

# MAPPING THE BOUNDS FOR INTEGRATION OF BLOCKCHAIN TITLES IN A TORRENS SYSTEM

KATE GALLOWAY,<sup>\*</sup> FRANCINA CANTATORE<sup>†</sup> AND LOUISE PARSONS<sup>‡</sup>

*As land becomes increasingly expensive in Australia fewer people can afford it, with consequences for wealth distribution and housing. Real estate, in particular the family home, has formed a foundation for Australians' wealth over many decades, but the possibility of home ownership has been deteriorating in recent years. Alternative proposals for property investment include issuing fractions of land title on blockchain with parallel registration in the land registry. While such proposals are technically feasible, they are silent as to the means of integrating the blockchain ledger with the land administration system. As the land administration system comprises multiple statutory processes, this article uses the Queensland system as a case study, to analyse the relevant statutes in terms of the integration of a fractionalised blockchain titles system. The aim is to identify the law reform necessary to achieve a high level of integration of fractionalised land titles on a blockchain, within an existing land administration system — without detracting from the policy goals of that system.*

## I INTRODUCTION

As land becomes increasingly expensive in Australia fewer people can afford it, with consequences for wealth distribution and housing. Real estate, in particular the family home, has formed a foundation for Australians' wealth over many decades. However, between 1981 and 2016, those with a real property mortgage (an indicator of land ownership) fell from more than 60 per cent of the population, to 45 per cent. In addition, for the poorest 20 per cent of the population, home ownership fell during that period from 63 per cent of the population to only 23 per cent.<sup>1</sup>

So long as land remains a key component of Australian household wealth, there is an inherent paradox: wealth is maximised for those who have land through a buoyant market supporting high values, yet high prices act as barriers

---

<sup>\*</sup> Professor, Australian Catholic University, Thomas More Law School.

<sup>†</sup> Associate Professor, Faculty of Law, Bond University.

<sup>‡</sup> Associate Professor, Faculty of Law, Bond University.

<sup>1</sup> Brendan Coates and Carmela Chivers, 'Home Ownership Now the Great Divider of Australian Society', *Sydney Morning Herald* (Online, 19 September 2019) <<https://www.smh.com.au/national/home-ownership-now-the-great-divider-of-australian-society-20190919-p52syz.html>>.

to entry into that same market. Consequently, there is interest in measures that support affordable land ownership.

Various asset structures have emerged as an indirect means of investment in land. They generally involve acquisition of shares or units in a landowning entity, with dividends payable based on capital gains or rental returns. Such products do not, however, comprise land ownership as such.<sup>2</sup> By contrast, in late 2019, the South Australian government announced a proposal to release *fractions* of a land title where each fraction is 1/20 of the title. The fraction would be held in common with other investors who would each receive a proportion of the rent, and the capital gain on the land. These *fractionalised* interests would be traded using blockchain technology, as well as being registered in the land title registry. These interests were to be called 'bricklets'. This novel means of issuing land titles would, theoretically, provide the security of ownership of land but at a price that would be affordable to many more people.

In our initial analysis of the proposal, we identified that the issue and trading of blockchain-based bricklets would be technically possible.<sup>3</sup> However, using Graglia and Mellon's framework,<sup>4</sup> we also identified that the proposal failed to provide for even a low level of integration of the bricklet blockchain into the existing land administration system. According to Graglia and Mellon, the lower the level of integration, the weaker the use-case for a blockchain. To fully analyse the potential for integration of a blockchain-based system of fractionalised land titles requires a deeper understanding of the relationship between land title and administrative structures that facilitate it.

In this article, following from our initial analysis, we examine the land administration system itself to identify more clearly the data infrastructure that surrounds land title. Our aim is to analyse the capacity of a (theoretical) bricklet-style fractionalised title on a blockchain to integrate with a land administration system.

Part II explains land in terms of data, where that data collectively comprises a land administration system. Part III then provides a survey of the literature to identify the conceptual foundations and goals of a contemporary land administration system, focusing on those of a developed economy.<sup>5</sup> Part IV builds on the conceptual foundation developed in Part III by identifying the foundation and goals of land administration in the Australian context, before applying this understanding to the statutory framework of Queensland's land administration system. It uses the Queensland system as a case study of the state's

---

<sup>2</sup> Francina Cantatore, Kate Galloway and Louise Parsons, 'Fractionalised Land Interests: More Questions Than Answers' (2020) 28(2) *Australian Property Law Journal* 39, 48.

<sup>3</sup> Cantatore, Galloway and Parsons (n 2) 50.

<sup>4</sup> J Michael Graglia and Christopher Mellon, 'Blockchain and Property in 2018: At the End of the Beginning' (2018) 12(1–2) *Innovations: Technology, Governance, Globalization* 90.

<sup>5</sup> See generally Henri AL Dekker, *The Invisible Line: Land Reform, Land Tenure Security and Land Registration* (Routledge, 1<sup>st</sup> ed, 2016).

representation of land as data, mapping it onto the recognised standards of effective land administration systems. This part reveals the extent of data involved in land titling as part of a land administration system, providing a foundation on which to assess the feasibility of integrating a blockchain title scheme, canvassed in Part V. Our contention is that land title is dependent not only on principles of property, or a single data point known as ‘title’, but rather is part of an extensive network of data, which poses a significant challenge for the introduction of new titling technologies. Consequently, any proposal to represent land title on a blockchain requires integration within the broader land administration system.

## II LAND AS DATA

As a precursor to analysing the features of a land administration system, this Part explains how the law depends upon the conception of land as data. While real property law in Australia is concerned with land title, it is well recognised that title alone cannot exist without an information infrastructure:<sup>6</sup> the land administration system. That system includes the land register, which is the ‘official record ... of rights on land or of deeds concerning changes in the legal situation of defined units of land’.<sup>7</sup> The register in turn depends on spatial information and multiple other datapoints relevant to identifying land and the rights subsisting in it. This is frequently termed the cadastre: ‘a methodically arranged public inventory of data concerning properties within a certain country or district, based on a survey of their boundaries’.<sup>8</sup> Despite the materiality of the thing that is owned, possessed, or otherwise put to use (ie, land), interests in land in Australia exist in the abstract realms of data. One consequence of its representation as data is that land has become readily and securely fungible, representing its key role within the nation’s financial and socially constructed infrastructure.<sup>9</sup>

The primary unit of land tenure, and therefore of land administration, is the land parcel<sup>10</sup> — the product of what Dekker describes as ‘invisible lines’ across the

---

<sup>6</sup> See Simon Winchester, *Land: How the Hunger for Ownership Shaped the Modern World* (William Collins, 2021).

<sup>7</sup> Jaap Zevenbergen, ‘A Systems Approach to Land Registration and Cadastre’ (2004) 1(1) *Nordic Journal of Surveying and Real Estate Research* 11, 11 (‘A Systems Approach’).

<sup>8</sup> *Ibid.*

<sup>9</sup> See generally, Sarah Keenan, ‘Property: Changing Formations of Having and Being’ in Simon Stern, Maksymilian Del Mar and Bernadette Meyler (eds), *The Oxford Handbook of Law and Humanities* (Oxford University Press, 2019) 539; Sarah Keenan, ‘The Transfer of What? Electronic Conveyancing and the Destabilisation of Property’ (2023) 5(1) *Law, Technology and Humans* 11, 15 (‘Destabilisation of Property’).

<sup>10</sup> International Federation of Surveyors, *FIG Statement on the Cadastre* (FIG Publication No 11, 1995); Dekker (n 5) 27.

landscape.<sup>11</sup> It is accepted that there is no possibility of tenure — of any kind — without first identifying the area of the earth's surface attaching to the relevant rights.<sup>12</sup> The spatial dimensions of the parcel exist both as a measure and as fixed points, situating the parcel in relation to other parcels and as an absolute location on the earth. A 'metes and bounds' description was traditionally used to this end, according to features of the natural landscape, but increasingly sophisticated surveying tools now render lot boundaries by GPS as an ostensibly absolute reading. Of note, however, is that even GPS technology is variable due to alterations in the earth's axis. The Queensland government, for example, is currently fixing the datum to accommodate a shift in Australia's continental tectonic plate of some 7cm per year,<sup>13</sup> highlighting the need for ongoing maintenance of spatial data in the interests of accuracy, and therefore confidence, in the system.

While bounds might be fixed solely with reference to geospatial coordinates, the cadastre generally encompasses survey plans as a visual representation of the parcel's spatial dimensions.<sup>14</sup> The survey plan captures not only absolute and relative locational data, but also differential usage such as roads and easements, some landscape features such as creeks and rivers, and unique parcel identifiers that provide a reference point for tenure and other interests and purposes.<sup>15</sup> The unique parcel identifiers on the plan of survey link the physical parcel of land to property in that parcel, as well as to operations of the State such as taxation, land distribution, planning, and other regulation. Kalantari et al identify four principal subsystems that represent these datasets: land mapping, land registry, land development and land valuation.<sup>16</sup>

Data concerning a single parcel of land forms part of a state's digital cadastral dataset<sup>17</sup> and relates to data for all other parcels. This data is captured, used, and shared by many departments of executive government, and interrelates with private sector activities such as conveyancing, building and land development, and the financial sector.

Collectively, this data and the activities concerning it comprise the land administration system.

---

<sup>11</sup> Dekker (n 5) 27–8.

<sup>12</sup> Jo Henssen, 'Basic Principles of the Main Cadastral Systems in the World' (Seminar Paper, Committee 7 – Cadastre and Rural Land Management, International Federation of Surveyors, 16 May 1995) 7–8.

<sup>13</sup> 'GDA2020 in Queensland', *Queensland Government Department of Resources* (Web Page, 21 July 2023) <<https://www.resources.qld.gov.au/data-mapping/initiatives/gda2020-queensland>>.

<sup>14</sup> *Land Title Act 1994* (Qld) s 49A ('LTA'): 'A lot defined in the plan [of subdivision] is created as a lot when the plan is registered'.

<sup>15</sup> *Survey and Mapping Infrastructure Act 2003* (Qld) s 46 ('*Survey and Mapping Infrastructure Act*').

<sup>16</sup> Mohsen Kalantari et al, 'An Interoperability Toolkit for e-Land Administration' (Conference Paper, Centre for Spatial Data Infrastructures and Land Administration, 9–11 November 2005) 1 ('*Interoperability Toolkit*').

<sup>17</sup> *Ibid.*

### III BEST PRACTICE IN LAND ADMINISTRATION SYSTEMS

Divergent approaches to land administration systems have been recognised.<sup>18</sup> The two key variables in evaluating the effectiveness of a system appear to be the principal purpose of the state's regulation of land — and thus its land administration system — and the history, or cultural approach to land within any given society.<sup>19</sup>

For example, a principal concern expressed in the global literature over recent years, in the face of changing climate and rapid industrial development, has been the relationship between a land administration system and how that system upholds land management priorities that support agriculture and therefore food security.<sup>20</sup> Related to protecting the farming capacity of land is the question of environmental protection,<sup>21</sup> and the distribution of access to land.<sup>22</sup> These priorities are, however, not central to the primary concern of Australian land administration systems. Like other western nations, governmental administration of land in Australia tends to prioritise economic outcomes, which are perhaps best exemplified by the cornerstone of private land administration, the Torrens register. Keenan, for example, describes the 'speed and efficiency' of the Torrens system and the shoring up of security interests attendant on the move to e-conveyancing.<sup>23</sup> Generally, economic goals are achieved through systematised access to accurate and guaranteed title generating trust in the land market and, consequently, ready access to credit through mortgaging land.<sup>24</sup> While property rights aligned with the cultural, political and historical norms of a jurisdiction are the building blocks of land tenure and the register component of

<sup>18</sup> As canvassed, eg, in S Enemark, I Williamson and J Wallace, 'Building Modern Land Administration Systems in Developed Economies' (2005) 50(2) *Journal of Spatial Science* 51.

<sup>19</sup> See generally, Evrim Tan et al, 'A Capacity Assessment Framework for the Fit-for-Purpose Land Administration Systems: The Use of Unmanned Aerial Vehicle (UAV) in Rwanda and Kenya' (2021) 102 *Land Use Policy* 105244; Ian P Williamson, 'Land Administration "Best Practice" Providing the Infrastructure for Land Policy Implementations' (2001) 18(4) *Land Use Policy* 297.

<sup>20</sup> See, eg, Georgina Rockson, Rohan Bennett and Liza Groenendijk, 'Land Administration for Food Security: A Research Synthesis' (2013) 32 *Land Use Policy* 337; Rohan M Bennett et al, 'Land Administration For Food Security' in Jaap Zevenbergen, Walter de Vries and Rohan Bennett (eds), *Advances in Responsible Land Administration* (CRC Press, 1<sup>st</sup> ed, 2015) 37; Peter H Verburg et al, 'Land System Change and Food Security: Towards Multi-Scale Land System Solutions' (2013) 5(5) *Current Opinion in Environmental Sustainability* 494.

<sup>21</sup> See Diana Stuart, 'Constrained Choice and Ethical Dilemmas in Land Management: Environmental Quality and Food Safety in California Agriculture' (2009) 22(1) *Journal of Agricultural and Environmental Ethics* 53.

<sup>22</sup> See, eg, Stig Enemark et al, *Fit-or-Purpose Land Administration* (FIG Publication No 60, 2014); Stig Enemark, 'Land Administration Systems' (Conference Paper, Map World Forum, 10–13 February 2009).

<sup>23</sup> Keenan, 'Destabilisation of Property' (n 9) 13, 14.

<sup>24</sup> As argued by Hernando de Soto, 'A Tale of Two Civilizations in the Era of Facebook and Blockchain' (2017) 49(4) *Small Business Economics* 729.

a land-administration system, in a modern society credit structures might also be included.<sup>25</sup>

A land-administration system that prioritises economic considerations, such as those in Australia, will generally involve a process of registration that can facilitate legally enforceable rights. This is especially important in supporting an active real estate market. To achieve a sustainable system protecting property interests, however, requires adequate information for policymakers,<sup>26</sup> which demands a holistic approach to the cadastre. The system's data interoperability with both public and private systems, and the imperative for ready access to data by different stakeholders, are common themes in the literature.

Oukes et al offer a case study of The Netherlands by way of example, describing the process involved in updating its cadastre, land registry, and mapping agencies' information systems.<sup>27</sup> They identify core design considerations including information and data model design, including information exchange, laws and regulations, delegations and responsibilities, and interoperability.

Similarly, Austria has traditionally relied on an elaborate system of land administration to support its highly secure land titling system.<sup>28</sup> In the late 1990s, Austria deployed technology to combine data from various government and judicial agencies. Despite enhanced efficiency through more interoperable land data, Zevenbergen observes that it remains expensive, bureaucratic, and over-decentralised. Enhancements are only likely to be undertaken where stakeholders perceive an imperative to do so.<sup>29</sup>

In the case of Switzerland, Steudler and Williamson found a comprehensive cadastre, a very decentralised system with high private sector participation, good cooperation between public and private sectors, well-established data modelling techniques, a conceptually strong basis for a national spatial data infrastructure, a reputation for reliability and security, and a regular and comprehensive review strategy.<sup>30</sup> Despite these strengths, they also observe weak cooperation between the public, private, and academic sectors, weak horizontal cooperation between federal offices regarding spatial data, competition between different interest groups, low digitisation of cadastral data, and copyright and privacy issues.<sup>31</sup>

In contrast to these observations of European jurisdictions, Australian land administration systems are largely integrated within each state and territory —

---

<sup>25</sup> Dekker (n 5) 32.

<sup>26</sup> Such as the systems approach described in Zevenbergen, 'A Systems Approach' (n 7).

<sup>27</sup> Peter Oukes et al, 'Domain-Driven Design Applied to Land Administration System Development: Lessons from the Netherlands' (2021) 104 *Land Use Policy* 105379.

<sup>28</sup> Jaap Zevenbergen, *Systems of Land Registration: Aspects and Effects* (Netherlands Geodetic Commission, 2002) 152–8.

<sup>29</sup> *Ibid.*

<sup>30</sup> D Steudler and IP Williamson, 'Evaluation of National Land Administration System in Switzerland' (2005) 38(298) *Survey Review* 317, 329.

<sup>31</sup> *Ibid.*

although they stand alone within each jurisdiction. Australian jurisdictions have moved towards e-land administration in the last 30 years,<sup>32</sup> including the shift to digital titles, digital lodgement of survey plans, online access to survey plan information,<sup>33</sup> and, most recently, the introduction of electronic conveyancing. The automation of Australian registers has enhanced the interoperability of the cadastre,<sup>34</sup> and, despite early concerns about electronic titling,<sup>35</sup> has seen wide acceptance among stakeholders.

Despite the state-based systems, the public-private cooperative venture of e-conveyancing, discussed below, has facilitated greater interoperability between jurisdictions. E-conveyancing is an information technology platform interlinked with the electronic register of each participating state and territory,<sup>36</sup> evidencing the tolerance of Australian stakeholders to expand and embrace technological advances in the interests of enhanced economic efficiency in land administration. Digitising the land administration system makes more information available to stakeholders. In Australia, where efficiency in the real estate market is a prime driver of advances in land administration, an integrated system reduces the information cost of real estate transactions,<sup>37</sup> at least for certain stakeholders.<sup>38</sup>

As Kalantari et al observe, however, digitisation of constituent data does not guarantee interoperability of subsystems as their implementation can be isolated to one subsystem rather than designing overall harmonisation of data between all subsystems. Further, the extent of their interoperability is constrained by the extent of data exchange.<sup>39</sup>

The time taken to implement Australia's e-conveyancing system illustrates the challenges in designing a register that is interoperable both beyond state lines<sup>40</sup> and through integration of additional data. In the next Part, we use Queensland as an example to set out the principal datasets comprising its land-administration system.

---

<sup>32</sup> For a description of e-land administration, see Mohsen Kalantari et al, 'Toward e-Land Administration: Australian Online Land Information Services' in *Proceedings of the SSC (Spatial Sciences Institute, 2005)* ('Toward e-Land Administration').

<sup>33</sup> Kalantari et al, 'Interoperability Toolkit' (n 16) 1.

<sup>34</sup> For a case study in interoperability, see Hamed Olfat et al, 'Moving Towards a Single Smart Cadastral Platform in Victoria, Australia' (2020) 9(5) *ISPRS International Journal of Geo-Information* 303.

<sup>35</sup> Sharon Christensen and Amanda Stickley, 'Electronic Title in the New Millennium' (2000) 4(2) *Flinders Journal of Law Reform* 209, 233.

<sup>36</sup> See description in Keenan, 'Destabilisation of Property' (n 9) 15.

<sup>37</sup> See generally, A Dawidowicz, A Radzewicz and M Renigier-Bilozor, 'Algorithm for Purposes of Determining Real Estate Markets Efficiency with Help of Land Administration System' (2014) 46(336) *Survey Review* 189.

<sup>38</sup> See, eg, Keenan, 'Destabilisation of Property' (n 9) 17.

<sup>39</sup> Kalantari et al, 'Interoperability Toolkit' (n 16) 7.

<sup>40</sup> As analysed in, eg, Eugene Clark, 'E-Conveyancing in Australia: An Important Step Along the Journey to E-Government' (2011) 21(1) *Journal of Law, Information and Science* 62; Peter Rosier, 'Electronic Conveyancing in Australia: Recent Developments' (2020) 94(3) *Australian Law Journal* 172.

## IV LAND ADMINISTRATION FRAMEWORK IN QUEENSLAND

There are six principal types of land title in Australia — Torrens title; strata title (reliant upon Torrens, but with its own features); Crown land title; Aboriginal and Torres Strait Islander tenures including native title; old system title; and possessory title.<sup>41</sup> This article focuses on the application of the land administration system in the context of freehold in fee simple only. Although only constituting approximately 30 per cent<sup>42</sup> of the Australian land mass, the freehold estate (comprising Torrens and including strata title) is the predominant form of landholding in the most populous areas of the nation. Given the size and economic importance of the market in freehold land in Australia,<sup>43</sup> and the highly developed nature of the system of which the Torrens register forms part, our investigation focuses on the freehold land administration system.

Using Queensland as a representative case study, this Part provides an overview of the State land administration system to identify its purpose and cultural context relating to freehold title; the subsystems involved; and the extent of the three baseline standards of a land administration system: registration, data interoperability, and access to data. It starts by briefly outlining the current Australian context for land administration.

### A Purpose and Context of the Freehold Land Administration System

Through the English assertion of the common law in the Australian colonies, land tenures before the introduction of the Torrens system were held under ‘old system’ title, unless and until it was converted to Torrens title.<sup>44</sup> A primary disadvantage with old system title was that title information was privately held. The system relied on the landowner to retain the deeds relating to dealings with the lot granted, and to provide current and historical deeds to a purchaser as evidence of title. In the colonies, where land grants and a market in land were essential for emerging economies, privately held land information resulted in complex conveyancing processes and significant scope for error and fraud.<sup>45</sup>

<sup>41</sup> Brendan Edgeworth, *Butt's Land Law* (Thomson Reuters, 7<sup>th</sup> ed, 2017) 801.

<sup>42</sup> ‘National Land Account, Experimental Estimates’, *Australian Bureau of Statistics* (Web Page, 22 June 2021) <<https://www.abs.gov.au/statistics/environment/environmental-management/national-land-account-experimental-estimates/latest-release>>. See also ‘Climateworks Centre’, *Land Use Futures: Freehold* (Web Page, 2023) <<https://climateworkscentre.org/land-use-futures/australias-land-use>>.

<sup>43</sup> See, for example, the growth of the Western Australian property market, detailed in Landgate, *Annual Report* (Report, 2022–23), 48 <<https://www.landgate.wa.gov.au/siteassets/documents/about-us/strategic-plans-and-annual-reports/landgate-22-23-annual-report.pdf>>.

<sup>44</sup> In Queensland, all land has been converted to Torrens Title and no old system land remains as a result of compulsory conversion under the *Property Law Act 1974* (Qld) pt 18 div 4 ss 250–4A.

<sup>45</sup> Anne Wallace, Michael Weir and Les McCrimmon, *Real Property Law in Queensland* (Thomson Reuters, 5<sup>th</sup> ed, 2020) 278.

The Torrens system, introduced in South Australia in 1858, centralised land titling information to reduce the cost of information access and to shore up the accuracy of the titling information held. The system depends upon a centralised and accessible register of land data, including the cadastre and all interests. To operate on a title required matching data in the government ledger with a duplicate instrument of title or dealing. The combination of state-managed and guaranteed land data with the indefeasibility of the recorded interest created certainty in commercial dealings, supporting the objectives of secure land titles and economic growth, both in the early days of the State and into the present.<sup>46</sup> It did so through introduction of ‘title by registration’,<sup>47</sup> conferring on the registered proprietor of an interest in Torrens title land a government guaranteed indefeasible title to that interest.<sup>48</sup> The system was adopted throughout Australia,<sup>49</sup> and is regulated by each individual state and territory.

In a major development in the management of land data, the physical ledger and paper title were replaced in Queensland by the automated titles system with the advent of the *Land Title Act 1994* (Qld) (*LTA*). Paper titles are no longer available and all freehold land data is electronic.

To date, proposals recommending a uniform Torrens title code Australia-wide have not been implemented.<sup>50</sup> Consequently, land administration has been dealt with pursuant to the systems of each state and territory. Jurisdictional differences are also reflected in regulation of the transfer of land and conveyancing systems. In all states and territories, conveyancing of both old system and Torrens land has traditionally occurred face-to-face, a method used in Queensland for over 150 years,<sup>51</sup> until February 2023, when e-conveyancing was introduced as the standard method of conveyance.<sup>52</sup>

## B Land Administration Systems and Subsystems

Given the background of the Torrens focus on economic development through a central government register of interests supported by associated land data, the starting point for analysing Queensland’s land administration system lies in three agencies responsible for surveying and mapping, land registration, and land

<sup>46</sup> Tim Hanstad, ‘Designing Land Registration Systems for Developing Countries’ (1998) 13 *American University International Law Review* 647, 658–9.

<sup>47</sup> *Breskvar v Wall* (1971) 126 CLR 376, 381 (Barwick CJ).

<sup>48</sup> *Bahr v Nicolay [No 2]* (1988) 164 CLR 604, 613 (Mason CJ and Dawson J).

<sup>49</sup> Edgeworth (n 41) 824.

<sup>50</sup> As reported in, eg, Marcia Neave, ‘Towards a Uniform Torrens System: Principles and Pragmatism’ (1993) 1(2) *Australian Property Law Journal* 114; Susan MacCallum, ‘Uniformity of Torrens Legislation’ (1993) 1(2) *Australian Property Law Journal* 135; Edward Kerr, ‘Property Law: Uniformity of Laws’ (1993) 1(2) *Australian Property Law Journal* 145.

<sup>51</sup> Wallace, Weir and McCrimmon (n 45) 291.

<sup>52</sup> *Land Title Regulation 2022* (Qld) reg 2: ‘This regulation commences on 20 February 2023’.

valuation.<sup>53</sup> Kalantari et al characterise these within four main *subsystems* of the overall land administration system: land mapping, land registry, land development and land valuation. These subsystems map on to higher level *systems* objectives of regulation of land development, the control of land use, land taxation, and resolution of disputes involving land.<sup>54</sup>

The volume of spatial data generated by the Queensland land administration system is significant and relies on multiple administering agencies. The diversity of regulation in the four key areas identified would require further examination to ascertain the extent of their integration. We note, for example, the comprehensive study of Victorian statutes undertaken by Bennett, Wallace and Williamson to estimate the number of provisions that authorise the creation of statutory encumbrances, and to provide a system for classifying them.<sup>55</sup> The authors identified 514 Federal Acts, 620 Victorian Acts and 11 local laws that authorised the creation of types of ‘property rights, restrictions or responsibilities’ affecting interests in land.<sup>56</sup>

This more modest analysis highlights, for our purposes, the cornerstone legislation establishing the framework for Queensland’s land administration system.

For the Queensland system supporting freehold titles, Table 1 summarises the key statutes involved in achieving the system’s higher objectives, based on their objects. Each forms a step in developing an infrastructure for achieving the system objectives.

---

<sup>53</sup> See generally, Peter F Dale and John D McLaughlin, *Land Administration* (Oxford University Press, 1999). The authors take the approach that, in the new land-management paradigm, the core functions of land administration remain organised around three sets of agencies responsible for surveying and mapping, land registration, and land valuation.

<sup>54</sup> Kalantari et al, ‘Interoperability Toolkit’ (n 16).

<sup>55</sup> Rohan Bennett, Jude Wallace and Ian Williamson, ‘Organising Land Information for Sustainable Land Administration’ (2008) 25(1) *Land Use Policy* 126 (‘Organising Land’) 128. See also Pamela O’Connor, Sharon Christensen and Bill Duncan, ‘Legislating for Sustainability: A Framework for Managing Statutory Rights, Obligations and Restrictions Affecting Private Land’ (2009) 35(2) *Monash University Law Review* 233, for a discussion of the research.

<sup>56</sup> Bennett, Wallace and Williamson, ‘Organising Land’ (n 55) 128; Rohan Bennett, Jude Wallace and Ian Williamson, ‘Achieving Sustainable Development Objectives Through Better Management of Property Rights, Restrictions and Responsibilities’ (Conference Paper, Expert Group Meeting on Incorporating Sustainable Development Objectives into ICT Enabled Land Administration Systems, 9–11 November 2005) 9.

**Table 1: Queensland Statutes Reflecting Land Administration Objectives**

	Objects	Develop- ment	Land use	Taxation	Dispute Resolu- tion
<i>Land Act 1994</i> (Qld) s 4	‘[L]and to which this Act applies must be managed for the benefit of the people of Queensland by having regard to the following principles — ... land evaluation based on the appraisal of land capability and the consideration and balancing of the different economic, environmental, cultural and social opportunities and values of the land[;] ... allocating land for development in the context of the State’s planning framework, and applying contemporary best practice in design and land management[;] ... when land is made available, allocation to persons who will facilitate its most appropriate use that supports the economic, social and physical wellbeing of the people of Queensland[;] ... efficient, open and accountable administration[;] ... a market approach in land dealings, adjusted when appropriate for community benefits arising from the dealing’.	X	X		
<i>Land Title Act 1994</i> (Qld) s 3(a)	‘[T]o define the rights of persons with an interest in registered freehold land’.		X		X
<i>Body Corporate and Community Management</i>	Section 2 provides that the primary object of the Act is to ‘provide for flexible and contemporary communally	X	X		X

	Objects	Develop- ment	Land use	Taxation	Dispute Resolu- tion
<i>Act 1997 (Qld)</i> ss 2–4	based arrangements for the use of freehold land'. Section 4 provides that the secondary objects of the Act are 'to promote economic development'; 'to encourage tourism potential'; 'to provide ... consumer protection for owners and buyers'; 'to ensure accessibility to information about scheme issues'; 'to provide an efficient and effective dispute resolution process'.				
<i>Planning Act 2016 (Qld)</i> s 3(1)	'[T]o establish an efficient, effective, transparent, integrated, coordinated, and accountable system of land use planning..., development assessment and related matters that facilitates the achievement of ecological sustainability'.	X	X		
<i>Coastal Protection and Management Act 1995 (Qld)</i> ss 3(c)–(d)	To 'ensure decisions about land use and development safeguard life and property from the threat of coastal hazards; and encourage the enhancement of knowledge of coastal resources and the effect of human activities on the coastal zone'.	X	X		
<i>Land Tax Act 2010 (Qld)</i>	The long title of the Act provides that it is '[a]n Act about land tax and for related purposes'.			X	
<i>Local Government Act 2009 (Qld)</i> s 3(b)	To '[p]rovide for 'a system of local government in Queensland that is accountable, effective, efficient and sustainable'. See also Part 3: Roads and other infrastructure.			X	

	Objects	Develop- ment	Land use	Taxation	Dispute Resolu- tion
<i>Water Act 2000</i> (Qld) s 2(a)(i)–(ii)	‘[T]he sustainable management of Queensland’s water resources and quarry material by establishing a system for — the planning, allocation and use of water; and the allocation of quarry material and riverine protection’.	X	X		
<i>Foreign Ownership of Land Register Act 1988</i> (Qld)	The long title of the Act provides that it is ‘[a]n Act to provide for the disclosure of foreign ownership of land’.		X		

The *Land Act 1994* (Qld) (*‘Land Act’*) provides the foundation of the land administration system in a number of ways. First, it establishes what land is. It distinguishes tidal waters that are owned by the State,<sup>57</sup> and reserves minerals, quarry materials and public purpose land for the State.<sup>58</sup> Secondly, it empowers the Executive to grant unallocated State land in fee simple as well as reserves and rail land,<sup>59</sup> and to dedicate roads.<sup>60</sup> This Act establishes the legal framework necessary for the creation of titles and physical infrastructure that support land development, use, and taxation.

Once a grant is made, land can be brought onto the Torrens register, pursuant to the *LTA*.<sup>61</sup> In defining the nature of a title and the process for its creation,<sup>62</sup> the *Land Act* also responds to the need for establishing priority of interests and thus the orderly transmission of interests in land to avoid disputes. Similarly, the *Body Corporate and Community Management Act 1997* (Qld) (*‘BCCM Act’*) provides for the creation of community title schemes whereby a freehold lot is comprised within part of a building and is brought into being through registration on the Torrens register. It regulates the use of common areas within community title schemes, and the relationships and potential disputes between owners within a scheme.

The use to which all ‘flat’ land might be put is regulated under the *Planning Act 2016* (Qld) (*‘Planning Act’*) — including use of land for the creation of a

<sup>57</sup> *Land Act 1994* (Qld) ch 1 pt 4 (*‘Land Act’*).

<sup>58</sup> *Ibid* ch 2 pt 2.

<sup>59</sup> *Ibid* ch 2 pt 1.

<sup>60</sup> *Ibid* ch 3 pt 2.

<sup>61</sup> *LTA* s 47.

<sup>62</sup> *Ibid* ss 173, 178, 180–2, 184.

community title scheme. While the *Planning Act* does not have any direct bearing on the title to land or interests in it,<sup>63</sup> it generates data about land use and consequently the development of that land. Land is also regulated under the *Coastal Protection and Management Act 1995* (Qld), to the extent that it can limit the development of land where it interferes with coastal environments. Inclusion of this legislation in the framework illustrates the capacity for integration of environmental protection and land use data.

Finally, the *Land Tax Act 2010* (Qld) fulfills the object of taxation based on land and is intrinsically connected to other land data as part of the wider land administration system. The *Local Government Act 2009* (Qld) also provides for taxation, in the form of rates.<sup>64</sup> It is implicated in the land administration system through the requirement to levy rates on all 'rateable land' (ie, all land within a local government area that is not exempt).

There are two further Acts we have included as part of the system level of land administration in Queensland. The first is the *Water Act 2000* (Qld), which regulates the use of water — a resource that is owned by the State and not by the titleholder.<sup>65</sup> The Act provides for the keeping of a register of interests in water and, to the extent that water is physically connected with land more broadly, it regulates the use and development of land per se.

Second is the *Foreign Ownership of Land Register Act 1988* (Qld), which regulates land ownership in a different way from planning and resource statutes. It requires the recording of interests owned by foreign owners, and thereby affords the State an oversight mechanism on titles, with potential implications also for development, taxation, and even land distribution.

These last two examples are slightly more distant from what might be considered core to the systems of land administration, yet they are intuitively part of the overarching structures that govern land overall. They also indicate that there are likely to be other statutes, not included in this analysis, which may, through specific and targeted provisions, affect the governance of land. To this extent, we acknowledge that this list is open to wider engagement with the statutory regulation of land.

Having outlined the systems of land administration, we turn now to the subsystems. These are necessary components of the systems, in that mapping and registry support the use of land, valuation supports taxation, and so on. In the statutory framework, some Acts already mentioned as contributing to the system also support the subsystem and are therefore repeated in Table 2.

---

<sup>63</sup> Kate Galloway, 'One Tale of Property, in My Own Words' (2018) 27(1) *Griffith Law Review* 157, 166.

<sup>64</sup> *Local Government Act 2009* (Qld) ss 92–4.

<sup>65</sup> *Water Act 2000* (Qld) s 26.

**Table 2: Subsystems within the Queensland Land Administration System**

Act	Objects	Mapping	Registry	Develop- ment	Valuation
<i>Survey and Mapping Infrastructure Act 2003</i> (Qld) s 3(1)	'[D]eveloping, maintaining and improving the State survey and mapping infrastructure'; 'maintaining and improving cadastral boundaries throughout the State and information held by the department about the boundaries'; 'coordinating and integrating survey and mapping information'; 'improving public access to survey and mapping information'.	X	X		
<i>Property Law Act 1974</i> (Qld)	The long title of the Act provides that it is '[a]reform the law relating to conveyancing, property, and contract'.		X		
<i>Land Title Act 1994</i> (Qld) s 3(a)–(b)	'[T]o define the rights of persons with an interest in registered freehold land; and to continue and improve the system for registering title to and transferring interests in freehold land'.	X	X		
<i>Land Valuation Act 2010</i> (Qld) s 4	To 'provide for how land is to be valued'.				X
<i>Planning Act 2016</i> (Qld) s 3(1)	'[T]o establish an efficient, effective, transparent,			X	

Act	Objects	Mapping	Registry	Development	Valuation
	integrated, coordinated, and accountable system of land use planning ..., development assessment and related matters that facilitates the achievement of ecological sustainability’.				
<i>Environmental Protection Act 1994 (Qld)</i> s 3	‘[T]o protect Queensland’s environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends’.			X	
<i>Water Act 2000 (Qld)</i> s 2(a)(i)–(ii)	To provide for ‘the sustainable management of Queensland’s water resources and quarry material by establishing a system for — the planning, allocation and use of water; and the allocation of quarry material and riverine protection’.		X (s 168)	X	
<i>Local Government Act 2009 (Qld)</i> s 3(b)	Provide for ‘a system of local government in Queensland that is accountable, effective, efficient and sustainable’. See also Chapter 3, Part 3: Roads and other infrastructure.			X	

As noted in Part I, the interoperability of land data with both public and private systems, and the imperative for ready access to data by different stakeholders, are important concerns for the effective operation of a land administration system. For ease of reference and viewed in relation to the four subsystems identified above (land mapping, land registry, land development, and land valuation) the next Section identifies the interrelationship of datasets created by each statute.

### C Primary Legislation Functions

The foundation of land data is land mapping, undertaken under the *Survey and Mapping Infrastructure Act 2003* (Qld) ('*Survey and Mapping Infrastructure Act*').<sup>66</sup> The Act establishes a series of State datasets that establish administrative area boundaries, remotely sensed images, digital cadastral data, and the survey control register.

The core unit of management is that of the administrative area boundary, used to define a dataset based on information that is provided by a public authority,<sup>67</sup> providing an example of communication between, or interoperability of data from, administering bodies (state and local government). These boundaries relate also to the remotely sensed images of land and coastal waters of the State retained in the remote images database.<sup>68</sup> This data may also support survey and mapping infrastructure including the cadastre.<sup>69</sup> In turn, the State cadastral dataset is integral to the identification of each lot, achieved through recording a unique description of the land (its real property description) and the approximate coordinates for the corners of the parcel together with graphical representation of roads, natural features forming a boundary of land, and the approximate coordinates of the roads and natural features. All unique survey marks relevant to the cadastre are also recorded.<sup>70</sup>

Survey and mapping data is integral to the operation of the second subsystem, the land registry, pursuant to the *LTA*.

The land registry includes the freehold land register.<sup>71</sup> The Registrar may record in the freehold land register anything the registrar is permitted to record by any Act, as well as anything that they consider needs to be recorded to ensure the freehold land register is an accurate, comprehensive, and usable record of

---

<sup>66</sup> *Survey and Mapping Infrastructure Act 2003* (Qld) s 3 ('*Survey and Mapping Infrastructure Act*').

<sup>67</sup> *Ibid* ss 48–9.

<sup>68</sup> *Ibid* s 50.

<sup>69</sup> See *ibid* s 131 for evidentiary provisions about remotely sensed images. The image needs to show: the location of the area; a feature or point, or location of a feature or point in the image; the date and time of when the image was taken and the approximate scale of the image.

<sup>70</sup> *Ibid* s 51.

<sup>71</sup> *LTA* (n 62) s 7.

freehold land in the State (of Queensland).<sup>72</sup> There is, therefore, a broad potential scope for the recording of land information.

At a minimum, the registrar must record in the freehold land register the particulars necessary to identify: (a) every lot brought under the Act; (b) every interest registered; (c) the names of each person who has held a registered interest; and (d) all instruments registered in the register and the timing of lodgement and registration.<sup>73</sup>

While ‘interest’ is defined broadly in the *Acts Interpretation Act 1954* (Qld) sch 1, the *LTA* restricts it to interests that are capable of registration.<sup>74</sup> Such instruments are detailed within the body of the *LTA* and include survey information that is generated pursuant to the *Survey and Mapping Infrastructure Act*. The instruments that are lodged to notify the interest created also form part of the data recorded under the *LTA*.<sup>75</sup>

While not generating an interest in land as such, the Registrar of Titles must also maintain a Foreign Ownership of Land Register,<sup>76</sup> recording the details of a ‘foreign person’ who acquires or disposes of an interest in land. This register details additional particulars of the interest holder, thus relating directly to the *LTA* provisions.

The key legislation enabling land development is the *Planning Act*.<sup>77</sup> In guiding land use planning for future development in Queensland and setting out a system for determining if and how development may occur, planning depends intrinsically on the mapping and titling data of the land administration system. There is a range of spatial mapping data available to the public, including interactive maps and map products.<sup>78</sup> In this sense, data from various agencies operates within government but is available externally to stakeholders.

---

<sup>72</sup> *LTA* (n 62) s 29.

<sup>73</sup> *LTA* (n 62) ss 28(1)(a)–(c), (e).

<sup>74</sup> These include a fee simple alienated by the State: s 47. See also *Property Law Act 1974* (Qld) s 20; s 60 (a transfer of a lot or of an interest in a lot); ss 109–10 (an interest as trustee); s 111 (an interest as a personal representative after the death of the registered proprietor); s 112 (a transfer to a beneficiary under the terms of a will); s 49A (a plan of subdivision — for further information see pt 4 div 3); s 64 (lease of a lot or part of a lot — for further information see pt 6 div 2; Land Title Practice Manual (Queensland) (Manual, 21 June 2021) pt 7 (‘QLTPM’)); s 72 (a mortgage — for further information see pt 6 div 3; QLTPM pt 2); s 82 (an easement — for further information see pt 6 div 4; QLTPM pt 9); s 99 (a title by an adverse possessor); s 97E (a profit à prendre); s 116 (a writ of execution); ss 54A–J (a building management statement); a statutory covenant under s 97A of the *LTA* in favour of the State or local government (for further information see pt 6 div 4A; QLTPM pt 31); s 97O (carbon abatement interest — for further information see pt 6 div 4C; QLTPM pt 36).

<sup>75</sup> *LTA* (n 62) ss 31, 175.

<sup>76</sup> *Foreign Ownership of Land Register Act 1988* (Qld) ss 2, 11(1).

<sup>77</sup> See also *Planning Act 2016* (Qld); *Planning Regulation 2017* (Qld); *Planning (COVID-19 Emergency Response) Regulation 2020* (Qld); *Planning and Environment Court Act 2016* (Qld); *Planning and Environment Court Rules 2018* (Qld); *Regional Planning Interests Act 2014* (Qld).

<sup>78</sup> See ‘Mapping’, *Queensland Government: Planning* (Web Page, 10 November 2023) <<https://planning.statedevelopment.qld.gov.au/planning-framework/mapping>>.

The cornerstone legislation in the final subsystem, land evaluation, is the *Land Valuation Act 2010* (Qld) ('*Land Valuation Act*'). This Act establishes a digital valuation roll for each local government area,<sup>79</sup> including information derived from the register: the owner's details; the land area, location, and description; and a property identification number for each parcel.<sup>80</sup> It adds information including its valuation date; its date of effect; the land's value; and the amount of the site improvement deduction (if any).

While the *Land Valuation Act* relies on data from other subsystems, it also shares information it creates, signalling its role in intra-governmental interoperability. Land valuations are used by other governments and government departments to calculate land tax,<sup>81</sup> and in making and levying rates.<sup>82</sup> Valuation data may be shared with the Commonwealth and other State departments<sup>83</sup> and the Valuer-General must give the Commissioner of State Revenue, any relevant administering body and the relevant local government a copy of the roll document or the parts of it that the entity requires.<sup>84</sup>

In a further illustration of interoperability, data also flows in the other direction. The Commissioner of State Revenue, Registrar of Titles, Registrar of the Supreme Court and every public service officer must give any information relating to the performance of their functions that the Valuer-General requires.<sup>85</sup> So too must local government allow the Valuer-General to take details from local government's valuation-related documents.<sup>86</sup>

While other subsystems are apparent, the data flows described here signify extensive interoperable databases supporting the subsystem of valuation that in turn supports the system of land taxation. An increasing imperative to address environmental and social objectives,<sup>87</sup> for example, may generate further integration of additional datasets into existing systems.<sup>88</sup>

Despite a degree of interoperability between the datasets identified, they exist largely within a single jurisdiction. Interoperability is, therefore, a question of degree that depends upon the goals of any land administration system. Given our interest in the feasibility of an interoperable blockchain, we pose the question of the feasibility of a national land administration system. By way of example, the last decade has seen a move towards land administration data interoperability between states, with the implementation of e-conveyancing.

---

<sup>79</sup> *Land Valuation Act 2010* (Qld) ss 180, 207(1)(c) ('*Land Valuation Act*').

<sup>80</sup> *Ibid* s 181(1).

<sup>81</sup> *Land Tax Act 2010* (Qld) ss 16–17.

<sup>82</sup> *Land Valuation Act* (n 81) s 6.

<sup>83</sup> *Ibid* ss 184(a)–(b).

<sup>84</sup> *Ibid* s 203.

<sup>85</sup> *Ibid* s 243.

<sup>86</sup> *Ibid* s 244(1).

<sup>87</sup> O'Connor, Christensen and Duncan (n 55) 233.

<sup>88</sup> Bennett, Wallace and Williamson, 'Organising Land' (n 55) 126–7.

## D Interstate Interoperability: E-Conveyancing

While the change from a physical register to electronic data might intuitively signal enhanced interoperability of a land administration system,<sup>89</sup> it was not until the introduction of e-conveyancing in 2014 that interstate data interoperability was put to the test. To create national uniformity in conveyancing transactions and obviate the need for buyer and seller (or their representatives) to be physically present, a private provider established a digital platform for property transactions, allowing New South Wales and Victoria to implement e-conveyancing in 2014, followed by Queensland in 2015.<sup>90</sup> The model, based on the success of electronic conveyancing systems in jurisdictions such as Ontario and British Columbia in Canada, and New Zealand<sup>91</sup> as well as Singapore, is currently operational in five states — Queensland, New South Wales, Victoria, South Australia and Western Australia — following extensive input by Australian industry stakeholders.<sup>92</sup>

The scheme is established by three key components: Electronic Conveyancing National Law ('EC National Law'),<sup>93</sup> Operating Requirements, and Participation Rules, which collectively contain provisions designed to align the titling aspects of the partner jurisdictions' land administration systems, in a way that minimises fraud and protects the integrity of both the system and land titles. It reduces information costs in qualifying transactions by introducing interjurisdictional interoperability, and by 'providing a common legal framework' that 'enables documents in electronic form to be lodged and processed under land titles legislation of each participating jurisdiction' without 'derogat[ing] from the fundamental principles of the Torrens system of land title, such as indefeasibility of title'.<sup>94</sup>

E-conveyancing has been described as 'a faster and more efficient and cost effective method of conveyancing', as long as opportunities for fraud are

---

<sup>89</sup> Rohan Bennett, Jude Wallace and Ian Williamson, 'Integrated Land Administration in Australia: The Need to Align ICT Strategies and Operations' (Conference Paper, Proceedings of SSC 2005 Spatial Intelligence, Innovation and Praxis: The National Biennial Conference of the Spatial Sciences Institute, September 2005) 1.

<sup>90</sup> Ibid.

<sup>91</sup> Summarised in Sharon Christenson, 'Electronic Land Dealings in Canada, New Zealand and the United Kingdom: Lessons for Australia' (2004) 11(4) *Murdoch University Electronic Journal of Law* 1 <<http://classic.austlii.edu.au/au/journals/MurdochUeJlLaw/2004/37.html>>.

<sup>92</sup> Wallace, Weir and McCrimmon (n 45) 291. See also Peter Rosier, *Understanding National E-Conveyancing* (LexisNexis Butterworths, 2014) xi–xii.

<sup>93</sup> *Electronic Conveyancing National Law (Queensland) Act 2013* (Qld) s 4 ('*Electronic Conveyancing National Law (Queensland)*'); *Electronic Conveyancing (Adoption of National Law) Act 2013* (Vic); *Electronic Conveyancing (Adoption of National Law) Act 2013* (Tas); *Electronic Conveyancing National Law (South Australia) Act 2013* (SA); *Electronic Conveyancing (National Uniform Legislation) Act 2013* (NT); *Electronic Conveyancing Act 2014* (WA). Australian Capital Territory has not joined the national scheme.

<sup>94</sup> See, eg, *Electronic Conveyancing National Law (Queensland)* s 5(1).

prevented.<sup>95</sup> Under the EC National Law, to implement a digital national conveyancing system, the Registrar in each participating jurisdiction is authorised to operate (or to authorise another entity to operate) an Electronic Lodgement Network ('ELN')<sup>96</sup> and to provide rules governing its operation.<sup>97</sup> The ELN functions as a clearinghouse for land data sourced from each registry, effectively extending the reach of a jurisdiction's land administration system. In a departure from the longstanding tradition of government control of land data, the three approved Electronic Lodgement Network Operators ('ELNOs') are all private companies.<sup>98</sup> Extending stakeholder access to data held by each registry through enabling an online transaction fully integrated between parties to a transaction, 'electronic conveyancing in participating States has been described as the single biggest change to conveyancing practice since the introduction of the Torrens system'.<sup>99</sup>

E-conveyancing 'aims to deliver a system that will minimise manual procedures, be quicker than traditional conveyancing, eliminate the need for physical interaction between participants, and deliver a more certain outcome'.<sup>100</sup> In a prime example of the reduction of transactional friction arising from information costs, the system provides advantages to purchasers because there is no delay between paying the funds and lodging the documents for registration.<sup>101</sup> It also has the benefit of stricter requirements to verify identity and the right to deal which reduces the opportunity for fraud.<sup>102</sup>

A modern land registration system 'must provide security of tenure for the land holders, it must encompass and recognise the significant land rights that impact on the majority of the population, and in its use it must be trusted'.<sup>103</sup> Achieving this requires three proof requirements: proof of identity, proof of ownership, and authority to deal.<sup>104</sup> Although proof of identity has been addressed by the ELNO system, Thomas et al raise concerns about risks associated with meeting the second and third requirements in e-conveyancing,<sup>105</sup> and suggest

---

<sup>95</sup> See Rouhshi Low, 'Opportunities for Fraud in the Proposed Australian National Electronic Conveyancing System: Fact or Fiction?' (2006) 13(2) *Murdoch University Electronic Journal of Law* 225–6.

<sup>96</sup> An ELN enables the lodging of registry instruments and other documents in electronic form.

<sup>97</sup> See, eg, *Electronic Conveyancing National Law (Queensland)* ss 5(2), 13–22.

<sup>98</sup> Wallace, Weir and McCrimmon (n 45) 293.

<sup>99</sup> *Ibid* 297.

<sup>100</sup> Lynden Griggs, 'Consumer Issues: It's a New Day, It's a New Dawn, It's a New Life' (2016) 6(2) *Property Law Review* 117, 117.

<sup>101</sup> Jessica Beckman, 'Changes in Property Transactions: Out with PAMDA, In With e-Conveyancing' (2016) 36(1) *Queensland Lawyer* 18; *Ibid*.

<sup>102</sup> See, eg, PEXA, Sympli and LEXTECH. See also Wallace, Weir and McCrimmon (n 45) 297.

<sup>103</sup> Wallace, Weir and McCrimmon (n 45) 4.

<sup>104</sup> Rod Thomas, Lynden Griggs and Rouhshi Low, 'Electronic Conveyancing in Australia: Is Anyone Concerned About Security?' (2014) 23(1) *Australian Property Law Journal* 1, 3.

<sup>105</sup> *Ibid* 7.

ways in which to limit risk by drawing an analogy with the transfer of shares on the Australian Stock Exchange.<sup>106</sup>

To date, NSW, Victoria, South Australia, and Western Australia have mandated the use of e-conveyancing for most standard transactions. Queensland had implemented e-conveyancing on a piecemeal basis on two approved ELNOs: PEXA and Sympli.<sup>107</sup> However, e-conveyancing became mandatory for certain transactions in Queensland since early 2023.<sup>108</sup> In sum, the introduction of e-conveyancing has been a slow process fraught with difficulties, inconsistencies, and delays, which, even once fully implemented, will still have to allow for exempted transactions.

In terms of data interoperability, the case study of e-conveyancing facilitating land data flows between jurisdictions illustrates the challenges of introducing and operating a national digital platform that relies on the cooperation of state and territory agencies and legislators to support a uniform approach. Although the roll-out has been lengthy and inconsistent, it has achieved a measure of success, being implemented in various stages in five states and territories to date.<sup>109</sup> E-conveyancing has made data instantly accessible, and in this way can be regarded as successfully achieving this objective, paving the way for further initiatives building on its infrastructure. The challenge of integrating the subsystems to achieve a holistic, operational result would prove more complex, because of the complex interrelations between various datasets. The challenge would be compounded by politics, evidenced by Queensland's recent plan to include interstate landholdings in calculating land tax, and New South Wales's rejection of the plan.<sup>110</sup>

Whether the introduction of blockchain is a conceivable way to achieve better integration is discussed below.

## V INTEGRATION THROUGH BLOCKCHAIN LAND TITLES

Conceiving of land titles as data paves the way for the application of digital technologies to collect, store, organise and retrieve that data. A digital system offers greater scope than an analogue one to connect data sources and thus achieve greater efficiencies and, potentially, more ambitious goals for a land administration system. Our interest lies in analysing the capacity of a blockchain

---

<sup>106</sup> Ibid 9.

<sup>107</sup> See 'eConveyancing', *Titles Queensland* (Web Page) <<https://www.titlesqld.com.au/elodgment-econveyancing/electronic-conveyancing/>>.

<sup>108</sup> *Land Title Regulation 2022* (Qld) reg 2.

<sup>109</sup> Wallace, Weir and McCrimmon (n 45) 291.

<sup>110</sup> Rachel Riga, 'Queensland Government Shelves Controversial Land Tax Changes as Treasurer Defends Policy' *ABC News Online* (online, 30 September 2022) <<https://www.abc.net.au/news/2022-09-30/queensland-land-tax-government-shelves-changes-after-opposition/101491332>>.

system to achieve fractionalised land titles, which coheres with the land administration system itself.

Blockchain technology is a data-driven system that has been implemented in some jurisdictions to run land titling systems.<sup>111</sup> A blockchain system provides an algorithmic record of all transactions effected and recorded on the blockchain. These are stored on a public or shared ledger between nodes or users of the blockchain system.<sup>112</sup> Using blockchain technology to record and facilitate real property transactions is an attractive concept, because of the benefits of the uniquely secure blockchain database, which can provide a time-stamped and secure register<sup>113</sup> of transactions. All transactions ever completed on the blockchain are permanently and immutably recorded, providing tamper-free and transparent evidence of transactions through the unique technical functioning of a blockchain, which is superior to other digital systems. These include the combination of the blockchain hashing function and use of cryptography.

While in one sense a blockchain might simply serve as a ledger akin to an analogue or even digitised Torrens system, it offers greater capability to integrate financial and other commercial systems into pure land administration. In addition, conceptualising land as a digital token has generated innovative approaches to the financialisation of real property itself.

This Part first introduces fractionalised real property as a digital (data) manifestation of land title, before analysing the feasibility of its integration into a land administration system.

### ***A Fractionalisation of Real Property and Tokenisation on a Blockchain***

Beyond merely substituting a digital ledger for an analogue one, we are interested here in the creation of land interests as digital tokens that are freely tradeable on a blockchain. Our model is the 2019 South Australian ‘Bricklet’ scheme,<sup>114</sup> which would involve a system of fractionalisation of property rights in individual

---

<sup>111</sup> See, eg, Georg Eder, ‘Digital Transformation: Blockchain and Land Titles’ (Conference Paper, 2019 OECD Global Anti-Corruption and Integrity Forum, 20–21 March 2019). The Select Committee on Australia as a Technology and Financial Centre has recommended that the National Cabinet ‘consider supporting a blockchain land registry initiative as a pilot project for Commonwealth–State cooperation on RegTech’: see Senate Select Committee on Australia as a Technology and Financial Centre, Parliament of Australia, *Second Interim Report* (Report, April 2021) ix [7.59].

<sup>112</sup> Lynden Griggs et al, ‘Blockchains, Trust and Land Administration: The Return of Historical Provenance’ (2017) 6(3) *Property Law Review* 179, 183.

<sup>113</sup> Cantatore, Galloway and Parsons (n 2) 42. See also Muharem Kianieff, *Blockchain Technology and the Law: Opportunities and Risks* (Informa Law, 2019) 38.

<sup>114</sup> This scheme was announced by then South Australian Premier, David Ridgway in September 2019. See David Ridgway, ‘SA-based Innovation to Revolutionise Property Investment Bricklet by Bricklet’ *Mirage News* (online, 23 September 2019) <<https://www.miragenews.com/sa-based-innovation-to-revolutionise-property-investment-bricklet-by-bricklet/>>.

apartments in two new residential towers, enabling up to 20 individual owners to become co-owners of fractions of a single apartment with the benefit of Torrens title.<sup>115</sup> The Bricklet scheme envisaged increased affordability of real property and easier access to the economic benefits of property ownership for individual private owners.<sup>116</sup> Of interest here is that blockchain technology would be used to record ownership and to enable quick and easy transactions with the registered interests.

The Bricklet scheme capitalised on the notion of property as data and coupled it with the unique capacity of blockchain technology to deal with data commensurate with the security and reliability required in real property transactions. The scheme foreshadowed a possible future of real property transactions as seamless data exchanges where payment is made through a data exchange using digital currency. Two important concepts effectively underpinned the proposal — *fractionalisation*, signalling potentially different real property rights; and *tokenisation*, referring to the use of blockchain technology not only to effect and reflect fractionalisation, but also to facilitate all aspects of the land administration system involved in transactions with the ‘fractions’, or ‘bricklets’, as they were referred to.

Although the published Bricklet proposal did not provide conceptual and technical details, it appears as if each fraction of each lot was intended to be recorded both as a digital asset on a private permissioned blockchain for the scheme and also in the land title register.<sup>117</sup> For the scheme to operate practically, it would have been necessary for the relevant land titles registry to also be included as a participant on the blockchain,<sup>118</sup> together with other key stakeholders such as the developer of the new residential towers, the subsequent owners of the fractionalised interests, and any tenants.<sup>119</sup>

To make such a scheme work, each fraction would require ‘a specific folio identifier corresponding to its encoded coin identifier (for example, Bricklet 1 in Lot 1 in Scheme X)’.<sup>120</sup> The participants would likely have used a token representing each fraction on the blockchain. As we pointed out in 2020:

Ownership could in principle be transferred seamlessly if blockchain integration is complete including the capacity to perform identity checks. The transaction of purchase and sale is effected through cryptography and hashing, and the proof of work is confirmed by all nodes in the network. Funds are transferred automatically when set algorithmic conditions have been satisfied from the wallet of the incoming owner to the wallet of the outgoing owner through a smart contract.<sup>121</sup>

---

<sup>115</sup> Ibid.

<sup>116</sup> Ibid.

<sup>117</sup> Cantatore, Galloway and Parsons (n 2) 49.

<sup>118</sup> Ibid.

<sup>119</sup> Ibid.

<sup>120</sup> Ibid.

<sup>121</sup> Ibid.

Although this Bricklet scheme has not come to fruition, the combined use of fractionalisation of land title, and tokenisation of a tangible asset to render it digital, on a blockchain, is still a desirable possibility. Our interest lies in whether a tokenised land title system, such as that proposed by the Bricklet proposal, would fit within the standards of a land administration system optimised for blockchain. In particular, we analyse registration of real property, access to data, and true interoperability through full integration of blockchain into the land administration system.

The Blockchain Property Registry Adoption Levels created by the Future of Property Rights program, New America, and reproduced by Graglia and Mellon in 2018 serve as the framework for the balance of the analysis in this article. The levels can be summarised as follows:

Description of integration	Level
No integration	0
Blockchain recording of documents relating to the transaction	1
Blockchain used to record progress of a transaction	2
Smart contracts used for payment escrow	3
Blockchain replaces central database	4
Rights in a single parcel of land disaggregated and managed via blockchain	5
Fractional rights (ie, fractional rights on a given parcel of land) managed via blockchain	6
Peer-to-peer transactions without intermediaries	7
Interoperability through merger of different blockchain registries	8

While e-Conveyancing is an example of digital integration of data within a land administration system, the current level of blockchain integration in Queensland (and Australia) is level zero. In a land administration system where ownership is linked to and derived from registration, and where the rights of property owners are guaranteed by the State, the transfer of crypto tokens representing the interest in land will unlikely be sufficient to transfer property rights.<sup>122</sup>

We identify six key issues requiring attention to integrate fractionalised land interests into a land administration system, emphasising facets of interoperability according to Graglia and Mellon's framework.

We suggest that, beyond the digital token's identifying information, to reach the threshold of data required to identify the spatial location of the tokenised asset, the blockchain must respond to the subsystems of land mapping, registry, land development and land valuation.<sup>123</sup>

<sup>122</sup> See Graglia and Mellon (n 5) 103, referring to the work of European scholar(s).

<sup>123</sup> Kalantari et al, 'Interoperability Toolkit' (n 16) 7.

## 1 Creation of Blockchain — The Registry Subsystem

The first four levels of integration of a blockchain with the land administration system are linked to the creation of a blockchain to serve as the system, or at least part of it. At its simplest, the blockchain may be used to satisfy the registry subsystem: to record documents, to record the progress of a transaction, or to act as a secure but comprehensive database. This alone would take blockchain integration up to Level 4 in the scale proposed by Graglia and Mellon. As evidenced by the complex interaction of the Queensland statutes providing the backbone of land administration, details of the requirements for access, viewing, and transacting by different stakeholders would need to be built into the blockchain register as well as being specified in the core land administration legislation set out in Tables 1 and 2.<sup>124</sup>

We note, further, that an interoperable blockchain system requires integration of payment and should include a payment system subject to regulatory control by the Payment Systems Board of the Reserve Bank of Australia. Access and operation standards as well as security requirements would be dealt with on a national level.

## 2 Legal Characterisation of Land as Data (Tokenisation)

While the land administration system provides the infrastructure that supports a property interest in land, the threshold question of property is brought into question when land dealings are transformed from digitised to digitalised transactions.

To progress to Level 5 of the Graglia and Mellon scale of integration of blockchain in land administration systems, rights in parcels of land must be 'disaggregated'.<sup>125</sup> Parcels of land would be linked to crypto tokens to enable transacting on the blockchain. Legal certainty, the very rationale behind a land administration system, is required to enable effective tokenisation. Given ongoing analysis of the legal status of crypto-assets within the established common law categories of property, there may be insufficient conceptual certainty at this stage to satisfy this requirement.<sup>126</sup> Furthermore, the legal nature

---

<sup>124</sup> Given the creation of novel rights, there would be consequential amendments required to legislation providing rights and remedies associated with interests in land. This analysis is beyond the scope of this article.

<sup>125</sup> Graglia and Mellon (n 5) 98.

<sup>126</sup> See, eg, United Kingdom Law Commission, *Digital Assets: Consultation Paper* (Consultation Paper No 256, 28 July 2022) ('*Digital Assets: Consultation Paper*'). See also United Kingdom Law Commission, *Digital Assets: Final Report* (Report No 412, 27 June 2023) ('*Digital Assets: Final Report*'), in which the Law Commission of England and Wales acknowledges the importance of further developments in the common law to accommodate digital assets. Law reform recommendations were targeted and limited, focussing on enhancing legal certainty.

of crypto tokens that may be used in property tokenisation is not yet settled.<sup>127</sup> The Australian approach to date has been pragmatic, focussing primarily on the manner in which crypto assets generally should be regulated for protecting consumers or users,<sup>128</sup> and the emphasis to date has been on financial products rather than the implications for land administration more broadly.

Of note, a blockchain alone does not have the characteristics of a Torrens land register. The distributed ledger is not a ‘definitive record of (superior) legal title to a crypto-token’.<sup>129</sup> ‘The state of the distributed ledger or structured record may provide a definitive record of the links between transactions within the crypto-token system, but this provides a factual, as opposed to legal, account of the world’.<sup>130</sup> A crypto token has been described by the Australian Commonwealth Treasury as ‘a unit of digital information that can be “exclusively used or controlled” by a person’.<sup>131</sup> The United Kingdom Law Commission similarly considered that ‘control plays an important (although not determinative) role in the overall analysis as to the legal effect of a transfer of a crypto-token’.<sup>132</sup> The ‘link between a given crypto-token and the linked external thing would likely be evidential only’ and the crypto-token itself would ‘confer no additional legal rights’ to its holder.<sup>133</sup> Unlike the existing land administration system that encompasses the Torrens register, a blockchain without more, will not afford legal title.

Legislation would thus be needed to make a crypto-token based register of land effective, to strengthen the ‘evidentiary power of the record and any transfer formalities’.<sup>134</sup> In reality, the situation remains complex, because if ‘the subject of the link is a tangible thing ... [it is] more difficult legally to prevent the transfer of the external thing separately to a (legal or factual) transfer of the crypto-token’.<sup>135</sup> This difficulty may be less pronounced in real property compared to movable

---

<sup>127</sup> ‘There is currently no consensus — either in Australia or globally — on the meaning of key concepts in the crypto space. A single concept may have varied and conflicting meanings across industry, academia, and government institutions’: see Australian Government Treasury, *Token Mapping* (Consultation Paper, February 2023) 11 [23] (*‘Token Mapping’*).

<sup>128</sup> See, eg, Australian Government Treasury, *Crypto Asset Secondary Service Providers: Licensing and Custody Requirements* (Consultation Paper, 21 March 2022).

<sup>129</sup> United Kingdom Law Commission, *Digital Assets: Consultation Paper* (Consultation Paper 256, 28 July 2022) 244 [13.2].

<sup>130</sup> *Ibid* 245 [13.8].

<sup>131</sup> Australian Government Treasury, *Token Mapping* (n 133) 13 [33].

<sup>132</sup> United Kingdom Law Commission, *Digital Assets: Consultation Paper* (n 129) 268 [13.95]. Note that Australia has a functional approach to financial regulation and that crypto assets are not ‘excluded or “carved out” from Australia’s financial services regulatory framework’: see Australian Government Treasury, *Token Mapping* (n 133) 11 [18]. What a crypto token is linked to will likely affect its classification as a form of property: at 37–8.

<sup>133</sup> United Kingdom Law Commission, *Digital Assets: Consultation Paper* (n 129) 287 [14.22].

<sup>134</sup> United Kingdom Law Commission, *Digital Assets: Summary of Consultation Paper* (Consultation Paper) 13 [1.68] <<https://cloud-platform-e218f50a4812967ba1215eaecede923f.s3.amazonaws.com/uploads/sites/30/2022/07/Digital-Assets-Summary-Paper-Law-Commission-1-1.pdf>>.

<sup>135</sup> *Ibid*, 15 [1.70].

physical objects such as diamonds or gold bars, but if land title is fractionalised and tokenised, additional difficulties arise.

At present, unlike a land title, a crypto-token itself may not ‘embody’ legal rights. Although it is feasible to develop principles allowing for the instrument to embody the rights it records,<sup>136</sup> other models such as negotiable instruments depend on possession and, for example, transfer of title through possession. In a blockchain, ‘possession’ is a more complex concept.

In practice, therefore, there is a risk that the values of the physical land and the crypto-token it represents may diverge. It is difficult to see how this problem can be overcome without legislative intervention. Legislative changes to invest the data with property rights would enable the *tokenisation* envisaged by the Bricklet proposal and enable integration as envisaged by Graglia and Mellon up to Level 5 (and further).

To create the legal infrastructure necessary to build a viable blockchain registry as a land administration subsystem would require an overhaul of the key Torrens statutes in Queensland. At a minimum, amendments would be necessary to:

- the *LTA* to allow setting up the blockchain register and articulating its data composition, as well as explaining the process by which title is derived; and
- the *BCCM Act* to reflect changes to the *LTA*.

The *Land Act* would also require consideration in terms of the creation of the estate in fee simple and whether this comprehends the tokenisation of real property. This is conceptually interesting given an estate in fee simple is itself a description of the rights in land rather than the land itself.

As with all aspects of a land administration system, to work, these changes would require stakeholder approval and adoption.

### 3 *Creating the Legal Framework for Fractional Property Rights (Fractionalisation)*

Apart from co-ownership under a tenancy in common or joint tenancy, there is no recognised means of recording fractional rights directly on Torrens title. Existing forms of co-ownership reflect a legal relationship between people

---

<sup>136</sup> See International Institute for the Unification of Private Law, Digital Assets and Private Law Working Group, *Draft UNIDROIT Principles on Digital Assets and Private Law*, Doc No 2 Study LXXXII/W.G.8, 8th sess, 8–10 March 2023. See also generally the work by the International Institute for the Unification of Private Law, ‘Law and Technology: UNIDROIT Work and Instruments in the Area of Law and Technology’, *UNIDROIT (Web Page, 2023)* <<https://www.unidroit.org/law-technology/>>. See generally also United Kingdom Law Commission, *Digital Assets: Consultation Paper* (n 129).

generally known to each other. Fractionalisation would permit the free acquisition and disposal of real property held in common with strangers.

Alternatives to true fractional ownership of land currently depend on legal vehicles such as trust, corporate structures, or in the case of company title, a combination of a corporation and leasehold rights. To reach Level 6 on the Graglia and Mellon scale of integration, and recognising the foundation of property in a land administration system, *fractionalisation* would have to be legally possible and protected.

Interoperability in this context includes the system of dispute resolution not only between token-holders and the rest of the world, but also as between those who hold fractionalised interests in the same physical parcel.

Legislative creation of a different type of land interest, reflected on the blockchain through a crypto-token, would support Level 6 integration. When the fractionalisation occurs through operation of the blockchain, a higher level of integration of blockchain usage in real estate would be achieved.

#### **4 Digital Peer-to-Peer Transactions**

E-conveyancing provides one example of a digital system for peer-to-peer transactions. The principles behind this system would be relevant for achieving Level 7 integration on the Graglia and Mellon scale. However, to achieve integration beyond land dealings to all systems and subsystems of land administration would require more stakeholders to have access to the blockchain, including government departments for purposes of identity authentication, tax, land development, and even the court system, which may have to apply a remedy in determining a dispute. Payment — whether in fiat currency or via cryptocurrencies — would also have to be secured over the blockchain.

#### **5 International Interoperability**

Graglia and Mellon describe true interoperability and the ultimate integration of blockchain technology in real property transactions as ‘something of a Holy Grail — interoperability between multiple blockchain-enabled registries and levels of jurisdiction — whether it is Santa Clara and San Mateo counties, the Netherlands and Spain, or China and the US’ would be the highest level to which blockchain integration may be taken in real estate.<sup>137</sup> The ultimate would be:

an actual peer-to-peer transaction between two blockchain-enabled registries. From a technology perspective, this would require some standardization of what defines a property on a blockchain between registries and blockchain firms in order to have a unified definition for a physical space and its associated rights. The political and legal challenges to such transactions would be significant. The vision here entails the

---

<sup>137</sup> Graglia and Mellon (n 5) 102.

world's property being managed on a large hybrid blockchain that came together by virtue of its interoperability.<sup>138</sup>

This visionary approach is shared, albeit at a less sophisticated academic level, by operators who see opportunities for individuals to diversify their investments by making micro-investments internationally without bureaucratic red tape. For example, a person may be a joint owner of a property in Canberra in which they reside but may also own a fraction of three apartments in London, Mumbai and Barcelona (for an investment of say \$20,000 each), which earns a proportionate rental income that is paid directly into a bank account linked to the blockchain, after deduction of proportionate maintenance and administrative costs. As trading over the blockchain takes minutes not weeks, buying and selling online as prices fluctuate becomes as easy as transferring money on an app on your mobile phone. To achieve this level of data interoperability, more than the current proposed principles for a legal framework proposed by the UNIDROIT working group will be required.<sup>139</sup>

At this level though, the ideals of a land administration system would be fulfilled.

## **6 Removal of Other Constraints**

Although these may not have been expressly mentioned in the Graglia and Mellon framework of integration, the successful integration of blockchain in real estate to Level 8 would depend on overcoming several other obstacles. In many critical instances, the draft UNIDROIT principles resort to national legal principles, and the unencumbered transacting across borders may not eventuate.

Political considerations are evident even in creating an Australian e-conveyancing system. Government stakeholders may be sensitive to foreign investment in real property, and control over the extent of foreign ownership.

International and domestic criminal activity generate concerns about money laundering and terrorism financing in cross-border transactions under the Financial Action Task Force principles,<sup>140</sup> another barrier to an idealised full integration.

Given the public-private nature of blockchains, stakeholders such as governments may be hesitant to divest themselves of control over record correction. Similarly, the judiciary may express concerns if the courts lose control of civil remedies. These concerns are more than practical in nature, going to the fundamentals of government and the role of the state in private transactions between citizens.

---

<sup>138</sup> Ibid.

<sup>139</sup> International Institute for the Unification of Private Law (n 136).

<sup>140</sup> Financial Action Task Force, *High-Level Principles and Objectives for FATF and FATF-style regional Bodies*, (FATF Reports, February 2019) 1.

In conclusion, using the framework of Graglia and Mellon, the existing land administration system of Queensland would require a significant transformation even to reach some of the lowest levels of blockchain integration. Issues such as stamp duty could be an additional barrier to tokenisation without government buy-in on a national level. The existing e-Conveyancing system as detailed above provides a pathway to national integration but has also pointed to the limitations of the existing national integration of property transfer.

## VI CONCLUSIONS

A land administration system forms a data-driven ecosystem that facilitates land ownership and land dealings. It provides a web of data connections between processes of the state and those of private actors. These connections are vital for a system to achieve its core purposes.

Traditionally, the purpose of a land administration system in Australia has been to facilitate the efficiency and effectiveness of land transactions. Already there are emergent systems within which data are informing the development of sophisticated environmental management, beyond the foundation goal of a record of land title. It is not difficult to imagine an expansion of the core features of a land administration system to promote and protect sustainable land use and accommodate environmental considerations.

In Queensland, the statutes at the heart of the land administration system can be categorised according to recognised subsystems of land administration. These statutes work together through the movement of data about land. And, if land is data, there is scope for the application of new technologies to innovate in the way in which land is dealt with. To this end, we analysed the potential of fractionalised, tokenised land interests, held on a blockchain, to meet the needs of a contemporary land administration system.

Using Graglia and Mellon's scale of blockchain integration, our analysis reveals that while a fractionalised blockchain is technically feasible, there is considerable work to be undertaken to justify a blockchain serving land administration as an entire system. Although baseline data management might appear to be relatively simple, to serve land administration more broadly would require a series of sophisticated and complex statutory interventions that would disrupt the current systems.

These would require, first, creation of a public-private blockchain, protocols for access and security, and the means of payment. Importantly, the legal nature of the tokenised interest remains unresolved. Where a land administration system is expressly designed to facilitate certainty, the novelty of the interest represents a fundamental stumbling block for any tokenised approach to land administration.

While theoretically exciting, the concept of fractionalised land title on a blockchain is not yet evolved enough to satisfy the principles of the land administration system.