we have to do in Brazil, Chile or Peru. Reporting formats are different. Our goal is a tax data model which can serve as a single, global, source of truth, to meet both existing and future requirements."

As **Jane McCormick, former Global Head of Tax at KPMG** says, *"The holy grail is to ask for data only once – for all purposes."*

The FTA acknowledges that the process will need to be gradual, but leaves no doubt about the need for change, describing the current state of tax administration as "a burning platform".

2020 (digital) vision

HMRC's own digital agenda was set out in July 2020 in *Building a Trusted, Modern Tax System*. The vision is of a tax system fit for the challenges and opportunities of the 21st century, based on real-time information, allowing government to assess and react to changes to the economy as they are happening.

"We see MTD as a catalyst for change, an important first step, but Covid more than anything brought home to us what we could achieve with more and better data: we could have given more support, more effectively. We need to use every piece of data we have to full effect for the customer."

A key ambition is for businesses and taxpayers to be able to view their tax position and interact with HMRC through a single online account. Smarter use of data - including pre-population of tax returns – will reduce the need for taxpayers and agents to submit information that HMRC either already holds or could verify itself. To facilitate this, HMRC is migrating the taxes covered by MTD from legacy systems to its Enterprise Tax Management Platform (ETMP), which will eventually be used to store all taxpayer records. **Anita Monteith, Technical Lead and Senior Policy Adviser at ICAEW** believes this is an essential step:

"We need to move away from standalone systems. Effective integration will be essential if we are to see HMRC's ambitions realised."

MTD, which sits at the heart of HMRC's plans, employs digital links and MTD-compliant software and apps to reduce errors and help bring record keeping closer to real time. By mid-2021 over 1.5 million business had signed up for MTD for VAT and over 11 million VAT returns had been successfully submitted via MTD. From April 2024, over 4 million self-employed individuals and landlords will be required to join MTD for ITSA

and report summary income and expenses quarterly, giving HMRC access to information no more than 4 months old. Limited companies are expected to join from 2026.

HMRC's ability to deliver payments to businesses through the CJRS furlough and SEISS schemes was crucial to the government's Covid-19 response and as **David Gauke, Head of Public Policy at Macfarlanes LLP** observes, *"The furlough scheme would not have been possible without RTI."*

Quarterly data from MTD for ITSA will enable future support to be even better targeted.

Giles McCallum, Director, Making Tax Digital, HMRC:

"We proved we could be agile with our response to Covid – we need to build on that."

Other countries, including Australia and Ireland, also looked to their tax administrations to deliver Covid 19 business support.

"Australia reverse engineered the STP system to deliver Covid help – the tax system is the best national business network for doing things like this." says **Jennie Granger, Professor of Practice, School of Accounting, Auditing and Taxation, University of New South Wales**.

"We see MTD as a catalyst for change, an important first step, but Covid more than anything brought home to us what we could achieve with more and better data: we could have given more support, more effectively. We need to use every piece of data we have to full effect for the customer."

Jo Rowland, Director General (Transformation), HMRC

Catalysts for change

MTD has been one catalyst for change; the Covid 19 pandemic has been another, triggering a quantum shift to remote working, on-line payment methods and cloud-based software. These trends are set to continue. The most powerful catalyst however is a clearly perceived business case or personal preference. As **Simon Lyons, latterly of the Open Banking Implementation Entity** says:

"Just because technology is available doesn't mean it is going to be used: there has to be a convincing case for adoption."

"Too much thinking is about how we make a digital version of an existing process – we should be asking what we can do differently in a digital world."

Tax processes based on paper and post are inefficient in both human resource and time. Re-keying data inevitably carries the risk of error. Optical Character Recognition (OCR), Robotic Process Automation (RPA) and Artificial Intelligence (AI) can automate processes and reduce errors. They are becoming increasingly familiar tools for businesses and advisers across the business size spectrum. **Toby Woodhead, Head of Technology at Armstrong Watson** spoke for many, saying, *"We have to get away from bits of paper. We are increasingly asking clients to scan personal tax return documentation and we are moving ahead with OCR and robotics to capture, assemble and categorise information, automating time-consuming processes."*

Toyin Oyeneyin, Tax Product Specialist at Octopus Investments agreed:

"Robotics increases efficiency and saves time – I am constantly looking out for opportunities to use OCR and RPA."

Paul Lodder, Product Domain Expert at Dext sees real time data as a key enabler:

"MTD provides a reason – an opportunity – to get records into a digital format and to move to the cloud. Getting data standardised and in one place means you can harness the power of technology for cash flow forecasting and to gain real-time insight into how a business is doing. It opens up more opportunities for proactive client contact, for being on the front foot and planning for the future rather than explaining the past."

"Technology has been critical in helping firms get, sell and operate online, be ready for future disruption and adjust to changing customer patterns. We have seen digital adoption accelerate, with perhaps ten years of development compressed into just two to three."

But not everyone is convinced. Some still ask "why use software to do something that can be done more quickly manually?" **Asif Ahmed, Founder & MD of Acclivity Advisors** re-frames the question:

"Too much thinking is about how we make a digital version of an existing process – we should be asking what we can do differently in a digital world."

Cloud-based software facilitates delivery of more responsive and proactive advice, through 24/7 access to records. Accurate, contemporaneous records enable software and apps to generate sales invoices, chase outstanding debts and automate categorisation of costs and expenses. Problems that are often only discovered after the event in manual systems, such as overpayment of dividends and overdrawn directors' accounts, can be avoided. Software and apps need to be seen as enablers of new services, not impositions.

Gary Turner (co-founder of Xero) sums up:

"The thinking behind MTD is that through digitisation, taxes will become much more transparent and accurate and our tax system will become resilient, seamless and connected. However, history has shown us that any change of this magnitude will not happen overnight. There will be many who see this as yet another thing they've got to contend with, as compliance that they have to meet. But there are secondary benefits: Technology has been critical in helping firms get, sell and operate online, be ready for future disruption and adjust to changing customer patterns. We have seen digital adoption accelerate, with perhaps ten years of development compressed into just two to three."

Tax Horizons: Technology & Tax Administrations

PART TWO: TRANSFORMING THE TAXPAYER EXPERIENCE

- Making it personal
- How personal?
- Single vision
- Pre-population
- Government and data
- Agents and intermediaries
- The unrepresented & digitally challenged

Part Two: Transforming the Taxpayer Experience

Making it personal

Technology will radically change the experience of tax administration over the next few years. **Giles McCallum, Director, Making Tax Digital, HMRC**:

"We are trying more and more to look at what we do from the viewpoint of the customer and the customer journey, to try to identify and take away pain points. Sometimes the answer will be enabling new technology, but sometimes it will be improving a process."

The goal, as **Jennie Granger, Professor of Practice at the School of Accounting, Auditing and Taxation at the University of New South Wales** says, is that tax administration *"Should be more of a service, less of a "gotcha" experience."*

An understanding of taxpayer needs and preferences is essential. People will use things they like and understand; channels they find useful and convenient.

"Young people are immersed in technology. It is how they live their lives. They expect to engage and to be engaged with digitally."

Praveen Gupta, National Head of Tax, Azets

"We are trying more and more to look at what we do from the viewpoint of the customer and the customer journey, to try to identify and take away pain points."

Taxpayers will increasingly be enabled to self-serve at a time and in a way that suits them. Chatbots, which are used by many tax authorities, will become more sophisticated. HMRC reportedly saw an increase from 4,000 webchat contacts a day pre-pandemic to a staggering 33,000 on one day in April 2020 (though the service was paused for a review at the beginning of 2022).

Asif Ahmed, Founder & MD of Acclivity Advisers sees apps as another key tool:

"We run our lives through smartphones. I should be able to see and do more via an app, including everything that requires authorisation. There is still too much being sent by post: do it electronically and make life easier!"

The UK, Russia, Ireland and Australia all employ apps as convenient "touch points" for taxpayers. Early taxpayer apps simply provided information and guidance, but many countries now offer highly sophisticated versions, allowing taxpayers to register for taxes, access tax records, communicate with the tax authority and make payments.

"Should be more of a service, less of a "gotcha" experience."

Apps can be used to proactively deliver prompts and nudges, to highlight potential errors, signpost reliefs and flag impending deadlines. One obvious candidate for a digital compliance prompt would be the new self-assessment late filing penalties regime: the points-based system is fairer and more proportionate, but the legislation is far more complex than the regime it replaces. A clear message back to the taxpayer's smartphone when a point has been incurred could help them understand their error, avoid a cash penalty and be more compliant in future: less "gotcha" and more "here to help".

As the interface between taxpayer and tax authority, apps hold the potential to actively characterise that relationship as assisting compliance rather than penalising non-compliance.

And as **Victoria Todd, Head of LITRG** says, *"It is often relatively small acts which build trust in larger systems."*

How personal?

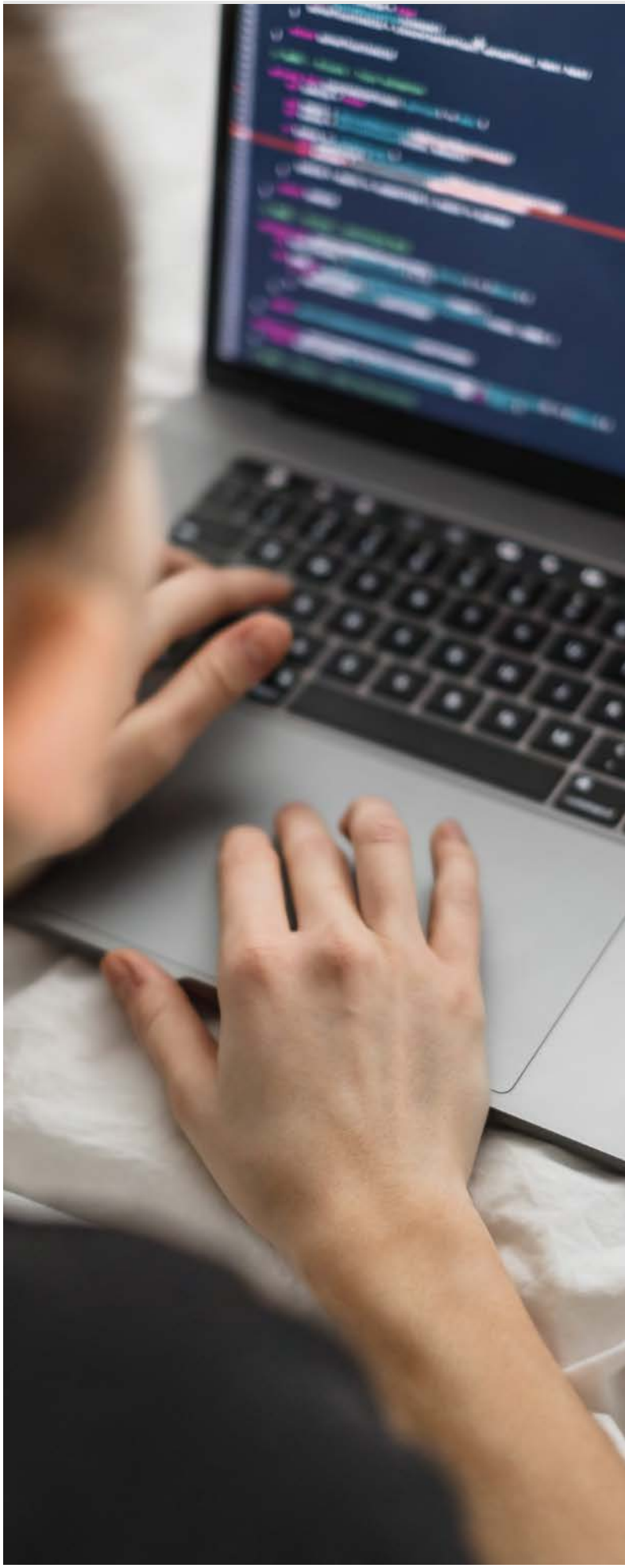
How far should prompts and nudges go? Tax Administration 3.0 envisages autonomous tax algorithms informing taxpayers upfront of tax consequences and liabilities. There has been a long-running debate over sharing of tax risk rules. On the one hand, if software can flag a potential error or anomaly, a taxpayer can be helped to avoid making a mistake. On the other hand, knowing what might trigger interest from a tax authority could enable some to change their behaviour in ways that increase risk to the system.

Australia's ATO app incorporates a business performance check tool which allows small businesses to compare their performance with others in the same industry. It uses benchmark data from over 100 different business types, provides financial performance ratios and compares current and past results. **Nikki Firth, Founder & Director, Your Accounting Sanctuary Pty, Sydney**:

"Tools like this can be really useful, but they need to be kept up to date, cover a wide range of business types (financial services for example isn't currently an option) and be marketed effectively to the business community to ensure that people are aware of them."

Several years ago, Italy introduced Redditometro, popularly known as the "income meter". Redditometro assesses a citizen's standard of living and spending capacity, based on actual expenditure from sources known to the tax authority such as healthcare costs and school fees, supplemented by estimates of other expenditure made by reference to the annual ISAT survey of household consumption. After adjustment for factors such as business use, the result is compared with income declared on the tax return. If the calculated figure exceeds the declared income by 20% or more, the taxpayer is asked to explain. Alongside Redditometro sits Redditest, which allows taxpayers to check the consistency of the income they intend to declare against their standard of living based on 100 expenditure indicators. The result is displayed as a red or green light. While Redditometro illustrates how technology can harness and analyse data to identify potential non-compliance, Redditest illustrates how a single prompt can either aid or undermine compliance depending on the taxpayer's mindset.

Estonia – one of the world's leading digitalised states – has also taken a step in this direction with a new "tax behaviour ratings e-service". This allows a company's legal representative to see what the company looks like to the tax administration and whether the tax administration believes there are shortcomings in data provided. It offers specific guidance on how to remedy deficiencies.



Entrepreneurs also receive feedback on their compliance rating (on a red, yellow, green scale), drawing attention to possible shortcomings and inconsistencies in the declaration of data.

Technology can help to avert unintentional non-compliance, but there is always a risk that it may be abused by the intentionally non-compliant. These benefits and risks will have to be weighed constantly as we move forward.

Single vision

For individuals, the future is a more personalised, citizen-centric approach.

The UK has already taken a first step towards this goal through the digital Personal Tax/Business Tax Account, through which an individual can see and update HMRC about their employments, private pensions, PAYE codes, tax credits, child benefit and contact details. It gives access to three years tax summaries, a summary of how the tax paid has been spent by government, the taxpayer's NI record and a state pension forecast. Some of this is replicated in the HMRC app. There is potential to go much, much further.

"The UK needs to invest in a hub for two-way engagement between taxpayers and HMRC."

"The initial idea was to improve the experience for taxpayers, especially small businesses, making it simpler to do more themselves, to see what they had filed, make claims etc. The prize was a tax system that was simpler to comply with. I think it would be feasible to have a personal government account with tax information, local crime statistics, local Ofsted reports etc to improve a citizen's experience of the state."

David Gauke, Head of Public Policy, Macfarlanes LLP and former Treasury minister

As HMRC consolidates taxes onto ETMP, the new Single Customer Account will allow taxpayers to see – and do – more. The OTS has recommended that it should be the hub for all of a taxpayer's engagement with HMRC, including making claims and elections and for sharing information HMRC holds about them. Going forward, this would include new sources of third-party data used to pre-populate tax returns. In its Evaluation Note released in March 2022, the OTS described the SCA as the keystone of the government's 10-year strategic plans for tax administration.

"I think it would be feasible to have a personal government account with tax information, local crime statistics, local Ofsted reports etc to improve a citizen's experience of the state."

"The UK needs to invest in a hub for two-way engagement between taxpayers and HMRC (with data also made available to agents). This could enhance transparency and taxpayer trust in the tax authority, as well as reducing costs and freeing resources to provide additional help for those who need it."

Bill Dodwell, Tax Director, Office of Tax Simplification

The SCA could also be used proactively, for example to prompt taxpayers to claim work-related flat-rate allowances based upon what HMRC knows about them, avoiding the need to pay an intermediary for such a basic task. Making the SCA a familiar and helpful "touch point" could transform taxpayers' perception of the compliance process.

Ireland has embraced this concept and proved its value. Virtually all interaction (other than investigations) with Revenue Ireland is now online. Taxpayers can notify changes and have a real-time view of their pay and tax details through the myAccount portal, a benefit that has been credited with driving taxpayer engagement.

"Digitalisation is happening organically in Ireland: PAYE modernisation was not fixing something that was broken, but modernising it to make it better – the big lesson is that there has to be something in it for the taxpayer – a cost saving or efficiency and where this was missing, projects stalled or proceeded more slowly."

Brian Keegan, Director of Advocacy & Voice at Chartered Accountants Ireland

Pre-population

Pre-populating tax returns with third-party data can radically simplify tax administration for individuals. The concept holds huge potential.

"– the big lesson is that there has to be something in it for the taxpayer – a cost saving or efficiency and where this was missing, projects stalled or proceeded more slowly."

The OTS in its recent report *Making Better Use of Third-Party Data – A Vision for the Future* recommends that HMRC should set out a roadmap for the stages in which greater use of third-party data will be made. As candidates for pre-population, it suggests interest; dividend and income data from investment managers; pension contributions and gift aid payments - with a longer-term vision for capital gains and insurance bond chargeable events. It also advocates a consultation about the balance of responsibilities between data providers, software providers, agents, taxpayers and HMRC and the extent to which it is reasonable for taxpayers to rely on the data provided. The OTS found a wide level of support for the concept from all parties.

Pre-population is a core element of taxpayer experience in a number of countries. Denmark began pre-populating taxpayer information in 1988. Australia, Estonia, Ireland, the Netherlands, New Zealand, Russia and Singapore all partially pre-populate returns. In Australia, pre-population is extensive. **Professor Michael Walpole, of the School of Accounting, Auditing and Taxation at the University of New South Wales**: *"For most taxpayers pre-population*

almost eliminates the tax return; the only interaction for many is claiming work-related expenses. It takes away much of the chore but the risk is that taxpayers become less engaged." That point is echoed by **Paul Morton, former Tax Director of the OTS**:

"We need to think about people's level of involvement. A fully pre-populated return where a taxpayer simply has to click a button to agree would make things very simple, but would that be at the cost of them losing sight of their obligation to make a correct return? There is a balance to be struck."

Robust, standardised, timely third-party reporting systems are essential and the entities required to report need to be given time to adapt their systems. Taxpayers must also be able to challenge and correct information they believe to be wrong.

Another key requirement is a strong, unique taxpayer identifier, to enable data to be associated with the correct person. One option would be the NI number. A more comprehensive solution would be a single unique identifier used for all government purposes. The Government Digital Service has set out an ambition to design such a solution, building on experience with GOV.UK Verify. This would be closer to the vision in *Tax Administration 3.0* of a digital identity that works across government, private sector intermediaries, the systems that citizens and businesses use in their daily lives and across borders. Australia provides a good example of what can be achieved: the myGovID and Relationship Authorisation Manager components of Australia's Digital Identity program give access across 30 government agencies (planned enhancements include using biometric data).

Government and data

Should a citizen be able to engage digitally with government rather than with individual departments? **Ian Hayes, Chair of the CFE Tax Advisers Europe Tax Technical Committee** believes so:

"We need a single central government data department: citizens see government not departments". The "collect once, use many times." approach maximises efficiency, but there are obvious concerns about greater data sharing, as **Jane McCormick, former Global Head of Tax at KPMG** highlights:

"People are concerned about privacy – not just what data will be used for now but what it could be used for – and by whom – in the future."

"People are concerned about privacy – not just what data will be used for now but what it could be used for – and by whom – in the future."

Kevin Sefton, CEO of untied asks another fundamental question *"Should government join up a citizen's information or should software chosen by the citizen do that?"*

Joining up information across government could create a more citizen-centric system as well as helping to detect tax and benefit fraud. Tax authorities are well placed to take a central role given the volumes of data they process. The UK government clearly sees this, describing HMRC as *"an organisation central to our UK national resilience and crisis response as well as discharging their traditional role as a tax authority"*. Some data sharing already takes place between HMRC and other UK government departments such as DWP and HM Courts & Tribunals Service. But different systems used by departments can make it difficult to share data effectively. Digital twinning, mentioned in the UK National Data Strategy, would be one potential means of significantly increasing the interoperability and effectiveness of data across different government departments.

"Should government join up a citizen's information or should software chosen by the citizen do that?"

Data sharing can, however, go spectacularly wrong if different government departments do not fully understand the data. Professor Michael Walpole, of the School of Accounting, Auditing and Taxation at the University of New South Wales cited Australia's "Robodebt" saga as a "sobering moment". Information from the Australian Tax Office was shared with the Department of Social Services (Centrelink) to verify income declared by welfare recipients. The automation of the previously manual matching process dramatically increased the number of records checked. Unfortunately, the assumptions behind the calculations led to incorrect claims for repayment and the Federal Court ultimately approved a settlement of over A$1.8 billion plus legal costs as well as wiping all remaining debts.

"Tax can be a convenient source of data but it needs to be used with great care. Different government departments have different data needs and mindsets – people must have confidence in how the data will be used, stored and secured – both now and in the future."

Jennie Granger, Professor of Practice, School of Accounting, Auditing and Taxation, University of New South Wales.

Steve Smith, Data Lead at Fujitsu, stresses the importance of *"A balanced data strategy, aligned to both the organisation and the technology," to provide "the foundation to correctly understand, harness and exploit the value contained within data assets."*

"Tax can be a convenient source of data but it needs to be used with great care. Different government departments have different data needs and mindsets – people must have confidence in how the data will be used, stored and secured – both now and in the future."

Agents and intermediaries

Agents are vital to the effective operation of any tax system and the prime source of training and support in the transition to digital. Agent services must be designed in from the start. As **Henry Lowe, Private Client Partner at Mercer & Hole** says:

"Client, agent and HMRC should all have access to the same view of core information for the taxpayer: they should be seeing the same, not different, things, though each may need some extras to meet their specific needs."

Jessica Pillow of Pillow May Accountancy wants *"To be able to see everything HMRC holds on my clients, to be able to self-serve things like requesting a PAYE code change, to do so at a time that suits me and for HMRC to be able to action the request at a time that works for them. That would deliver better workflow management for me and for HMRC and a clear, timed audit trail."*

Nikki Firth, Director and Founder of Your Accounting Sanctuary Pty in Sydney shares an Australian agent's perspective:

"Digitalisation has certainly helped us as accountants to access more information from the ATO rather than relying on the client, saving us time. A client report from the ATO might show that they had a capital gain during the year. It may not include all the necessary details to complete the return, but it at least gives us a 'heads up' that something has been reported and we need to follow up."

Technology is challenging us to look beyond the traditional relationship between client, tax adviser and tax authority. As software becomes more sophisticated, does it at some point become an intermediary? If it contains prompts and nudges, does the developer bear some of the risk if they fail to alert the taxpayer to an issue? How closely does a taxpayer or agent using software need to check the output? As AI intrudes further into the advisory space, who is responsible for the decisions it prompts?

"By not supplying the software itself, HMRC has imposed a third party between citizen and state. Where the software is effectively assuming the role of intermediary: whose responsibility is it if something is wrongly treated?"

Jason Piper, Head of Tax and Business Law at ACCA identifies another issue:

"By not supplying the software itself, HMRC has imposed a third party between citizen and state. That is not the same as a citizen or business choosing to use an agent, which is a choice and not a legal requirement. With MTD the only choice is which third party supplier to choose. That is a very fundamental change. Where the software is effectively assuming the role of intermediary: whose responsibility is it if something is wrongly treated?"

Will technology ultimately make tax advisers redundant? **Nicola Mandale, Associate Director, Tax, Grant Thornton UK LLP** thinks not:

"Digitalisation doesn't side-line agents, it changes our role. Many people will still want an expert involved, will value that human contact. Technology gives us more time and scope to think about the client's whole situation, to bring tax and advisory together."

Technology may not make agents – or tax officials – redundant, but it will certainly change what they do and how they do it.

The unrepresented & digitally challenged

Those who struggle with digital must not be forgotten.

Valerie Boggs, Chief Executive Officer at TaxAid believes that *"Technology creates enormous opportunities to enable people with limited understanding of the tax system to engage with it better and to reduce the compliance burden for people on very low-incomes."*

But it is necessary to properly understand the barriers people face: ***"We need to be clear about the obstacles to engagement and understanding: it's easy to think we know, but research is needed. Technology can smooth the individual's journey but it must reflect their needs, not just HMRC's. If we don't know where the digital comfort/ comprehension line is for people, we risk widening the digital divide, so the engaged get even further ahead."***

"Technology creates enormous opportunities to enable people with limited understanding of the tax system to engage with it."

Victoria Todd, of the Low Income Tax Reform Group points out that *"Both the digitally excluded and the digitally challenged need to be catered for. There is a difference between being able to send emails or make online purchases and being truly comfortable and confident with more complex tasks online."*

It is important not to generalise: people have different issues with technology at different points in their lives. As tax administration becomes ever more digital, the human impacts must not be ignored. As **Sir Edward Troup, former Chair of HMRC** says, *"The human side remains important – how do you deliver digitally & still deliver customer service?"*

"The human side remains important – how do you deliver digitally & still deliver customer service?"

Tax Horizons: Technology & Tax Administrations

PART THREE: DATA AND TECHNOLOGY

- All about data
- Blockchain
- Open Banking
- Digital Currencies
- The All-Seeing Eye
- Current trends: skills and advisory

Part Three: Data and Technology

All about data

Everything depends on the quality of data and making it available across functions. As tax authorities increasingly seek transaction level detail, compliance will be driven further and further upstream. Having tax-sensitised data in an accessible format will be key.

"We can now think beyond data lakes and data warehouses, which seek to provide a single pool of data. Such pools can quickly become swamps and can require the shifting of data. Instead, we now have the option to use data meshes and data fabrics, that provide more insight, create more value and avoid many of the challenges of shifting data."

Chris Sanger, EY Global Government Tax Leader

"We now have the option to use data meshes and data fabrics, that provide more insight, create more value and avoid many of the challenges of shifting data."

Kate Rothwell, Head of Tax at online retailer AO, stresses the need to take a holistic view of data across an organisation

"Tax and finance teams have to work together when new ERP systems are implemented. Everyone has to understand the uses to which information will be put – there must be accurate allocation even at purchase order stage if the tax team is to have the information it will ultimately need."

Eleanor Macdonald, Tax Transformation and Technology Lead at Anglo American agrees:

"Complex transactions will often have come through lots of systems before they hit ERP and still require the application of judgement to achieve the correct treatment. The more tax-sensitised we can make data, the more effectively we can apply AI and ML, and avoid going back through the chain to ask questions."

"The more tax-sensitised we can make data, the more effectively we can apply AI and ML, and avoid going back through the chain to ask questions."

While data in an ERP System may be structured, other data within and outside the organisation may well be unstructured and held in many different formats. One solution is to employ a Common Data Model such as that created by Engine B, whose data ingestion product automates the data extraction process and maps data to a common format. Data in this Common Data Model can then be used by bespoke or mainstream analytics products such as Microsoft's Power BI or through knowledge graphs to interrogate and analyse data to support tax compliance. **Franki Hackett, Head of Audit and Ethics at Engine B**:

"Data needs to be there once: a single point of truth. A Common Data Model makes data from multiple sources accessible to different users for their particular needs."

A decade ago, HMRC looked to iXBRL to yield more value from data, mandating its use by limited companies for tax filing, giving HMRC a powerful tool to view and analyse data at the final accounts and tax computation level. While it would be possible to tag data at transaction level, this is not currently envisaged as a requirement when companies join MTD. But will iXBRL still be the best solution when they do?

Kevin Hart, of the Business Application Software Developers Association: *"Transaction-level tagging would be a challenge and would present another potential business burden. Technically it can be done, but there would be practical costs. Is it still the best solution or is the API/JSON route the better way forward?"*

APIs - which will form the backbone of MTD - allow systems to connect without giving direct access, providing reassurance on data security and confidentiality. Singapore makes use of APIs embedded in taxpayer systems. Russia's Tax Monitoring system embeds tax controls within taxpayers' systems and APIs give the tax authority direct access. Norway employs APIs to carry out validation checks within business accounting systems prior to VAT returns being filed.

"Data needs to be there once: a single point of truth. A Common Data Model makes data from multiple sources accessible to different users for their particular needs."

Blockchain

Blockchain enthusiasts believe it could revolutionise tax compliance. **Steve Cox, Head of Accountancy & Commercial, Iris Software Group**:

"Wider adoption of Blockchain has the potential to completely transform the way we do business and it, rather than MTD, could be the thing that causes the death of the tax return as we know it."

Blockchain is a distributed ledger technology (DLT), a chain of encrypted blocks of information of which there are multiple shared identical copies which once created cannot be changed without the knowledge of all participants. Smart contracts can be built into the chain to trigger specific actions (for example payment) upon satisfaction of specified conditions (such as delivery of goods or services) agreed by the chain's participants.

In commerce, it can facilitate faster, cheaper and more secure cross-border payments. Transfer pricing could be transformed by DLT systems, enabling easier and more reliable tracking of transactions and involved entities. It could revolutionise payroll processes: the employer would insert the gross pay and smart contracts would calculate the deductions, transfer the net pay to the employee, tax to the revenue authority and pension contributions to the pension fund. The European Asset Fund and Management Association has announced a pilot to look at how DLTs could be used to create a withholding tax relief at source model.

A 2015 report by the UK Government Chief Scientific Adviser *Distributed Ledger Technology: beyond blockchain* noted the potential for reducing tax fraud. The DWP undertook a trial the following year, in which claimants used a mobile phone app via which they received and spent their benefit payments, the transactions being recorded on a distributed ledger.

The Estonian government has used distributed ledger technology for some years. Keyless Signature Infrastructure (KSI) allows citizens to verify the integrity of their records on government databases. It has helped Estonia launch digital services such as the e-Business Register and e-Tax. Tax authorities in Argentina, Finland and Sweden have also looked to blockchain to improve tax administration. It is especially suited to transactional taxes such as VAT and GST and to property-based taxes. Smart contracts can settle tax liabilities automatically in real time.

"We can expect the digitisation of assets and the accompanying transition of economic activity into blockchain platforms to enable new possibilities of varying impact, from new means of calculating tax liabilities to embedding the payment of tax into transactions on a real time basis."

The 2021 Global Tax Advisers Platform (GTAP) Declaration asserts that *"For global tax purposes, the uses to which blockchain could be put are limitless"*. The declaration cites as potential benefits: Secure storage of information; the ability to audit at will, and safe sharing of requested information with other tax authorities. **Antonio Lanotte of I.CON Integrated Consultancy, Rome**, expands on that potential:

"A large-scale consortium blockchain could facilitate more efficient exchange of information between tax authorities under the OECD Common Reporting Standard, with smart contracts enabling tax data to

be shared only between relevant countries. Blockchain can be used by tax authorities to help prevent fraud and potentially to allocate profits for a Common Consolidated Corporate Tax Base."

Tyler Welmans, Blockchain Lead at Deloitte UK sums up:

"We are early in the evolution of blockchain, digital asset management, and the wider decentralisation of systems, processes and organisations. At the broadest level, we can expect the digitisation of assets and the accompanying transition of economic activity into blockchain platforms to enable new possibilities of varying impact, from new means of calculating tax liabilities to embedding the payment of tax into transactions on a real time basis."

"Open Banking could and will be transformational. Banks are not currently employing it consistently, but it is early days and that will change."

Open Banking

Open Banking allows regulated banks to share data with third parties authorised by the customer. Account Information Services (AIS) allow the customer to see account information from different banks in one place; Payment Initiation Services (PIS) facilitate direct payment and Confirmation of Payee (COP) shows the customer that a payment is going to the correct recipient before a transfer is made. Open Finance will allow accounting software to harness all of a person's - or business's - financial information in one place in real time. It is estimated that half the UK's small businesses and over 4 million consumers now use services powered by open banking technology.

The potential of Open Banking to identify tax-sensitive data across multiple accounts and to further automate accounts production and tax compliance is considerable. It is being actively explored both by software developers and by HMRC.

In December 2020, HMRC issued a tender for introducing Open Banking for payment of tax, with the aim of reducing errors, fraud and the cost of collection of a range of taxes. The contract was awarded to Ecospend in February 2021. Taxpayers authorise HMRC to share their payment reference, tax reference and the amount of tax due with Ecospend via an API; Ecospend shares this information with the taxpayer's bank and the taxpayer logs on to authorise the payment. HMRC has reportedly seen a dramatic reduction in allocation errors as a result.

The tender also sought information to enable HMRC "to fully understand the feasibility and potential uses of accessing real-time transaction data through Open Banking directly from business banking products and the application of automated tax determination, calculation and payment." The questions posed by HMRC show the extent of their interest in Open Banking and included: how can we make tax calculation frictionless for everyday business transactions? How feasible is it to calculate and take tax in real-time in/from business banking products, and submit it directly to HMRC? What activity can feasibly be centralised to banking products to support and simplify the preparation and calculation of income tax, VAT, Corporation and other taxes for small and medium enterprises/sole traders/self-employed customers? What appetite is there for this amongst sole traders and small businesses?

"Open Banking could and will be transformational. Banks are not currently employing it consistently, but it is early days and that will change."

Kevin Hart, Business Application Software Developers Association

"I don't think I will see any technology as ground-breaking as Open Banking again in my lifetime. It solves the suspense account problem, because you know exactly what every payment is and API-based payments can make really onerous tasks easy."

Simon Lyons, formerly of the Open Banking Implementation Entity

Digital Currencies

Cryptocurrencies - digital "money" in the form of digital tokens created and exchanged on decentralised blockchain systems - are regularly in the headlines. While Bitcoin, Etherium, Tether and Litecoin are among the best-known, there are now thousands of cryptocurrencies. Tax authorities are coming to terms with how to tax them (HMRC has a Cryptoassets Manual) and the risks they pose. HMRC is also reported to have seized cryptoassets and digital artwork Non-Fungible Tokens in a recent case.

Cryptocurrencies have been designed to be independent of government interference and control. Several countries, however, including the UK, Japan and Sweden are looking at the idea of Central Bank Digital Currencies (CDBCs) to combine the efficiency of digital payment instruments with the safety of central bank money. The Bank of England and HM Treasury established a joint CBDC Taskforce in April 2021 and issued a statement announcing next steps in November 2021. In January 2022 the House of Lords Economic Affairs Committee issued a report, with Committee Chair Lord Forsyth of Drumlean concluding that the idea was "a solution in search of a problem". Given the possibilities CBDCs hold however, the "search" is likely to continue. China has run live trials with a digital Yuan. The European Central Bank is exploring the concept of a digital Euro to complement rather than replace cash. The ECB concluded that the core infrastructure would be environmentally friendly, as based on the test architectures, "the power used to run tens of thousands of transactions per second is negligible compared with the energy consumption of crypto-assets such as bitcoin."

There is an intriguing further possibility: programmable currencies. The digital Yuan can be programmed to have an expiration date to encourage users to spend it quickly. The implications of incorporating "programmable demurrage" to change the purchasing power of a digital currency to spur consumption, or programmed restrictions to govern what it could be used for are significant. It would for example be possible to programme state benefits paid in digital currency so that they could only be used for specified purposes, such as buying food and essentials; the same possibility would exist for future business support programmes administered by HMRC.

Decentralised Finance and Digital Financial Assets (DFAs) provide new opportunities for commerce but also for fraud (due in part to the fact that owners of cryptocurrencies can be extremely hard to identify) with inevitable consequences for tax administration.

The All-Seeing Eye

Tax Administration 2021 reveals that 98% of the tax authorities involved use or plan to use data analytics techniques to improve risk management and to design-in compliance; 72% use or plan to use Artificial Intelligence and Machine Learning to predict taxpayer behaviour or to apply tax rules.

As people live more of their lives online, they leave an-ever more revealing data trail, from what they purchase, when and where, to where they go and what they do. Data can be exploited by technology such as HMRC's Connect, which can for example compare names appearing on the Land Registry with tax returns to identify potential sources of undeclared rent. The greater the amount of available data, the greater the potential for making connections that reveal non-compliance.

Chile has used data analytics to identify fraudulent invoices. Brazil uses AI to identify individuals with income or assets that would not be expected given where they live (an approach with echoes of Italy's Redditometro). Other tax authorities have developed – or are developing – tools based on data analytics, AI and NLP to identify specific anomalies that may pose risks and to give behavioural insights.

The Internet of Things (IoT) offers, via electronic tills and other devices linked to a tax authority's systems, opportunities to reduce fraud. Russia has mandated the use of online cash registers in all retail businesses, a move that has been credited with significantly raising levels of tax compliance as well as providing a real time flow of economic and price data.

In the October 2021 Budget, HMRC announced measures to tackle Electronic Sales Suppression (ESS), the deliberate suppression of sales through manipulation of Electronic Point of Sale (EPOS) systems. Systems can be manipulated to facilitate fraud by, for example, excluding specific restaurant tables from the sales summary. It was recently reported that almost one in five restaurants in California had used illegal software applications known as "zappers" to under-report sales with a potential tax loss over a five-year period amounting to $30 million.

Information is exchanged between tax authorities automatically through the Common Reporting Standard (CRS), reducing the scope for hiding taxable transactions. CRS is based on annual returns of information, but technology can enable information exchanges in real time. Estonia and Finland have begun secure, real-time exchanges of VAT, labour and social taxes information and plan to add further sources of information in the future. Such real-time exchanges, rather than periodic reporting, are the shape of things to come.

Tax authorities will continue to exploit technology to move from physical to virtual investigations and to target interventions.

Current trends: skills and advisory

Low-code and no-code solutions are increasingly being utilised by tax personnel: code generators and drag-and-drop editors enable people without deep programming knowledge to do things that were until very recently the province of specialists. White labelling – rebranding and adapting existing solutions rather than inventing new ones from scratch – and AI-assisted development are also contributing to this trend. While there is still a need for IT experts, these tools are giving tax specialists more control. **Kate Rothwell, Head of Tax at AO**:

"I don't actually need a tax technologist – I need to upskill my current team to use our tools better and where this doesn't give us our desired outcome, I need an IT person who can produce a solution to a problem I can define – we want to work in collaboration with our IT colleagues".

Rapid build technologies are powering a quiet revolution, as **Bivek Sharma, Tax Technology and Transformation Lead at PwC** highlights:

"Many solutions which would have taken six months to build in the past, can now be built in a matter of weeks and for a fraction of the cost. Complex problems can now be solved which would have been virtually impossible five years ago. Tax departments adopting these technologies are having to spend considerably less time on data collection, wrangling and reconciliation and are having greater value-add, insights driven, conversations with the wider business."

"Many solutions which would have taken six months to build in the past, can now be built in a matter of weeks and for a fraction of the cost. Complex problems can now be solved which would have been virtually impossible five years ago."

Trends we saw in The Tax Technology Horizon continue to develop, with AI making further inroads into the advisory space. **Lee Jefferson, a tax partner at BDO**, points to the firm's R&D benchmarking tool which *"Uses an advanced neural net, available third-party information, and our own data lake to provide clients with a benchmark against which to assess their own position."*

And as we have seen throughout this report, advisory services are becoming more focused on harnessing real time information. **Dave Gibson, Co-founder of Blusky Chartered Accountants**:

"So much was reactive, but the cloud changes that. Why would you want to run a business on even six-week-old data when you can have up to date data? It's a mistake to think of cloud as equivalent to a desktop product – having an up-to-date view of your assets and liabilities gives you more control of your finances. MTD for VAT was a non-event – the clients were all on-line anyway."

But there is still too much paper. **Anish Mehta, Managing Partner UK, APARI Software**:

"Taxpayers need data, not paper. Take letting agents' statements for example: why am I still only getting PDFs by email, rather than information supplied as CSV or via an API? Let's automate boring and error-prone activities, like data entry."

"So much was reactive, but the cloud changes that. Why would you want to run a business on even six-week-old data when you can have up to date data? It's a mistake to think of cloud as equivalent to a desktop product – having an up-to-date view of your assets and liabilities gives you more control of your finances."

Tax Horizons: Technology & Tax Administrations

PART FOUR: TRANSFORMING TAXATION

- New ways of working and trading
- New ways of taxing
- Keeping it simple

Part Four: Transforming Taxation

New ways of working and trading

In 2017, the Taylor Review of Modern Working Practices looked at the evolving labour market, noting an increase in part time working and self-employment and a shift to new ways of working facilitated by technology (such as the gig economy, in which people use apps to sell labour). It was recently reported that almost 15% of working adults in the UK now get paid by platforms such as Deliveroo, Uber and Flex. A business model such as Uber's could not exist without digital platforms to connect drivers and passengers.

Changing work patterns and business models will inevitably require tax administration processes to adapt. The OECD has published Model Reporting Rules setting out how digital platforms should collect information about sellers and sales and report it to the tax authority where the platform is resident, incorporated or managed. The information can then be exchanged with the tax authority in which the seller is resident. HMRC is consulting on how the rules should be implemented in the UK and proposes that information should be supplied in a standardised OECD Sharing and Gig Economy XML Schema via a new online service similar to that for existing Automatic Exchange of Information (AEOI) agreements such as CRS. The option of offering an API to transfer information from a platform operator's IT system to HMRC's systems is also being explored.

By its very nature, the gig economy creates less stable, more fragmented working patterns than traditional employment models. A technology solution could consolidate information from different engagements and present a taxpayer-centric view to simplify reporting. Withholding tax rates could even vary according to the type of work.

As **Jennie Granger, Professor of Practice, School of Accounting, Auditing and Taxation, University of New South Wales** says, *"People's circumstances change dynamically and the tax system has to change dynamically to reflect that."*

New ways of taxing

Technology opens up new ways of taxing. Real-time data makes it easier to tax individual transactions rather than transactions accumulated over an accounting period.

"To get the full value from real time information for income tax or corporation tax you might have to start thinking of them as transactional taxes or go down the flat rate tax route."

Russia has introduced a simplified flat-rate income tax system for "professional income". When rendering a service, those within the scheme use the My Tax app to generate an invoice by tapping in the amount received and the type of goods or service sold. The app displays the tax rate and allows the user to view all sales for the period and the accrued tax bill. The information is automatically transferred to the Federal Tax Service. A bank card can be registered for automatic payment of the tax. The app also generates certificates of self-employment and income which can be used when applying for loans or benefits.

Digital technology offers the potential to tax small businesses and certain types of discrete transaction – for example taxi drivers - in this way. A flat rate of tax simplifies record keeping and an app can make transactional compliance easy and instantaneous as well as offering an accurate tax estimate and the opportunity to pay as you go.

John Cullinane, Director of Public Policy at the Chartered Institute of Taxation:

"To get the full value from real time information for income tax or corporation tax you might have to start thinking of them as transactional taxes or go down the flat rate tax route (for progressivity you would need a different tax, as surtax used to be), otherwise things like end of year adjustments, claims and elections and reliefs such as pension contributions would make the process of converting real time data into reliable tax estimates or liabilities incredibly complex. In a nutshell, if you want to tax more on the basis of real time transactions, you have to think more in terms of a transactional tax."

Emerging Technologies could also make a consumption tax easier to deliver and harder to avoid. **Jane McCormick, former Global Head of Tax at KPMG** sees the opportunity *"To personalise a consumption tax by giving exemptions transaction by transaction or by taxing up front and putting the onus on the taxpayer to claim relief."*

"Goods could potentially be tagged with information relating to their carbon footprint for example – having better data, more information about individual items and transactions, could open up new options for taxation."

Helen Miller, Deputy Director at the Institute for Fiscal Studies, sees potential for delivering environmental taxes through the employment of digital technology *"Goods could potentially be tagged with information relating to their carbon footprint for example – having better data, more information about individual items and transactions, could open up new options for taxation."*

And as robots take on new physical tasks and AI takes on new analytical and advisory tasks, how will the taxes paid by the humans who previously did this work be replaced? As electric vehicles take the place of petrol- and diesel-powered vehicles, fuel-related tax receipts will fall, raising the prospect of taxing vehicles on the basis of miles driven or routes taken rather than taxing fuel consumed. What we tax – and how we tax it – will change.

Keeping it simple

Complexity can result in both deliberate and inadvertent non-compliance. The Tax Technology Horizon asked whether technology could drive simplification, acting as a filter to shield taxpayers from complexity and allowing them to engage with only what was necessary. The danger of such an approach is that it can weaken ambition to simplify the system. Complexity creates problems even for technology, as the number of exclusions requiring a paper self-assessment return a quarter century on from the introduction of e-filing in the UK demonstrates. The lead time between new law being made and it being fully reflected in software and systems is a challenge.

Anita Monteith, Technical Lead and Senior Policy Adviser at ICAEW believes that *"We have to simplify the rules first and as we design new rules, do so in a way that works in a digital world."*

"Part of the problem is the continuous flow of new legislation, creating new obligations that must be accommodated in systems. The technology struggles to keep pace and new systems do not always join up with existing ones."

John Cullinane, Director of Public Policy, Chartered Institute of Taxation

"We have to simplify the rules first and as we design new rules, do so in a way that works in a digital world."

"You have to build tax policy in concert with the technology – there may be things that technology would deliver in a really easy way, but to which the policy makers are blind. Maybe we should be writing tax code as code – as in algorithms – rather than words."

Kevin Sefton, CEO of untied

The concept has been tried. In the Netherlands, Regelspraak ("RuleSpeak"), a Controlled Natural Language (CNL), has been employed by the tax administration in its Agile Law Execution Factory (ALEF) to render legislation into rules that are both human-readable and convertible into code for the authority's multiple IT systems. ALEF's multi-disciplinary team of lawyers, tax and IT experts has built considerable expertise. New laws are quickly subjected to what is now a well-tried process and the rules generated are tested on examples to ensure that they yield the correct result.

"You have to build tax policy in concert with the technology."

Technology offers AI-driven approaches to dispute resolution: We saw in the Tax Technology Horizon how Blue J is using AI to predict the outcome of tax cases, based upon the facts and outcomes of previous cases. There is also scope for automating elements of penalty appeal processes. The possibilities are (almost) limitless.

Tax Horizons: Technology & Tax Administrations

THE HORIZON

- **Where does all this lead?**
- **Four Final Insights**

The Horizon

Where does all this lead?

Amara's Law tells us that we tend to overestimate the effect of a technology in the short run and underestimate its effect in the long run. It is impossible to predict with certainty which technologies or trends will prove to be the most transformative for tax over the next few years, but some we know will be contenders.

Individuals will certainly see greater personalisation of their experience of tax administration, through pre-population of information in returns and through apps. The Single Customer Record/Account will be central to (and essential for) this transformation: the OTS has described it aptly as the "keystone" of HMRC's plans for digital transformation.

"The month-end (or tax return) mind set is not sustainable in a world of real-time reporting and e-invoicing."

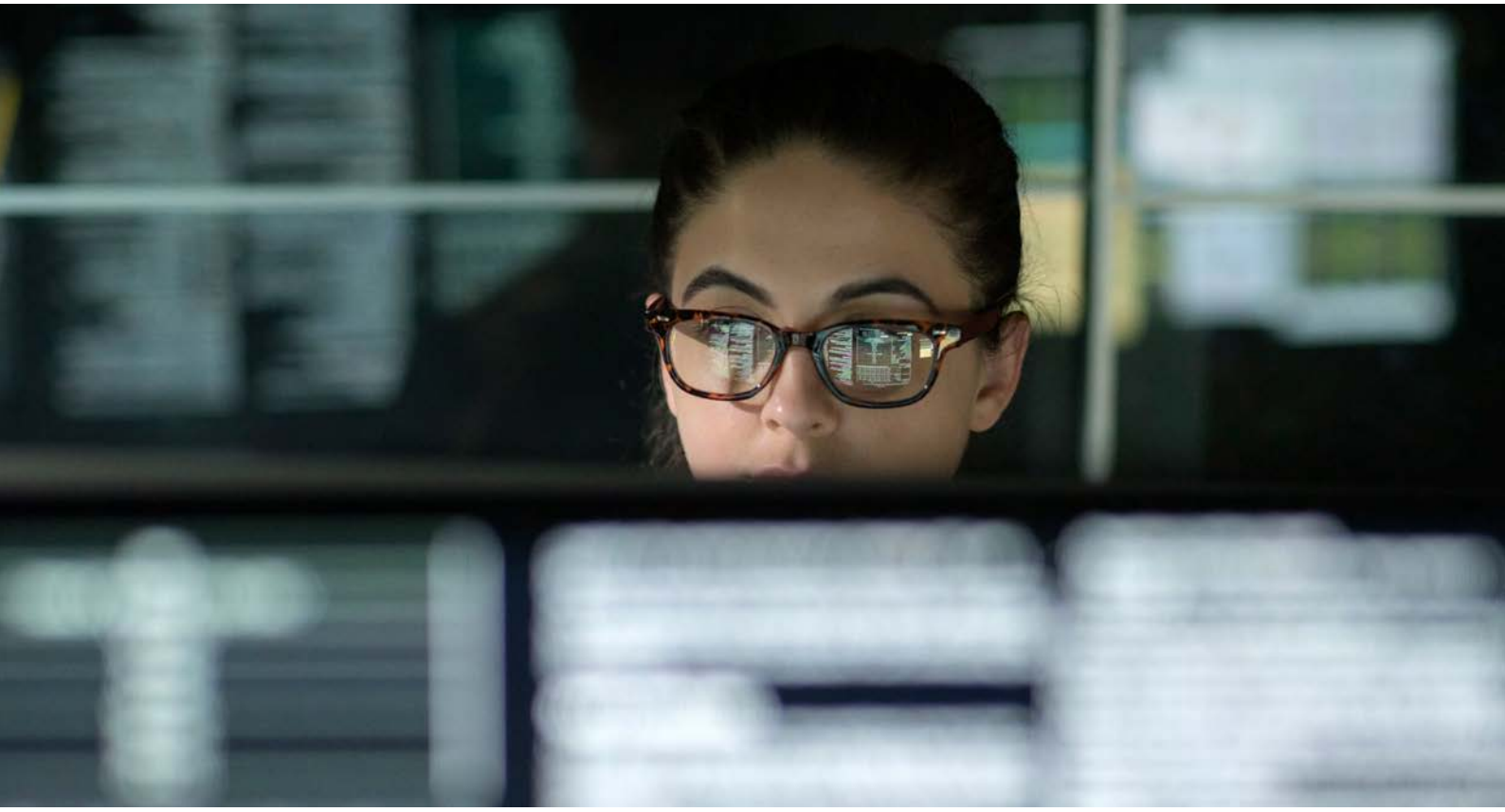
Advisers will continue to increase their use of robotics to eliminate paper, post and delay in the ingestion of data and will employ AI to make best use of it. AI will also take an increasingly important role in the advisory space. Open Banking will facilitate better and faster categorisation of income and expenses. Distributed Ledger Technology could be transformative.

Large businesses will find better ways to harness data and to make data available and easily usable across the enterprise using common reporting models and data fabrics. Tax sensitisation will become routine.

Tax authorities will make ever more effective use of data analytics and AI to police compliance. Tax rules will increasingly be embedded in taxpayers' natural systems. Real time data will transform what is possible. As **Chris Sanger, Global Government Tax Leader at EY** says, *"The month-end (or tax return) mind set is not sustainable in a world of real-time reporting and e-invoicing."*

Technology opens up new ways to tax. As the way we work and live changes, tax will have to change too. Platforms, the switch to electric vehicles and environmental taxes will be just some of the factors driving that change.

MTD is just one small part of this vast, ever-changing tax and technology landscape.



FOUR FINAL INSIGHTS

"There is an opportunity for better connection between citizens and government, an opportunity for citizens and for us as a country to understand and think about what tax is there for and how it's raised."

Nicola Mandale, Associate Director, Tax, Grant Thornton UK LLP

"Do we just use technology to do the same things better and faster – or to do new things entirely?"

Ian Hayes, Chair, CFE Tax Advisers Europe Tax Technology Committee

"Delivering ten small things a year successfully is better than aiming for nirvana and not getting there. Change that people can actually see is important – it's how you get buy-in."

Asif Ahmed, Founder & MD, Acclivity Advisers

"We shouldn't just be driven by what technology can do but by what citizens and businesses are comfortable about allowing it to do. It is part of a bigger issue, the relationship between citizen and state."

Charlotte Barbour, Director of Tax, ICAS

Sir Edward Troup's words at the beginning of this report hold true:

"We need a shared understanding of what is possible and a collective vision of how far we want to go."

Convening and maintaining the conversation to create – and successfully deliver - that collective vision is the greatest challenge we face. Only by convening it will we succeed.

Tax Horizons: Technology & Tax Administrations

GLOSSARY

Glossary

AEOI
Automatic **E**xchange **o**f **I**nformation

API
Application **P**rogramme **I**nterface: the link that allows two applications, software packages or systems to "talk" to each other.

AI (Artificial Intelligence)
Technology such as machine learning, neural networks and algorithms used to replicate human cognitive characteristics, for example the ability to recognise and interpret patterns in data and to make decisions based on those patterns and on programmed or "learned" experience.

ATO
Australian **T**ax **O**ffice

Blockchain
A digital, decentralised, distributed ledger formed from an immutable, chronological shared database of transactions.

Blue J
Blue J is a North American company which has developed an AI-powered platform to predict the likely outcome of tax and legal cases.

CbCR
Country **b**y Country Reporting

CJRS
Coronavirus **J**ob **R**etention **S**cheme

CDM (Common Data Model)
A CDM is a system enabling the sharing of data across different applications and processes, including data analytics, such as Engine B.

Cryptocurrencies
A form of cryptoasset designed as a means of payment such as Bitcoin, Etherium and Litecoin.

CNL
Controlled **N**atural Language

CRS
The OECD Common Reporting Standard for international exchange of information.

Data Analytics
The process of collecting, organising and analysing data to reveal patterns and features. ***Descriptive dat***a analytics provides insight into what has happened, whereas ***predictive*** data analytics can provide insight into what is likely to happen and ***prescriptive data*** analytics into what can be made to happen.

Data Fabric
An end-to-end data integration and management framework, enabling easy access to and sharing of data in a distributed data environment.

Data Lake
A large pool of raw data.

Data Mesh
A distributed architecture involving data sets stored across multiple domains, making them accessible and interoperable securely.

Data Visualisation
The process of rendering data in a visual, comprehensible form via graphs, charts and graphical representations.

Data Warehouse
A repository for processed, structured data.

Data Wrangling
Preparation of data for loading into existing programmes.

Decentralised Finance
Financial applications and protocols built on blockchain technology with programmable capabilities and not reliant on traditional finance intermediaries.

Digital Twinning
A digital twin is a virtual representation of an object or process, which can be used to model or predict how the "real" entity will behave. In the context of this report, it refers to a digital twin of a dataset.

DLT
Distributed **L**edger **T**echnology (see Blockchain)

DFA
Digital **F**inancial **A**sset

DWP
The **D**epartment for **W**ork and **P**ensions

Engine B
A Common Data Model

ERP (Enterprise Resource Planning)
The integrated ecosystem of software that a business or organisation uses to collect, store, manage, and interpret data from its activities, generally based around an integrated database. ERP systems can be in-house, cloud-based or delivered via SaaS (Software as a Service). Major players in this market include SAP, Oracle and Microsoft Dynamics.

EPOS
Electronic **p**oint **o**f **s**ale systems

ESS
Electronic **s**ales **s**uppression

ETMP
HMRC's **E**nterprise **T**ax **M**anagement **P**latform

Fintech
Fintech, or "Financial Technology" refers to software and other technology - such as mobile payment technology - used to facilitate automated, modernised financial services.

FTA
The OECD Forum on Tax Administration brings together Commissioners from 53 OECD and non-OECD countries to share information and experience and to identify international good practices for resolving tax administration issues.

IoT (Internet of Things)
The ecosystem of physical devices connected to the internet.

JSON
Java**S**cript **O**bject **N**otation

Knowledge Graph
A knowledge base that uses a graph-structured data model or topology to integrate data.

Low code/No code
An approach to software and application design that enables users without deep technical programming knowledge to select and build applications from off the shelf building blocks.

Machine Learning
The process by which an algorithm "learns" based on experience of the data to which it is exposed. The three main types of machine learning are unsupervised (using unlabelled datasets), supervised (using labelled datasets) and reinforcement (using unlabelled data but rating output as correct or incorrect).

MTD
Making **T**ax **D**igital, the main components being MTD for VAT and MTD for Income Tax Self-Assessment (MTD for ITSA)

Neural Network
A subset of machine Learning which attempts to replicate the neural net of a human brain.

NLG (Natural Language Generation)
Re-rendering data in language and form understandable by humans.

NLP (Natural Language Programming)
Re-rendering human-understandable language or unstructured data in a machine-readable form.

OECD
The **O**rganisation for **E**conomic Co-operation and **D**evelopment

Open Banking
Open Banking enables consumers and businesses to share bank and credit card transaction data securely with trusted third parties.

OTS
The **O**ffice of **T**ax **S**implification

OCR (Optical Character Recognition)
Technology that recognises text in physical documents or electronic documents such as PDFs and renders it into digital form.

Power BI
A Microsoft interactive data analytics, modelling and visualisation service which can draw on data from Excel, Google Analytics and a variety of other sources including social media platforms.

RTI
Real **T**ime **I**nformation (in the context of PAYE)

RPA (Robotic Process Automation)
The performance of a task otherwise performed manually by a machine. RPA is especially suited to automating routine, repetitive, high-volume tasks that do not require the exercise of judgement.

SCA/SCR
Single **C**ustomer **A**ccount/**S**ingle **C**ustomer **R**ecord

Smart Contract
A self-executing contract within a blockchain, triggered automatically when pre-agreed conditions have been satisfied.

SEISS
Self **E**mployed **I**ncome **S**upport **S**cheme

UC
Universal **C**redit

White-labelling
The process of rebranding an existing item rather than creating a new one from scratch.

XML
e**X**tensible **M**ark-up **L**anguage

XBRL/iXBRL
e**X**tensible **B**usiness **R**eporting **L**anguage/inline e**X**tensible **B**usiness **R**eporting **L**anguage

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