

**Introducing Distributed Ledger Technology (DLT)
in international operations:
The blockchain in admissions processes**

The Great Artesian Basin Institute of Technology
A blockchain discourse
AIEC October 2018

The Great Artesian Basin Institute of Technology

*Tá eolas an t-uisce na beatha**



Convocation to consider the merits of blockchain

AIEC October 2018

*Knowledge is the water of life

The Frame: a modest purpose

- Let's consider blockchain for IET as it's on the curriculum & is in use.
- BC many aspects: our emphasis on DLT, not Bitcoin, T & L, not tech.
- Privilege international admissions: in use, all sectors & touches us all.
- Hypothetical: multi sector GrabIT. Relax & leave your day job behind.
- Approach. 5 Acts & Finale, breaks for Q&A, general discussion at end
 - Act 1. Welcome, introductions & overview (Kevin)
 - Act 2. Technical. What is blockchain? (Darragh) Q&A
 - Act 3. Practical. Recruiting & enrolling international students (Jo)
 - Act 4. To consider. If, when and how to adopt blockchain (Jason) Q&A
 - Act 5. The end user. Anticipating student needs and expectations (Arfa)
 - Finale Q& A. (All) Conclusion, thanks and acknowledgements
- Disclaimer: the panel are not experts. **Any BC experts here?**

Introducing the GrabIt panel

Director, Cryptic Analytics

The PVC for Doubtful Students

President's Visiting Fellow for BS

Acting up, as Provost International

Assistant to the spin doctor in residence (P/T)

Mr Darragh Murray

Ms Johanna Castellaro

Mr Jason Howard

Ms Arfa Noor

Mr Kevin Brett

WHY OUR INTEREST IN THE BLOCKCHAIN?

THE WHAT? HEARD OF IT BUT....

Woolf University

Building the first blockchain university

“the Woolf education will mostly consist of one-to-one personal tutorials. The smart contracts on the Woolf blockchain will dramatically reduce the need for a traditional university’s administrative staff. Indeed, we hope many traditional universities will adopt Woolf and increasingly phase out their administrative staff.”

© 2018 Woolf Development Ltd White paper P.1

The blockchain is in use here and now. Time to have a think?

- **The University of Nicosia** is the leading university in Cyprus and one of the largest English language universities in the Mediterranean region. The first accredited university in the world to accept Bitcoin payments & launch an MSc Degree in Digital Currency. First course offered as a free online MOOC.
- [TECH INSIDER](#) Jul 24, 2018 . “**RMIT** University students will soon be able to get blockchain-enabled digital credentials”.
- [AFR](#) Apr 30 2017. “**University of Melbourne** first in Australia to use blockchain for student records”.
- [UAC](#) 15 Dec 2017. “In the first of its kind in Australia, UAC has released official Australian Tertiary Admission Rank (ATAR) documents to NSW HSC students using state-of-the-art blockchain technology”
- Australia: Standards Australia, government, stock exchange, community.

The Uber University / The University of One



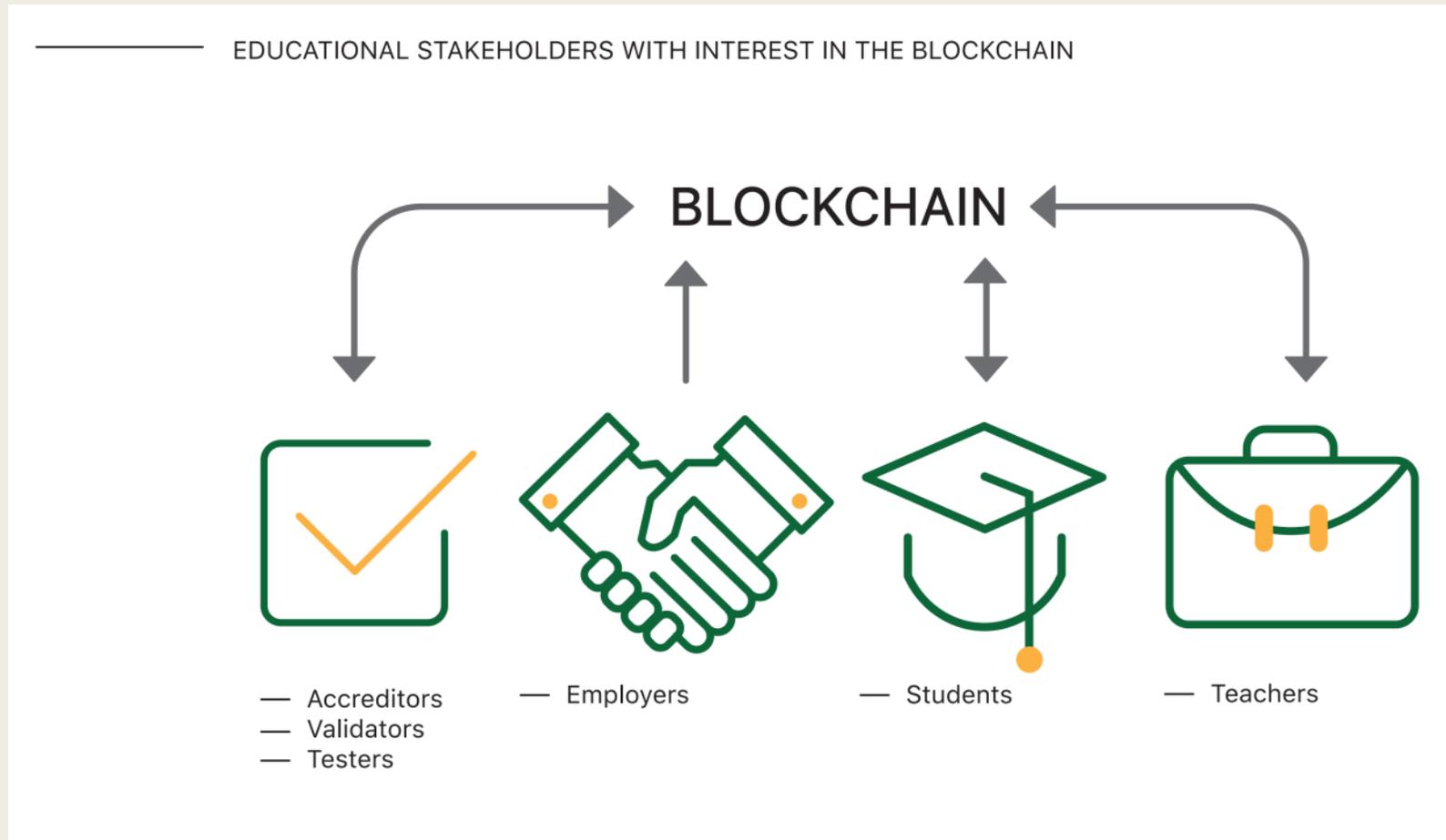
“In the near future, students will not want to embark on a three- to four- year university programme, for a variety of reasons – from financial to opportunity costs. A degree will be deconstructed as an ‘a la carte’ set of courses.”
(Domingue 2018)

Academic and administrative challenges ahead

A personal view: the stakeholder array

- Decade of student experience data: agency & stakeholder complexities
- The former – desire of students to engage with their institutions in meaningful ways is not sufficiently recognised . (CSHE 2016).
- Acknowledge the work of IEAA, institutions, CISA and government in addressing these issues, student ambassadors.
- Does framing the student as client inadvertently skew the fundamental T & L relationships? (S.Darwin on student feedback & surveys)
- Harnessing the team approach to experience: campus, community, third parties (Agents Group, ICEF, PIER, initiatives)
- BC may enable reframe institutions around student success.
 - Arfa.....

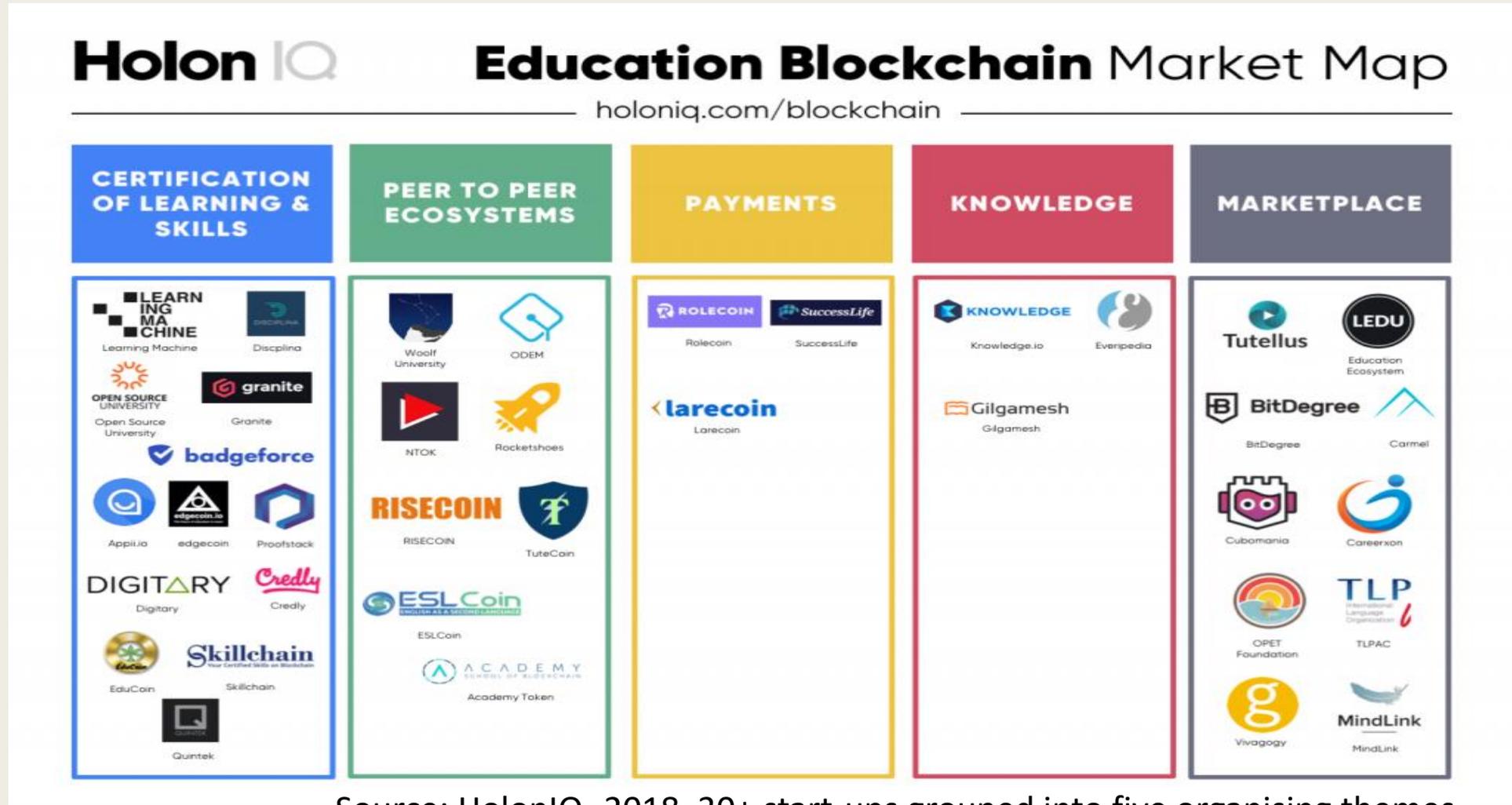
■ New Perspectives on the Student Experience . CSHE. 2016



3rd party, community, professional associations

Grech & Camilleri, 2017

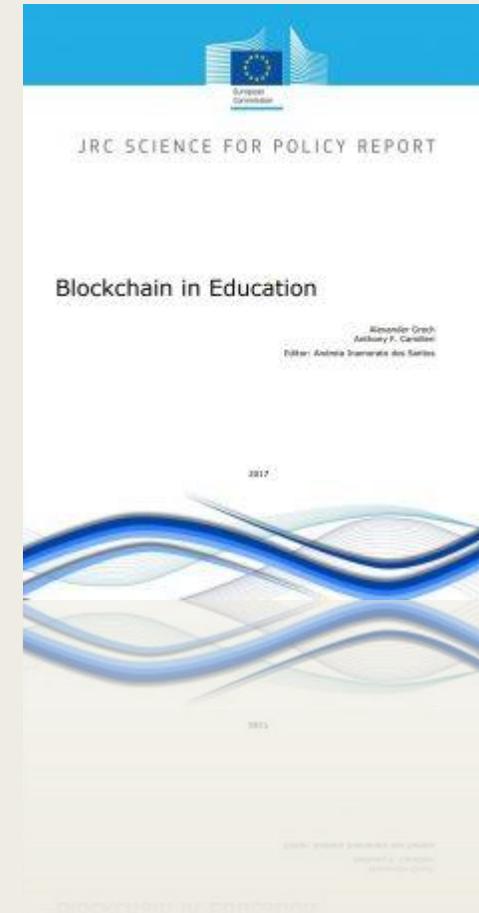
Blockchain start-ups and themes



Source: HolonIQ, 2018. 30+ start-ups grouped into five organising themes

Where is DLT/blockchain expected to impact on education?

- “Blockchain technology is forecast to disrupt any field of activity that is founded on time-stamped record-keeping of titles of ownership.
- Within education, activities likely to be disrupted by blockchain technology include
 - the award of qualifications
 - licensing and accreditation
 - management of student records
 - intellectual property management
 - payments.”



Grech & Camilleri, 2017

The rationale for adopting blockchain at GrabIT.

- International admissions processes have changed little in decades. To maintain competitive advantage we must re-think the way we attract and recruit students, in the face of global competition and innovation. It is time for our Great Institute GrabIT to prepare for the 21st century.
- Rationale pointers for admissions:
 - Better decision making with better data
 - Lower administration costs
 - Increased transparency
 - Reduced fraud risks/ risk management
 - Student-centred: the student ‘owns’ their application credentials and documentation

DISTRIBUTED LEDGER TECHNOLOGY (DLT) IN INTERNATIONAL OPERATIONS

AIEC 2018

ACT 2

WHAT IS BLOCKCHAIN?

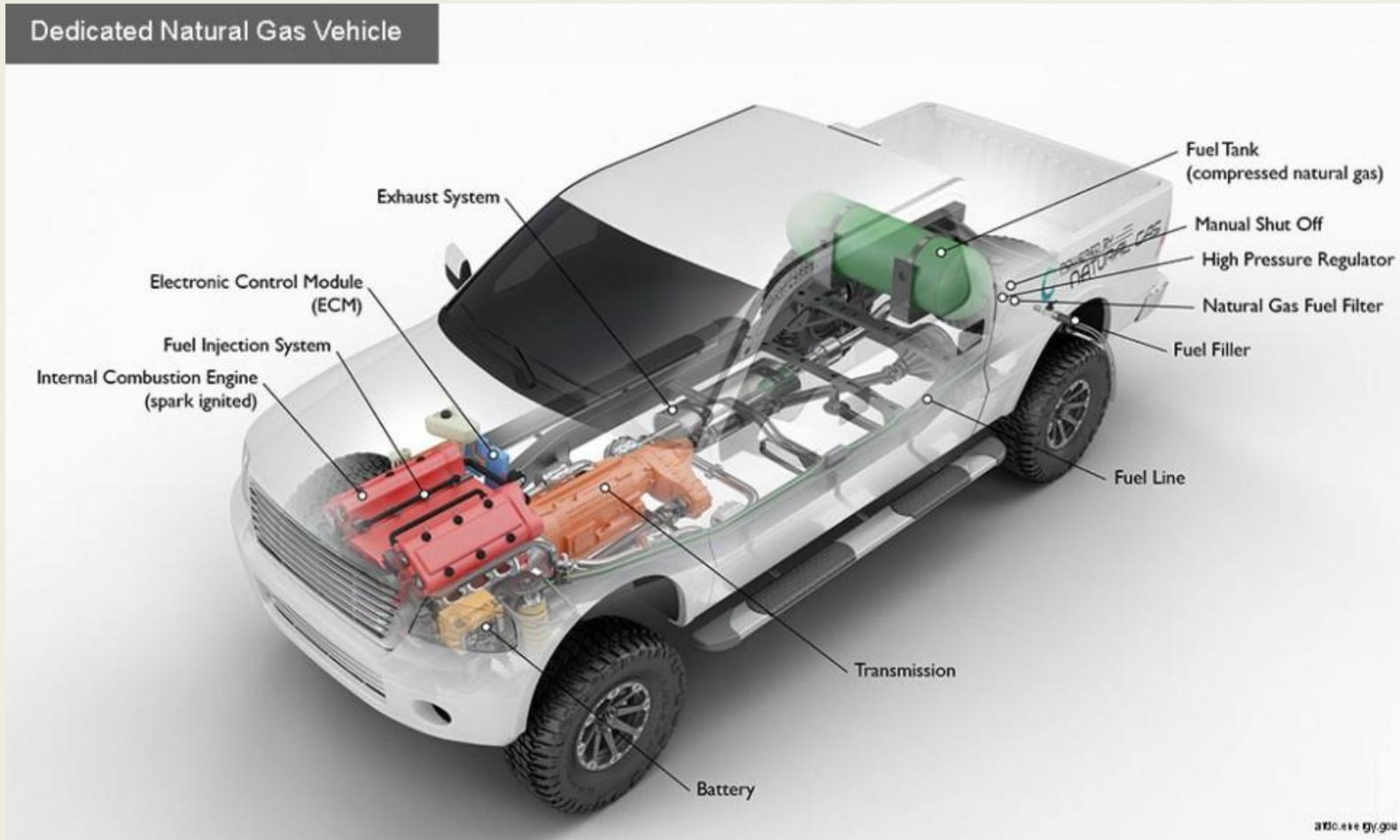
DARRAGH MURRAY

Graphic courtesy of collaboration between GrabIT
Contemporary Art, Criminology & IT teams

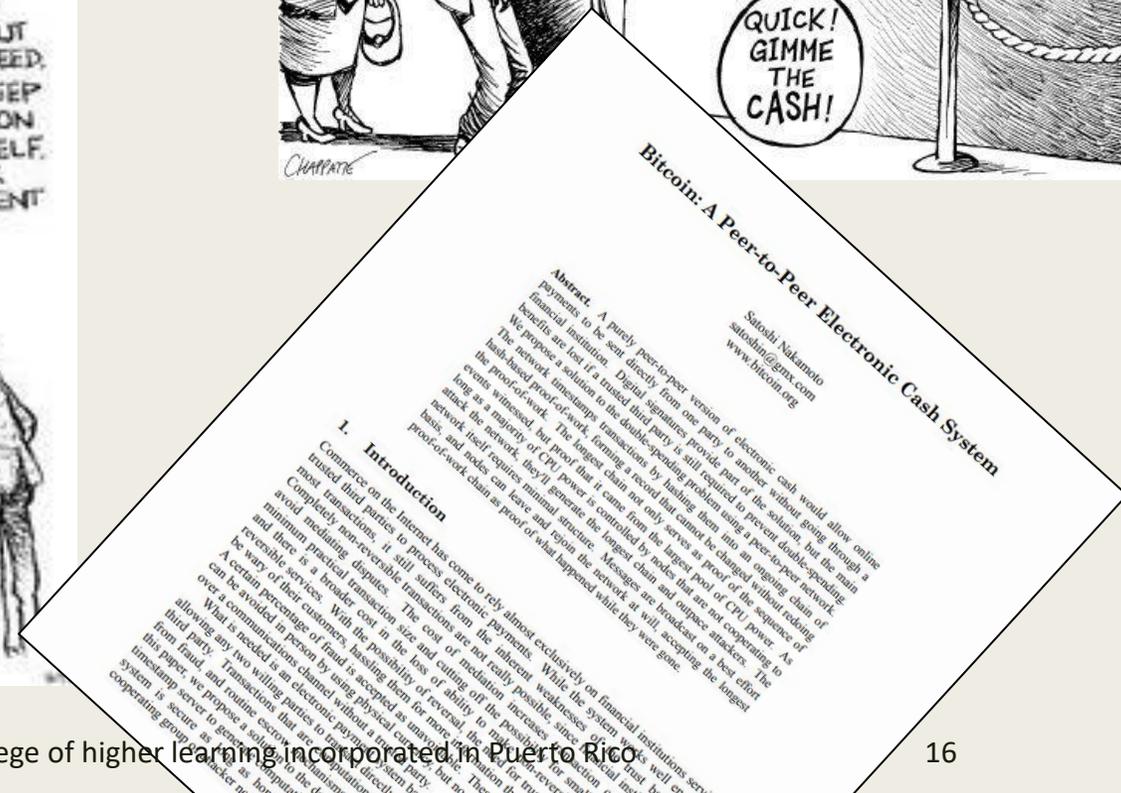


Cars and engines

Dedicated Natural Gas Vehicle



Remember the GFC?



If blockchain is the answer, what was the problem again?

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Blockchain technology to fight food fraud

04 December 2017

A research project designed to track beef from the paddock to the plate and protect Australia's reputation for world-class beef production will be launched today (Monday 4 December) at QUT.

Marcus Foth, Professor of Urban Informatics at the QUT Design Lab said BeefLedger is an industry-led project bringing together design, business, technology, and food research. It is one of the first cabs off the rank supported by the QUT-based \$200 million [Food Agility CRC](#).

- World-first approach to tracking beef
- Food fraud prevention to protect the Australian brand

An overview will be presented by Professor Foth at *The Promise of Blockchain for Food and Agriculture* at QUT's Gardens Point campus from 4.30pm-6.30pm this afternoon. He will be joined by Warwick Powell of Sister City Partners and CEO of [BeefLedger Limited](#) which today launched its BeefLedger Token (BLTs) Pre-Sale – a new digital cryptocurrency for people to contribute to, and participate in, the project.

"The BeefLedger Token, or BLT, is being developed as part of the design and implementation of the world's first application of distributed ledger or blockchain technology to the entire beef supply chain," Professor Foth said.

"It has the potential to revolutionise the industry by limiting price fluctuations, supporting food provenance and preventing food fraud, which is a growing problem in international export markets.

"If you are a consumer of Australian beef in China, Japan or elsewhere, then you are expecting a premium

Contacts

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 Brisbane

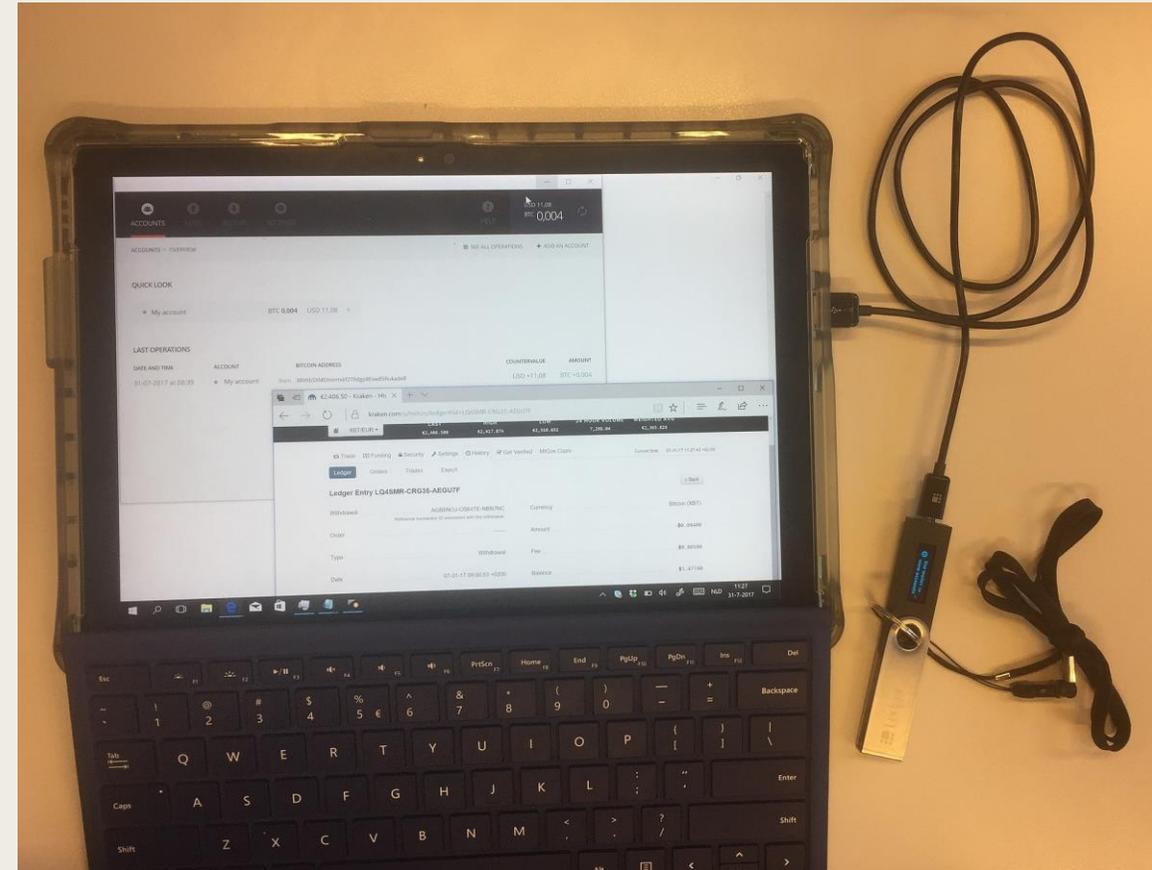
Postal address:
 QUT Business School
 GPO Box 2434
 Brisbane QLD 4001



In a globalised, connected world, facts can sometimes be difficult to verify!

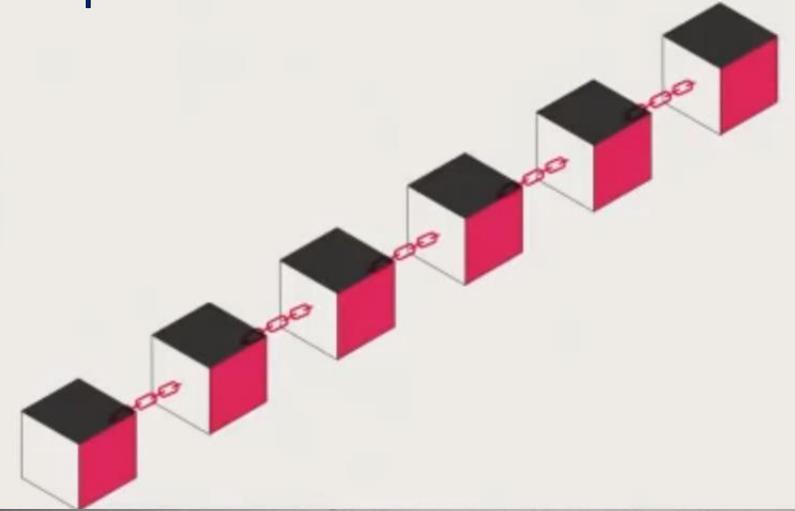
An initial definition

“Blockchain is a collection of distributed ledger technologies that can be programmed to track things of value.”

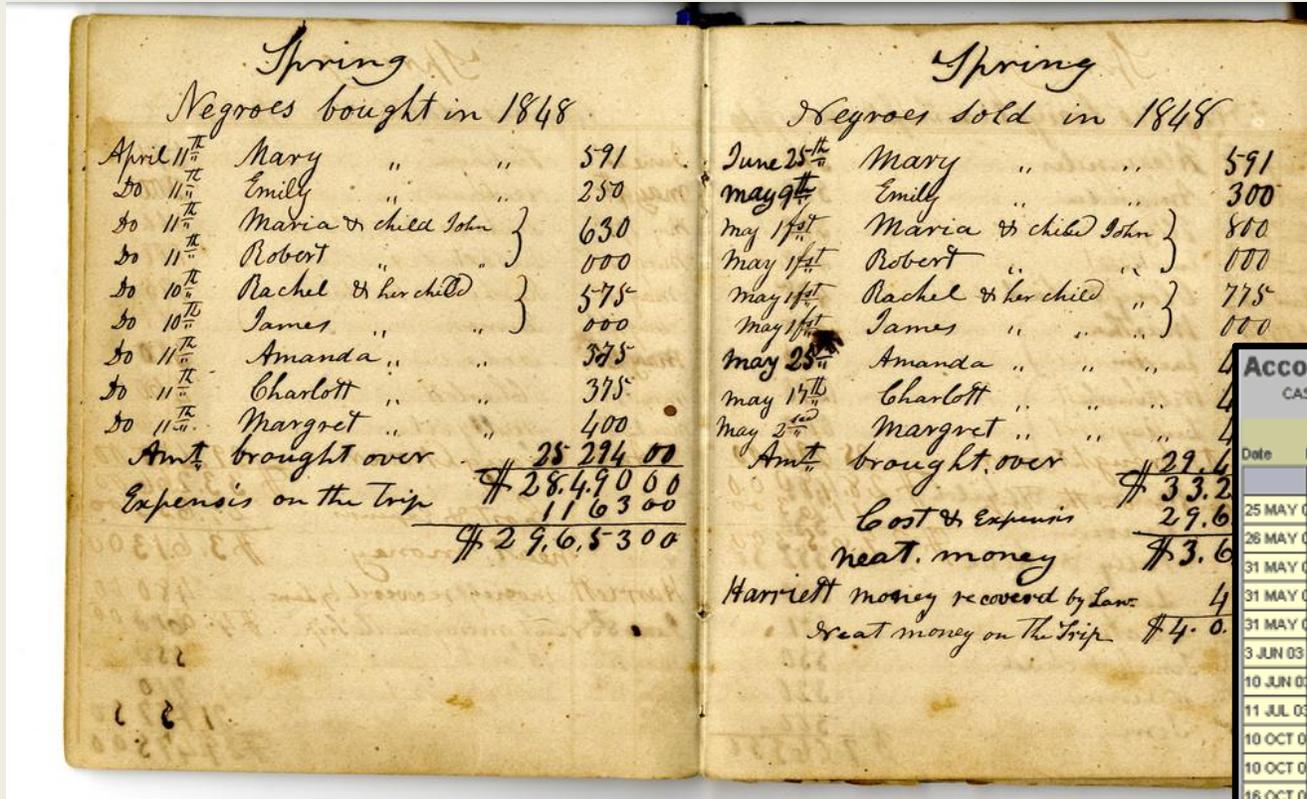


Tracking and storing data

- Information stored in batches called blocks
- Blocks are linked together in a chronological fashion – like a chain, hence block chain
- Additional data or changes to existing data in the block results in the addition of new blocks – existing blocks are never edited.
- Each addition is timestamped and also linked to the previous block in the chain via cryptography.



Ledgers

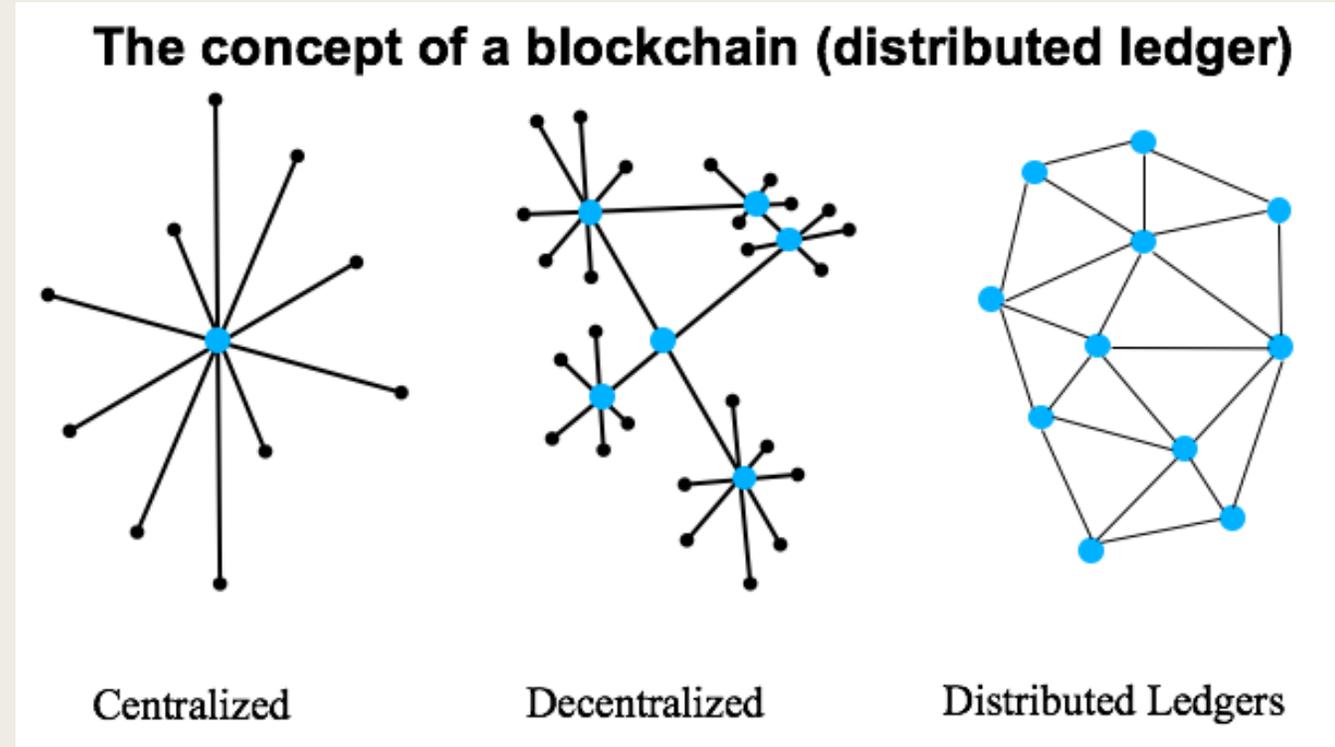


Accounts for Demo
 CASH ACCOUNT From 01/03/2003 to 29/02/2004

Date	Payee	Reference	Category	Actual (gross)	Recon	Admin. fund split		Sink. fund split		Balance (net)
				Amount	Balance (gross)	GST net	Non GST	GST net	Non GST	
				0.00	0.00		0.00	0.00	0.00	0.00
25 MAY 03	Mr J Citizen	Lot 1 levy pa	Deposit	500.00	500.00		0.00	500.00	0.00	500.00
26 MAY 03	Local Insurance	Insurance Ar	Insurance Bu	-269.00	231.00		0.00	-269.00	0.00	231.00
31 MAY 03	Netbank	Govt Debit Te	Govt Debit Te	-2.52	228.48		0.00	-2.52	0.00	228.48
31 MAY 03	Netbank	Account Ser	Account Ser	-5.00	223.48		0.00	-5.00	0.00	223.48
31 MAY 03	Netbank	Interest	Bank Interest	0.52	224.00		0.00	0.52	0.00	224.00
3 JUN 03	Clarks Grounds	Grounds Mai	Grounds Mai	-30.00	194.00		0.00	-30.00	0.00	194.00
10 JUN 03	Electrical Engine	Replace light	Building Maint	-22.60	171.40		0.00	-22.60	0.00	171.40
11 JUL 03	Levy credit trans	Lot 1 credit tr	Levy credit tr	0.00	171.40		0.00	-250.00	0.00	250.00
10 OCT 03	Mr Leahy	Terror Payou	Bank Transfe	1000.00	1171.40		909.09	0.00	0.00	1080.49
10 OCT 03	Fencers Upstand	Broken Palli	Fencing	-120.00	1051.40		0.00	0.00	0.00	-120.00
16 OCT 03	Mr P D Jakeson	Lot 1 levy pa	Deposit	400.00	1451.40		0.00	0.00	363.64	0.00
6 NOV 03	Mr P D Jakeson	Lot 1 levy pa	Deposit	25.00	1476.40		0.00	0.00	22.73	0.00
11 NOV 03	Mr P D Jakeson	Lot 1 levy pa	Deposit	5.00	1481.40		0.00	0.00	4.55	0.00

Distributed and decentralised

- A blockchain exists in many different places at the same time.
- It is a shared record book recording information distributed across a network of computers (nodes).
- Decentralising of information increases security as it is difficult to make changes because tampering requires all copies to be updated at the same time.



Creating trust: an example scenario

Suppose Kevin has just won a local 10 kilometre running race and a crowd has gathered to see the awarding of the winners medals.

Do we agree that this is Kevin?

Did I just award Kevin the first place medal?

How do you know that this did or did not occur?

Given what you all saw, what if I said “Actually I gave Arfa the first place medal?”

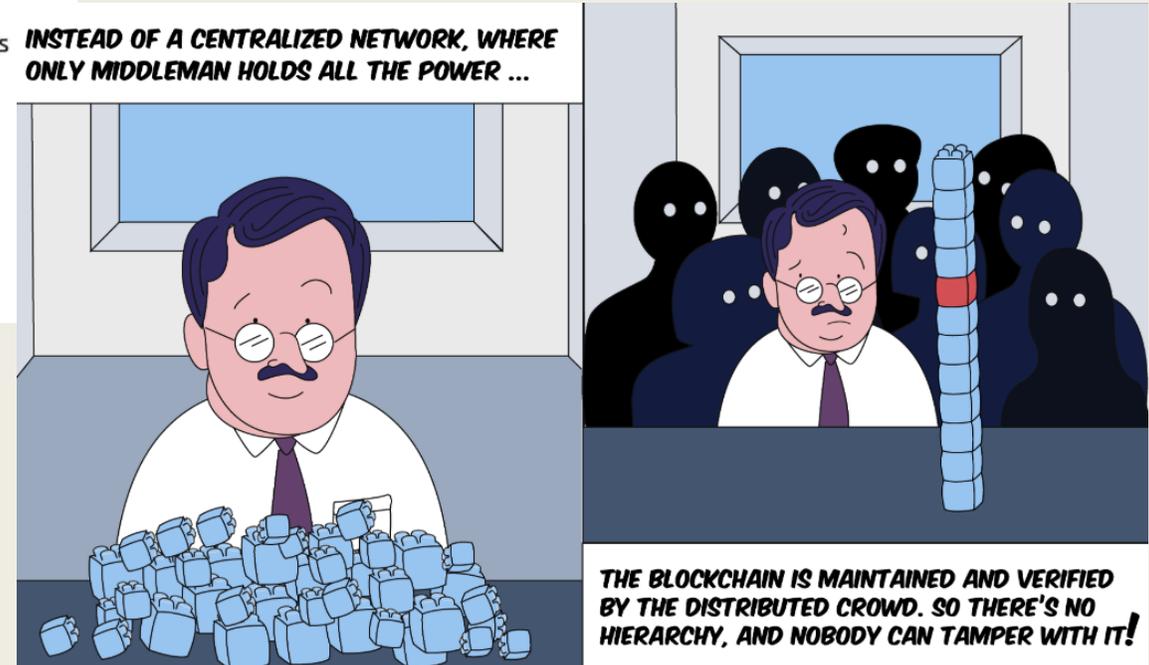
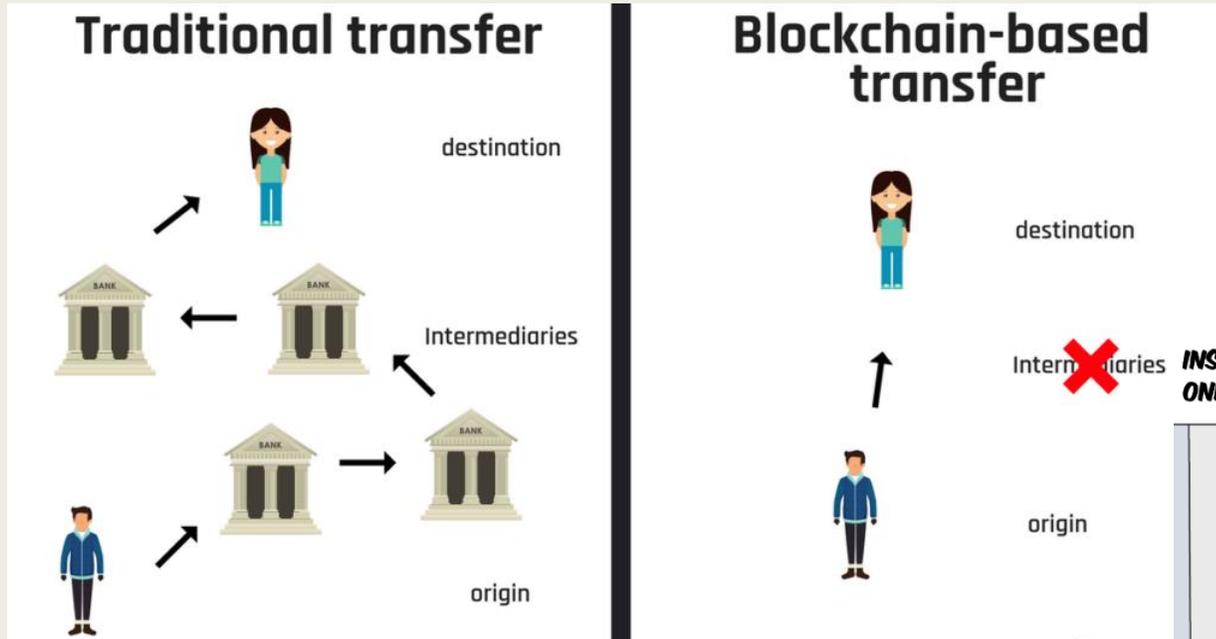


Consensus and updating the blockchain

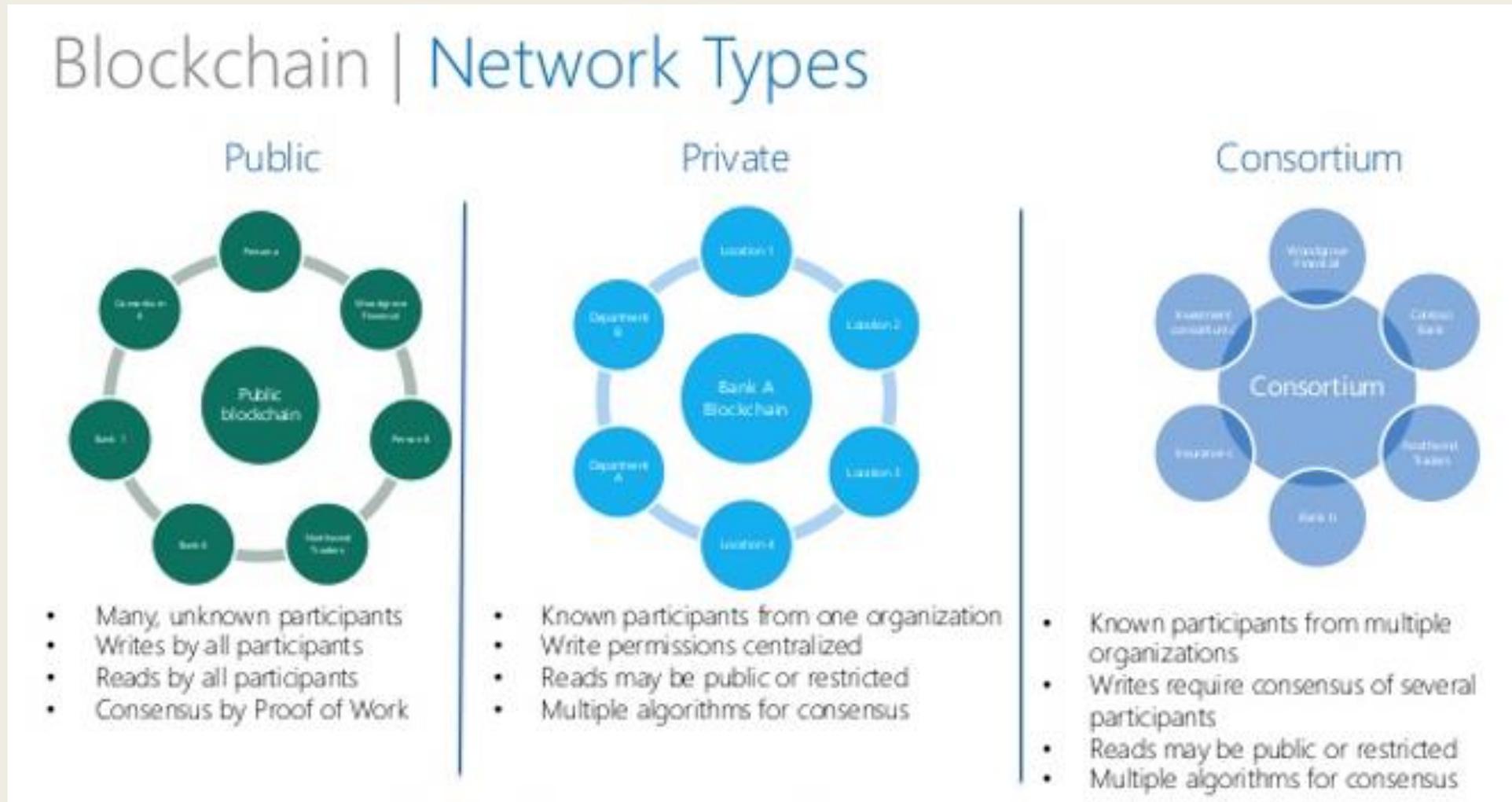
- Instead of people agreeing that a transaction happened, computers attached to the blockchain network do the hard work.
- Only when consensus is reached (>50%) amongst the network on which a blockchain is stored, a valid transaction is then added to every instance of the blockchain ledger on the network.



Intermediaries not required! Security guaranteed!



Types of blockchain



What is blockchain? A summary

- *“Blockchain is a collection of distributed ledger technologies that can be programmed to track things of value.”*
- Shared ledger for recording transactions between parties.
- It is technology that is distributed and decentralised – owned by all and none at the same time.
- It’s secure and immutable due to the consensus requirement.
- No trusted intermediary needed!



The Great Artesian Basin Institute of Technology

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Discussion

Q & A

*Knowledge is the water of life

Recruiting and enrolling international students

■ Validation of a prospective student and their data

- Proof of Identity
- English language proficiency
- Academic qualifications

■ Visa requirements (Australia)

- Financial requirements – proof of documents, bank statements/salary/loans etc.
- Personal history including visa history

■ Personalisation of communications

- faster and more efficient, personal and relevant touchpoints



Image: www.google.com smartbear.com

Recruiting and enrolling international students

Contractual requirements

- Transparent information upfront
- Privacy requirements
- Agreements
- Signed contracts
- Sharing of data
- Release of funds



■ Images: www.google.com stockunlimited.com

Recruiting and enrolling international students

Outcomes

- Interconnectedness
- Great Timelines
- Satisfied Students
- Progress



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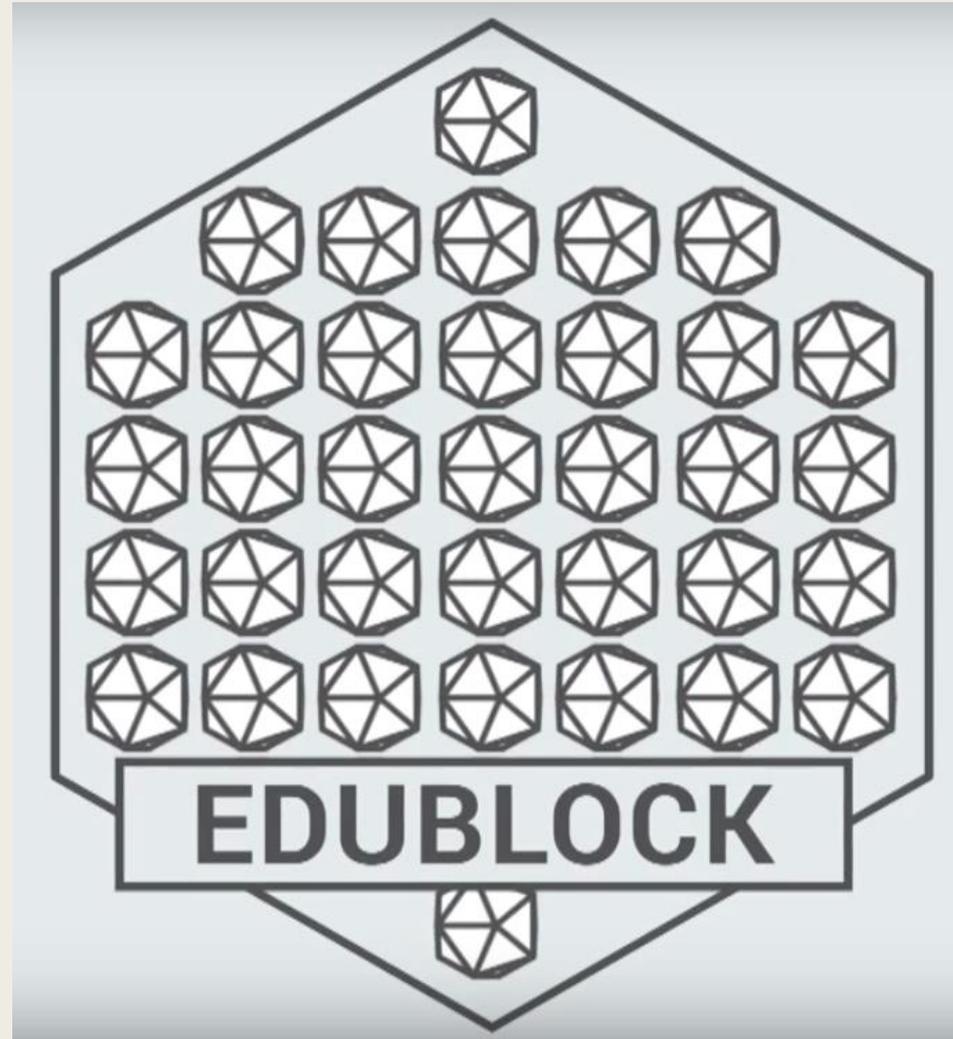
ACT 4

IF, WHEN AND HOW TO
ADOPT BLOCKCHAIN

JASON HOWARD

Graphic courtesy of collaboration between GrabIT
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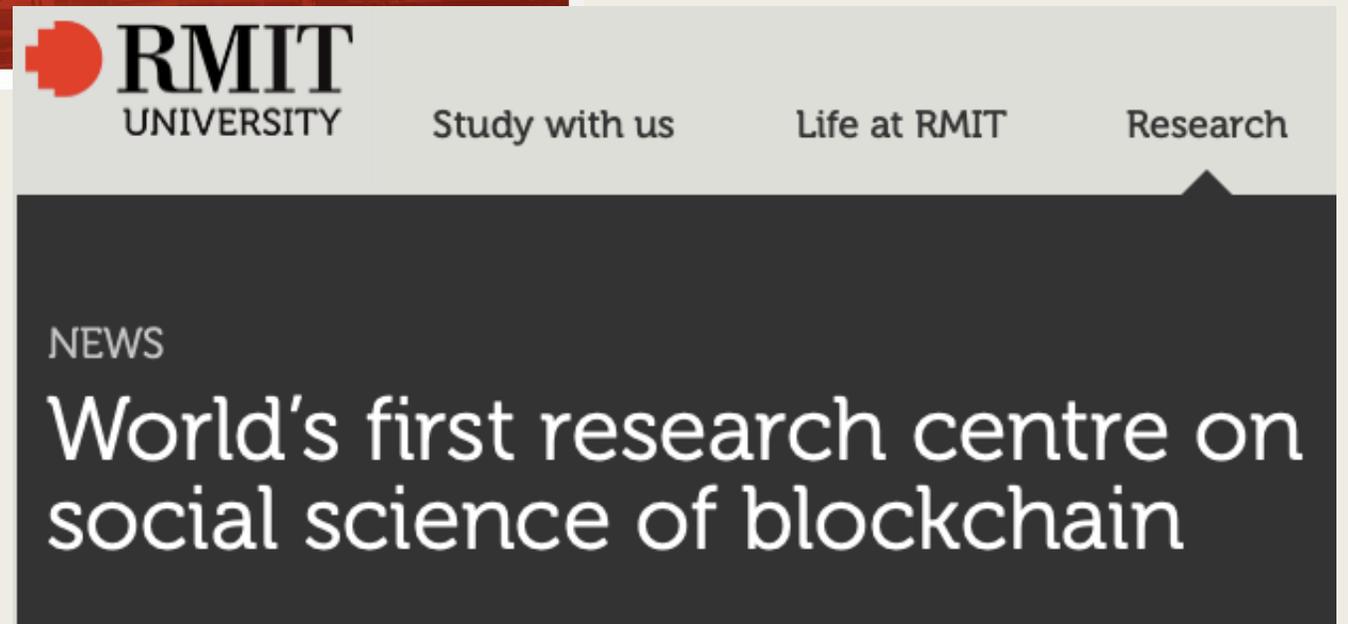
'It's not that exciting anymore': how Bitcoin turned boring

6 October 2018 – 8:26am

f t ✉ | A A A



The screenshot shows the top section of the ADCA website. On the left is the ADCA logo, which consists of an orange circle with a white dot inside, followed by the text "ADCA" in a bold, sans-serif font, and "AUSTRALIAN DIGITAL COMMERCE ASSOCIATION" in a smaller font below it. To the right of the logo is a navigation menu with links for "Home", "About", "Education", "Membership", "Resources", and "Subscribe". Further right are social media icons for Twitter, LinkedIn, Facebook, and YouTube, followed by a hamburger menu icon. Below the navigation is a large red banner with the text "PROMOTING BLOCKCHAIN INNOVATION IN AUSTRALIA" in white, serif, all-caps font. The text is arranged in three lines, with "PROMOTING" on the first line, "BLOCKCHAIN INNOVATION" on the second, and "IN AUSTRALIA" on the third. A white downward-pointing chevron is centered at the bottom of the banner.

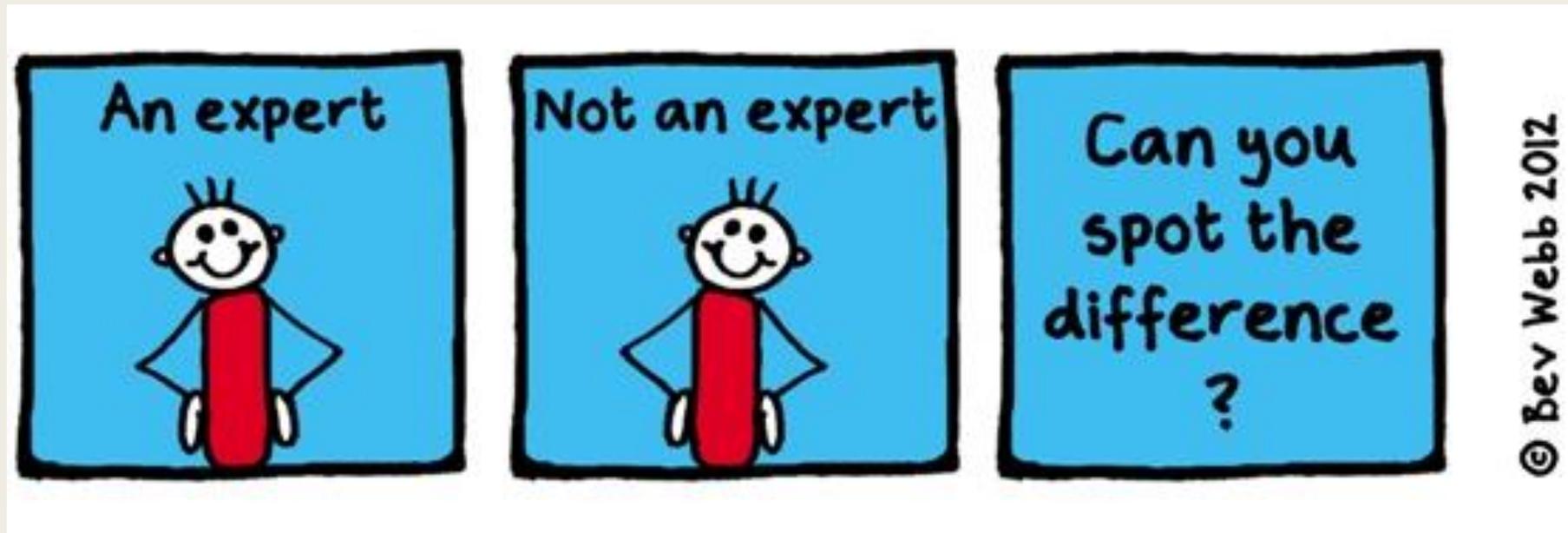


The screenshot shows the top section of the RMIT University website. On the left is the RMIT logo, which consists of a red square with a white dot inside, followed by the text "RMIT" in a bold, sans-serif font, and "UNIVERSITY" in a smaller font below it. To the right of the logo is a navigation menu with links for "Study with us", "Life at RMIT", and "Research". Below the navigation is a dark grey banner with the text "NEWS" in a white, sans-serif font, followed by the headline "World's first research centre on social science of blockchain" in a larger, white, sans-serif font.



Business case for blockchain

- Avoid the 'bleeding edge' and start small
- Focus on areas that reduce costs by removing:
 - Reconciliation
 - Verification
 - Mistakes and errors
- Other benefits:
 - Reputation risk
 - Data is a toxic asset
- New business opportunities:
 - Track and promote based on outcomes
 - Flexible and life-long learning
- Timing



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Discussion

Q & A

*Knowledge is the water of life

Shifting relationships

■ Agents

For GrabIT, the role of agents has evolved in certain markets

- Smart contracts and agent management (performance, commission, subagents)
- Fraudulent documents
- From collecting and submitting of admissions documents to greater focus on counselling and guidance
- Financial and resource savings: Greater focus on student experience and welfare rather than administration

Shifting relationships

- Employers and industry partners
 - The GrabIT approach: Broker relationships and verify learning securely without putting learners and educators in traditional boxes
 - Questions we are considering: How much student performance should be shared with potential employers and partners? What is the impact of recording (and sharing) every failure?

<https://www.blockchaindailynews.com/attachment/756565/>

Learning on the Block:

Could Smart Transactional Models Help Power Personalized Learning?



Shifting relationships

■ Community

- “The best teachers are behind ivy covered doors, giving access to those who are able to pay with administration there to ensure quality and act as intermediary between teachers and students”

<https://cryptocoremedia.com/smart-contracts-upward-mobility/>

Shifting relationships

10 ultra-successful millionaire and billionaire college dropouts

Abigail Hess | @AbigailJHess | 2:53 PM ET Wed, 10 May 2017



David Dobrik

22 years old

Reported net worth - \$2 million

3 billion views

9 million subscribers

Averages 3-4 million views per video

High school drop out



Shifting relationships

■ Community

Shifting community engagement from passive observers of education processes to active participants in the evolution of education delivery

- Data about resource allocation available to public: accountability and involvement of community
- Student performance data publicly available
- Donors, scholarships and finances: direct connection to students without the involvement of intermediaries/institutions



Shifting relationships

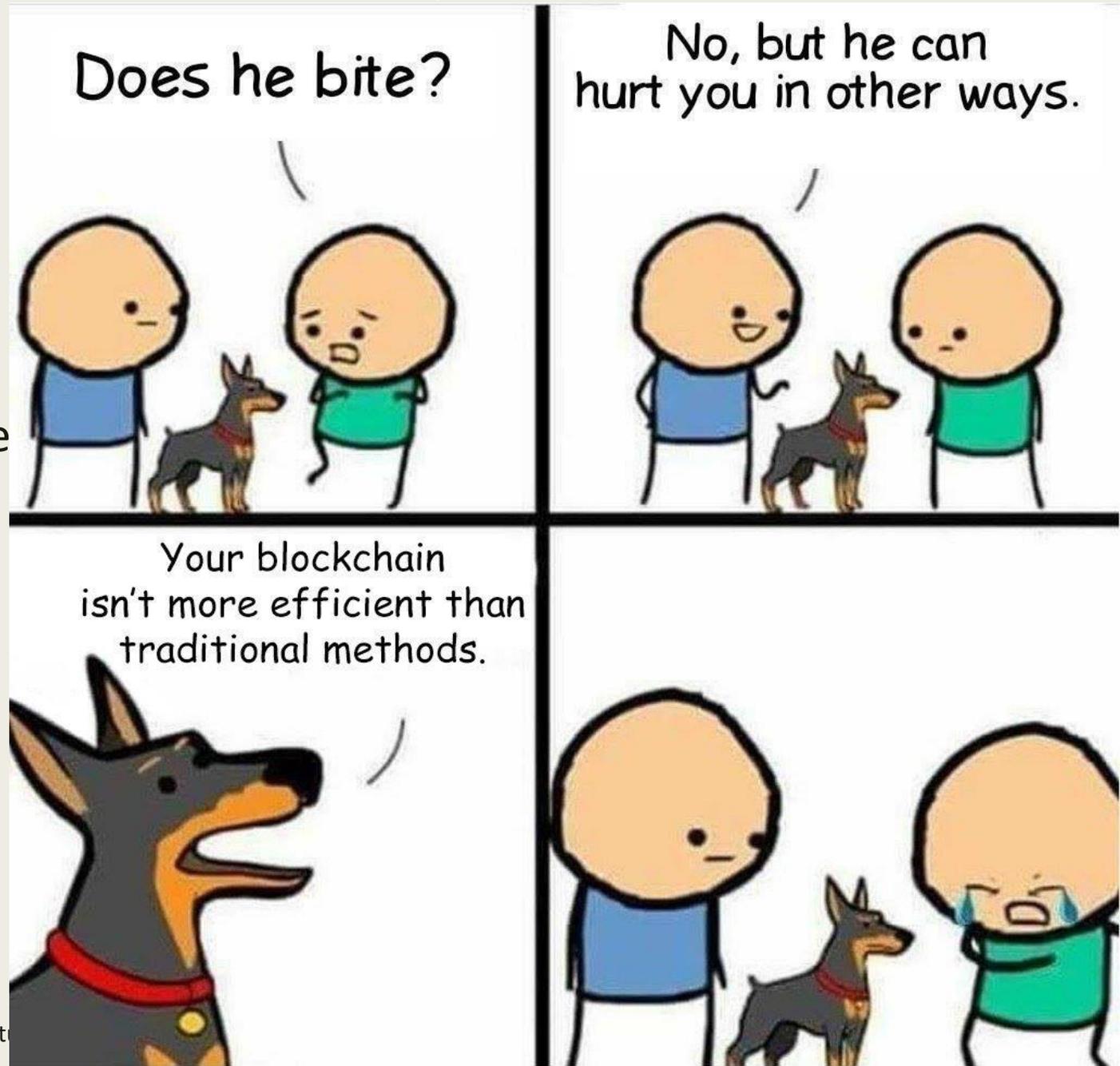
■ Students

- Shift in power dynamics
- Cultural shift in teaching in learning (customized and personal)
- Shift in pedagogy (student centered, micro-credentials, recognition of competencies, clear learning pathways)
- Student performance patterns, resource allocation and early intervention
- Management of digital rights and access to expanded learning resources. A more internationalised learning experience?
- Equity: greater access to previously marginalized students?

To consider

- Could having more efficient and secure data systems create the illusion of improvement but actually reinforce our reliance on limited and sometimes inequitable measures of student achievements?
- The role of cultural and racial bias and the permanency and transparency of disciplinary records?

<https://www.blockchaindailynews.com/attachment/756565/>



DISTRIBUTED LEDGER TECHNOLOGY (DLT) IN INTERNATIONAL OPERATIONS

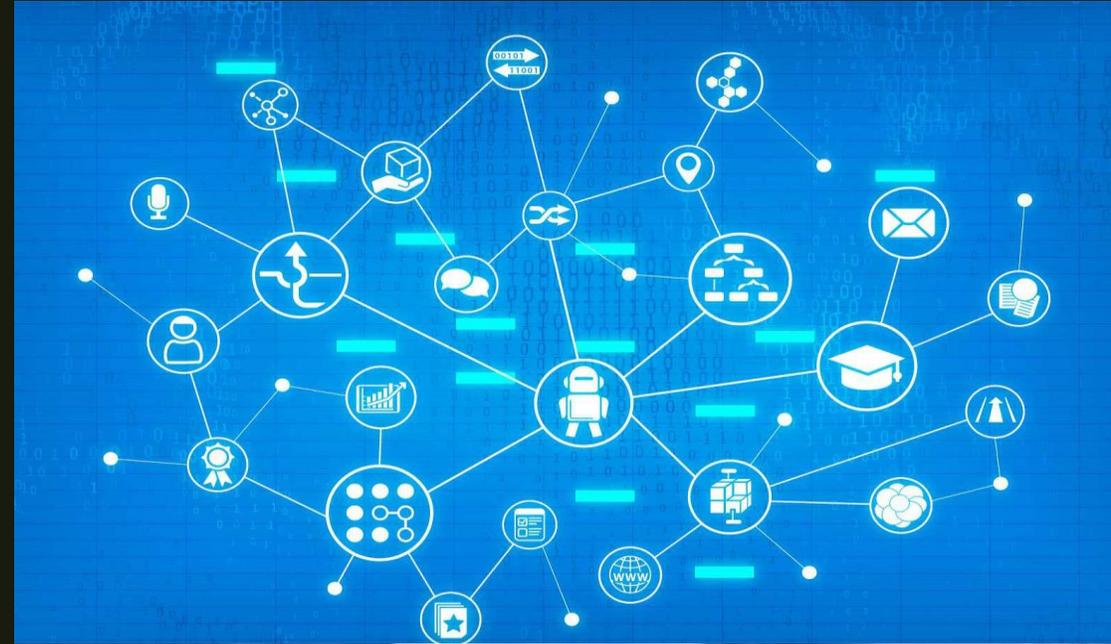
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FINALE

THINKING ABOUT
BLOCKCHAIN?

ALL

Graphic courtesy of collaboration between GrabIT
Contemporary Art, Criminology & IT teams



The GrabIT findings from our discussions

- DLT could make admissions systems more efficient and reliable.
- The potential to transform other admin, and the learning experience.
- Complexity: consumer protection, data integrity, transaction speed, environmental footprint, legal, regulatory and technological issues.
- DLT applications will be incremental, as they replace processes.
- We encourage dialogue within and across institutions to monitor, research and pilot applications based on blockchain and DLT.
- The excitement is in the application, not the technology.
- Begin with the user – student and stakeholders.

Concluding our purpose: five key messages

1. The BC is established in education. Consider from your perspective.
2. You don't need to have detailed technical info (unless you are in IT).
3. It's about application. How might you use the blockchain?
4. The thinking in your institution? Pitch in from the IET perspective.
5. Approach: the implications for the student and stakeholder experience. Step aside from the institutional perspective.

And an afterthought:

Is there a role for IEAA to promote discussion, perhaps a BC SIG?

The Great Artesian Basin Institute of Technology

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Discussion

Q & A

*Knowledge is the water of life

Credits: thanks to the following for advice and the loan of colleagues

- Australian Digital Commerce Association (ADCA)
- CQUniversity (CQU)
- Masterly
- Queensland University of Technology (QUT)
- StudyLink
- Study Queensland

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AIEC October 2018

THANK YOU ALL

