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# Blockchain in Government Land Titles and Registries

**Asian Development Bank**  
**Exploring Opportunities for Blockchain Technology in**  
**Financial Inclusion and Sustainable Development**

Wednesday, 23 May 2018  
Manila, Philippines

Katrina Donaghy  
Chief Executive Officer and Co-Founder



To realise the potential of  
blockchain technology to  
enable peoples greater  
participation with government

## CIVIC LEDGER VISION

To develop the digital tools citizens use everyday to make interactions with their governments easier, faster, secure and transparent.

## CIVIC LEDGER MISSION





# WHAT IS THE PROBLEM?

- Speed and Cost to Transact
- Speed and Cost to Reconcile
- Speed and Cost to Contract

**DATA SILOS**

**LOCKED IN  
PAPER**

**LEGACY  
SYSTEMS**

# BLOCKCHAIN IN GOVERNMENT POTENTIAL

*"We are at the beginning of a multi-decade, multi-billion dollar technology replacement cycle in governments around the world."*

Government services are often some of the largest scale of any country.

Australian federal and state governments deliver 811 million citizen transactions per year.

Governments globally spend over \$400B a year on services related technologies.

In 2018 alone:

- Australia will spend US\$86B
- Singapore will spend US\$2.4B
- Canada will spend US\$95B

# MARKET TRENDS

## EVOLVING CITIZEN NEEDS

- Reliable
- Responsible
- Reduces Red Tape

Shifting away from building systems over 3-5 years that cost tens of millions of dollars

Dubai Government to spend \$225M to replace 1B of paper-based transactions p.a. with blockchain tech by 2021

Replace “heavily paper-based” systems that have “limited self-serve options”

Canadian Government to spend \$197M over 5 years to replace such a paper-based system with an online platform



# MARKET TRENDS

## BLOCKCHAIN

- ① Immutability → Blockchain
- ② Ease of transaction → Smart Contracts
- ③ Cost of ownership → Token Management

# BLOCKCHAIN IN GOVERNMENT VALUE PROPOSITION

- Citizen at the centre
- Immediacy of service
- Empowering inclusive digital societies

## Blockchain Benefits

- Lower cost of development and ownership
- (Near) Real-time settlement
- Accountability and audit trails
- Zero need for reconciliation
- Ease of inquirability
- Ease of transferability
- Decentralised nature for more secure storage
- Embedded business rules (smart contracts enabled)
- Self-enforced execution for greater governance



# BLOCKCHAIN BASED LAND REGISTRIES VALUE PROPOSITION

- Facilitate the exchange of property information
- Immediacy of service
- Empowering inclusive digital societies

## Blockchain Benefits

- Immutable
- Transparent
- Tamper proof
- Distribution of digitalised documents
- Leave a complete trail of auditability
- Reducing risks of manual error
- Decentralised nature for more secure storage
- Better record management procedures
- Streamlined business processes for greater governance

# Blockchain in Government Land Registry Projects

Hondurous

Japan

Hyderabad

Netherlands

Republic of Georgia

Russia

Sweden

Ukraine

United Kingdom

United States

**CIVIC LEDGER  
BLOCKCHAIN  
SOLUTION  
OFFERINGS**

Distributed Registry Platforms

Entitlements, licenses, permits, registrations

Trading and Exchange Platforms

Water, precious metals, IP rights, carbon credits



# PROOF OF CONCEPT: ISSUANCE COMMUNITY LIQUOR LICENSE



USE BLOCKCHAIN  
PLATFORM TO DIGITALISE  
ONE STOP SHOP

## WHAT WE DID

Issued a Community Liquor License via One Stop Shop website

Customer could download digital license to native Apple Pass in mobile device

Able to click on link to see the transaction recorded on the blockchain

# WHAT WE DELIVERED

Queensland Government  
Office of Liquor and Gaming Regulation

Home | Site map | Contact us | Help

Home About us Liquor Gaming Grants Training Publications and resources

**Scheduled maintenance notice**  
OLGR wishes to advise the online community liquor permit system will be **unavailable**:  
• **Sunday April 29 between 10:00am - 2:00pm**  
You will not be able to apply for applications during the stated period. Please ensure that you have saved any partially completed applications before this outage. We apologise for any inconvenience this may cause.

### Application for Community Liquor Permit

**Qualification**

Email address:

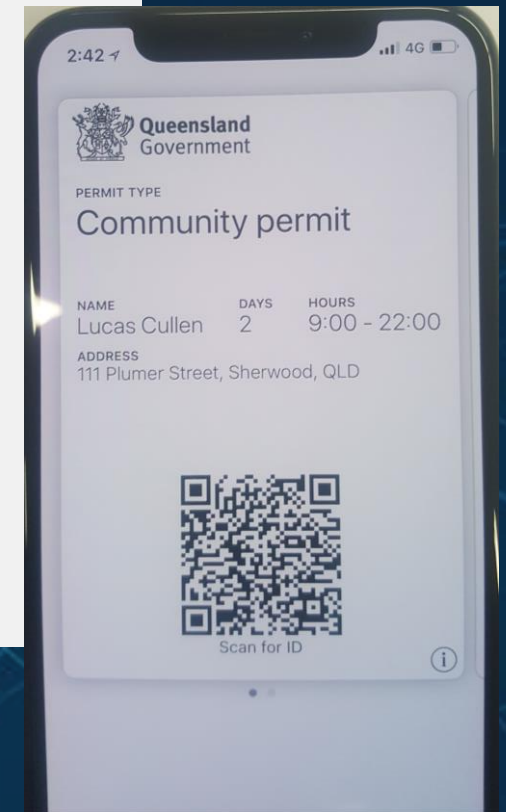
Please confirm your email address:

*We will use this email address to communicate with you regarding your CLP application.*

(First) date of event:

**Application progress**

- ✓ Introduction/Exemption
- ✓ Qualification
- ✓ Applicant
- ✓ Event
- ✓ Endorsement
- ✓ Review
- ✓ Payment
- ✓ Receipt



(There are still +260 other types of community permits managed by the State)



**BLOCKCHAIN  
VALUE POTENTIAL  
AT ONE STATE  
GOVERNMENT**

Across Queensland State Government:



480 broad  
service  
categories

1,600 direct  
transactional  
services

Over \$1B p.a.  
in costs to  
transact  
(2013-14)

# TRIAL: AGRICULTURAL WATER TRADING RIGHTS



**Australian Government**  
**Department of Industry,  
Innovation and Science**



**CIVIC LEDGER**  
Blockchain solutions for public sector markets

National feasibility study to improve transparency of water trading in Australian water markets.

# TRIAL: AGRICULTURAL WATER TRADING RIGHTS

## THE CHALLENGE

To consider problems in the Australian water markets which is worth \$16B p.a. and determine whether blockchain technology would increase efficiency and transparency.

*“Whiskey is for drinking;  
water is for fighting”* – Mark Twain





# TRIAL: AGRICULTURAL WATER TRADING RIGHTS

## WHAT WE DELIVERED

### WaterLedger™

- A blockchain platform based on Ethereum
- Tokenised a physical asset which was mega-litres of water
- Smart contracts to enable trade of water allocations based on complex business rules (+16,000)
- Real-time updates of state based water registries

**Water Ledger**

Search for Holders and Transactions Details Authorised Officer

[Back to List](#) **WAL0032** Status: **Current** Category: **Regulated River**

**\$251,575.50** 2,123 ML Water Sold **\$40,527.23** 342 ML Purchased

**Entitlement Usage** **Water Purchased**

**Licence Details** [See Full Licence](#)

Status: Active  
Annual use limit: 100.0 megalitres  
Water share holding limit: 200.0 megalitres  
Licensing water authority: Goulburn-Murray Water  
Trading zone for water use: 1A Greater Goulburn  
Related works licences: Nil  
Associated water shares: WEE000000

**Transactions** ALL PURCHASED SOLD

Type	Account	Location	Volume	Price / ML	Total	Date
<b>SOLD</b>	WAL0123	Menindee, NSW	250 ML	\$118.50 per ML	\$29,625.00	1 min ago
<b>BUY</b>	WAL5212	Cunnamulla, NSW	100 ML	\$114.00 per ML	\$11,400.00	3 hours ago
<b>BUY</b>	WAL0003	Menindee, NSW	340 ML	\$111.50 per ML	\$37,910.00	5 days ago
<b>SOLD</b>	WAL0567	Collarenebri, NSW	50 ML	\$108.50 per ML	\$5,425.00	6 days ago

Volume: 22,404 ML  
In Transit: 45ML

POWERED BY **civic ledger**

# TRIAL: AGRICULTURAL WATER TRADING RIGHTS

## WATER LEDGER VALUE PROPOSAL

Improving “liquidity” of  
water markets

Replace 4 legacy  
systems with one,  
saving \$90M

Reduce trade  
frictions resulting  
in \$50-100M of  
savings to  
farmers

Reduce  
transaction times  
from (up to) 9  
weeks to near  
real-time

### Water rights



19,446,966 ML

total surface water and  
groundwater entitlements

### Water assets



13,500,354 ML

closing net water assets  
at 30 June 2016

similar to last year

### Trade



1,359,000 ML

entitlement trade

5,567,000 ML

allocation trade

### Outlook



19,300,000 ML

expected water assets  
at 30 June 2017

increase from this year





# Buy and sell water, instantly.

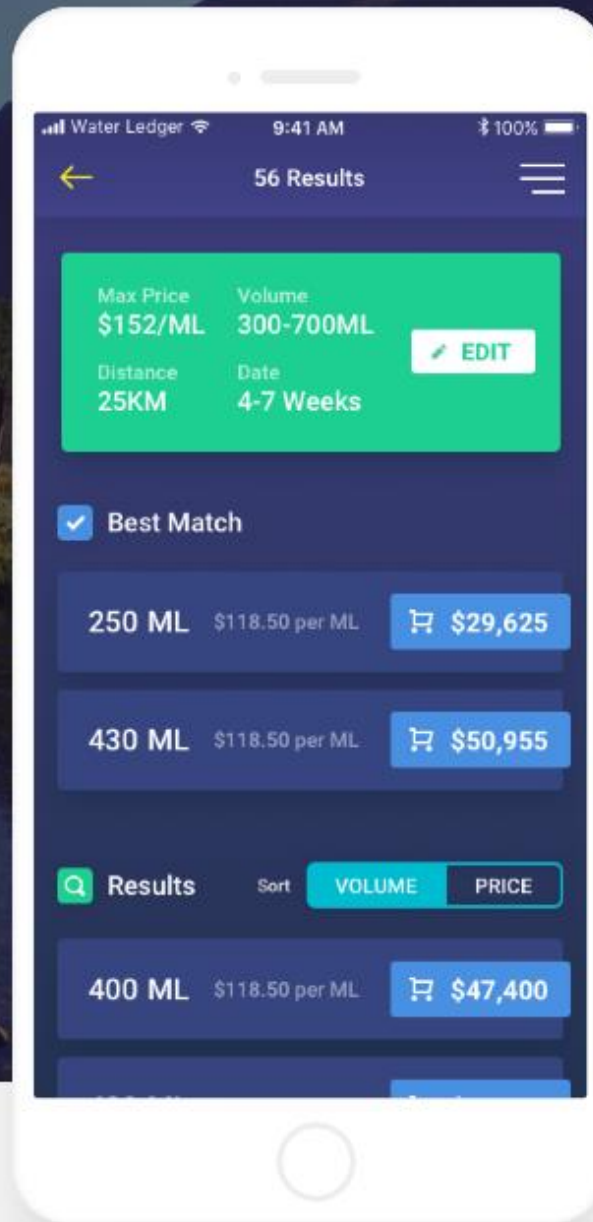
Secure Blockchain Technology Save time on your water trades

**22,403.5 ML**  
Total Volume Available

[View Current Water Allocations](#)

**\$172.12**  
Average Sell Price

**\$132.43**  
Lowest Buy Price



## Water Ledger TM

[Website](#)

[Mobile App](#)

Download Now



Powered By





# TRIAL: INTELLECTUAL PROPERTY RIGHTS



Australian Government

IP Australia



**CIVIC** LEDGER

Blockchain solutions for public sector markets

Explore and discover blockchain  
technology to future proof the agency.

# TRIAL: INTELLECTUAL PROPERTY RIGHTS

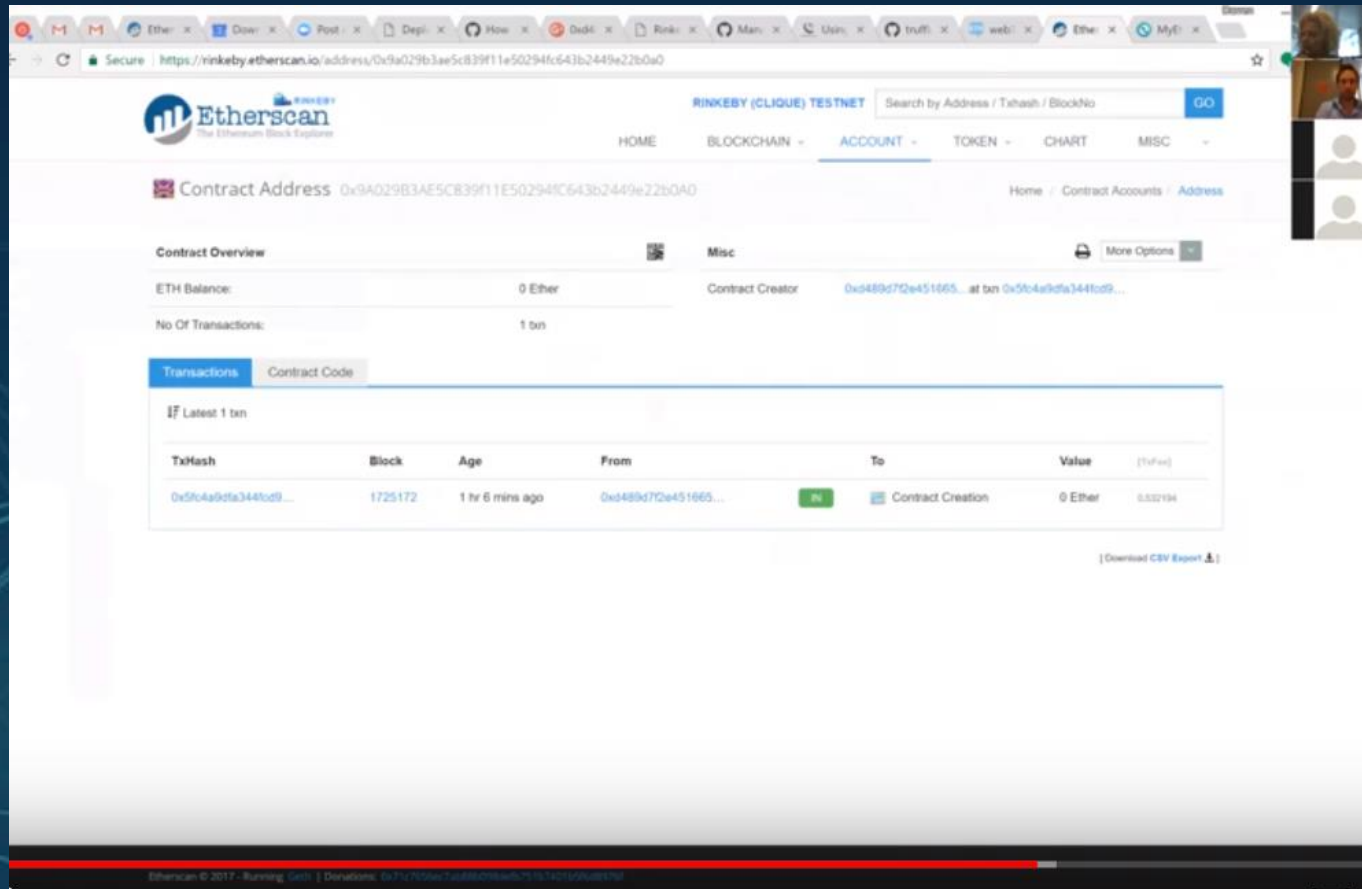
## THE CHALLENGE

- Registering patent applications, issuing patents, creating immutable records of ownership
  - Enable IP right owners to license or sell their IP to interested parties
- 

## WHAT WE DELIVERED

- Automation of rights registration using the Ethereum blockchain
- Transferred 50,830 patent applications using smart contracts in under 4 hours (the process normally takes up to a year)
- Discovery of patent rights for non-exclusive licensing

# COMMERCIAL TRIAL: INTELLECTUAL PROPERTY RIGHTS



The screenshot displays the Etherscan Rinkeby Testnet interface. The main content area shows the 'Contract Overview' for a specific contract address. The 'ETH Balance' is 0 Ether, and there is 1 transaction. The 'Contract Overview' section includes a 'Misc' tab and a 'Contract Creator' field. Below this, the 'Transactions' tab is active, showing a table of transactions. The table has columns for TxHash, Block, Age, From, To, and Value. A single transaction is listed with a value of 0 Ether.

TxHash	Block	Age	From	To	Value	(Tx Fee)
0x504a90fa344f0d9...	1725172	1 hr 6 mins ago	0xd489d72e451665...	Contract Creation	0 Ether	0.002134

## IP Ledger™ Value Proposition

Replace a legacy IT system  
for around 10 per cent of  
traditional system cost ~  
\$70m savings



# TRIAL: INTELLECTUAL PROPERTY RIGHTS

## STAGE TWO: PEER TO PEER MARKETPLACE

- Discoverability of Patent Rights in a Peer to Peer Marketplace
- Interested parties can make a bid to IP Right Owners for the non-exclusive licence of their patent right
- IP Right Owners able to monetise on their patent right
- IP Registry to be updated only if the IP Right Owner sells their patent right to an Interested Party to record change of ownership

# CIVIC LEDGER CUSTOMERS



**Australian Government**  
**Department of Industry,  
Innovation and Science**



**Australian Government**  
**IP Australia**



**Australian Government**  
**Department of Agriculture  
and Water Resources**

**South East  
Water**



**Queensland  
Government**



**CITY OF MELBOURNE**



Australian Government

**Business**  
*business.gov.au*

# CIVIC LEDGER PARTNERS





## NEXT STEPS

- Relevant Regulatory Agency establish a Regulatory Sandbox for the exploration and discovery of the potential of blockchain technology in government
- Select a number of use cases that are a best fit for blockchain technology
- Form a strong team with diverse interests and skills
- Secure sponsorship from key Government officials
- Agree on the problems to be solved and its hypothesis
- Adopt agile software development methodologies to minimise waste and maximise minimal viable product output



**CIVIC LEDGER**

Blockchain solutions for public sector markets

**THANK YOU**

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