

College of Law

Master of Applied Law

MP15 – Major Project

**BLOCKCHAIN IN RURAL AND REGIONAL LEGAL PRACTICE: A
WINDOW INTO THE FUTURE**

Name: LISA COATES

Student ID: redacted

Supervisor: David Cosgrave

Date: 10 August 2023

Word Count: 11,228

Award by COL: HD

For Joel

The future is yours

RESEARCH PROPOSAL

The Student

My name is Lisa Coates. I was admitted as a legal practitioner in the Australian Capital Territory and the High Court in 2001. I have held practicing certificates as a solicitor in the ACT from 2001- 2007, Victoria from 2008- 2011 and NSW from 2018 onwards. I have extensive experience in general practice and civil litigation, especially in worker's compensation and third-party liability. I hold a current unrestricted practicing certificate in NSW, though I have not worked in practice since 2011. I have worked as a law academic and a founding member of the Centre for Law and Justice and the LLB degree at Charles Sturt University since 2016, teaching in particular the 'Priestley 11' property law subject in the Bachelor of Laws. I chose to continue my studies to further both my academic career and to position myself for re-entry into legal practice.

Area of Investigation

My research question is whether products or services using Blockchain – specifically a contract performance management and assurance tool - can improve the delivery of legal services for rural and regional legal practices and their clients in the Central West of NSW.

The foundation for analysing and addressing this question is a survey producing a current snapshot of rural and regional legal practices in the Central West of NSW. This includes the scope of client business transactions, including but not limited to:

- a. the sale & purchase of companies
- b. the sale and purchase of non- incorporated businesses
- c. restructuring
- d. business assets sale and purchase
- e. Intellectual property

This paper's objectives are to:

The paper will address the following:

- Situate the economic, industrial, demographic and contextual area of Central West legal practice (CWLP)
- Analyse the CWLPs' current configuration by practice area and expertise
- Collate data on the current file and contract performance management tools used by CWLPs
- Describe the blockchain tool
- Consider how using blockchain could improve the delivery of legal services by rural and regional law practices

- Assess blockchain's theoretical and practical significance to the delivery of legal services

Blockchains are described by the National Blockchain Roadmap as:

*A particular type of 'distributed ledger technology. At their core is a shared database that is organised as a list of 'blocks', with the constraint that an additional block of data is appended to the ledger only if a majority of nodes 'agree that it is valid.'*¹

The National Blockchain Roadmap identifies specific potential for use in agricultural sector through credentialling and financial services sector via the identity requirements. A contract management system that is underpinned by blockchain technology could create layers of automation, security and functionality in rural and regional industries.

My view is that the essential quality of a blockchain, also referred to as distributed ledger technology (DLT) is efficiency. This will be examined via the qualities of security, confidentiality and assurance.

How would this improve the delivery of legal services by rural legal practices?

Risk management, visibility of transactions, continuing relationship with legal providers (via the blockchain register), client relationship building and trust.

A contract management system using distributed ledger technology (blockchain) can bring several key features that enhance security, transparency, and efficiency in handling contracts. Below are some of the key features:

1. **Immutable and Secure Smart Contracts:** Smart contracts are self-executing contracts with the terms and conditions directly written into the code. Once deployed on the blockchain, they become immutable, meaning the terms cannot be altered or tampered with, providing a high level of security and trust.
2. **Transparency and Auditability:** All contract-related activities, including creation, amendments, and execution, are recorded on the blockchain. This provides a transparent and auditable trail of actions, making it easier to verify the history of the contract and detect any unauthorized changes.
3. **Decentralisation:** The distributed nature of blockchain eliminates the need for a central authority to manage contracts. Instead, the network of nodes validates and stores contract data, reducing the risk of single points of failure and increasing the system's overall resilience.
4. **Automated Execution and Enforcement:** Smart contracts automatically execute the terms of the agreement when predefined conditions are met. This feature reduces the need for manual intervention and minimises human error.
5. **Digital Signatures and Identity Management:** Participants in the contract management system can have cryptographic identities that allow them to sign and validate contracts securely. This ensures that only authorized parties can engage in the contract process.

¹ 'THE NATIONAL BLOCKCHAIN ROADMAP: Progressing towards a blockchain- empowered future', The Australian Government, Department of Industry, Science, Energy and Resources (Web Page) <<https://apo.org.au/sites/default/files/resource-files/2020-02/apo-nid276541.pdf>>

6. Version Control and Tracking: With blockchain, every change or update to a contract is recorded as a new block. This enables version control, allowing users to access and review previous iterations of the contract easily.
7. Time-Stamping and Proof of Existence: Blockchain's timestamping feature provides irrefutable proof of the existence of a contract at a specific point in time. This can be valuable for resolving disputes related to contract creation or content.
8. Conditional Payments and Escrow Services: Blockchain can facilitate conditional payments based on predefined criteria. Additionally, smart contracts can act as escrow services, releasing funds only when the contract's conditions are met.
9. Integration with External Data Sources: Smart contracts can be designed to integrate with external data sources (known as oracles) to access real-world data. This enables the execution of contracts based on real-time events or data.
10. Privacy and Permissioning: Depending on the blockchain's architecture, access to contract data can be permissioned, ensuring that only relevant parties have visibility into specific contract details.
11. Interoperability and Standardisation: The use of common blockchain standards and protocols allows for interoperability with other systems, enabling seamless data sharing and collaboration between different contract management platforms.
12. Notifications and Reminders: Automated notifications and reminders can be built into the contract management system to inform relevant parties about upcoming contract events or deadlines.

By leveraging these features, a contract management system using distributed ledger technology can streamline contract processes, increase security, reduce administrative overhead, and foster a more trust-based environment for all participants involved.

All of the above features represent a net- sum benefit to modern Australian legal practice. There is a further incentive for CWLPs. Block- enabled contract management systems would also address the physical distances involved and also support engagement with international clients.

In 2011, Harcourt, an economics fellow at UNSW considered Blainey's seminal text, *The Tyranny of Distance*, and evaluated Australia's economic, digital growth and integration with the Asia- Pacific region in the decades since 1966.² Since Harcourt wrote in 2011, the digital revolution has moved on exponentially and the "power of proximity" he described may only be empowered by stronger and more secure information and communication technology.³

The Paper's theoretical significance

Whilst there is general acceptance of blockchain as having a place in the financial services and business sectors, the acceptance and adoption of blockchain DLT for use in the legal services industry in rural and regional Australia is at nascent stage. This is likely to change.

The reasons for the predicted change are that:

- Firstly, the National Blockchain Roadmap identifies blockchain's specific potential for use in the agricultural sector through credentialling,

² Tim Harcourt 'Australia's tyranny of distance gives way to the power of proximity', *The Sydney Morning Herald* (online 25 November 2011) <<https://www.smh.com.au/business/australias-tyranny-of-distance-gives-way-to-the-power-of-proximity-20111124-1nwxt.html>>

³ Ibid.

- Secondly, the Roadmap identifies its potential utility in the financial services sector via the need for identity verification; and
- Thirdly, blockchain’s applicability for use in credentialling in the education sector.

Considering the first reason, the AEC Group Pty Ltd note that agriculture, education and tourism are the three major sectors of the Central West NSW economy.⁴

The National Blockchain Roadmap also observed that,

“The costs to Australian food and wine producers of direct product counterfeiting and substitution (that may be addressed if the supply was tracked via blockchain processes), was estimated to be over AU\$1.68 billion in 2017 alone”.⁵

The Central NSW wine region is home to approx. 64 wineries which collectively comprise a significant proportion of the region’s agricultural output.⁶

Like many novel technologies, blockchain’s uptake both globally and domestically has been disparate and unevenly distributed.⁷ As early as 2018, the United Nations was receiving advice on blockchain’s potential application in the implementation and maintaining the integrity of agricultural supply chains.⁸ From a domestic, regional and legal services point of view there has been a paucity of analysis and evaluation. The NSW Central West and its agriculture-driven economy has not been the subject of research on this vis adoption of blockchain and contract management systems. It may also serve as an indicia or proxy for other regional agricultural areas.

Research Methods

The paper will use empirical methods, including quantitative and qualitative research, to formulate conclusions about the research question.

The rationale for this approach, involving small-scale surveying, is to gather information from the Central West region legal practices on:

1. Areas of law (in particular contract law) undertaken and the proportion of the practice
2. Contract management systems utilised by law practices
3. Considerations, knowledge or adoption of blockchain

Additionally there will be a literature review of the contract management system, legal practice industry and evolving blockchain ‘landscape’ to date. This will contextualise the survey study in the

⁴ ‘Central West; Major Industries’ *DataAu* (Web Page) <<https://dataau.com.au/profile/central-west#block-hero>>

⁵ ‘THE NATIONAL BLOCKCHAIN ROADMAP: Progressing towards a blockchain- empowered future’, The Australian Government, Department of Industry, Science, Energy and Resources (Web Page) <<https://apo.org.au/sites/default/files/resource-files/2020-02/apo-nid276541.pdf>>

⁶ ‘Central NSW Wineries’ *Australian Good Food Guide (AGFG)* <<https://www.agfg.com.au/wineries/central-nsw?pg=3>>

⁷ William Gibson, ‘The Future is Already Here - It’s Just Not Evenly Distributed’ (4 December 2003) *The Economist*

⁸ Tripoli Mischa and Josef Schmidhuber, *Emerging Opportunities for the Application of Blockchain in the Agri-food Industry* (Issue Paper 2018) Food and Agriculture Organisation of the United Nations. International centre for Trade and Sustainable Development.

present and further test the relevance of the use of blockchain technology in contract management systems and application to rural and regional practice in the future.

The paper will:

1. Engage in targeted surveying of contract management systems utilised via regional law networks in the Central West.
2. Review the efficacy of contract management systems utilised via regional law networks in the Central West in line with the five stated aims of a blockchain distributed ledger posited; Confidentiality, Security, Assurance (through the Blockchain), Remote access, Efficiency.
3. Prepare at least one hypothetical modelling comparison for the applicability of a blockchain enabled case management system in rural and regional practice *vis a vis* current case management systems.

To date I have identified the following risks to the paper:

1. Issues with potential responsiveness to surveys in time. Should an unsatisfactory range of responses be returned then this will affect data spread. The paper can still be answered with a narrower scope and focus on real property contracts and transactions. PEXA as a contract management system is almost universally used in rural and regional NSW. However, this limits the potential scope of the paper.
2. Delays in survey responses and the timeframes in this paper.
3. Ethics approval is not required as survey responses will be anonymously collected.

List of Research materials

The research materials will be sourced from government, NGOS, industry groups, news publications and academic studies. The paper will be centred in the discipline of law and the efficacy of blockchain enabled case management systems. However to contextualise this, the topic will involve some research reaching into subject matter areas such as agribusiness, tourism and education.

Expected Impact and Outcomes

The paper will contribute by developing a non- technical hypothetical modelling of a blockchain based contract performance management system for rural and regional law practices.

The National Blockchain Roadmap identified potential for use in agricultural sector through credentialling and financial services sector via the identity requirements is germane to the Central West area of NSW.

If successful, the paper will offer a starting point on:

- a) Contributing to the National narrative on blockchain and how the rural and regional legal sector may become early adopters
- b) Demonstrating a unique need and application for blockchain DLT in contract performance management services for rural and regional business transaction law practice.

Lisa Coates

Contents

Introduction and research question	9
Literature review	9
Results of the Literature Review.....	11
Blockchain and ‘smart contract’	11
Use of Contract Management Systems by Legal Practices.....	13
The National Blockchain Roadmap	14
Research Methodology	15
Survey.....	16
Survey Results	17
Discussion	19
Definitions- Blockchain for lay people.....	20
History of Blockchain	20
The Central West of NSW	22
Geographical spread and population.....	22
Industries and Economy.....	23
Practice areas	25
Current contract management systems	26
Relevant International Examples	29
Efficacy of current contract management systems.....	32
Comparison of blockchain-based system with current contract management systems.....	33
Conclusion	34
Annexure 1. Survey Questions.....	37
Annexure 2. Table of Figures	39
Annexure 3. Figures.....	40
Bibliography	48

Introduction and research question

Like many novel technologies the axiom of ‘seeing is believing’ or more accurately put, ‘seeing is explaining’ applies.

Despite the social behavioural changes that occurred with the introduction of the internet and the *World Wide Web* in 1989⁹ and technologies we associate with it, many users do not understand the core technological basis for these innovations. They simply accept the systems as being beneficial and having a utility in their industry.

This paper poses and considers the research question of whether legal practitioners in the Central West region of NSW would benefit from using or have need of a blockchain enabled contract management system or tool.

The selection of NSW’s Central West region is based the strength of agribusiness and viticulture in the region and moves by both industries – globally and in Australia – to implement blockchain-based solutions.

As client industries in the future adopt blockchain into their systems, legal practitioners will likely follow suit, if only because of the need, driven by compliance obligations and legal duties, to be involved in the transactions. The essential quality of a blockchain¹⁰, is efficiency. This quality or indicia will be examined via the issues of security, confidentiality and assurance the research question is addressed.

Literature review

The literature review focused on academic literature on blockchain developments nationally and internationally and industry developments germane to the NSW region published between Jan 2010 and June 2023.

The methodology adopted was the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) framework.¹¹

Given the narrowness of the topic and the geographical area, non-peer reviewed sources were included to capture as dynamic an analysis as possible.

To ensure the academic integrity of the range of sources, searches were conducted across EBSCOhost, Informit Online, ProQuest, ScienceDirect, Taylor and Francis Online, Ulrichsweb

⁹ ‘History of the Web’, *World Wide Web Foundation* <<https://webfoundation.org/about/vision/history-of-the-web>>

¹⁰ Also referred to as distributed ledger technology (DLT)

¹¹ The Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) statement was originally published in 2009 and is a reporting guideline designed to address poor reporting of systematic reviews. The PRISMA 2009 statement comprised a checklist of 27 items recommended for reporting in systematic reviews and a paper providing additional reporting guidance for each item, with exemplars of reporting and a framework. The recommendations have been widely adopted in various disciplines and endorsed almost 200 journals. “The PRISMA 2020 statement replaces the 2009 statement and includes new reporting guidance that reflects advances in methods to identify, select, appraise, and synthesise studies.” Matthew J. Page et al, ‘The PRISMA 2020 statement: An Updated Guideline for Reporting Systematic Reviews’ (2021) 18(3) *PLoS Medicine* 1003583

Global Serials Directory, NSW and Commonwealth Legislation databases, Google Scholar and Google online.

The searches were conducted across search terms, titles, abstracts and keywords utilising variations of the following; (Blockchain in Australia/ rural and regional OR NSW OR Central West NSW +/- and wine industry/ +/- and legal practice/+ and legal services/ +/- and agribusiness).

The search demonstrated there is exponential growth in theoretical publications in this field, both academic and government vis the National Blockchain Roadmap, there is a dearth of evaluative or empirical work, particularly in areas of blockchain and distributed ledger technology (DLT) that is not focussed directly on cryptocurrency.¹²

The final sources used in this paper were selected on the following criteria as reflected in the below adapted PRISMA flowchart:

- Relevance to paper
- Trusted source
- In date (i.e. after 2010 and retaining currency)

¹² Julie Frizzo-Barker et al, 'Blockchain as a disruptive technology for business: A systematic review' (2020) (51) *International Journal of Information Management* 102029

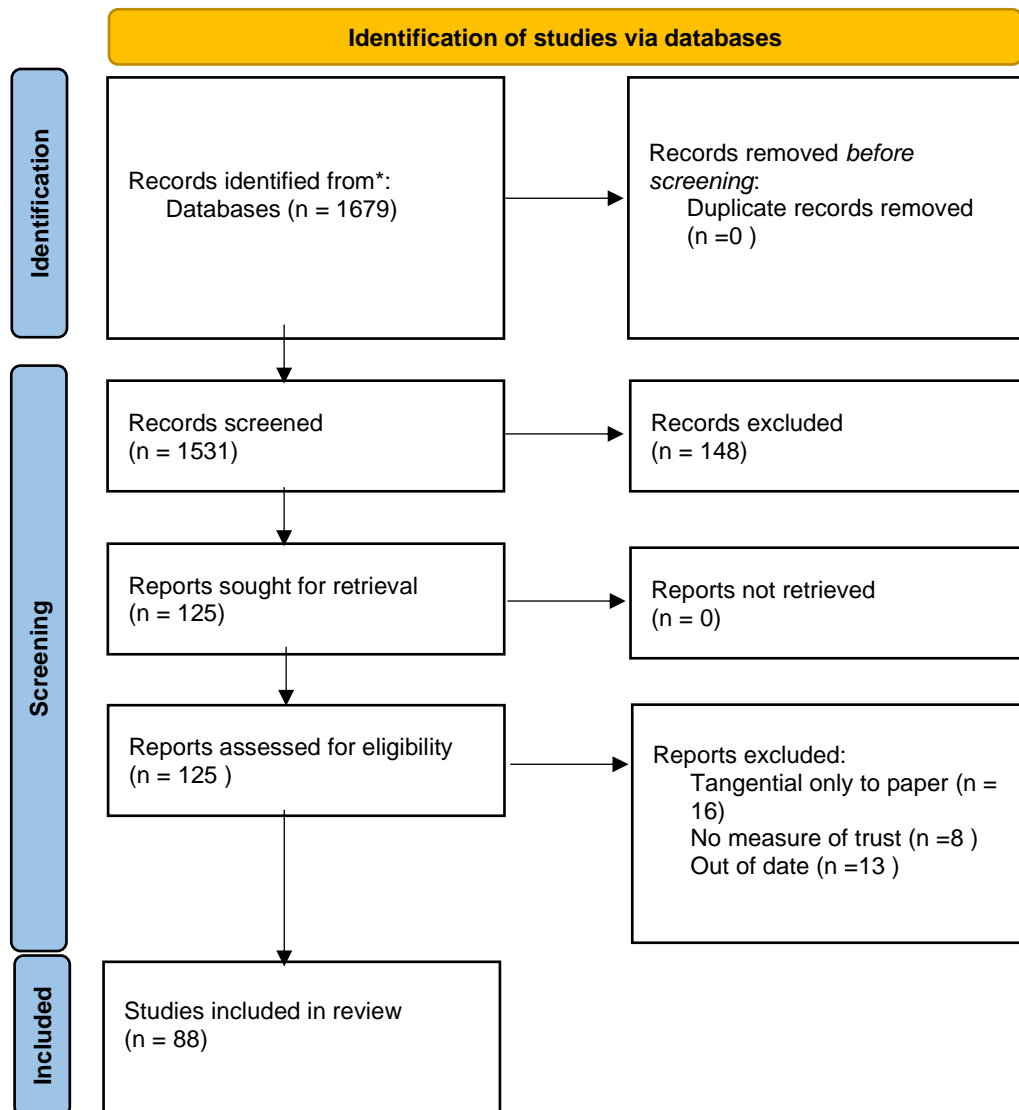


Fig 1. Prisma flow chart adapted from Page et al (2020)¹³

Results of the Literature Review

Blockchain and ‘smart contract’

¹³ Matthew J. Page et al, ‘The PRISMA 2020 statement: An Updated Guideline for Reporting Systematic Reviews’ (2021) 18(3) *PLoS Medicine* 1003583

*A blockchain is a decentralized ledger of all transactions across a peer-to-peer network. Using this technology, participants can confirm transactions without a need for a central clearing authority. Potential applications can include fund transfers, settling trades, voting and many other issues.*¹⁴

Blockchains typically fall into two types: permissioned block chains and permissionless (public) blockchains.

Permissioned blockchains usually restrict access to its members and favoured by industry and government as administrators of such blockchains can control which selected participants can be involved in the consensus process.

There is the flexibility within permissioned blockchains (also referred to as ‘private’ blockchains) to further divide into consortium blockchains and fully private blockchains.¹⁵

Blockchains are inherently transactional in nature. The peer to peer network (P2P) of computers that validates each transaction using algorithms are known as nodes. Each validated transaction may take the form of cryptocurrency, credentialling records, smart contracts or other information.¹⁶

Smart contracts may be defined as, “self-enforcing and self-executing programmes which actuate the terms and conditions of one particular agreement or contract using software codes and computational infrastructure.”¹⁷

The potential for ‘smart’ or self- executing contracts on the blockchain (in particular the Ethereum blockchain) is not a new concept. A ‘smart’ contract is an automated contract is simply computer code that “automatically executes all or parts of an agreement”.¹⁸

There two types of generally accepted smart contract:

1. code that is the “sole manifestation of the agreement between the parties”¹⁹, or
2. code that is representative of a text- based contract between the parties or executes certain provisions, such as the transfer of funds.

The completion of the smart contract on the Ethereum blockchain requires to payment of a transaction fee known as ‘gas’.²⁰ Given the essential components between self-execution and terms and conditions of contract, this model of technology has a unique synergy with the logical sequencing of contract completion, for example when a ‘trigger’ event causes the release of funds held in escrow.

¹⁴ ‘Making Sense of Bitcoin, Cryptocurrency and Blockchain’ PWC (Web Page)
<<https://www.pwc.com/us/en/industries/financial-services/fintech/bitcoin-blockchain-cryptocurrency.html>>

¹⁵ Lingling Guo et al, ‘A Blockchain-Driven Electronic Contract Management System for Commodity Procurement in Electronic Power Industry’ (2021) (9) *IEEE Access* 9473-9480

¹⁶ ‘Making Sense of bitcoin, cryptocurrency and blockchain’ PWC (Web Page)
<<https://www.pwc.com/us/en/industries/financial-services/fintech/bitcoin-blockchain-cryptocurrency.html>>

¹⁷ Tharaka Hewa, Mika Ylianttila and Madhusanka Liyanage, ‘Survey on blockchain based smart contracts: Applications, opportunities and challenges’ (2020) 177 *Journal of Network and Computer Applications* 102857

¹⁸ Stuart D. Levi et al, ‘An Introduction to Smart Contracts and Their Potential and Inherent Limitations’, Harvard Law School Forum on Corporate Governance (Web Page 2018) <<https://corpgov.law.harvard.edu/2018/05/26/an-introduction-to-smart-contracts-and-their-potential-and-inherent-limitations>>

¹⁹ Ibid.

²⁰ Ibid.

Hewa, T. et al note the utility of smart contracts in escrow service in international trading marketplaces in the financial sectors.²¹ The same application could be used in settlements of legal matters with money held in escrow.

Use of Contract Management Systems by Legal Practices

For a legal practice, adoption of a contract management system involves firstly, legal compliance and secondly, adopting a best practice approach.

For legal compliance, there is no express positive requirement in the following legislation that requires an encrypted level of security in NSW legal practitioners' contract management systems:

- *Civil Procedure Act 2005* (NSW)
- *Evidence Act 1995* (Cth)
- *Legal Profession Uniform Law Australian Solicitors' Conduct Rules 2015*
- *Legal Profession Uniform Conduct (Barristers) Rules 2015*

In terms of best practice, the *Competition and Consumer Act 2010* (Cth) (the Act) sch 2 provides guidance as to current best practice.

Subsection 29(a) (False and misleading representations about good or services) of the Act addresses legal standards around false and misleading representations that services [including legal services] are of a particular "standard, quality, value or grade".

Legal practitioners offering inadequate contract management systems may face liability under this provision if they made claims regarding the efficacy and efficiency of those systems.

However liability may arise due to the combination of fiduciary obligations owed to clients and the increasing prevalence of both contract management systems and data breaches. It is likely in the post-HWL Ebsworth data breach era that legal practitioners dealing with a data breach will face claims of professional negligence unless they can demonstrate the security of their systems and processes. A blockchain-powered system could well assist in evidencing this defence.

After examination of specific examples and industries, a blockchain traceable system has not been implemented for the wine industry in Australia. However, the University of New England (UNE) is in earnest research to develop modelling around this. Kapoor et al note that, "the need for a blockchain-based wine supply chain traceability system is now critical because of a surge in forging an adulteration, and the utilisation of additives and dangerous synthetic compounds".²²

Clare Valley grape grower David Travers and wine maker Jeff Grossett in South Australia have developed cloud based software to improve integrity, speed, and simplicity of both collection and compliance with Wine Australia's label integrity programme (LIP) information during vintage. The aim of the programme is to create a trusted digital record via digital information attached to a chip in the screw cap of each wine bottle. Whilst *Wine Australia* notes that this information is immutable, what is not noted is that the chips themselves could be subject to corruption, falsification or copying.

²¹ Ibid at 12.

²² Akshita Kapoor, Garry Griffith and Adam Loch, 'Adapting Blockchain Technology in the Wine Industry to Curb Wine Counterfeiting' (2021)12 (24) *Australasian Agribusiness Perspectives*

However, this is a closer step towards higher security and the increased protections as a precursor to blockchain.²³

An exemplar for the future is already available with *Crurated*, a blockchain-enabled wine subscription service that connects customers and wineries/ wine vendors directly. This business model already exists but the difference with *Crurated* is that a non-fungible token (NFT) is created for every bottle of wine and barrel on the blockchain so that the provenance of every bottle / barrel can be tracked. Each bottle label displays a unique scannable code that provides trace ability and future value. At time of writing, *Crurated* serves a network of European vitners.²⁴ Theoretically, there is no reason why a similar model could not work in Australia, noting the 64 wineries that are established in the Central West of NSW.

The National Blockchain Roadmap

The Australian Federal Department of Industry, Science, Energy and Resources has oversight and responsibility for the National Blockchain Roadmap (“the Roadmap”), which was launched in 2020 under the then Coalition federal government.

It was formulated with industry stakeholders, including *Blockchain Australia* the peak national industry body for blockchain. The decentralised nature of blockchain technology was initially viewed in the mid-2000s as being both a technological disruptor and a potential threat to nation state governance across a range of sectors, but predominantly the finance sector. This has been borne out with the rise of cryptocurrency.²⁵

Blockchains are described by the National Blockchain Roadmap as:

*A particular type of ‘distributed ledger technology. At their core is a shared database that is organised as a list of ‘blocks’, with the constraint that an additional block of data is appended to the ledger only if a majority of nodes ‘agree’ that it is valid.*²⁶

The Roadmap exemplifies one nation state’s attempts to both work with industry as well as exert some level of control over the direction and use of this emerging technology by the planning of strategic priorities and allocation of money via grants.

To date, four working groups have been established in the areas of; credentialing, supply chains, cybersecurity and regtech.²⁷

²³ ‘Statutory data collection moves towards automation after Clare Valley Entrust trial’, *Wine Australia* (Web Page) <<https://www.wineaustralia.com/news/articles/data-collection-moves-towards-automation>>

²⁴ ‘Press, From Burgundy to the World’, *Crurated* (Web Page) <<https://crurated.com/press>>

²⁵ ‘Australia’s Blockchain Roadmap’. *The Australian Government, Department of Industry, Science, Energy and Resources* (Web Page) <<https://www.dfat.gov.au/about-us/publications/trade-and-investment/business-envoy-april-2021-digital-trade-edition/australias-blockchain-roadmap>>

²⁶ ‘THE NATIONAL BLOCKCHAIN ROADMAP: Progressing towards a blockchain- empowered future’, The Australian Government, Department of Industry, Science, Energy and Resources (Web Page) <<https://apo.org.au/sites/default/files/resource-files/2020-02/apo-nid276541.pdf>>

²⁷ Ibid

Research Methodology

The research methodology selected is Grounded Theory. This commonly involves developing a theory or hypothesis based on field data and surveying a sample size.²⁸ Grounded theory is appropriate to the topic of the author's project, given the examination of a novel area of technology in an untested geographical area.

To assess and compare the relative efficacy of blockchain or distributed ledger technology (DLT) against current contract management systems used by legal practitioners in terms of efficiency, it is necessary for legal practitioners to have a level of technical understanding of what is blockchain and how it addresses each of these metrics.

The rationale is not simply for best practice. Efficiency, measured by the qualities of confidentiality, security and assurance (that blockchain would address) may be considered directly related to legal practitioners' client statutory responsibilities broadly categorised under the Legal Profession Uniform Law:

1. **Duty to the court-** *Legal Profession Uniform Law Australian Solicitors' Conduct Rules 2015* (NSW) rr 3, 17-21, 23, 29, 33, 34;²⁹
2. **Duty to the public-** *Competition and Consumer Act 2010* (Cth) sch 2, *Civil Procedure Act 2005* (NSW) ss 26, 38, *Legal Profession Uniform Conduct (Barristers) Rules 2015* rr 17, 101, 103, 104, 105, *Legal Profession Uniform Law Australian Solicitors' Conduct Rules 2015* rr 3, 4, 17, 18, 27, 36; and³⁰
3. **Duties owed to the client** (regarding representation, communication and confidentiality) - *Legal Profession Uniform Law Australian Solicitors' Conduct Rules 2015* rr 7-9, *Legal Profession Uniform Conduct (Barristers) Rules 2015* r 36, *Evidence Act 1995* (Cth) ss 117-131.³¹

The paper undertakes an analysis of legal practitioners in the Central West region of NSW, including current systems of file management, use of contract management tools online and virtual data rooms

²⁸ Grounded theory is an approach that was first developed by Glaser and Strauss in the late 1960' s to address criticisms that qualitative research was insufficiently scientific. Instead of analysing data with existing data, grounded theory posits that new theories could be developed from the process and result of analysis of data. This process involves; the identification of a question, data collection, coding and categorisation, analysis and the generation of a hypothesis. Caron Carter, *Successful Dissertations: The Complete Guide for Education, Childhood and Early Childhood Studies Students* (Bloomsbury Publishing Plc, 2018)

²⁹ *Rondel v Worsley* [1969] 1 AC 191, 227; *Legal Practitioners Conduct Board v Vaezi* [2009] SASC 271; *Legal Services Commissioner v Puryer* [2012] QCAT 48; *New South Wales Bar Association v Cummins* [2001] 52 NSWLR 279; *Giannarelli v Wraith* (1988) 165 CLR 543; *R v Apostilides* (1984) 154 CLR 563; *Galea v Galea* (1990) 19 NSWLR 263; *Day v Perisher Blue Pty Ltd* (2005) 62 NSWLR 731;

³⁰ *New South Wales Bar Association v Sahade* [2005] NSWADT 159; *Ziems v Prothonotary of the Supreme Court of New South Wales* (1957) 97 CLR 279; *Prothonotary of the Supreme Court of New South Wales v Pangallo* (1993) 67 A Crim R 77; *New South Wales Bar Association v Hamman* (1999) 217 ALR 553; *Kooky Garments Limited v Charlton* [1994] 1 NZLR 587; *Giannarelli v Wraith* (1988) 165 CLR 543; *Legal Practitioners Board v Morel* (2004) 88 SASR 401; *Mitchell v Burrell* [2008] NSWSC 772; *Neumegen v Neumegen & Co.* [1998] 3 NZLR 310; *Legal Practitioners Complaints Committee v Browne* [2006] WASAT 201

³¹ *Hawkins v Clayton* (1988) 164 CLR 539; *Mallesons Stephen Jaques v KPMG Peat Marwick* (1990) 4 WAR 357; *Spectrum Ophthalmics Pty Ltd v Ryan* [2010] VSC 19; *Prince Jefri Bolkiah v KPMG (A firm)* [1999] 1 All ER 517; *Morales v Morales* [2015] FamCA 781; *Esso Australia Resources Ltd v Commissioner of Taxation of the Commonwealth of Australia* (1999) 201 CLR 49

(VDR) (as a precursor to blockchain), in addition to a data analysis of demographic and economic statistics of the region.

Brief conclusions from the analysis indicate as follows:

- Contractual (non- property transactions) make up a minority of work in predominantly mixed practice small firms;
- There is a strong use and familiarity with PEXA as an encrypted system for property transactions (noting that PEXA has a fee per transaction model that can be passed onto clients as disbursements);
- There is a lack of understanding of the security differences between cloud- based systems and encrypted- based systems; and
- It is unlikely that regional practitioners will take up opportunities to adopt blockchain based systems unless required to by legal regulatory, cost efficiency or market forces (client pressure) into the future.

The paper also considers the Australian National Blockchain Roadmap and international examples of adoption of blockchain in industry as both frameworks and precedents for the future application of DLT for Central West NSW legal practice.

My research question has involved consideration of:

- legal practice;
- blockchain; and
- blockchain application.

Grounded theory³² has been applied to develop a working hypothesis that there will be a future need for blockchain technology in CWLP case management systems or tools due to the developments toward blockchain in their client industries.

Grounded theory has been applied by a focus on developing a theory grounded in field data and drawing a significant sample size. This has necessitated a twofold approach in research methods:

- a. small scale surveying of Central West Legal practitioners and analysis of data; and
- b. a literature review of available data.

Survey

The author has researched the current law firms in private practice across the 11 Local Government Areas (LGA) of the Central West region. The methodology employed was as follows:

1. Small scale surveying of Central West Law practitioners. This involved:
 - 1.1. Development of a ten question multiple choice survey on www.surveylegend.com (Annexure 1);
 - 1.2. Distribution via all Central West Law Society members via the Central West Law Society Committee official email channels on 8 June 2023; and

³² Caron Carter, *Successful Dissertations: The Complete Guide for Education, Childhood and Early Childhood Studies Students* (Bloomsbury Publishing Plc, 2018)

- 1.3. The author followed up 58 practitioners via email or firm website contacts on 14, 15, 26 and 27 June with individual requests to complete the survey. Participant responses increased from 3 to 21 during this period of targeted requests.
2. To use the empirical data in the public register of the NSW Law Society Register of Solicitors³³, cross referenced against firm webpages where available. 70 private law firm webpages were surveyed in total.

The aim of (2) was to extract a summative picture of the following:

- 2.1 Total number of solicitors in private practice by geographic distribution;
- 2.2 Total number of accredited specialists (all areas of practice);
- 2.3 Number of solicitors who self- advertise commercial or business- related legal practice as their primary areas of practice on their firms' websites; and
- 2.4 Numbers of accredited specialists in areas of commercial, business or property law.

Survey Results

A total of 21/132 (15 %) Central West practitioners responded to the request for the survey. The key findings were as follows:

- 62% of participants worked in micro-firms (1- 5 legal practitioners, including principals)
- 67% of participants stated their law firm had been under its current ownership/ management structure for more than 5 years (29% were new firms of up to 2 years)
- There was a wide distribution of common legal file management systems used; LEAP, Actionstep, Smokeball, Clio
- All participants except one used PEXA for their property management software needs
- 42 % of participants performed 0- 10% of contract based work and 42 % performed 10- 30% of contract based work (excluding property transactions) (see pie chart below)

³³ 'NSW Law Society Register of Solicitors', *NSW Law Society* <<https://www.lawsociety.com.au/register-of-solicitors>>



Fig 2. - Distribution of contract- based work excluding property transactions

Regarding Virtual data rooms, question 7 put to participants was, “my understanding is that these options for contracts performance management: 1) a virtual data room OR 2) cloud based storage with online sharing- appear to be...”

Answer options		Number of Responses
1	the same except in a virtual data room, all parties can participate in the room in real time	4
2	virtual data rooms have better security features	2
3	Cloud based storage with online sharing have better security features	1
4	I do not understand the question	6

Fig 3. Survey question 7

These responses indicate either a lack of understanding of the question, a lack of understanding the technological differences between virtual data rooms (‘VDR’) and cloud based storage (‘CBS’) with online sharing, or a combination of the two. It is a reasonable hypothesis that the next iteration of technology, to apply to contract performance management systems, blockchain, would produce a similar response.

As noted in the survey results, 90% of survey participants used PEXA for property transactions. PEXA has the following features that operate as a virtual data room making it attractive for exclusivity of property transactions.³⁴

- I. Encrypted technology (commensurate with financial services providers);
- II. Digital certificates (eliminating the need for wet ink signatures);
- III. Compliance with the e-conveyancing regulator (ARNECC), to maintain an information security management system (ISMS); and
- IV. Annual independent expert review.

PEXA's fee model is per transaction, rather than by registration or an ongoing subscription. This removes any requirement for an ongoing commitment by the firm to allocate these external fees into their budget. PEXA has a higher utility, being property- exclusive as the majority of practices surveyed offered property transactions in their practices, either alone or combined with other areas, such as family, will and estates or commercial law. By contrast, there are a number of VDRs in the online marketplace with different fee models; annual or monthly subscriptions, fluctuating fees for a fixed number of users, minimum storage or short term use. Generally, the less services purchased for the shortest period of time or lowest commitment generates a higher tariff.³⁵

Out of the survey participants, 90% + either performed 0-10% or 10-30% of contract based work (excluding property transactions). Using a VDR may simply not be cost- effective, especially when the length of a commercial transaction may be fluid. Brief conclusions that may be drawn from the survey results are as follows:

1. CWLPs operate predominantly on a mixed-general practice model, with non- property commercial contract matters taking up a minority of work in a minority of practices;
2. There is a low level of understanding amongst practitioners surveyed as to the benefits of Virtual Data Rooms (as a pre-cursor to blockchain technology) over Cloud Based systems in terms of security;
3. PEXA for property transactions has a high dominance of use for property based transactions. It is also cost effective as subscribers pay on a cost- per transaction basis; and
4. CWLPs also operate with a cloud- based file management system that is embedded with trust accounting software. A blockchain based system would add another layer of day to day technology for use by practitioners who, in general practice, meet and are required to interact with many individual clients to meet performance metrics.

Discussion

My research question is whether legal practitioners in the Central West region of NSW would benefit from using or have need of a blockchain-enabled contract management system or tool.

³⁴ 'How we protect you', *PEXA* (Web Page) <<https://www.pexa.com.au/security/how-we-protect-you>>

³⁵ 'How Much Should a Virtual Data Room Cost?', *Data Room* (Web Page) <<https://dataroom-providers.org/data-room-pricing>>

Definitions- Blockchain for lay people.

Blockchains are described as:

Blockchain technology is an advanced database mechanism that allows transparent information sharing within a business network. A blockchain database stores data in blocks that are linked together in a chain. The data is chronologically consistent because you cannot delete or modify the chain without consensus from the network. As a result, you can use blockchain technology to create an unalterable or immutable ledger for tracking orders, payments, accounts, and other transactions. The system has built-in mechanisms that prevent unauthorized transaction entries and create consistency in the shared view of these transactions.³⁶

The key components of blockchain technology:³⁷

1. A 'chain' of data based an open ledger
2. The 'chain' of data is:
 - a. made up of blocks that are immutable once added, and
 - b. usually underpinned by a cryptographic protocol.
3. The open ledger is:
 - a. a database composed of all the records of transactions between participating parties,
 - b. able to be seen by every computer in the network,
 - c. transparent, and
 - d. verifiable in real time.

History of Blockchain

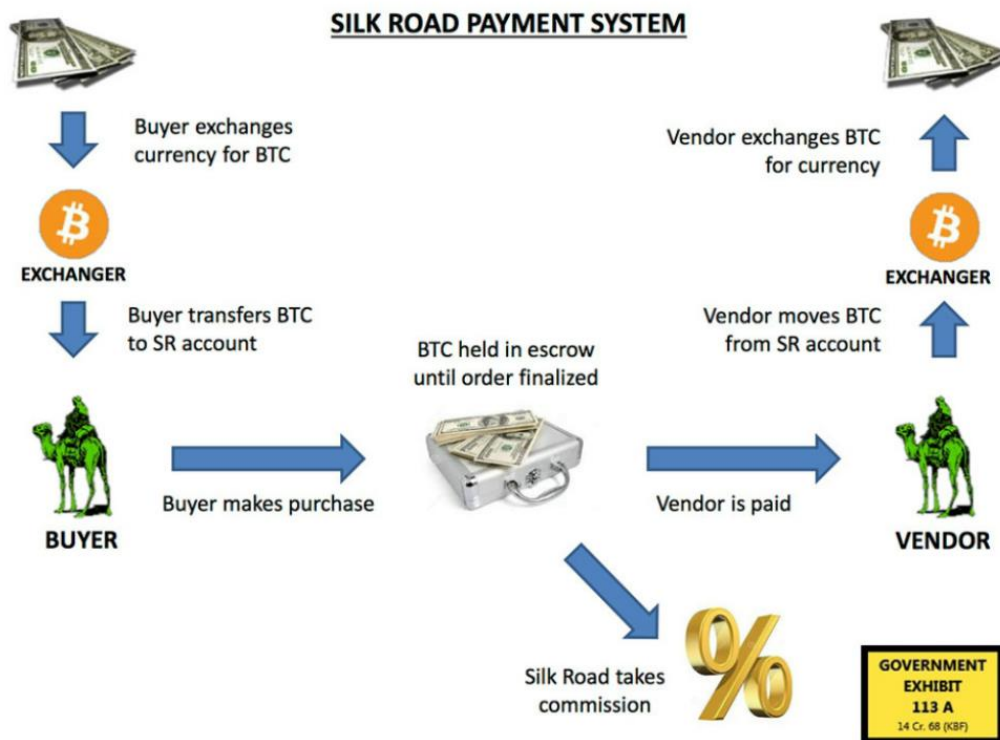
Blockchain technology was announced by the internet release of a white paper "Bitcoin: A Peer-to-Peer Electronic Cash System," by Satoshi Nakamoto in 2008. The correct identity of Satoshi Nakamoto remains unverified. Blockchain technology was initially used to create cryptocurrency, being predominantly associated with digital currencies such as Bitcoin.

However, blockchain's features that enable it to be decentralised, international, immediate, secure, immutable and anonymous (being governed by numbered "keys") enabled the early uptake of the technology by illicit dark web marketplaces and facilitation of financially driven cyber-attacks.³⁸ The most well-known dark web marketplace was the 'Silk Road', founded in February 2011 by the pseudonymous "Dread Pirate Roberts" (later revealed to be Ross Ulbricht).

³⁶ 'What is Blockchain Technology?' *Amazon Web Services (AWS)* <<https://aws.amazon.com/what-is/blockchain/?aws-products-all.sort-by=item.additionalFields.productNameLowercase&aws-products-all.sort-order=asc>>

³⁷ Ian Merrell, 'Blockchain for decentralised rural development and governance' (2022) 3 (3) *Blockchain: Research and Applications* 3.

³⁸ Paul J. Taylor et al, 'A systematic literature review of blockchain cyber security' (2020) 6 *Digital Communications and Networks* 147



Evidence entered into the record of Ross Ulbricht's federal trial in the U.S. Southern District Court of New York, depicting a flowchart of Silk Road's payment system, as envisioned by the U.S. Government.

Fig 4. Silk Road Payment System. Source: <https://www.coindesk.com/company/silk-road/>

The site was best known for selling illegal drugs and purchases were made with digital currency Bitcoin (BTC). At the time it was shut down by US law enforcement officers in 2013, it had done more than \$US1.2 billion in illegal business.³⁹

Ethereum was introduced the same year in 2013 by programmer Vitalik Buterin and launched in 2015. By then the reputation of Blockchain was irrevocably connected with BTC and the scandal attached to the 'Silk Road'.

Whilst the advent of Ethereum was welcomed in the innovation and online communities, traditional industries such as law and government remained more cautious.

The key difference between Ethereum and Bitcoin is that the smart contracts created on the Ethereum block chain are more flexible and comprehensive.⁴⁰

Additionally, by adoption of a 'proof of stake' model, rather than Bitcoin's 'proof of work' model, less energy was being consumed to create both the Ethereum blockchain and Ether (ETH), the native

³⁹ 'Silk Road', *Coin Desk* <<https://www.coindesk.com/company/silk-road>>

⁴⁰ 'Difference between Bitcoin and Ethereum', *Geeksforgeeks* (Web Page) <<https://www.geeksforgeeks.org/difference-between-bitcoin-and-ethereum>>

coin to Ethereum. This is of increasing importance as at one time the Bitcoin blockchain network used electricity consumption commensurate with that of Norway.⁴¹

Whilst Ethereum as a technology seemed positioned as the best way forward for smart contracts and adaptability for the decentralised finance (DeFi) market, it suffered its own early image and culture issues.

The primary cause of this was a hack of its decentralised autonomous organisation fund (DAO) that was set up in 2016 to democratise the fund's asset allocation. The resolution of this was a split in the asset pool, a "hard fork" and a creation of two separate blockchains- the majority who "forked off" to leave retained the Ethereum name and those who remained became Ethereum Classic (ETC)⁴².

The settling of these two networks with new security protocols did not restore market confidence for long. Unlike the traditional financial markets, the digital currency market remains volatile⁴³. However, the potential for blockchain technology to be utilised in other ways such as Non- Fungible Tokens (NFTs) (not covered within this paper's scope) and smart contracts has emerged.

The Central West of NSW

Geographical spread and population

The Central West region of NSW covers approx. 63,000 square km extending west of the Blue Mountains and is home to 11 local government areas (LGAs) and as at the 2021 Census, 212,962 people.⁴⁴

⁴¹ Mark Hooson, 'Bitcoin vs Ethereum', *Forbes Advisor* (Web Page 2022)
<<https://www.forbes.com/advisor/au/investing/cryptocurrency/bitcoin-vs-ethereum/>>

⁴² 'History of ETH: The rise of the Ethereum blockchain', COINTELEGRAPH (Web Page)
<<https://cointelegraph.com/learn/history-of-ethereum-blockchain>>

⁴³ Mark Hooson, 'Bitcoin vs Ethereum', *Forbes Advisor* (Web Page 2022)
<<https://www.forbes.com/advisor/au/investing/cryptocurrency/bitcoin-vs-ethereum/>>

⁴⁴ Central West 2021 Census All Persons Quick Stats, *Australian Bureau of Statistics* (Web Page)
<<https://abs.gov.au/census/find-census-data/quickstats/2021/103>>



Fig.5. Central West; Our region <https://rdacentralwest.org.au/about-us/our-region/>

Industries and Economy

The Central West's main economy is driven by the agricultural industry, mining and tourism.⁴⁵ Health and education are also significant with Charles Sturt University (CSU) campuses in both Bathurst and Orange.

In 2021, CSU announced a multiyear partnership with IBM on the Bathurst campus, to create an IBM client innovation centre (CIC) with the aim to employ in excess of 300 professionals and support IBM client demand across Australia from Bathurst and deliver scholarships to CSU students to study and work in the CIC. Also in 2021, CSU commenced its first intake of Doctor of Medicine students at the Orange campus (joint program with Western Sydney University), building on the rural health teaching profile established with the Bachelor of Dentistry delivered at Orange.⁴⁶ This represents attempts by the University sector to both rebuild after the COVID-19 pandemic but for the regional stakeholders

⁴⁵ 'Our region', *Regional Development Australia Central West, An Australian Government Initiative* <<https://rdacentralwest.org.au/about-us/our-region/>>

⁴⁶ 'School of Rural Medicine', *Charles Sturt University* (Web Page) <<https://science-health.csu.edu.au/schools/medicine/home>>

to move away from traditional reliance on agricultural and mining- based businesses to drive the economy.

In a similar move, the demise of coal-fired electricity has highlighted the need for Lithgow bordering on the Central West region and the Blue Mountains, to transition into a more sustainable and modern economy and less dependent on the coal mines that will inevitably close over the next 20 years.⁴⁷

In 2021, the NSW Government announced a \$50M plan to build an ecotourism and adventure destination in the western area of the Blue Mountains near Lithgow. Whilst the geographic area sits outside the Central West, the 200 ed jobs to Lithgow and economic benefits will flow into the town, which is part of the Central West.⁴⁸

The following data is made available by the AEC group Brisbane (unpublished)⁴⁹ and the Australian Bureau of Statistics National Census 2021.⁵⁰

2020-2021	Central West NSW	NSW
Population	212,962	8,072,161
Employment	80,316	3,654,042
Median age	41	39
Unemployment rate	1.8%	3.0 %
AVG household income	\$96,178	\$118,496
Gross Regional Product	\$13 B	\$643 B

Fig 6. Industries and Economy

Employment in the Central West of NSW is most heavily distributed across the following sectors:

⁴⁷ Gregory, Xanthe, 'Looming closure of Lithgow coal mines fuels concern over transition plans for hundreds of workers', *ABC News, ABC Central West* (Web Page 2021) <<https://www.abc.net.au/news/2021-10-03/future-of-coal-fired-power-stations-lithgow/100493820>>

⁴⁸ Calderwood, Kathleen, 'NSW government to invest \$50m to build new eco-tourism and adventure destination on western edge of Blue Mountains' (Web Page 2021) <<https://www.abc.net.au/news/2021-11-13/nsw-government-invests-50-million-in-blue-mountains-eco-tourism/100616868>>

⁴⁹ Central West; Major Industries', *DataAu* (Web Page) <<https://dataau.com.au/profile/central-west#block-hero>>

⁵⁰ Central West 2021 Census All Persons Quick Stats, *Australian Bureau of Statistics* (Web Page) <<https://abs.gov.au/census/find-census-data/quickstats/2021/103>>

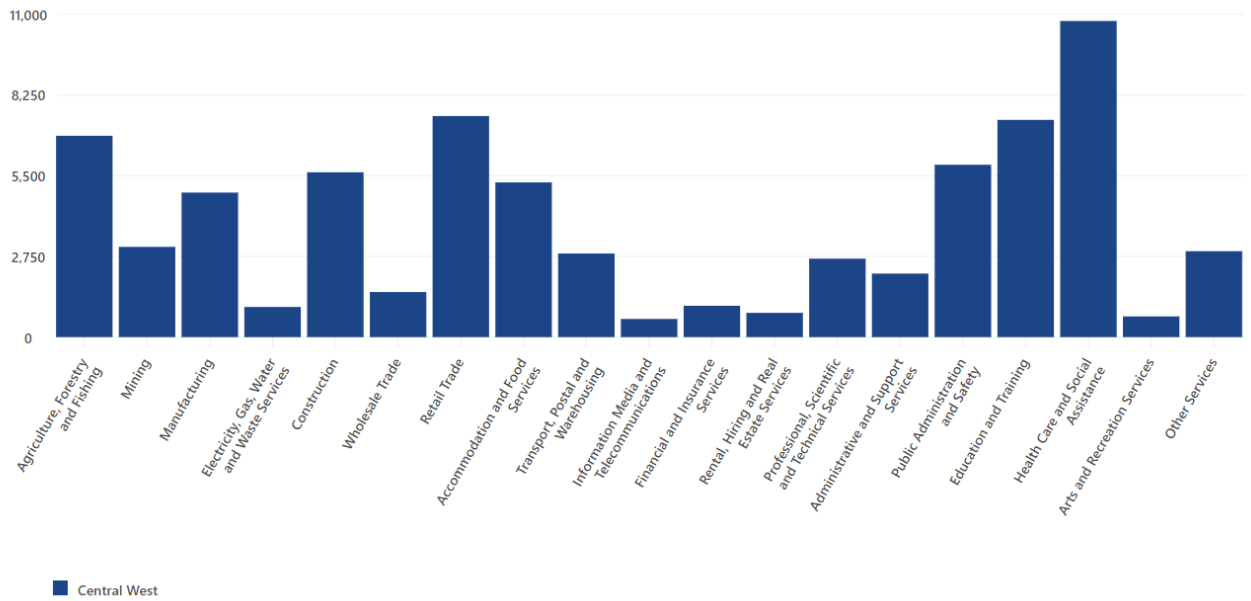
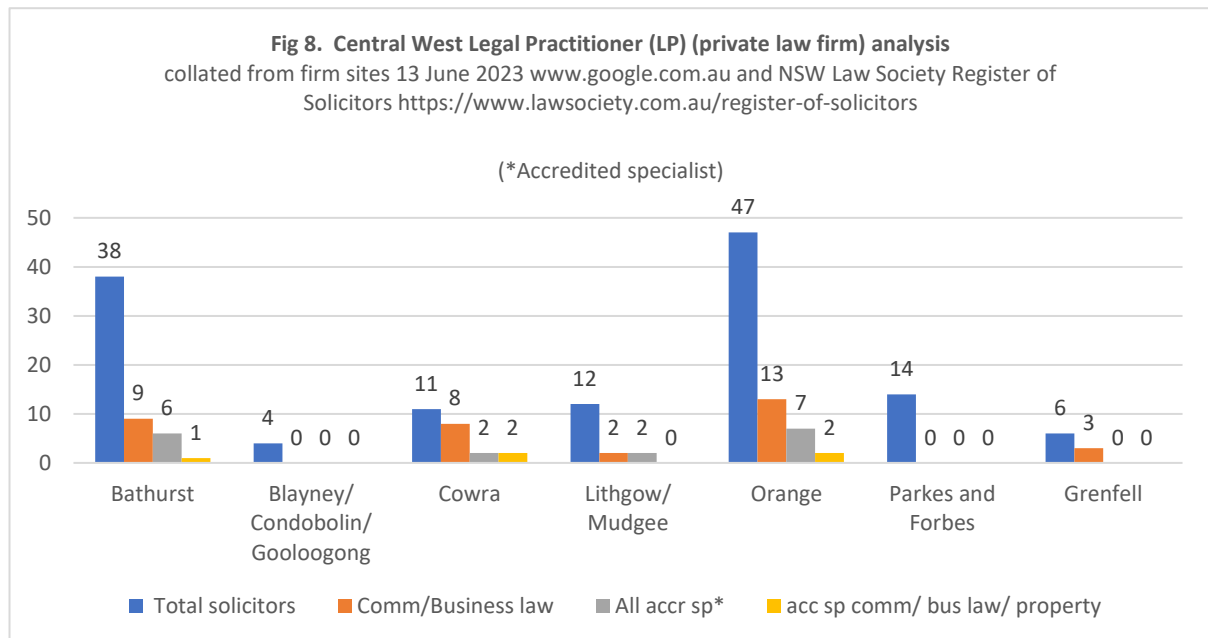


Fig 7. Central West; Major Industries’, AEC Group Pty Ltd (Web Page) <https://dataau.com.au/profile/central-west#block-hero>

Practice areas



There are a total of approximately 132 solicitors across the Central West region of NSW per population of 212,962 (1 solicitor per 1,613 persons). Verification has been made via cross referencing the NSW Law Society register of solicitors and law firm websites. It is common for the

law firms in larger centres such as Bathurst and Orange to offer satellite services to smaller neighbouring towns and this has been accounted for in the final numbers.

There are 17 accredited specialists across the region (NSW Law Society accredited specialists and National Mediation specialists included). These include a roughly equal distribution across family law, mediation, criminal law, personal injury law, property, wills and estates, planning and environment law and to a lesser extent, business law.

Current contract management systems

The survey results on current contract management systems were consistent with broader trends in legal practice. The market has a number of providers who have packaged their trust accounting software that is compliant with the NSW Law Society's accounting obligations under statute with file management systems and offer a full service file management system.⁵¹

Those named were as follows (in order of market position):

- Leap
- Actionstep
- Smokeball
- Clio

Over 63% of practices surveyed were micro-practices (1-5 legal practitioners) and 67% of practices had been in their current management structure for over 5 years.

PEXA (property exchange) dominated the industry for secure data platforms, with 18/20 participants noting that their firms used the platform.

Out of the survey participants, 90% + either performed 0-10% or 10-30% of contract based work (excluding property transactions). This may account for why only 2 participants had used a virtual data room in the past 2 years.

One of the survey questions was designed to target and assess participants' knowledge of current contract performance management systems against the metrics of confidentiality, security and assurance (that blockchain would address).

The difference between VDR and cloud based storage is one that legal practitioners in mergers and acquisitions, due diligence, fundraising and IPO may be expected to be more familiar with, as these are the areas of practise that more commonly use VDR. The differences may be most clearly set out below:

⁵¹ 'Trust Accounting Software', *The Law Society of New South Wales* (Web Page)
<<https://www.lawsociety.com.au/practising-law-in-NSW/trust-money-and-fidelity-fund/trust-accounting-software>>

Virtual Data Room Vs. Cloud Storage		
	Virtual data room	Cloud storage
Best for	Business needs	Personal use
Control		
Distribution of user roles	✓	✓
Custom access levels	✓	✗
User activity control	✓	✗
View only access	✓	✓
View time tracking	✓	✗
Security		
Basic security certifications	✓	✓
Advanced security certifications	✓	✗
Real-time data backup	✓	✗
Remote shred	✓	✗
Protection against mitm attacks	✓	✗
Custom watermarks	✓	✗
Encryption of sensitive data	✓	✗
Screenshot protection	✓	✗
Prevent download and print	✓	✓

Fig. 9 “Virtual Data Room Vs. Cloud Storage”⁵²

The clearest examples of weaknesses in cloud based storage and sharing systems was the Dropbox hack of 2012 that exposed 68 million people's data.

As at 2016, Dropbox was still in damage control mode and there was some doubt as to whether affected users passwords were unchanged, “that may have offered hackers in possession of the leak enough time to crack the cryptographic hashes and access not only their Dropbox accounts, but any other account where they reused that cracked password.”⁵³

Similarly, there was an iCloud Data breach in 2014. The private photos (predominantly celebrities and public figures) that were backed up from the individuals' Apples devices were hacked and leaked

⁵² ‘Virtual Data Room Vs. Free Cloud Storage: The Pros, the Cons, and the Facts’, *Data Room* (Web Page) <<https://dataroom-providers.org/blog/virtual-data-room-vs-cloud-storage>>

⁵³ Newman, Lily May, ‘Hack Brief: 4- Year- Old Dropbox Hack Exposed 68 Million People’s Data’ *Wired* (Web Page 2016) <<https://www.wired.com/2016/08/hack-brief-four-year-old-dropbox-hack-exposed-68-million-peoples-data>>

online.⁵⁴ The security features of the top five virtual data room vendors (as at 27 April 2021) are as follows:

Top 5 virtual data room vendors (based on Getapp ratings)

Security certificates	1. iDeals 4.8 (248 reviews)	2. Datasite 4.7 (3 reviews)	3. Intralinks 4.1 (17 reviews)	4. DFIN Venue 5 (2 reviews)	5. Firmex 4.8 (189 reviews)
GDPR	Yes	Yes	Yes	Yes	Yes
ISO 27001	Yes	Yes	Yes	Yes	Yes
SOC 2 Type II	Yes	Yes	Yes	Yes	No
HIPAA	Yes	Yes	Yes	Yes	Yes
Privacy Shield/CCPA	Yes	Yes	Yes	No	Yes
Security features					
2-factor authentication	Yes	Yes	Yes	Yes	Yes
Password strength policy	Yes	No	No	No	No
Single sign-on (SSO)	Yes	Yes	Yes	Yes	Yes
Detailed user permissions	Yes	Yes	Yes	Yes	Yes
Document-level permissions	Yes	No	Yes	No	No
Remote shred + no-plugin IRM	Yes	Yes	Yes	Yes	No
Time and IP restrictions	Yes	No	No	No	Yes
Built-in redaction	Yes	Yes	Yes	Yes	Yes
Customizable dynamic watermarking	Yes	No	No	No	Yes
256-bit data encryption	Yes	Yes	Yes	Yes	Yes
Customer-managed encryption keys	Yes	No	Yes	Yes	No
Customizable terms of use	Yes	Yes	Yes	Yes	Yes
Full audit logs	Yes	Yes	Yes	Yes	Yes

Fig. 10 “

Top 5 virtual data room vendors”⁵⁵

⁵⁴ Lewis, Dave, ‘iCloud Data Breach: Hacking And Celebrity Photos’, *Forbes* (Web Page 2014) <<https://www.forbes.com/sites/davelewis/2014/09/02/icloud-data-breach-hacking-and-nude-celebrity-photos/?sh=1c5b6d0a2de7>>

⁵⁵ ‘How Secure Are Virtual Data Rooms? The Ultimate Guide to VDR Safety’, *Data Room* (Web Page) <<https://dataroom-providers.org/blog/how-secure-are-virtual-data-rooms>>

Relevant International Examples

Wyoming, USA, enacted pro- blockchain laws in 2018 to facilitate business and corporate adoption of this technology. Wyoming, like the Central West of NSW, is also a high energy producing state, necessary for supporting blockchain technology.

There are two major commercial solar farms near the Central West of NSW that could be deployed for powering blockchain technology into the future. The 189MW Suntop Solar farm south of Dubbo and the 154MW Gunnedah solar farms west of Tamworth are currently Canadian- controlled solar projects. However, in 2022, Amazon signed major contracts with both farms to purchase the majority of their output to power their commercial operations globally.⁵⁶ This may indicate that NSW has not made a significant investment into blockchain technology and the energy infrastructure required that other states overseas have.

The adoption of smart contracts in Wyoming is considered to assist in shortening litigation settlement times and mitigating risk in the legal profession. The application is also envisaged across insurance industries by automating policy agreements and e-voting for government.⁵⁷

One of the key challenges in reconciling traditional contracts law with self-executing or smart contracts identified in Wyoming is that traditional contracts,

“implicate future performance by creating an obligation for one or more parties. Smart contracts do not create a future obligation, as neither party is legally obligated to take any action after they form the contract.”⁵⁸

Australian contract law follows the same principles, and this is relevant in examining any potential application of smart contracts embedded in contract management systems.

It leaves open the question as to what remedy is available to the client. For example, say a hypothetical Central West law firm (‘the firm’) has a contract management system powered by blockchain.

The hypothetical firm acts for a winery who forms a smart contract with a retailer. The winery is required to pay a late fee (escrowed cryptocurrency) if they are unable to deliver the designated order on time. Under the smart contract terms, neither party has a future obligation.

However, if the firm’s client, the winery is late the smart contract self-executes and sends escrowed money to the retailer by way of late fee payment. However, this may be considered the preferable outcome.

In March 2020 Southern Boundary Wines was fined NZ\$1.7 million and three former employees convicted of fraud after thousands of bottles of wine were sold with misleading labels. The 156 charges in total related variously to the sale of “non-compliant” wine (which involves inter vintage and interregional blending, one that was not able to be traced to source vineyards and one that was not compliant with export eligibility requirements and one that was not compliant with the grape variety

⁵⁶ Sophie Vorrath, “two more NSW Solar farms start sending power to the grid- and Amazon”, Renew Economy (online 18 May 2022) <<https://reneweconomy.com.au/two-more-nsw-solar-farms-start-sending-power-to-the-grid-and-amazon/>>

⁵⁷ Morgan N. Temte, ‘Blockchain Challenges Traditional Contract Law: Just How Smart Are Smart Contracts?’ (2019) 19 (1) *Wyoming Law Review* 7

⁵⁸ *Ibid* at 103.

as advertised. The case resulted in the winery company going into liquidation and considerable taxpayer funding following a long running investigation by the NZ Ministry of Primary Industries.⁵⁹

The use of the generic term ‘smart contract’ may be considered misleading at this still- early stage of regulatory law and development of technology for what is more accurately, a self-executing technological mechanism for legal agreements between parties. Grimmelman notes that there is a key difference between technical obligations as embedded in smart contracts and legal obligations in traditional contracts. Legal contracts are written by humans and by nature ambiguous. Smart contracts are unambiguous. Further, by pairing them with legal contracts you do not eliminate the human ambiguity, you hide it.⁶⁰ This goes to the core of the uneasy alliance between the two. Wöher and Zdun note that the most important provisions of any legal contract are covenants, which are future promises between the parties, and typically reciprocal.⁶¹ Covenants in legal contracts are considered the most relevant to smart contracts as they contain the “expected actions of what must be performed”.⁶² However, in order to meet the requirements of a smart contract, a trigger event must be met.

The hypothetical winery example above sets out one of the challenges that occurs when one trigger event is met. The smart contract executes and escrowed money is sent to the retailer. There is no room for nuance or renegotiation of the terms if there are other circumstances at play. One response to this would be efficacy of current computing language in smart contracts. “As a general rule, the more expressive a [computer] language is, the higher its complexity, and the more it is prone to include bugs and errors”.⁶³ The uneasy alliance coined by this author and examined by Grimmelman will remain until further research, development and practice of smart contracts in industry.

In Hangzhou, China, more than 6336 electronic contracts were executed between 2020 and 2021 for procurement business worth 1,353,329,250.00 \$AU (approx.) or RMB 6.5 billion. Blockchain technology has been developed specifically for a process- oriented contract management system (BEcontractor) in China and enabled the fast tracking of commodity supply during the COVID-19 epidemic “... the cost for accomplishing the contract signing process was significantly reduced, and the payment period shortened from around three months to around one month”⁶⁴.

Prior to 2020, BEcontractor was operating as and an electronic contract system but without the encryption or systematic protections of blockchain. One of the key features of BEcontractor was that the existing proof e-contracts is accepted as having the same legal validity as a traditional paper contract. One of the key vulnerabilities is that the electronic contracts were stored as regular files in the database. Over the lifespan of these contracts and providing verification and proof of them was only as good as the servers on which they were housed and kept. By adopting blockchain technology, the contract files are stored in the blockchain network and the “hash* value of each contract is synchronised to the judicial blockchain network run by the Internet courts. This means that each

⁵⁹ Phoebe French, ‘NZ wine company fined \$1.7m for wine fraud’, *the drinks business* (Web Page) <<https://www.thedrinksbusiness.com/2020/03/nz-wine-company-fined-1-7m-for-wine-fraud>>

⁶⁰ James Grimmelman, ‘All Smart Contracts are Ambiguous’, *Journal of Law & Innovation* (2019) 2 (1)

⁶¹ Maximilian Wöherer and Zdun Uwe, ‘Domain Specific Language for Smart Contract Development’ (Conference Paper. ND. Faculty of Computer Science, Research Group Software Architecture University of Vienna, Vienna, Austria) 3

⁶² Ibid at 3

⁶³ Ibid at 7

⁶⁴ Lingling Guo et al, ‘A Blockchain-Driven Electronic Contract Management System for Commodity Procurement in Electronic Power Industry,’ in *IEEE Access*, vol. 9, pp. 9473-9480, 2021, doi: 10.1109/ACCESS.2021.3049562.

electronic contract needs to be sent to the internet courts after the completion of all signatures by all parties.”⁶⁵

* The hash is a digital fingerprint of the previous block and locks blocks in order of timestamp⁶⁶

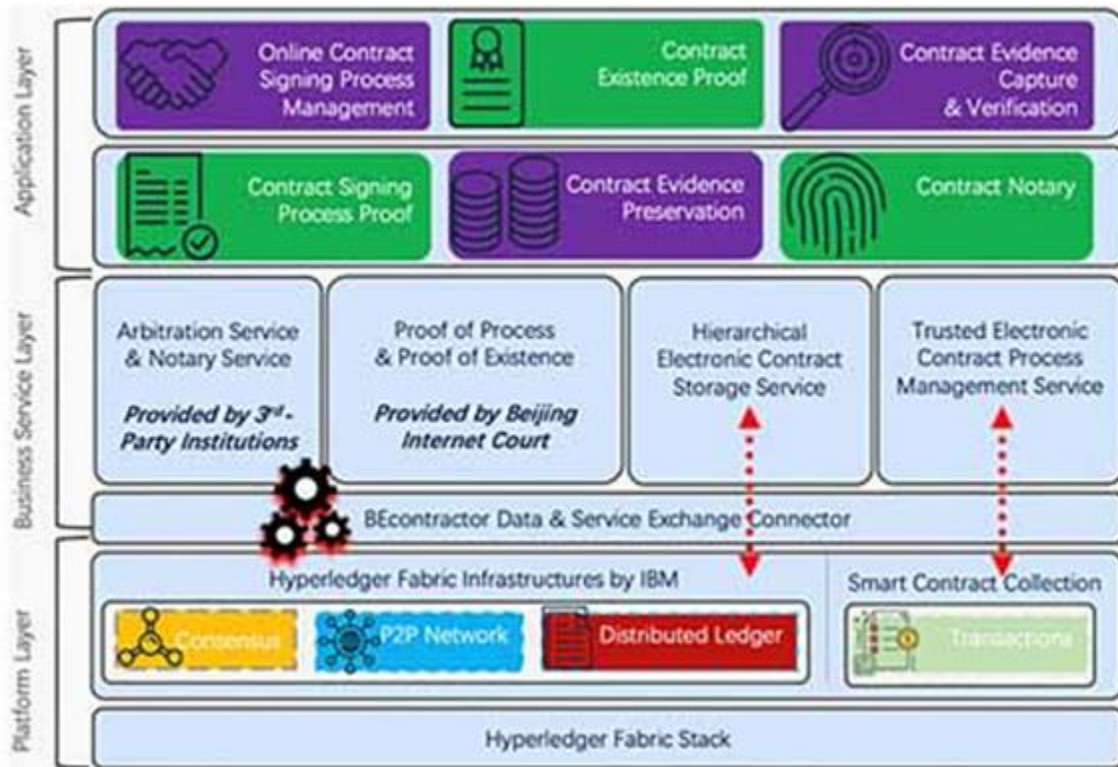


Fig 11. The architecture of BEcontractor⁶⁷

Each of the above stages; application layer which proceeds to the business service layer which then interacts with the platform layer provides a visual and practical model for the transaction. This covers goods and services to be provided, obligations of parties, verification of parties, financing, third party verification and notarising, execution of the contract and proof of existence.

In the UK, the Law Commission published advice to government on 25 November 2021 specifically on Smart Contracts, led by Professor Sarah Green. The Commission independently made the same point as Grimmelmann on the core differences between a legal contract in natural language and that written by code. Code is inherently command and action restricted. A natural language contract is nuanced and “defines and imposes rights, powers, privileges and immunities”.⁶⁸ Notwithstanding this, the conclusion of the Commission was that “the current legal framework in England and Wales is clearly able to facilitate and support the use of smart legal contracts.”⁶⁹ The Commission concluded after

⁶⁵ Ibid.

⁶⁶ Nakamoto, Satoshi, ‘Bitcoin: A peer-to-peer electronic cash system’, *Decentralized Bus. Rev.*, Nov. 2008.

⁶⁷ Ibid at Fig 2

⁶⁸ Law Commission, *Smart legal Contracts Advice to Government: November 2021* (Law Com No 401 CP563)36 <<https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jsxou24uy7q/uploads/2021/11/Smart-legal-contracts-accessible.pdf>>

⁶⁹ ‘Smart contracts’, *Law Commission* (Web Page) <<https://www.lawcom.gov.uk/project/smart-contracts>>

consultation that the code can define contractual terms based on consultation with the Digital Law Association.

Issues such as being able to ascertain the boundaries of natural language and code were considered critical for determining legal enforceability in any given smart contract.⁷⁰

There are broadly 3 forms in which the smart legal contract may take.⁷¹

- natural language contract with performance automated by code; or
- hybrid contract (consisting of natural language and coded terms); or
- contract written solely in (and performed by) code.

Since the Law Commission's report on smart contracts, the Law Commission has published their recommendations for reform of the law on digital assets. 'Digital assets' is an enormous descriptive category.

The Law Commission's report focused on "digital assets to which personal property rights could relate including payment for goods and services, speculation and investment and linking to or embodying debt and equity securities".⁷² One of the recommendations was to resolve and gap in personal property law by creating a new area outside of a chose in action or a chose in possession to create a third category (i.e.: a crypto token).

Part of the Commission's findings summarised legislative changes in other countries to address similar issues. It was noted that in 2020, Liechtenstein introduced legislation to create tokens as new legal objects and a specific, separate regime for the regulation and use of tokens⁷³. This is outside the scope of this research paper but demonstrates considerable movement by governments into the blockchain space and recognition that the traditional areas of law (i.e.: property law or contract law) are being reviewed and reformed against emerging technologies.

Efficacy of current contract management systems

To date, Lawcover, (the primary insurer for NSW Law Society members) have identified that the most common cybersecurity risks in NSW legal practices arise from file management systems and ransomware attacks. Cyberfraud professional indemnity claims to Lawcover had been increasing in

⁷⁰ Law Commission, *Smart legal Contracts Advice to Government*: November 2021 (Law Com No 401 CP563) 23 <<https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jsxou24uy7q/uploads/2021/11/Smart-legal-contracts-accessible.pdf>>

⁷¹ Law Commission, *Smart legal Contracts Advice to Government*: November 2021 (Law Com No 401 CP563)1 <<https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jsxou24uy7q/uploads/2021/11/Smart-legal-contracts-accessible.pdf>>

⁷² Holmes, Lord, 'Digital Asset Report Published', LinkedIn (Web Page 2023) <<https://www.linkedin.com/pulse/digital-asset-report-published-lord-holmes%3FtrackingId=73tYwijqu79riOoe4CGwHQ%253D%253D/?trackingId=73tYwijqu79riOoe4CGwHQ%3D%3D>>

⁷³ Law Commission, *Digital assets: Final Report*: June 2023 (Law Com No 412 HC1486) 39 <<https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jsxou24uy7q/uploads/2023/06/Final-digital-assets-report-FOR-WEBSITE-2.pdf>>

recent years- more than quadrupling in the period 2020/ 2021 during the COVID-19 work from home/ lockdown years after 2017/2018 but now appear to be trending downwards.⁷⁴

Whilst there is no proscriptive legal requirement for legal practitioners to encrypt communications at present, aligning with Internet security standards in business as a best practise measure is likely to not only be a commercial expectation of clients but also as a de facto industry standard moving forward. However, Australia has not yet embedded blockchain technology into common-use VDRs. We are even further away from making that a cost effective everyday practice in rural and regional commercial and business law practice.

Comparison of blockchain-based system with current contract management systems

The convergence of development of new technologies and unanticipated restrictions such as the COVID-19 pandemic created an impetus towards online solutions. One example of this internationally was the further development of BEcontractor in China to be underpinned by blockchain technology for the procurement process. This created greater efficiencies as well as security in a system that turns over billions of dollars per year.⁷⁵

As a result of the remote requirements of the COVID-19 pandemic, NSW made permanent changes to the *Electronic Transactions Act 2000* (NSW), In particular Part 2B that enables remote witnessing of documents, Part 2A (Additional provisions applying to contracts involving electronic communications) and Schedule 1 which establish is and sets out the electronic case management system (ECM) for NSW courts.

In Australia nationally, InfoTrackID has been used to check identity documents against the Australian government document verification service (DVS) and is a useful tool in the property exchange (Eproperty) transaction space. These tools for both electronic witnessing of documents and electronic verification of parties are already in place and are prerequisites for the establishment of any blockchain contract management system in the future.⁷⁶

The similarity that may be drawn between these two examples (procurement in China and the remote requirements of the COVID-19 pandemic in New South Wales) was that the rapid adoption of new technology occurred due to the pressure and unique circumstances of the COVID-19 pandemic and the commercial and logistical pressures that took place at scale.

There was no choice but to embrace innovation and trust new technology. Dupuis et al note that trust is paradoxically key to blockchain adoption, since “without initial consumer trust, blockchain technology usage will remain marginal.”⁷⁷

⁷⁴ Malcolm Heath, ‘Cyber claims- Lawcover Group Cyber Risk Insurance Policy’ (Seminar Paper, Lawcover Principal Practitioners Seminar, 22 February 2023)

⁷⁵ Lingling Guo et al, "A Blockchain-Driven Electronic Contract Management System for Commodity Procurement in Electronic Power Industry," in *IEEE Access*, vol. 9, pp. 9473-9480, 2021, doi: 10.1109/ACCESS.2021.3049562.

⁷⁶ ‘InfoTrackID’, *InfoTrackGlobal* (Web Page) <<https://www.infotrack.com.au/infotrackid>>

⁷⁷ Irma Dupuis et al, ‘Blockchain: the Paradox of Consumer Trust in a Trustless System - a Systematic Review’ (Conference Paper, 2021 IEEE International Conference on Blockchain (Blockchain), Melbourne, Australia, 2021) 505-512

Given that the blockchain technology lacks human ambiguity, is decentralised and is promoted as being “trust free”, the paradox and the irony in this statement is self-evident.⁷⁸ A blockchain-based system offers the opportunity to improve the delivery of legal services by rural legal practices across the following metrics; risk management, visibility of transactions, continuing relationship with legal providers (via the blockchain register), client relationship building and trust.

The modelling of a blockchain-based system in NSW, with features similar to BEcontractor would require the following:

1. Analysis of the BEcontractor system for efficacy, adaptability and risk management.
2. Assessment of the Beijing Internet Court and transnational study of the jurisdiction of the Court, construction and application to BEcontractor vis-a-vis comparison of how an Internet Court or an Internet ADR program may be implemented at the federal level in Australia.
3. Consultation with the Federal Government and National Blockchain Roadmap stakeholders.
4. Interest by Blockchain Australia and consultation and buy in from Blockchain company innovators to develop a contract management specific tool.
5. Consideration as to how/ whether a contract management specific tool would partner with existing technology in the legal market (PEXA, VDRs).
6. Consultation with the NSW Law Society, Lawcover, client industries and practitioners.

Conclusion

The analysis of research and small scale survey indicates as follows about the key legal needs of CWLPs:

1. CWLPs operate predominantly on a mixed- general practice model, with non- property commercial contract matters taking up a minority of work in practices.
2. There is a low level of understanding amongst practitioners surveyed as to the benefits of Virtual Data Rooms over Cloud Based systems for in terms of security.
3. PEXA for property transactions has a high dominance of use for property based transactions. It is also cost effective as subscribers pay on a cost- per transaction basis. It is a reasonable assumption that the Virtual Data rooms on offer in the current market (as surveyed), which operate on a monthly or yearly subscriber basis to the firm, are less attractive as a cost benefit analysis.
4. CWLPs also operate with a cloud- based file management system that is embedded with trust accounting software. A blockchain based system would add another layer of day to day technology for use by practitioners who, in general practice, meet and are required to interact with many individual clients to meet performance metrics.

A proposed blockchain system would address the issues of security, confidentiality and assurance via the blockchain and address the perils of distance that present a unique challenge to rural and regional

⁷⁸ Irma Dupuis et al, ‘Blockchain: the Paradox of Consumer Trust in a Trustless System - a Systematic Review’ (Conference Paper, 2021 IEEE International Conference on Blockchain (Blockchain), Melbourne, Australia, 2021) 505-512

practitioners. One unanticipated consequence of this may be progress towards parity in the profession between city versus regional practitioners, by the equalising effects of access to technology. A disadvantage is that by the time DLT becomes attractive for CWLP to use, the technology may still not be cost-effective. This is a similar scenario to the current experience of using VDRs. Alternatively a lack of knowledge of the efficacy or importance of blockchain credentialing may be a deterrent to adoption by CWLPs.

To date, PEXA has been a practical and pragmatic success story in the VDR space across the Central West region of NSW for legal practice. PEXA offers an encrypted property transaction online service that is charged by transaction, regulated by ARNECC. 90% of survey participants stated that they used PEXA. It is also notable that PEXA fees are claimable as disbursements from clients due to this type of fee modelling per transaction. This experience may distinguish PEXA from Virtual Data Rooms which have a fee modelling system that is generally tied to a monthly or yearly subscriber fee to the firm and would be more challenging to apportion as a disbursement. On this basis, there was no lack of willingness of survey participants to use online, encrypted services to perform legal transactions. The limitations of survey responses with respect to use of virtual data rooms (other than PEXA) may be indicative of a number of factors:

- overall low number of survey responses
- overall low number of practitioners predominantly working in the commercial/contracts space (as per data from this survey and as gathered from the Law Society of NSW register/firm website checks)

The Central West region wine industry continues to enjoy growth and progress has already begun in the South Australian wine region for cloud based credentialing and tracking of wine⁷⁹ and in Europe, blockchain end-to-end tracking of wine sales via NFTs.⁸⁰

The design of a contract management tool for Central West legal practices needs to be specific and practical to the mode of transaction and developed in consultation with industry. At present the Federal Government has allocated \$6.9 million in funding to two pilot papers on reducing compliance costs in business and the food and beverage sector.⁸¹

The Southern Boundary Wines case in NZ highlighted the need for trust in the goods and services supplied in the future, not only to mitigate business losses but to restore consumer confidence.⁸² The legal profession has one of the highest requirements of all professions in terms of both trust and confidentiality from both regulatory standpoint as well as public perception. This creates unique opportunities for legal practitioners into the future to utilise blockchain technology in building trust.

In addition to economic and political benefits, the coordination, record keeping, and irrevocability of transactions using blockchain technology are features that could be as fundamental for forward progress in society as the Magna Carta or the Rosetta Stone⁸³

⁷⁹ ‘Statutory data collection moves towards automation after Clare Valley Entrust trial’, *Wine Australia* (Web Page) <<https://www.wineaustralia.com/news/articles/data-collection-moves-towards-automation>>

⁸⁰ ‘Press, From Burgundy to the World’, *Crurated* (Web Page) <<https://crurated.com/press/>>

⁸¹ ‘Australia’s Blockchain Roadmap’. *The Australian Government, Department of Industry, Science, Energy and Resources* (Web Page) <<https://www.dfat.gov.au/about-us/publications/trade-and-investment/business-envoy-april-2021-digital-trade-edition/australias-blockchain-roadmap>>

⁸² French, Phoebe, ‘NZ wine company fined \$1.7m for wine fraud’, *the drinks business* (Web Page) <<https://www.thedrinksbusiness.com/2020/03/nz-wine-company-fined-1-7m-for-wine-fraud>>

⁸³ Swan, M. (2015). *Blockchain: blueprint for a new economy*. Sebastopol, California : O’Reilly Media.

In order for a DLT contract management system to succeed, modelling could be drawn from the successes of PEXA (encrypted, transactional, cost to be borne by client, user friendly), examples such as *Curated*, making inroads into the international wine industry via (NFTs) and BEcontractor in China.

The unique nature of the legal profession requires stakeholder support by the regulatory bodies, NSW Courts, government and industry.

The future vision is already presented via the National Blockchain Roadmap. Modelling and implementation requires a market need, meeting regulatory pressure and a cost- benefit analysis. The market need may be on the horizon, but not yet.

Lisa Coates

Annexure 1. Survey Questions

1. The law firm I work for currently has the following number of legal practitioners (including partners/principals)
 - a) 5
 - b) 6-10
 - c) 10 +

3. My law firm has been under its current ownership/ management structure for the following period of time
 - a) Up to two years
 - b) 2- 5 years
 - c) 5 years plus

4. Our firm uses the following file management system
 - a) LEAP
 - b) Actionstep
 - c) Smokeball
 - d) Clio
 - e) Other- please name

5. If your firm uses the following secure data platform, which of the following is it?
 - a) PEXA
 - b) Sympli
 - c) Other

6. My legal practice consists of:
 - a) 0-10% contract based work (excluding property transactions)
 - b) 10-30% contract- based work (excluding property transactions)
 - c) 30-50% contract- based work (excluding property transactions)
 - d) 50-70% contract- based work (excluding property transactions)
 - e) 70% + contract- based work (excluding property transactions)

7. Our firm has used the following secure contract performance management system (often referred to as a “virtual data room”) in the past 0-2 years
 - a) iDeals
 - b) ansarada
 - c) Onehub
 - d) Datasite
 - e) SecureDocs
 - f) Intralinks
 - g) Box

- h) Venue
- i) Sterling
- j) SmartRoom
- k) Other (please name)

8. My understanding is that these options for contract performance management:

- A virtual data room OR
 - Cloud based storage with online sharing
- appear to be

- a) The same except in a virtual data room, all parties can participate in the room in real time
- b) virtual data rooms have better security features
- c) cloud based storage with online sharing have better security features
- d) I do not understand the question

9. Our firm has a cyber security policy in place

- a) Yes
- b) I'm not sure

Annexure 2. Table of Figures

Fig 1	Prisma flow chart adapted from Page et al 2020
Fig 2	Distribution of contract- based work excluding property transactions
Fig 3	Survey question 7
Fig 4	Silk Road Payment System. Source: https://www.coindex.com/company/silk-road/
Fig 5	Central West; Our region https://rdacentralwest.org.au/about-us/our-region/
Fig 6	Industries and Economy
Fig 7	Central West; Major Industries', AEC Group Pty Ltd (Web Page) https://dataau.com.au/profile/central-west#block-hero
Fig 8	Central West Legal Practitioner (LP) (private law firm) analysis
Fig 9	“Virtual Data Room Vs. Cloud Storage”
Fig 10	“Top 5 virtual data room vendors”
Fig 11	The architecture of BEcontractor

Annexure 3. Figures

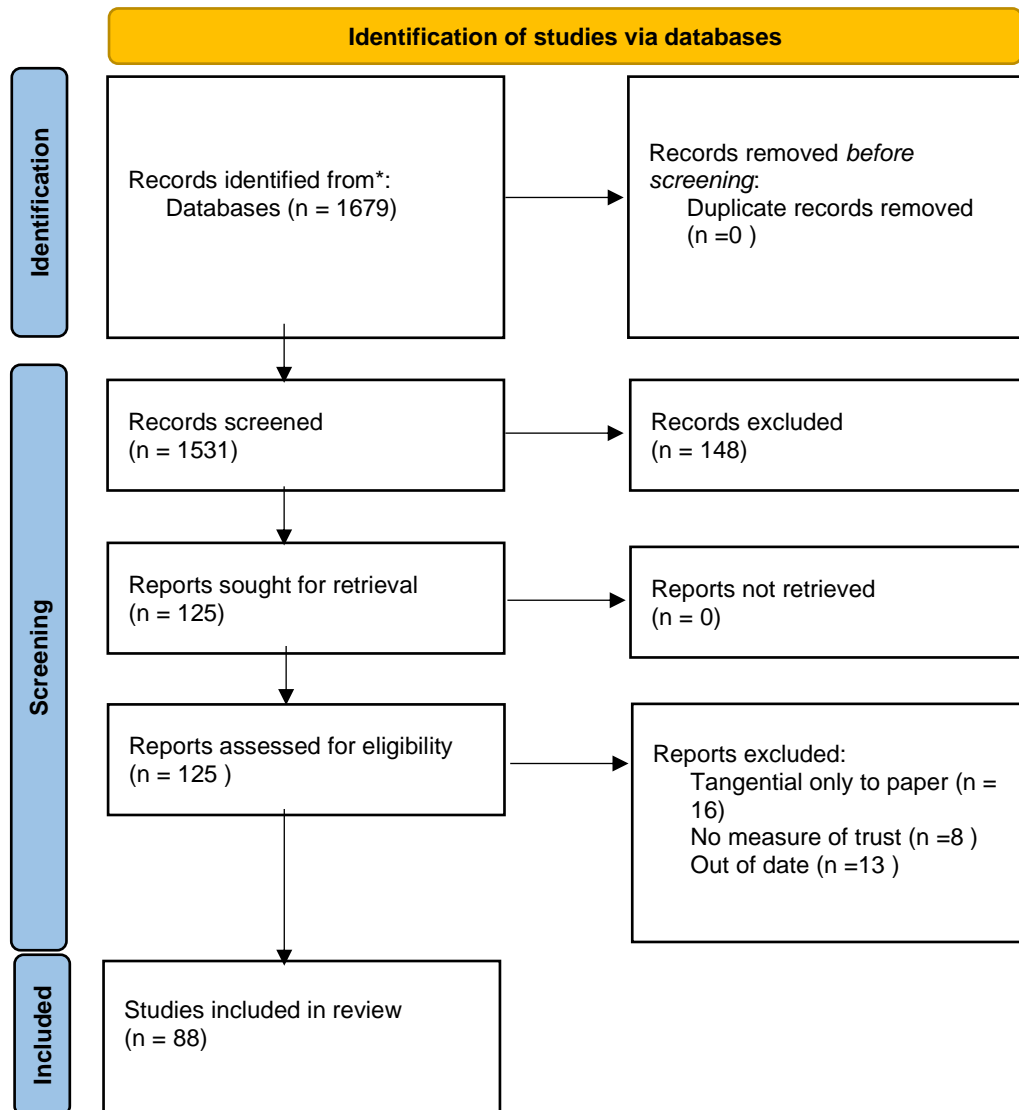


Fig 1. Prisma flow chart adapted from Page et al (2020)⁸⁴

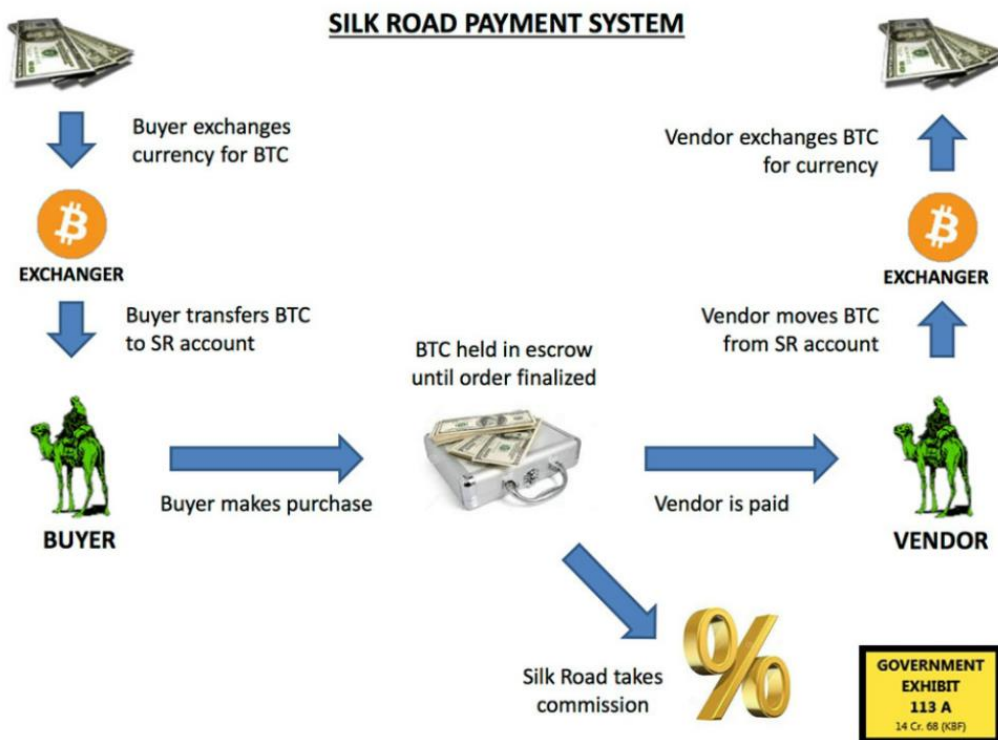
⁸⁴ Matthew J. Page et al, 'The PRISMA 2020 statement: An updated guideline for reporting systematic reviews' (2021) *PLoS Medicine* 18(3) 1003583



Fig 2- Distribution of contract- based work excluding property transactions

Answer options		Number of Responses
1	the same except in a virtual data room, all parties can participate in the room in real time	4
2	virtual data rooms have better security features	2
3	Cloud based storage with online sharing have better security features	1
4	I do not understand the question	6

Fig 3. Survey question 7



Evidence entered into the record of Ross Ulbricht's federal trial in the U.S. Southern District Court of New York, depicting a flowchart of Silk Road's payment system, as envisioned by the U.S. Government.

Fig 4. Silk Road Payment System. Source: <https://www.coindesk.com/company/silk-road/>



Fig 5. Central West; Our region <https://rdacentralwest.org.au/about-us/our-region/>

2020-2021	Central West NSW	NSW
Population	212,962	8,072,161
Employment	80,316	3,654,042
Median age	41	39
Unemployment rate	1.8%	3.0 %
AVG household income	\$96,178	\$118,496
Gross Regional Product	\$13 B	\$643 B

Fig 6 . Industries and Economy

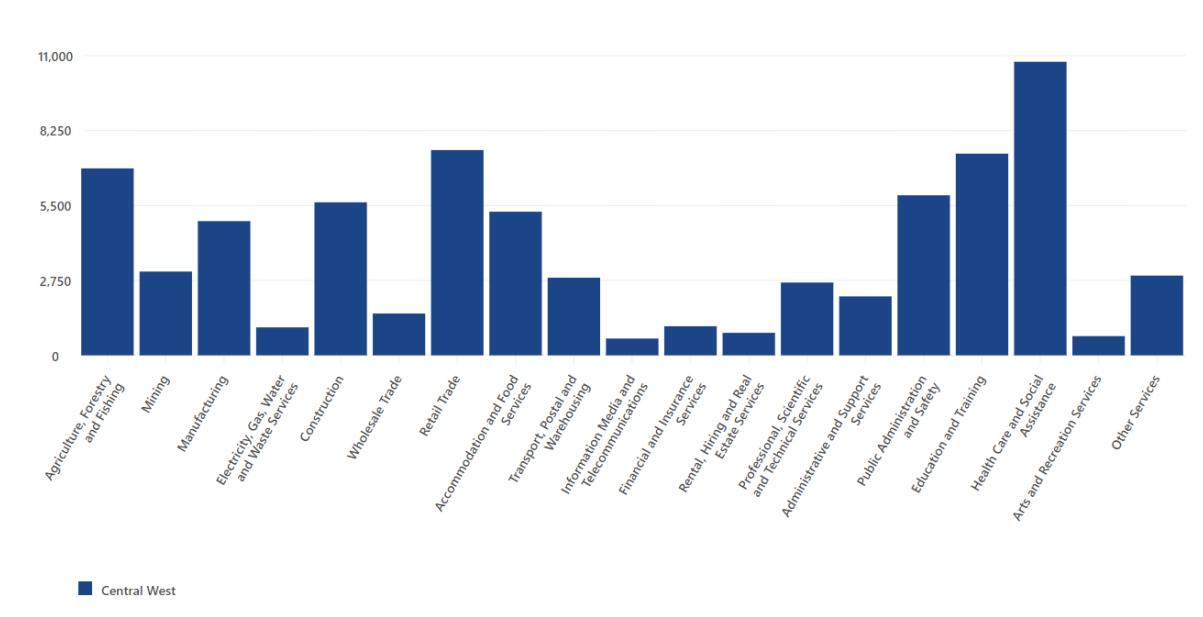
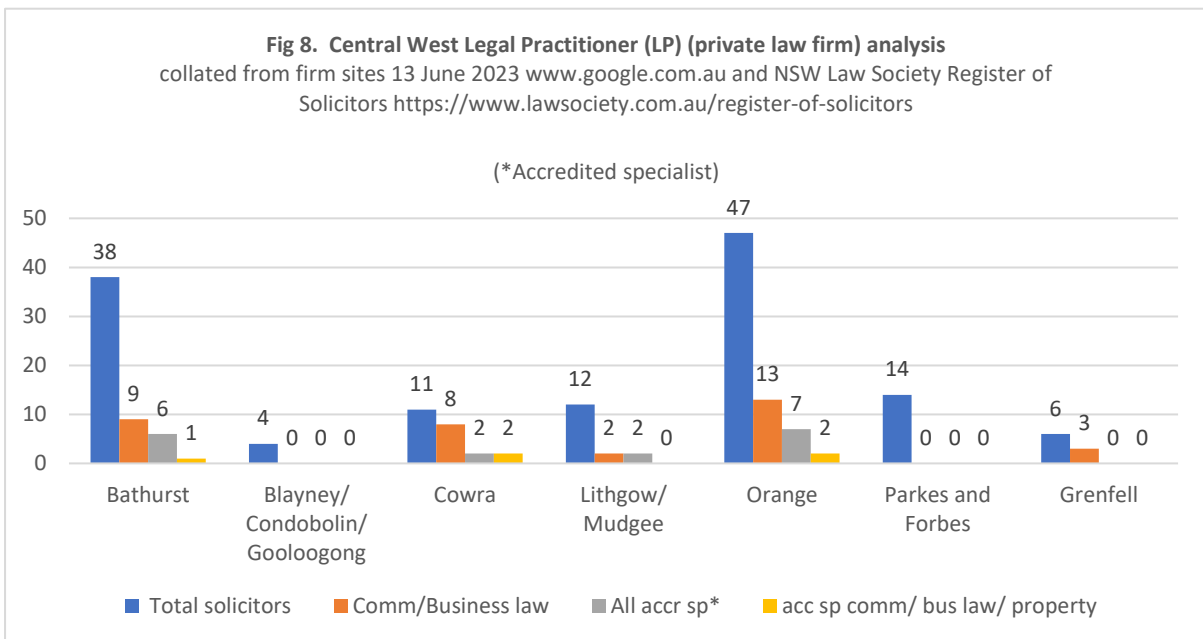


Fig 7. Central West; Major Industries', DataAu (Web Page) <<https://dataau.com.au/profile/central-west#block-hero>>



Virtual Data Room Vs. Cloud Storage		
	Virtual data room	Cloud storage
Best for	Business needs	Personal use
Control		
Distribution of user roles	✓	✓
Custom access levels	✓	✗
User activity control	✓	✗
View only access	✓	✓
View time tracking	✓	✗
Security		
Basic security certifications	✓	✓
Advanced security certifications	✓	✗
Real-time data backup	✓	✗
Remote shred	✓	✗
Protection against mitm attacks	✓	✗
Custom watermarks	✓	✗
Encryption of sensitive data	✓	✗
Screenshot protection	✓	✗
Prevent download and print	✓	✓

Fig. 9 “Virtual Data Room Vs. Cloud Storage”⁸⁵

⁸⁵ ‘Virtual Data Room Vs. Free Cloud Storage: The Pros, the Cons, and the Facts’, *Data Room* (Web Page) 21 May 2021
 <<https://dataroom-providers.org/blog/virtual-data-room-vs-cloud-storage>>

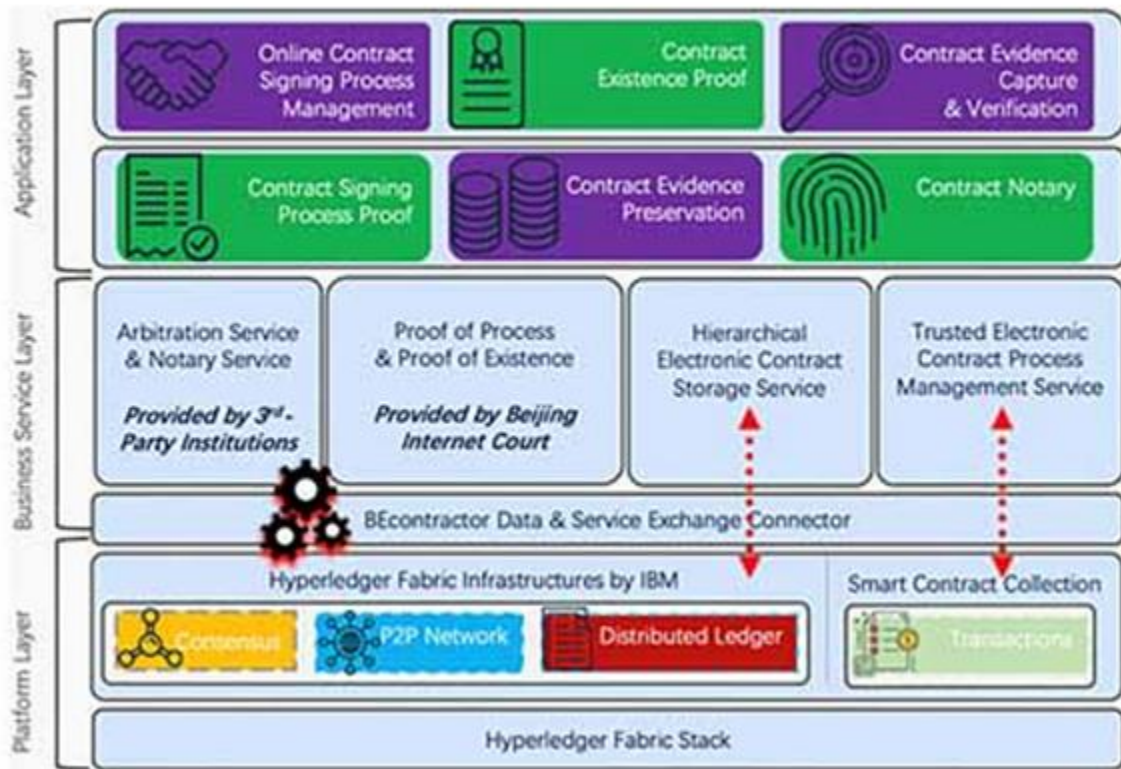


Fig 10- The architecture of BEcontractor⁸⁶

⁸⁶ Ibid at Fig 2

Top 5 virtual data room vendors (based on Getapp ratings)

Security certificates	1. iDeals 4.8 (248 reviews)	2. Datasite 4.7 (3 reviews)	3. Intralinks 4.1 (17 reviews)	4. DFIN Venue 5 (2 reviews)	5. Firmex 4.8 (189 reviews)
GDPR	Yes	Yes	Yes	Yes	Yes
ISO 27001	Yes	Yes	Yes	Yes	Yes
SOC 2 Type II	Yes	Yes	Yes	Yes	No
HIPAA	Yes	Yes	Yes	Yes	Yes
Privacy Shield/CCPA	Yes	Yes	Yes	No	Yes
Security features					
2-factor authentication	Yes	Yes	Yes	Yes	Yes
Password strength policy	Yes	No	No	No	No
Single sign-on (SSO)	Yes	Yes	Yes	Yes	Yes
Detailed user permissions	Yes	Yes	Yes	Yes	Yes
Document-level permissions	Yes	No	Yes	No	No
Remote shred + no-plugin IRM	Yes	Yes	Yes	Yes	No
Time and IP restrictions	Yes	No	No	No	Yes
Built-in redaction	Yes	Yes	Yes	Yes	Yes
Customizable dynamic watermarking	Yes	No	No	No	Yes
256-bit data encryption	Yes	Yes	Yes	Yes	Yes
Customer-managed encryption keys	Yes	No	Yes	Yes	No
Customizable terms of use	Yes	Yes	Yes	Yes	Yes
Full audit logs	Yes	Yes	Yes	Yes	Yes

Fig. 11 “ Top 5 virtual data room vendors”⁸⁷

⁸⁷ ‘How Secure Are Virtual Data Rooms? The Ultimate Guide to VDR Safety’, *Data Room* (Web Page) <<https://dataroom-providers.org/blog/how-secure-are-virtual-data-rooms>>

Bibliography

A Articles/Books/Reports

Carter, Caron, *Successful Dissertations: The Complete Guide for Education, Childhood and Early Childhood Studies Students* (Bloomsbury Publishing Plc, 2018)

Dupuis, Irma et al, 'Blockchain: the Paradox of Consumer Trust in a Trustless System - a Systematic Review' (Conference Paper, 2021 IEEE International Conference on Blockchain (Blockchain), Melbourne, Australia, 2021) 505-512

Frizzo-Barker, Julie et al, 'Blockchain as a disruptive technology for business: A systematic review' (2020) (51) *International Journal of Information Management* 102029

Grimmelmann, James. 'All Smart Contracts are Ambiguous', *Journal of Law & Innovation* (2019) 2 (1)

Guo, Lingling et al, 'A Blockchain-Driven Electronic Contract Management System for Commodity Procurement in Electronic Power Industry' (2021) (9) *IEEE Access* 9473-9480

Kapoor, Akshita, Garry Griffith and Adam Loch, 'Adapting Blockchain Technology in the Wine Industry to Curb Wine Counterfeiting' (2021)12 (24) *Australasian Agribusiness Perspectives*

Merrell, Ian, 'Blockchain for decentralised rural development and governance' (2022) 3 (3) *Blockchain: Research and Applications* 3

Page, Matthew. J et al, 'The PRISMA 2020 statement: An updated guideline for reporting systematic reviews' (2021) 18(3) *PLoS Medicine* 1003583

Swan, M. (2015). *Blockchain: blueprint for a new economy*. Sebastopol, California : O'Reilly Media.

Taylor, Paul. J et al, 'A systematic literature review of blockchain cyber security' (2020) 6 *Digital Communications and Networks* 147-156

Temte, Morgan, N., 'Blockchain Challenges Traditional Contract Law: Just How Smart Are Smart Contracts?' (2019) 19 (1) *Wyoming Law Review* 7

B Cases

Day v Perisher Blue Pty Ltd (2005) 62 NSWLR 731;

Esso Australia Resources Ltd v Commissioner of Taxation of the Commonwealth of Australia (1999) 201 CLR 49

Galea v Galea (1990) 19 NSWLR 263

Giannarelli v Wraith (1988) 165 CLR 543

Hawkins v Clayton (1988) 164 CLR 539

Kooky Garments Limited v Charlton [1994] 1 NZLR 587

Legal Practitioners Conduct Board v Vaezi [2009] SASC 271

Legal Practitioners Board v Morel (2004) 88 SASR 401
Legal Practitioners Complaints Committee v Browne [2006] WASAT 201
Legal Services Commissioner v Puryer [2012] QCAT 48
Mallesons Stephen Jaques v KPMG Peat Marwick (1990) 4 WAR 357
Mitchell v Burrell [2008] NSWSC 772
Morales v Morales [2015] FamCA 781
Neumegen v Neumegen & Co. [1998] 3 NZLR 310
New South Wales Bar Association v Cummins [2001] 52 NSWLR 279
New South Wales Bar Association v Hamman (1999) 217 ALR 55
New South Wales Bar Association v Sahade [2005] NSWADT 159
Prince Jefri Bolkiah v KPMG (A firm) [1999] 1 All ER 517
Prothonotary of the Supreme Court of New South Wales v Pangallo (1993) 67 A Crim R 77
R v Apostilides (1984) 154 CLR 563
Rondel v Worsley [1969] 1 AC 191, 227
Spectrum Ophthalmics Pty Ltd v Ryan [2010] VSC 19
Ziems v Prothonotary of the Supreme Court of New South Wales (1957) 97 CLR 279

C Legislation

Civil Procedure Act 2005 (NSW)
Competition and Consumer Act 2010 (Cth)
Electronic Transactions Act 2000 (NSW)
Evidence Act 1995 (Cth)
Legal Profession Uniform Law Australian Solicitors' Conduct Rules 2015 (NSW)
Legal Profession Uniform Conduct (Barristers) Rules 2015
Telecommunications (Interception and Access) Act 1979 (Cth)

E Other

‘Australia’s Blockchain Roadmap’. *The Australian Government, Department of Industry, Science, Energy and Resources* (Web Page) <<https://www.dfat.gov.au/about-us/publications/trade-and-investment/business-envoy-april-2021-digital-trade-edition/australias-blockchain-roadmap>>

Calderwood, Kathleen, 'NSW government to invest \$50m to build new eco-tourism and adventure destination on western edge of Blue Mountains' (Web Page 2021)

<<https://www.abc.net.au/news/2021-11-13/nsw-government-invests-50-million-in-blue-mountains-eco-tourism/100616868>>

'Central NSW Wineries' *Australian Good Food Guide (AGFG)*

<<https://www.agfg.com.au/wineries/central-nsw?pg=3>>

Central West 2021 Census All Persons Quick Stats, *Australian Bureau of Statistics* (Web Page)

<<https://abs.gov.au/census/find-census-data/quickstats/2021/103>>

Central West; Major Industries', *DataAu* (Web Page) <<https://dataau.com.au/profile/central-west#block-hero>>

'Central West Region Pilot Area Horticulture & Viticulture Profile', *NSW Government Department of Primary Industries* <https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0003/457590/Horticulture-viticulture-profile-central-west-region.pdf>

'Charles Sturt and IBM Australia partnership to grow digital skills and tech talent in regional NSW', Charles Sturt University (Web Page) <<https://news.csu.edu.au/latest-news/charles-sturt-and-ibm-australia-partnership-to-grow-digital-skills-and-tech-talent-in-regional-nsw>>

'Difference between Bitcoin and Ethereum', Geeksforgeeks (Web Page)

<<https://www.geeksforgeeks.org/difference-between-bitcoin-and-ethereum>>

Gibson, William, "The future is already here – it's just not evenly distributed.", *The Economist*, 4 December 2003

Gregory, Xanthe, 'Looming closure of Lithgow coal mines fuels concern over transition plans for hundreds of workers', *ABC News, ABC Central West* (Web Page 2021)

<<https://www.abc.net.au/news/2021-10-03/future-of-coal-fired-power-stations-lithgow/100493820>>

French, Phoebe, 'NZ wine company fined \$1.7m for wine fraud', *the drinks business* (Web Page)

<<https://www.thedrinksbusiness.com/2020/03/nz-wine-company-fined-1-7m-for-wine-fraud>>

Heath, Malcolm, 'Cyber claims- Lawcover Group Cyber Risk Insurance Policy' (Seminar Paper, Lawcover Principal Practitioners Seminar, 22 February 2023)

'How Much Should a Virtual Data Room Cost?', *Data Room* (Web Page) <<https://dataroom-providers.org/data-room-pricing>>

Holmes, Lord, 'Digital Asset Report Published', *LinkedIn* (Web Page 2023)

<<https://www.linkedin.com/pulse/digital-asset-report-published-lord-holmes%3FtrackingId=73tYwijqu79rIOe4CGwHQ%253D%253D/?trackingId=73tYwijqu79rIOe4CGwHQ%3D%3D>>

Hooson, Mark, 'Bitcoin vs Ethereum', *Forbes Advisor* (Web Page 2022)

<<https://www.forbes.com/advisor/au/investing/cryptocurrency/bitcoin-vs-ethereum>>

'History of ETH: The rise of the Ethereum blockchain', *COINTELEGRAPH* (Web Page)

<<https://cointelegraph.com/learn/history-of-ethereum-blockchain>>

'History of the Web', *World Wide Web Foundation* <<https://webfoundation.org/about/vision/history-of-the-web>>

'InfoTrackID', *InfoTrackGlobal* (Web Page) <<https://www.infotrack.com.au/infotrackid>>

‘How Secure Are Virtual Data Rooms? The Ultimate Guide to VDR Safety’, *Data Room* (Web Page) <<https://dataroom-providers.org/blog/how-secure-are-virtual-data-rooms>>

‘How we protect you’, *PEXA* (Web Page) <<https://www.pexa.com.au/security/how-we-protect-you>>

Law Commission, *Digital assets: Final Report: June 2023* (Law Com No 412 HC1486) <<https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jxsou24uy7q/uploads/2023/06/Final-digital-assets-report-FOR-WEBSITE-2.pdf>>

Law Commission, *Smart legal Contracts Advice to Government: November 2021* (Law Com No 401 CP563) <<https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jxsou24uy7q/uploads/2021/11/Smart-legal-contracts-accessible.pdf>>

Levi, Stuart D et al, ‘An Introduction to Smart Contracts and Their Potential and Inherent Limitations’, Harvard Law School Forum on Corporate Governance (Web Page 2018) <<https://corpgov.law.harvard.edu/2018/05/26/an-introduction-to-smart-contracts-and-their-potential-and-inherent-limitations>>

Lewis, Dave, ‘iCloud Data Breach: Hacking And Celebrity Photos’, *Forbes* (Web Page 2014) <<https://www.forbes.com/sites/davelewis/2014/09/02/icloud-data-breach-hacking-and-nude-celebrity-photos/?sh=1c5b6d0a2de7>>

‘Making Sense of bitcoin, cryptocurrency and blockchain’ *PWC* (Web Page) <<https://www.pwc.com/us/en/industries/financial-services/fintech/bitcoin-blockchain-cryptocurrency.html>>

Nakamoto, Satoshi, ‘Bitcoin: A peer-to-peer electronic cash system’, *Decentralized Bus. Rev.*, Nov. 2008.

Newman, Lily May, ‘Hack Brief: 4- Year- Old Dropbox Hack Exposed 68 Million People’s Data’ *Wired* (Web Page 2016) <<https://www.wired.com/2016/08/hack-brief-four-year-old-dropbox-hack-exposed-68-million-peoples-data>>

‘NSW Law Society Register of Solicitors’, *NSW Law Society* <<https://www.lawsociety.com.au/register-of-solicitors>>

‘NSW Law Society Professional Standards Scheme’, *NSW Law Society* (Web Page) <<https://www.lawsociety.com.au/practising-law-in-NSW/working-as-a-solicitor-in-NSW/scheme>>

Nwaokocha Amaka, ‘Australian stock exchange officially abandons blockchain plans: Report’, *Coin Telegraph* (Web Page 2023) <<https://cointelegraph.com/news/australian-stock-exchange-officially-abandons-blockchain-plans-report>>

‘Our region’, *Regional Development Australia Central West, An Australian Government Initiative* (Web Page) <<https://rdacentralwest.org.au/about-us/our-region>>

‘Press, From Burgundy to the World’, *Crurated* (Web Page) <<https://crurated.com/press>>

PR Newswire; New York [New York]: Sept 2021. *Blockchain Integrated Partners LLC announces issuance of new patent for Virtual Data Rooms* <<https://www.proquest.com/docview/2575064122?parentSessionId=%2BL%2BkqLbcSIUSfkbvF77INDfuvwk4JAsGZ%2FWxDS78VX4%3D&pq-origsite=primo&accountid=10344>>

‘School of Rural Medicine’, *Charles Sturt University* (Web Page) <<https://science-health.csu.edu.au/schools/medicine/home>>

‘Silk Road’, *Coin Desk* (Web Page) <<https://www.coindesk.com/company/silk-road>>

‘Smart contracts’, *Law Commission* (Web Page) <<https://www.lawcom.gov.uk/project/smart-contracts>>

‘Statutory data collection moves towards automation after Clare Valley Entrust trial’, *Wine Australia* (Web Page) <<https://www.wineaustralia.com/news/articles/data-collection-moves-towards-automation>>

Tripoli Mischa and Josef Schmidhuber, *Emerging Opportunities for the Application of Blockchain in the Agri-food Industry* (Issue Paper 2018) Food and Agriculture Organisation of the United Nations. International centre for Trade and Sustainable Development.

‘THE NATIONAL BLOCKCHAIN ROADMAP: Progressing towards a blockchain- empowered future’, *The Australian Government, Department of Industry, Science, Energy and Resources* (Web Page) <<https://apo.org.au/sites/default/files/resource-files/2020-02/apo-nid276541.pdf>>

‘Trust Accounting Software’, *The Law Society of New South Wales* (Web Page) <<https://www.lawsociety.com.au/practising-law-in-NSW/trust-money-and-fidelity-fund/trust-accounting-software>>

‘Virtual Data Room Vs. Free Cloud Storage: The Pros, the Cons, and the Facts’, *Data Room* (Web Page) <<https://dataroom-providers.org/blog/virtual-data-room-vs-cloud-storage>>

Wöhler, Maximilian, Zdun Uwe ‘Domain Specific Language for Smart Contract Development’ (Conference Paper. ND. Faculty of Computer Science, Research Group Software Architecture University of Vienna, Vienna, Austria) 3

‘What is Blockchain Technology?’ *Amazon Web Services (AWS)* <<https://aws.amazon.com/what-is/blockchain/?aws-products-all.sort-by=item.additionalFields.productNameLowercase&aws-products-all.sort-order=asc>>