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# Blockchain to the Rescue: Improving Taxpayer Engagement with Blockchain

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*Although tax authorities are increasingly moving to digitalisation, there has been limited use of blockchain for assisting tax administration and compliance. This article discusses the potential use of blockchain technology for this purpose. In particular, the Australian tax system is considered in light of the challenges identified in the recent official report published by the House of Representatives Standing Committee on Tax and Revenue. These challenges result from the rising gig economy, complex work-related deduction rules for individual taxpayers and, more generally, tax evasion in the cash economy. To overcome these challenges, this article proposes a blockchain solution that increases taxpayer engagement with the tax and superannuation system. Not only would this solution benefit the Australian Government's ability to raise revenue and induce a good compliance culture, but a similar solution could be adopted in other jurisdictions.*

## I. INTRODUCTION

According to the OECD, there has been a significant shift towards e-administration and the use of technology tools, data sources and analytics to improve tax compliance among 58 advanced and emerging economies.<sup>1</sup> Australia is one of these economies, using a range of technologies in its tax system. The Australian Taxation Office (ATO) recently tendered the UK-based biometrics company iProov to deliver facial recognition for verifying tax payer's identity in the next few years.<sup>2</sup> However, its approach to blockchain technology, emerging as one of the next disruptive information communication technology innovations,<sup>3</sup> has appeared limited. The only study, conducted in 2018–2019, reported that blockchain technology was too immature for adoption by the Australian taxation system,<sup>4</sup> and no further study has been undertaken since.

As blockchain technology is expected to transform how tax authorities operate,<sup>5</sup> this article explores the potential of blockchain technology as it applies to tax compliance. Specifically, the recent report published by the House of Representatives Standing Committee on Tax and Revenue, which highlights the real challenges that the Australian Government has faced in ensuring taxpayer engagement in the tax and superannuation system in the past few years, will be used.<sup>6</sup> These challenges have arisen from

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<sup>1</sup> OECD, *Tax Administration 2019: Comparative Information on OECD and Other Advanced and Emerging Economies* (OECD, 2019) (*OECD's Report on Tax Administration 2019*).

<sup>2</sup> Judy Skatsoos, "ATO Awards \$11M Contract for Face Scanning Technology", *Government News*, 17 March 2021 <<https://www.governmentnews.com.au/ato-awards-11m-contract-for-face-scanning-technology/>>.

<sup>3</sup> See, eg, OECD, *The Policy Environment for Blockchain Innovation and Adoption: OECD Global Blockchain Policy Forum Summary Report* (OECD Blockchain Policy Series, 2019).

<sup>4</sup> Digital Transformation Agency, *Blockchain Case Study: Australian Taxation Office* <<https://www.dta.gov.au/help-and-advice/technology/blockchain/do-you-need-blockchain/blockchain-case-studies/blockchain-case-study-australian-taxation-office/>> (*Blockchain Case Study: Australian Taxation Office*).

<sup>5</sup> *OECD's Report on Tax Administration 2019*, n 1, 201.

<sup>6</sup> Parliament of the Commonwealth of Australia, House of Representatives, Standing Committee on Tax and Revenue, *Taxpayer Engagement with the Tax System* (August 2018) (*Taxpayer Engagement with the Tax System*).



the growing gig economy, complex workplace deduction rules and the black economy; blockchain technology can help overcome these challenges.

The article is structured as follows. Part II provides an overview of blockchain, including the properties of blockchain. Part III discusses what the Australian Government has done towards the potential adoption of blockchain technology and describes the ATO's lack of effort to explore and adopt blockchain technology. Part IV explores tax problems that need to be solved, and Part V elaborates a proposal for solving these problems using blockchain technology. Finally, Part VI summarises the proposal and notes some potential challenges in implementing the proposal and the possible solutions.

## II. BLOCKCHAIN PRIMER

Bitcoin miners are spreading the word “blockchain” in the community. However, bitcoin and blockchain are not synonymous. Bitcoin is a digital currency underpinned by blockchain technology, whereas blockchain refers to “a distributed database that maintains a continuously growing list of records, called blocks, secured from tampering and revision”.<sup>7</sup> Blockchain is a database equipped with a unique feature that allows the addition but not deletion of information. This feature is advantageous to trust, transparency, verification and traceability, which is the reason for the rising use of blockchains in many industries. Traditional databases do not offer such benefits but can be used in conjunction with blockchain.

Because blockchain is a shared database, users share the same information. Information updated by one user is updated for everyone in the network. So, companies or stakeholders no longer need to keep duplicate records in their private databases. This feature saves much redundancy. For example, taxpayers and the tax authority could use the same dataset stored on the blockchain, where there is only one source of truth. Blockchain prevents data tampering or modification. It ensures the integrity of data and gives users the confidence that no one has altered the data. From a tax authority's perspective, accessing reliable and verified data on the blockchain adds confidence in other data analytics.

The methods in which blockchain is used are as follows. Information in a blockchain is stored in blocks of varying sizes, depending upon how the blockchain is configured. Once the block reaches its capacity, any additional information is stored in the next block. These blocks are connected via a unique code called “hash”: each block generates a unique hash, and the hash of the previous block is stored in the next block. Different blocks are chained together in chronological order, forming a blockchain.

A blockchain can be structured in one of three ways: permissionless, permissioned or hybrid blockchain.<sup>8</sup> Permissionless blockchains are also referred to as public blockchains because the network is open to the public and allows anyone to join without permission (eg, bitcoin or Ethereum networks). Conversely, permissioned blockchains are privately managed: Hyperledger Fabric and Corda are examples of permissioned blockchains. Permissioned blockchains can be divided into (1) private blockchains, owned by an organisation and used only by authorised members within the organisation and (2) consortium blockchains, owned by multiple organisations, with members from various organisations working together to manage and access a shared database. The use of permissioned blockchains is rising. Hybrid blockchains are a mix of permissioned and permissionless blockchains designed to improve the overall efficiency of blockchain applications.

“Smart contract” is the next concept developing within the blockchain space.<sup>9</sup> Smart contract refers to a software program designed to execute commands automatically when certain predefined conditions are satisfied. It can be commercially used to execute buyer-seller contracts when a specific condition is met,

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<sup>7</sup> Parliamentary Joint Committee on Law Enforcement, *Impact of New and Emerging Information and Communication Technology* (Commonwealth of Australia, 2019) vii (*Impact of New and Emerging Information and Communication Technology*).

<sup>8</sup> Some authors categorise the types of blockchain differently: for example, public permissionless blockchain, public permissioned blockchain, private consortium blockchain and private/permissioned enterprise blockchain: see Young Ran (Christine) Kim, “Blockchain Initiatives for Tax Administration” (2021) 69 *UCLA Law Review* (forthcoming).

<sup>9</sup> Iansiti and Lakhani provide a good summary of how blockchain technology has developed: in Marco Iansiti and Karim R Lakhani, “The Truth about Blockchain” (2017) 95(1) *Harvard Business Review* 118.

with legally binding contractual terms predefined within the program. Smart contracting can automate many business processes and cut out costly intermediaries.<sup>10</sup>

The features and structures of blockchain described above will be considered when developing an adequate solution to tax challenges later in this article.

### III. WHAT HAS THE AUSTRALIAN GOVERNMENT DONE SO FAR?

Digital solutions for government services have rapidly expanded in Australia in the past six years. In July 2015, the government established the Digital Transformation Office (DTO), an executive agency reporting to the Minister for Communications.<sup>11</sup> A year later, the DTO was replaced by the Digital Transformation Agency (DTA).<sup>12</sup> The Senate's Finance and Public Administration References Committee stated the role of the DTA as follows:<sup>13</sup>

The DTA has an oversight and advisory role. It has oversight of all ICT projects worth greater than \$10 million that are either being developed, or that are going through a significant transition, or that provide a service that affects a significant number of Australians. The DTA will also become involved where it has been specifically asked to help build capability. ... [T]he DTA does not get involved with everyday expenditure and resourcing of ICT operations across government, including outages.

Under the banner “simple, clear and fast public services”, the DTA has promoted that new technologies should be adopted based on user needs.<sup>14</sup> The study of user needs (preliminary work) is then followed by a four-stage service design and delivery process: (1) to discover and explore problems (discovery stage), (2) to test hypotheses (alpha stage), (3) to build and test a service (beta stage) and (4) to improve the service (live stage).<sup>15</sup>

In the 2018–2019 budget, the Australian Government allocated \$0.7 million to the DTA to investigate how blockchain technology could help minimise transaction costs, streamline processes and improve government services.<sup>16</sup> Subsequently, the DTA carried out several works.

At the outset, the DTA sought an understanding of blockchain. The extent of this study is unclear concerning the service design and delivery process. Without further context, it is difficult to determine if the study substantially sought the blockchain uses in the Australian context. This study concluded that the benefits of blockchain technology often overlooked limitations such as operational governance issues, referring to Wüst and Gervais's article titled “Do You Need a Blockchain” as a starting point.<sup>17</sup> The DTA claimed that its findings were consistent with those of the National Institute of Standards and Technology of the Department of Commerce in the United States<sup>18</sup> and suggested government

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<sup>10</sup> See further the risks and opportunities of using blockchain technology in M Staples et al, “Risks and Opportunities for Systems Using Blockchain and Smart Contracts” (Data61 (CSIRO), 2017); Ka-Chi Cheung, “Blockchain: Enforcement and Regulations” (2018) 20(10) *Internet Law Bulletin* 178.

<sup>11</sup> Parliament of Australia, Department of Parliamentary Services, Parliamentary Library, *Public Sector Digital Transformation: A Quick Guide* (Research Paper Series, 2018–2019, 2 April 2019) 3.

<sup>12</sup> Angus Taylor, “Transforming the Commonwealth's Digital Agenda” (Media Release, 14 October 2016) 16–19.

<sup>13</sup> Senate Finance and Public Administration References Committee, *Digital Delivery of Government Services* (Commonwealth of Australia, 2018) [2.21]. See also *Impact of New and Emerging Information and Communication Technology*, n 7, vii.

<sup>14</sup> See Digital Transformation Agency, *Getting Started with the Service Design and Delivery Process* <[https://www.dta.gov.au/help-and-advice/build-and-improve-services/service-design-and-delivery-process](https://www.dta.gov.au/help-and-advice/build-and-improve-services/service-design-and-delivery-process/getting-started-service-design-and-delivery-process)>.

<sup>15</sup> Digital Transformation Agency, *Service Design and Delivery Process* <<https://www.dta.gov.au/help-and-advice/build-and-improve-services/service-design-and-delivery-process>>.

<sup>16</sup> Australian Government, *Budget 2018–19, Agency Resourcing: Budget Paper No. 4 2018–19* (Commonwealth of Australia, 8 May 2018) 11, 166.

<sup>17</sup> Karl Wüst and Arthur Gervais, “Do You Need Blockchain?” (Crypto Valley Conference on Blockchain Technology, 2018), referred in Digital Transformation Agency, *Do You Need Blockchain* <<https://www.dta.gov.au/help-and-advice/technology/blockchain/do-you-need-blockchain>>.

<sup>18</sup> Digital Transformation Agency, *Blockchain Overview: Australian Government Guide* <<https://www.dta.gov.au/help-and-advice/technology/blockchain/blockchain-overview-australian-government-guide>>.

departments and agencies seek a suitable solution based on problems (which may not be blockchain technology).<sup>19</sup>

Next, the DTA piloted two studies. First, it allowed the ATO to run a “hackathon” for administering luxury car taxes. The aim was to improve transparency by sharing tamper-proof data between car dealers and government agencies, and the hackathon produced a prototype owned by James Murtagh within a week.<sup>20</sup> Although the prototype was workable, the DTA reported that the development tools and technology provided to develop the prototype were immature and using it in a production environment would potentially require high hosting and operational costs. Verification of high costs, however, requires a thorough analysis in consideration of associated benefits.

The second pilot was marginally more successful than the hackathon. The Making Money Smart project led by Daniel Royal trialled the creation of smart money for the Disability Insurance Scheme through blockchain. The DTA, however, reported critical challenges associated with collecting data from stakeholders to enable conditional payments for the scheme, suggesting more work was necessary for balancing performance and confidentiality.<sup>21</sup> These pilots remained at the preliminary stage of learning user needs. According to the DTA’s 2018–2019 annual report, blockchains were not ready for use in government services.<sup>22</sup>

In the same year, the ATO was separately involved in developing other technologies. For example, the ATO absorbed 28% of the \$92.4 million allocated to a project that promised to deliver a streamlined proof-of-identity process called “GovPass” to access various government services.<sup>23</sup> In addition, the ATO shared an additional \$19.3 million with the Department of Industry, Innovation and Science and the Australian Securities and Investments Commission for a project to modernise the government’s business registers that record business names and identifications and director identification numbers.<sup>24</sup> These projects did not utilise blockchain technology.

While the government’s support for using blockchain in regulatory activities was limited, the same was not true in the fiscal policy domain. Australia’s financial technology (fintech) industry was growing, from approximately \$250 million in 2015 to \$4 billion by 2020,<sup>25</sup> and the government was keen to support the industry.<sup>26</sup> In 2016, the FinTech Advisory Group, comprising key players from the fintech industry, was established to guide the Australian Government for policy priorities.<sup>27</sup>

In 2018, the Australian Government signed a FinTech Bridge with the United Kingdom to strengthen collaboration on fintech between these two nations.<sup>28</sup> More recently, the Senate Select Committee on Australia as a Technology and Financial Centre made its second interim report, with 23 recommendations

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<sup>19</sup> Digital Transformation Agency, n 18, referring to Dylan Yaga et al, “Blockchain Technology Overview” (Report No NISTIR 8202, US Department of Commerce: National Institute of Standards and Technology, October 2018).

<sup>20</sup> *Blockchain Case Study: Australian Taxation Office*, n 4.

<sup>21</sup> Digital Transformation Agency, *Blockchain Case Study: Commonwealth Bank and the NDIS* <<https://www.dta.gov.au/help-and-advice/technology/blockchain/do-you-need-blockchain/blockchain-case-studies/blockchain-case-study-commonwealth-bank-and-ndis>>.

<sup>22</sup> See Digital Transformation Agency, *Annual Report 2018–19* (2019) 38.

<sup>23</sup> Parliament of Australia, Department of Parliamentary Services, Parliamentary Library, *Budget Review 2018–19* (Research Paper Series, 2017–2018, 23 May 2018).

<sup>24</sup> Parliament of Australia, Department of Parliamentary Services, Parliamentary Library, n 23. In 2021, the Commissioner of Taxation was appointed as the Registrar under *Business Names Registration Act 2011* (Cth), *Commonwealth Registers Act 2020* (Cth), *Corporations Act 2001* (Cth) and *National Consumer Credit Protection Act 2009* (Cth).

<sup>25</sup> FinTech Australia, *Australian Fintech: Leading the World* <<https://www.fintechaustralia.org.au/learn/>>. The industry comprises different services or service providers such as neobanks, crowdfunding platforms, lending services, regtech solutions, next generation payment platforms, capital markets, wealthtech, analytics, personal finance and insurtech.

<sup>26</sup> See, eg, Commonwealth of Australia, *Budget 2016–17: Overview* (3 May 2016) 12; Commonwealth of Australia, *Budget 2019–19, Agency Resourcing: Budget Paper No. 4 2018–19* (8 May 2018) 11, 166.

<sup>27</sup> The Treasury, *FinTech* <<https://treasury.gov.au/fintech>>.

<sup>28</sup> The Treasury, n 27.

to the government regarding barriers to technology adoption in the financial sector, policy environments for neobanks and the investments governed by corporate law in. The committee is now investigating how to remove such barriers and put Australia at the forefront of fintech innovations, with a core focus on regulating cryptocurrencies and digital assets and supporting neobanks.<sup>29</sup> Separately, in 2017, the government funded the City of Fremantle to develop a blockchain solution for establishing an integrated power, water and mobility system.<sup>30</sup> While the Australian government recognises blockchain as an emerging technology with the potential to value-add over US\$175 billion by 2025 to the Australian economy,<sup>31</sup> it seems logical to seize the opportunity for tangible benefits that blockchain technology can bring to tax regulations.

#### IV. ATO'S CHALLENGES FOR TAXPAYER ENGAGEMENT

Since Chris Jordan was appointed the 12th Commissioner of Taxation in 2013, the ATO has launched six strategic programs to reinvent the ATO. One of these programs was the Smarter Data Program, a holistic administrative approach to risk assessment, intelligence, analytics, data management and technology.<sup>32</sup> The remaining programs were optimised workforce capability and culture, tailored engagement and support, governance design and evaluation, contemporary digital services and working with our partners in the tax and superannuation systems.<sup>33</sup> According to the ATO's annual reports in 2015–2016, 2016–2017, 2018–2019 and 2019–2020, approximately 3% of the ATO's workforce worked in data analytics.<sup>34</sup> The ATO appears to have shown no initiative to adopt blockchain technology. In the global tax community, blockchain technology is emerging as a new solution that can provide tax authorities with effective tracking of transactions for value-added tax, greater visibility of microtransactions and confidence in the data supplied to them.<sup>35</sup> It has been suggested that blockchain technology can also help multinational businesses submit a consistent dataset to multiple tax authorities, enhancing the estimation of global business profits for combating profit-shifting.<sup>36</sup> Before exploring such specific uses of blockchain technology, it is necessary first to consider what problems need to be solved in the Australian taxation system.

In recent years, the Australian Government has been concerned about falling taxpayer engagement with the tax and superannuation system. In 2016, it tasked the House of Representatives Standing Committee on Tax and Revenue to investigate the issue.<sup>37</sup> The committee released its final report two years later, in 2018, which outlined three challenges of taxpayer engagement as follows.

First, the committee noted the new trend of workforce hire, facilitated by increased offshoring, online retailing, greater automation and self-service and more portable, cheaper and connected tools of trade.<sup>38</sup> The gig economy was of particular concern, which had quickly grown over the preceding 10 years,

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<sup>29</sup> Senate Select Committee on Australia as a Technology and Financial Centre, *Issue Paper* (Commonwealth of Australia, 2021).

<sup>30</sup> Department of Infrastructure, Regional Development and Cities, *Smart Cities and Suburbs Program* <<https://www.infrastructure.gov.au/cities/smart-cities/>>.

<sup>31</sup> Department of Industry, Science, Energy and Resources, *The National Blockchain Roadmap: Progressing towards a Blockchain-empowered Future* (Commonwealth of Australia, 2020).

<sup>32</sup> Australian National Audit Office, *Management of Small Business Tax Debt: Australian Taxation Office* (Auditor-General Report No 42, Commonwealth of Australia, 2019) 22.

<sup>33</sup> Australian Taxation Office, *Reinventing the ATO: Program Blueprint* (Commonwealth of Australia, 2015); Greg Williams, "Smarter Data Program: Reinventing Data and Analytics – The ATO Experience" (Australian Taxation Office Presentation, May 2015).

<sup>34</sup> The figure is based on 670 of 20,561 employees in 2015–2016, 702 of 20,435 employees in 2016–2017, 520 of 19,157 employees in 2018–2019 and 558 of 21,184 employees in 2019–2020: see Commissioner of Taxation, *Annual Reports 2016/17; 2018/19; 2019/20* (Commonwealth of Australia, 2017; 2019; 2020).

<sup>35</sup> PWC, *How Blockchain Technology Could Improve the Tax System* (PricewaterhouseCoopers LLP, 2016) 1 (*PWC Blockchain*).

<sup>36</sup> *PWC Blockchain*, n 35, 1.

<sup>37</sup> *Taxpayer Engagement with the Tax System*, n 6, [1.2].

<sup>38</sup> *Taxpayer Engagement with the Tax System*, n 6, [6.8], [6.46].

forging a rise in contractors for Australian tax purposes.<sup>39</sup> This phenomenon was a threat to government revenue. In the past, income tax revenue from workers was relatively effortlessly raised through the withholding tax system that mandates employers withhold taxes from salaries and wages. However, unlike employees, contractors do not automatically participate in the tax system by having taxes withheld by payers or in the nationwide mandatory superannuation guarantee scheme administered by the ATO.<sup>40</sup> Contractors pay taxes much later, generally after the income year in which the income is derived ends (as opposed to paying at source). There is a potential for revenue leakage because contractors may not be fully aware of their tax obligations and may under-report their actual income. Because the gig economy tends to source cheaper labour,<sup>41</sup> workers may not have sufficient funds to meet their tax liability when it falls due or when an audit results in tax payable at a later time.

To overcome this challenge, the committee suggested reviewing the functionality and utility of the ATO's employee/contractor decision tool.<sup>42</sup> This tool is merely a questionnaire to inform the law, not in any way meant to engage taxpayers to be compliant. It is especially helpful for workers forced into a contractual arrangement. These workers can complete the questionnaire to better understand their legal status and, depending on the tool's decision, may pursue entitlements they would have otherwise missed.

In addition, the committee suggested collecting gig workers' taxes at source through a withholding tax system.<sup>43</sup> In practice, this is difficult. Under the existing withholding system, employers withhold taxes based on the estimated total of annual salary and wages. Transparency of this system has been further improved by the Single Touch Payroll system, integrated into the employers' software to enable real-time reporting to the ATO of any payments made to or on behalf of employees.<sup>44</sup> Conversely, joining or leaving work is flexible in the gig economy and gig workers generally work in irregular patterns, making it difficult to estimate each worker's annual earnings. While contractors are subject to a tax instalment system – for example, the ATO forces contractors with at least \$4,000 earnings in the preceding year enter in the system,<sup>45</sup> their liability may not fall due until the financial year ends. Also, taxpayers can advise the ATO if they wish to vary the amount or frequency of instalments.<sup>46</sup> This system has not helped taxpayer engagement as required.

Second, workplace deduction rules for individual taxpayers, especially employees, are complex in Australia. Arguably, complex rules create a high administrative burden and tax avoidance opportunities.<sup>47</sup> The committee sought a legislative amendment to introduce a threshold up to which individuals with simple tax affairs could automatically claim work-related deductions (push returns), leaving only the taxpayers with workplace deductions over the threshold with full substantiation requirements.<sup>48</sup> Although this amendment would reduce administrative and compliance costs, including tax agent fees,<sup>49</sup> the counterargument would be that discrepant treatment might lead to economic inefficiency, deterring the private investment necessary for economic growth. Alternatively, it has been argued that income

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<sup>39</sup> While characterising an employee vs a contractor is based on common law principles for both tax and industrial laws, the Fair Work Commission recently ruled that a Deliveroo delivery worker was a contractor and therefore was not entitled to unfair dismissal remedies: *Gupta v Portier Pacific Pty Ltd* (2020) 296 IR 246; [2020] FWCFB 1698.

<sup>40</sup> *Taxpayer Engagement with the Tax System*, n 6, [6.5]–[6.27].

<sup>41</sup> *Taxpayer Engagement with the Tax System*, n 6, [6.14].

<sup>42</sup> *Taxpayer Engagement with the Tax System*, n 6, [6.27] (see, especially, Recommendation 7).

<sup>43</sup> *Taxpayer Engagement with the Tax System*, n 6, [6.24] (see, especially, Recommendation 6).

<sup>44</sup> For more information, see the Australian Taxation Office, *Single Touch Payroll* <<https://www.ato.gov.au/General/Other-languages/In-detail/Information-in-other-languages/Single-Touch-Payroll/>>.

<sup>45</sup> Australian Taxation Office, *PAYG Instalments* <<https://www.ato.gov.au/general/payg-instalments/?anchor=WhyyouhaveenteredthePAYGinstalmentssyst1#WhyyouhaveenteredthePAYGinstalmentssyst1>>.

<sup>46</sup> Australian Taxation Office, n 45.

<sup>47</sup> *Taxpayer Engagement with the Tax System*, n 6, [6.28]–[6.46].

<sup>48</sup> *Taxpayer Engagement with the Tax System*, n 6, [6.45] (“Recommendation 8”). See further John Minas and James P Minas, “Deductions for Work-related Expenses in Australia: An Analysis of Options for Reform” (2021) 36(1) *Australian Tax Forum* 53.

<sup>49</sup> *Taxpayer Engagement with the Tax System*, n 6, [6.42]–[6.43].

tax should be calculated based on accounting data as entered in software in case of small businesses to reduce tax compliance costs.<sup>50</sup> This requires a legislative amendment.

The third point, concerns for the cash (or hidden) economy, was subtle in the report.<sup>51</sup> More generally, the ATO has been chasing lost revenue through collaborations with other agencies. For example, it shared 64,110 reports in 2013–2014 and 80,978 reports in 2014–2015 with the Australian Transaction Reports and Analysis Centre (AUSTRAC), an agency responsible for monitoring criminal abuse of financial systems in Australia; AUSTRAC data contributed to 16,038 ATO cases, resulting in \$466 million in debt collection in 2014–2015.<sup>52</sup> About 5,000 cross-border transactions worth over \$900 million were uncovered in 10 years.<sup>53</sup> However, although transactions in or out of Australia are reported to AUSTRAC, cash handling in the domestic market remains invisible to the government.

Although the report discussed the tax treatment of cryptocurrency,<sup>54</sup> the possibility of using blockchain in tax administration was not fully explored. The committee noted that Dr Chris Berg, a researcher affiliated with the RMIT Blockchain Hub, previously said the following to the government:

Blockchain applications make things like real-time reporting and payment of tax obligations possible. A large public company, for instance, could place its accounts on a publicly verifiable blockchain, substantially reducing or eliminating the need for auditors. We're not proposing requiring real-time blockchain reporting as a regulatory requirement, but we would urge shareholders in public companies to consider demanding this of management. We can also see some attractions for small- and medium-sized firms of real-time blockchain reporting, as this would automate tax compliance and make business activity statement redundant. The ATO, in our view, should develop guidelines for real-time blockchain reporting that it would consider to be reasonably compliant.<sup>55</sup>

Dr Berg informed the government that blockchain technology could offer the capability of observing transactions and ledgers with little risk.<sup>56</sup> Concerning blockchain, Dr John Coyne in his private capacity attacked the ATO's recruitment process and suggested the ATO take a more flexible approach and hire experienced technology professionals, rather than employing mostly young people roughly in their last year of university as the ATO had done in the past 20 years.<sup>57</sup>

## V. PROPOSED BLOCKCHAIN SOLUTIONS

The ATO envisions being a leading tax and superannuation administrator known for its contemporary service, expertise and integrity.<sup>58</sup> Its strategic direction is to foster community participation in the tax

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<sup>50</sup> Haydn Daw, "How to Build a Transformational Tax System for Small Businesses Using Technology as a Pathway to Reform" (Tax and Transfer Policy Institute, 21 June 2021).

<sup>51</sup> For example, the government appointed the Black Economy Taskforce, chaired by Michael Andrew of the Board of Taxation, to develop forward-looking strategies to combat the cash economy. See Black Economy Taskforce, *Final Report – October 2017* (Commonwealth of Australia, 2017).

<sup>52</sup> AUSTRAC, *Annual Report 2014–15* (Commonwealth of Australia, 2015) 43.

<sup>53</sup> Kelly O'Dwyer, Minister for Revenue and Financial Services; Minister for Women; Minister Assisting the Prime Minister for the Public Services, "Action Underway Against Tax Evaders" (Media Release, 2 May 2018). Similar problems chasing lost revenue have occurred in Europe, and the European Parliament's Special Committee on Financial Crimes, Tax Evasion and Tax Avoidance has been tasked with uncovering VAT frauds: see European Parliament, *Draft Report on Financial Crimes, Tax Evasion and Tax Avoidance* (Report 2018/2121(INI), 26 March 2019) <[https://www.europarl.europa.eu/doceo/document/TA-8-2019-0240\\_EN.html](https://www.europarl.europa.eu/doceo/document/TA-8-2019-0240_EN.html)>.

<sup>54</sup> *Taxpayer Engagement with the Tax System*, n 6, [6.80]–[6.124]. See also the summary of Australia's regulatory for cryptocurrency in Peter Reeves and Emily Shen, *Blockchain & Cryptocurrency Regulation 2021: Australia* <<https://www.globallegalinsights.com/practice-areas/blockchain-laws-and-regulations/australia>>.

<sup>55</sup> *Taxpayer Engagement with the Tax System*, n 6, [6.98], referring to Commonwealth, Parliamentary Debates, House of Representatives, 18 October 2017 (Dr Chris Berg) 1–2.

<sup>56</sup> *Taxpayer Engagement with the Tax System*, n 6, [6.94].

<sup>57</sup> *Impact of New and Emerging Information and Communication Technology*, n 7, [3.39].

<sup>58</sup> Australian Taxation Office, *Strategic Direction* <<https://www.ato.gov.au/About-ATO/Managing-the-tax-and-super-system/Strategic-direction/>>.

and superannuation system through integrity, taxpayer confidence and streamlined, integrated and data-driven services.<sup>59</sup> In line with this strategic direction, this section provides a proposed blockchain solution to the obstacles surrounding taxpayer engagement discussed in the previous section. This solution, if implemented, will automatically manage a significant proportion of personal income tax returns. Taxpayers will not be required to lodge their tax return at the end of each financial year; instead, this proposed solution will compute the tax liability automatically and send an outstanding tax bill to the taxpayer or issue a refund. This solution proposes the use of mobile app and blockchain technology.

The proposed framework has the following workflow:

*Step 1: Capturing tax-deductible receipts* – A user (or taxpayer) visits a shop and makes a purchase.

Typically, the point-of-sale (POS) operator will accept the payment and issue a receipt. The first variation to the proposed workflow is here. During the payment process, the user can select whether or not the purchase is tax deductible. The option can be selected on the screen by the user or the operator. For tax-deductible purchases, the user is then asked to enter the percentage of the sale that is not tax deductible. The POS software will accept an entry of any percentage or a choice between, say, 20%, 50% or 100%. After making this selection, the user finishes the payment.

Tax information entered at the POS can be linked to the user's tax file number by creating a link to the credit card used for payment or recording bank account details in the personal income tax lodgement system, myGov.

*Step 2: Recording tax deductions* – This transaction is forwarded to a central database connected to myGov and the ATO and emailed to the user for their records. Access to the myGov website can be extended to a mobile phone app, where users can access transactions on their mobile phones and amend them, if required, before tax returns are issued. Taxpayers will use this app to record all their claimable expenses. This app can be integrated with POS terminals across Australia. Alternatively, a different solution could be implemented that will allow the user to access these transactions. For example, Officeworks now offers users the option to receive their receipts via email. Similarly, receipts from tax-deductible purchases could be forwarded to a dedicated app. Users could alter their claimable deductions via this app if necessary. Users can also transfer transactions to other taxpayers (eg family members) in case the deduction belongs to them.

*Step 3: Storing a permanent record on the blockchain* – Tax-deductible transactions are stored on a private blockchain. This private blockchain will be under the custodianship of the ATO.<sup>60</sup> ATO will have complete control over the blockchain, and it will be a source of truth. All the required information will be available in a searchable format, substantially reducing the need for ATO officers to request additional information from taxpayers. Taxpayers will also have the option to submit any additional information (if requested by the ATO) to the blockchain using a myGov mobile app.

*Step 4: Automating tax returns* – Automatic processing of deductions will be an extension of the current myGov software. Currently, taxpayers need to log in and add information to myGov. The next generation "eGov" should have the following features or functionalities. It will automatically fetch information related to deductions and add it to eGov. The ATO will then process allowable deduction items automatically.

Earlier, the DTA suggested a legislative amendment surrounding deduction thresholds. Alternatively, the ATO can set the reasonable expense amounts limits for specific items or the overall deduction threshold.<sup>61</sup> Either way, deductions over this threshold will trigger an alert so that the taxpayer verifies the information. This processing is expected to automate tax returns for the vast majority of taxpayers. Tax automation needs a reliable data source to prevent rework; thus, reliable and vetted data stored on the blockchain become an important element of this workflow.

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<sup>59</sup> Australian Taxation Office, *ATO Corporate Plan* (Commonwealth of Australia, 2020) 2.

<sup>60</sup> This ensures control: see *PWC Blockchain*, n 35, 2.

<sup>61</sup> See, eg, the Australian Taxation Office, *Income Tax: What Are the Reasonable Travel and Overtime Meal Allowance Expense Amounts for the 2010–21 Income Year?* (Taxation Determination: TD 2020/5, 2020).



This framework streamlines one of the most common tax-related activities. In particular, steps 1 and 2 provide two marked benefits. First, they ensure proper record keeping of all tax-deductible receipts, so the user does not need to spend time collating all receipts at the end of the year. Second, they give real-time insight to the ATO on how many deductible purchases taxpayers will be making, which helps detect high-risk audit areas early and launch pre-lodgment tax compliance campaigns. Step 4 is complementary, creating a light touch, easy and convenient tax compliance environment. It is expected that a large proportion of the Australian population will benefit from this framework.

Some taxpayers may have other sources of income. The ATO currently verifies data from various sources, for example, Centrelink (administering welfare programs), AUSTRAC (recording transactions of \$10,000 or more within Australia and all cross-border transactions), banks (reporting interest income), companies (reporting dividend payouts), RP Data (recording real estate transactions) and private health insurers (reporting private health insurance tax rebates). The data verification presently carried out by humans can be built into the system with blockchain (step 3) for accurate calculation in step 4. For example, RP Data can hold off completing an automated tax return and trigger an alert to a property purchaser to input financial details of an investment property.<sup>62</sup> An option may be given for taxpayers to place a hold on automated tax returns until further notice in case taxpayers receive foreign income that cannot be captured automatically.

The next step is to extend the proposed framework above to integrate platforms that verify information from taxpayers operating in the gig economy or to capture unreported income in the cash economy. This can be done by requesting Uber, Uber Eats, Deliveroo and any such labour hire firms to automatically report gig workers' income to the ATO.

Overall, the proposed solution using blockchain technology will improve taxpayer engagement by easing the compliance burden.<sup>63</sup> It should result in a noticeable increase in productivity in the ATO's tax administration and compliance workflow. It will help combat tax evasion in the domestic cash economy; however, combating tax evasion in the international cash economy may require collaboration with other jurisdictions.

## VI. SUMMARY AND PERSPECTIVES

Blockchain technology has tremendous potential to improve the taxpayer experience for individuals and streamline the workflow for tax authorities. This article began with a brief description of blockchain technology and followed by investigating the status quo regarding blockchain adoption by the Australian Government. The Australian Government commissioned two pilot studies to investigate the potential use of blockchain in regulatory environments, but the DTA concluded in 2019 that blockchain technology was too immature for adoption by the government. Since no active project has followed in this space, this article considered real-life problems that blockchain could solve. In 2018, the House of Representatives Standing Committee on Tax and Revenue reported that three areas hindered taxpayer engagement: the growing gig economy, workplace deduction rules and, more generally, the hidden economy avoiding taxes.

Regarding blockchain adoption, PricewaterhouseCoopers commented: "We need to start small and look for the human problems that need to be solved."<sup>64</sup> This advice can be echoed for any technology solution. For example, fintech solutions have been successful because they address a specific problem that users face. A similar approach is needed to determine how technology can help the taxation system, that is, first find the pain points for taxpayers and then explore technology options to solve these challenges. This article outlines a proposal that solves a small problem that every taxpayer faces. By starting with

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<sup>62</sup> Utilising blockchain technology and in particular smart contracts for real estate transactions has been suggested in Ioannis Karamitsos et al, "Design of the Blockchain Smart Contract: A Use Case for Real Estate" (2018) 9(3) *Journal of Information Security* 177.

<sup>63</sup> High tax compliance burden is an ongoing issue in Australia: see, eg, The Tax Institute, *The Case for Change: A Paper to Prompt Discussion for the Future of Australia's Tax System* (2021) Chs 2–4.

<sup>64</sup> *PWC Blockchain*, n 35.

a small step, users gain confidence in the technology and trust in the software, learning how disputes are mediated and how other fraudulent behaviour can be detected. Accordingly, this article proposed a blockchain solution that will primarily benefit individual taxpayers in light of the three problem areas concerning taxpayer engagement.

The proposed solution comprises (1) capturing tax-deductible receipts, (2) recording tax deductions, (3) storing data permanently on the private blockchain and (4) automating tax returns. This solution enables the ATO to have greater visibility of microtransactions. A significant volume of individual taxpayers' personal income tax return lodgment is expected to become redundant by implementing it. This also allows the ATO to capture gig workers' true income in real time. While addressing this small aspect of personal income tax is the beginning, the blockchain solution could gradually include other aspects of personal tax returns and extend to corporate and multinational taxpayers.

Notably, blockchain technology is only part of the overall technology solution. Typically, any web or software application is a combination of various technologies, and every piece of technology has a specific purpose. While blockchain will offer reliable data storage with total transparency and visibility, ensuring trust and preventing fraud, it is best when supported by mobile app technology and back-end database technology. The solution will be a technology fusion.

As with all other technologies, blockchain has accompanying challenges. First, wrong or false information can enter the blockchain if proper validation is not in place. (Data validation can be incorporated in the proposed solution.) Fraudulent behaviour cannot be prevented entirely, although having easy access to historic information (or transactions) will make it more difficult to defraud the system.<sup>65</sup> History tells a story, and changing the story is difficult, especially when several parties are involved. In approaching taxpayers who frequently add information to ensure different tax outcomes, a function can be added to limit the number of changes that can be made during the lodgment period to reduce the opportunities for fraud. Second, allowing sensitive information to fall into the wrong hands is particularly detrimental for the government. Security and privacy concerns are an ongoing challenge (although permissioned blockchains, like that proposed in this article, better preserves privacy<sup>66</sup>), and blockchain technology is evolving to address these concerns. Last, implementing blockchain, like all technologies, requires a sound understanding of the problem to be solved – in this case, a sound understanding of tax law is integral to predetermining the functionalities of blockchain-based applications.<sup>67</sup> Additionally, the government, acting as a convenor or the main participant in the development, must ensure that the technical capability is present to make the blockchain solution adaptive to ongoing changes in the law.

Setting up blockchain is perceived to be costly, but the rule of thumb for any investment is the question of whether the potential returns outweigh the investment cost. There are many options available to tweak the blockchain solution to make it cost effective and affordable. Like any software or physical product, the cost is a function of features and functionality, and a blockchain solution can be designed across a range of price points that suit the business case. Likewise, the proposed solution in this article can be designed according to what it specifically intends to achieve regarding benefits, including low transactional costs, real-time visibility and credibility of data and effective revenue raising. The time has come to move away from politics and media hype and consult with blockchain experts who have experience in design, development and deployment and an open mind.

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<sup>65</sup> See Dimaz Ankaa Wijaya, "A New Blockchain-based Value Added Tax System" in Tatsuki Okamoto et al (eds), *Provable Security* (Springer, 2017).

<sup>66</sup> Xiwei Xu et al, "The Blockchain as a Software Connector" (13th Working IEEE/IFIP Conference on Software Architecture, 2016) 190.

<sup>67</sup> OECD suggests tax laws be clearly defined in different jurisdictions: OECD, "Blockchain Technologies as a Digital Enabler for Sustainable Infrastructure" (OECD Environment Policy Paper No 16, 2019) 56.