

# BLOCKCHAIN TECHNOLOGY FOR ACCOUNTING AND GOVERNMENT

Jana Schmitz, Policy Researcher, Policy &  
Advocacy, CPA Australia

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# AGENDA

**Blockchain 101**

**Blockchain for Accounting and Auditing**

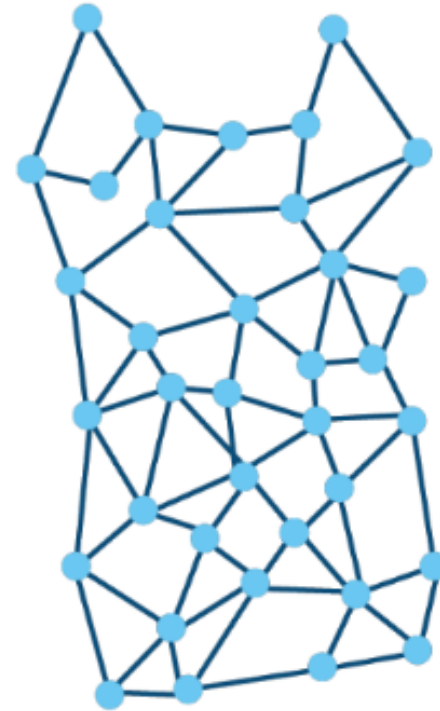
**Blockchain for the Public Sector**

**Regulating Blockchain**

# WHAT IS BLOCKCHAIN?

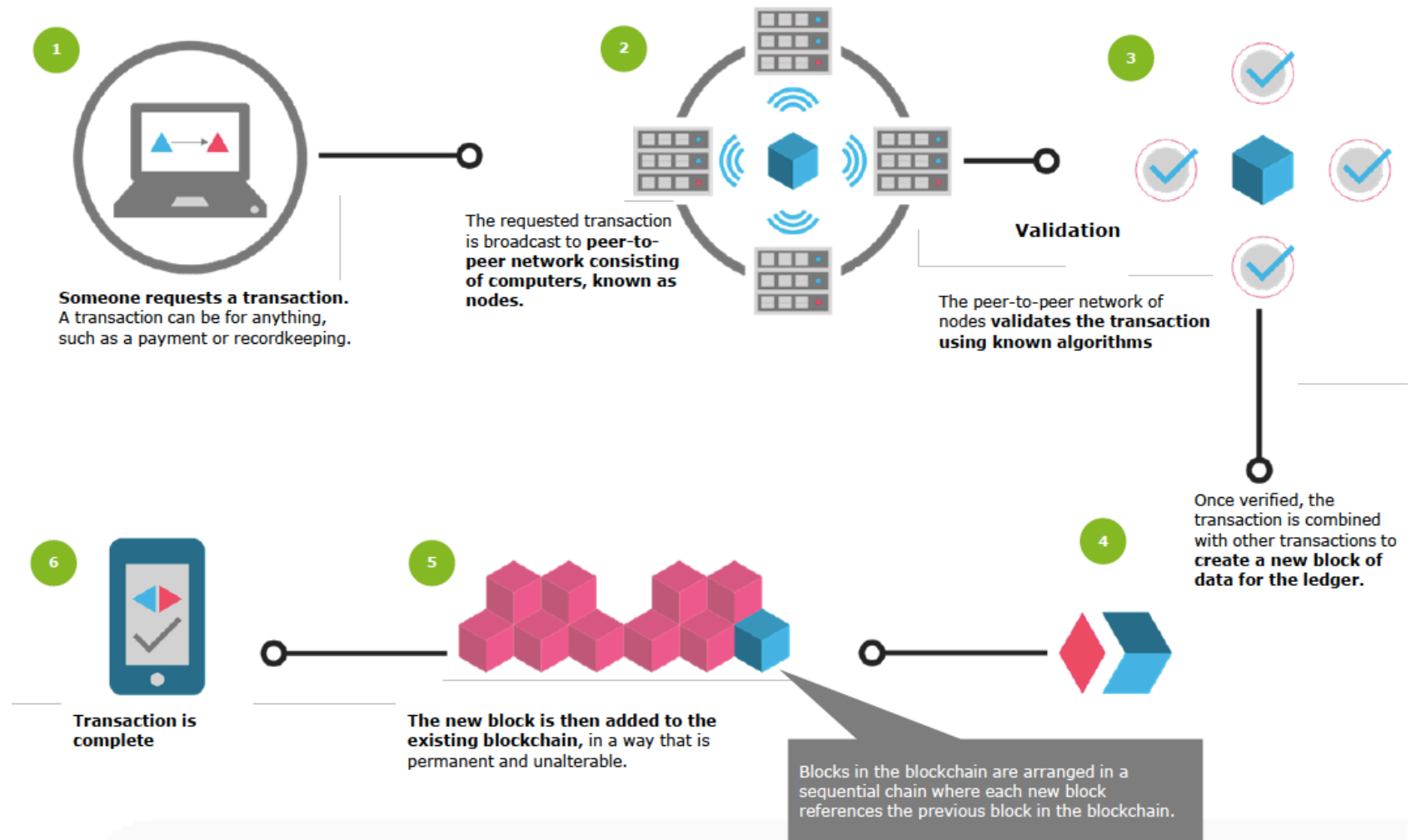


Centralised



Distributed

# HOW DOES BLOCKCHAIN WORK?



Source: Deloitte (2018); see also blockgeeks.com

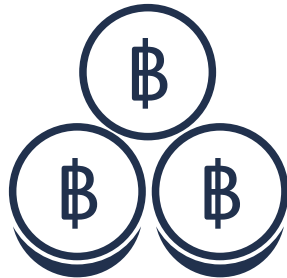


# PUBLIC VS PRIVATE BLOCKCHAINS

	Public	Private
<b>Access</b>	Permissionless	Permissioned
<b>Participation</b>	Everyone who wants to participate	Only selected participants can add new transactions
<b>Speed</b>	Relatively low	Fast
<b>Consensus</b>	E.g. proof-of-work	Pre-approved participants initiate addition of new blocks
<b>Energy</b>	High energy consumption	Low energy consumption
<b>Examples</b>	Ethereum, Bitcoin	Ripple, R3, Hyperledger Fabric

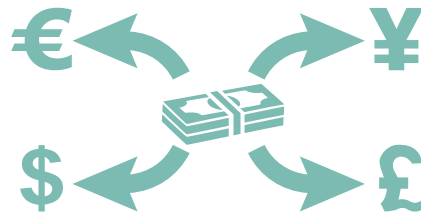
Source: OECD (2018)

# BLOCKCHAIN APPLICATIONS



## Cryptocurrencies

Blockchain facilitates record keeping related to storage and transactions in a secure but transparent fashion which appeals to users.



## Settlement and Payment

Value proposition of blockchain lies in leveraging the security and integrity offered, and the ability to automate the execution of transactions with 'Smart Contracts'.



## Accounting Systems and Supply Chains

Blockchain can potentially operate between transacting organisations, providing a secure mechanism for sharing and verifying data, enabling collaboration across the supply chain.

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# BLOCKCHAIN FOR ACCOUNTING

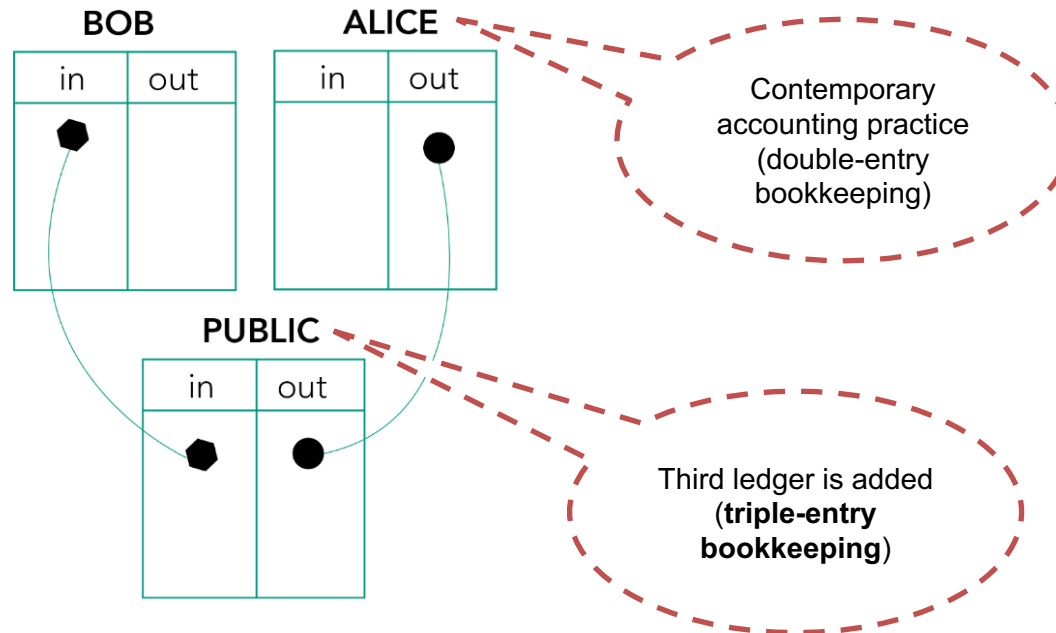
# BLOCKCHAIN'S USEFULNESS FOR ACCOUNTING AND AUDITING

**“Blockchain is an accounting technology. It is concerned with the transfer of ownership of assets, and maintaining a ledger of accurate financial information.”**



# TRIPLE ENTRY BOOKKEEPING

Near real-time recording, settlement and reconciliation of transactions at both the supplier and recipient ends.



Sources: Dai and Vasarhelyi (2017); Deloitte (2018); Karajovic et al. (2019); PwC (2016); Schmitz and Leoni (2019)

# CONTINUOUS AUDITING

## Immutability and irreversibility

- immutable record of full list of transactions
- audit trail that cannot be tampered with
- reduced cost for fraud detection

## Sampling

- audit of entire population of transactions
- less uncertainty about audit conclusions

## Timing

- real-time/continuous
- spot trends or future risks proactively

## More accurate view

- more accurate and transparent picture
- deeper understanding of overall business mode

# THE FUTURE OF ACCOUNTANTS AND AUDITORS


**“Accounting as we know it** – as a quarterly exercise in which teams of people review samples of past transactions to judge the integrity of past events – **will become obsolete.** And the Big Four’s audit divisions are just the tip of the accounting business iceberg. It’s not just the big-name **auditors at risk**; it’s every auditor – including companies’ internal auditors. In fact, once account-keeping itself becomes **fully automated** and **reconciliation functions become superfluous**, both **those who keep the books and those who audit them will be out of work.**”

Sources: Casey and Vigna (2018, pp. 221-2)

# IMPACT ON THE ACCOUNTING PROFESSION

Data Acquisition & Preparation	Data Processing & Analysis	Interpretation & Decision-making
Sourcing data	Classifying and aggregating data	Collaborating with other professionals
Evaluating data reliability	Ensuring data integrity	Communicating and reporting information
Evaluating data relevance	Ensuring data security	Contextualising reported information
Determining data scope	Maintaining an audit trail / transparency	Providing guidance and insight
Determining data content	Modelling with data	Planning and control

Major / Greater impact
  No / Less impact


Accountants and auditors remain important

Source: CPA Australia (2019)



# BLOCKCHAIN ACCOUNTING USE CASE



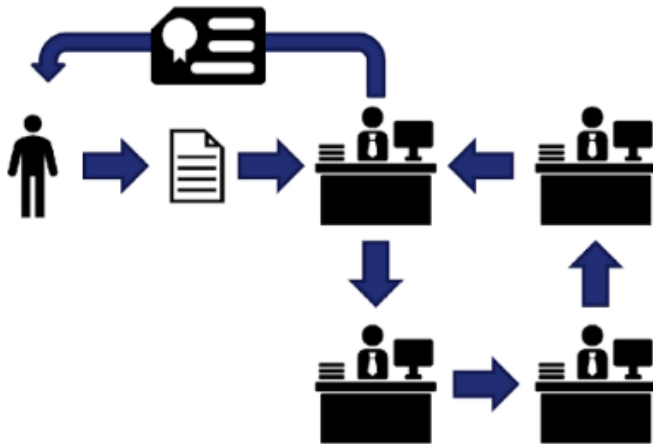
**BLOCK  
LEDGER**

Source: Block Ledger (2019)

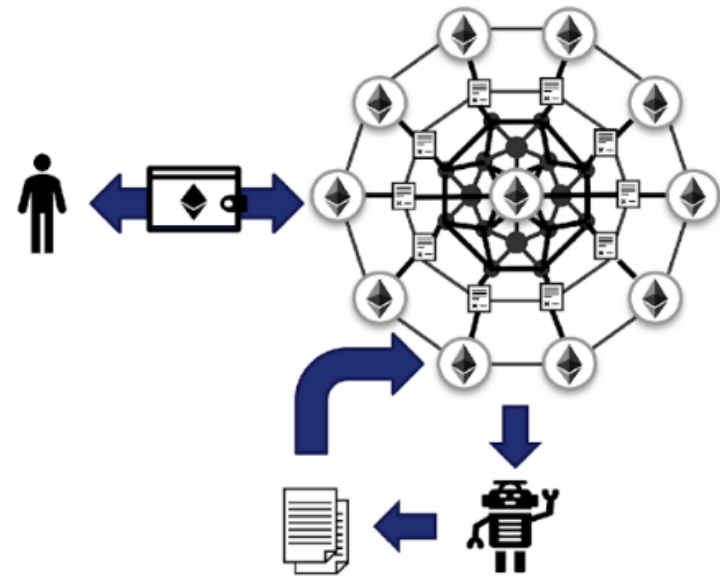
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# BLOCKCHAIN FOR THE PUBLIC SECTOR

# BLOCKCHAIN'S USEFULNESS FOR THE PUBLIC SECTOR



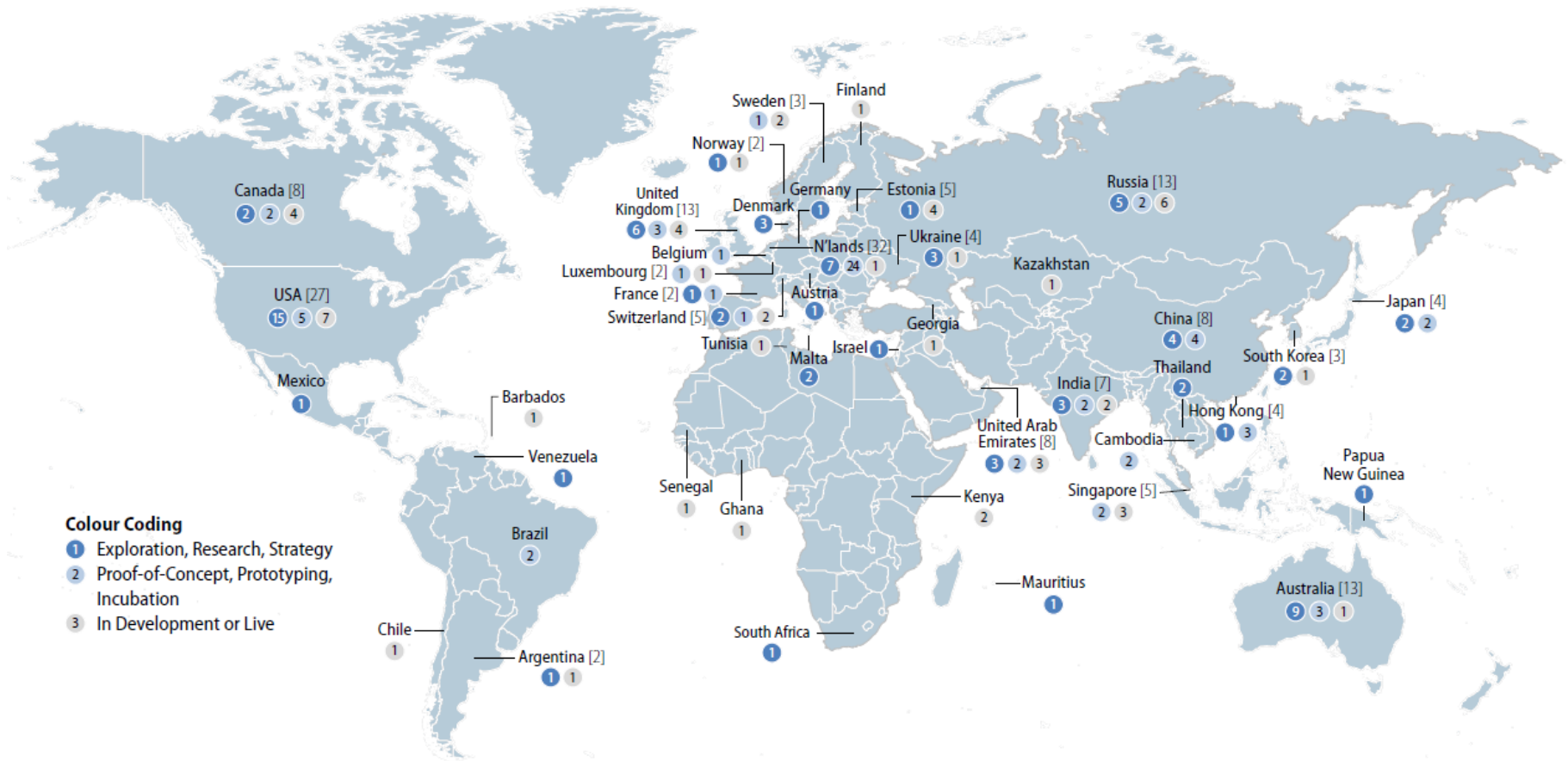
Traditional Government System



Blockchain Government System

Source: ConsenSys (2019); OECD (2018)

# GOVERNMENT INVOLVEMENT IN BLOCKCHAIN INITIATIVES (2018)



Source: OECD (2018)



# BLOCKCHAIN FOR THE PUBLIC SECTOR

Use cases	Description	Example
Identity	Establishing and maintain identities for citizens and residents	UN ID2020
Personal records	Birth certificates, marriage licenses, visas, death records, health records, insurance records etc.	Government of Dubai
Land title registry	Details and historic records related to real estate and property transactions	Fintech Valley Vizag (India)
Voting	Enabling new methods of digital voting, ensuring eligibility, accurate counting, and auditing (e.g. avoid ballot-rigging)	City of Zug (Switzerland)
Supply chain management	Tracking an asset from its creation, transportation, purchase, and inventorying	IBM partnering with Maersk
Energy utilities	Managing “smart energy”; peer-to-peer energy trading	Power Ledger
Streamlining inter-agency processes	Blockchains and smart contracts can automate transaction handling and improve information sharing between agencies	Civic Ledger

Source: OECD (2018)

# BLOCKCHAIN USE CASE – CIVIC LEDGER



Source: Civic Ledger (2019)

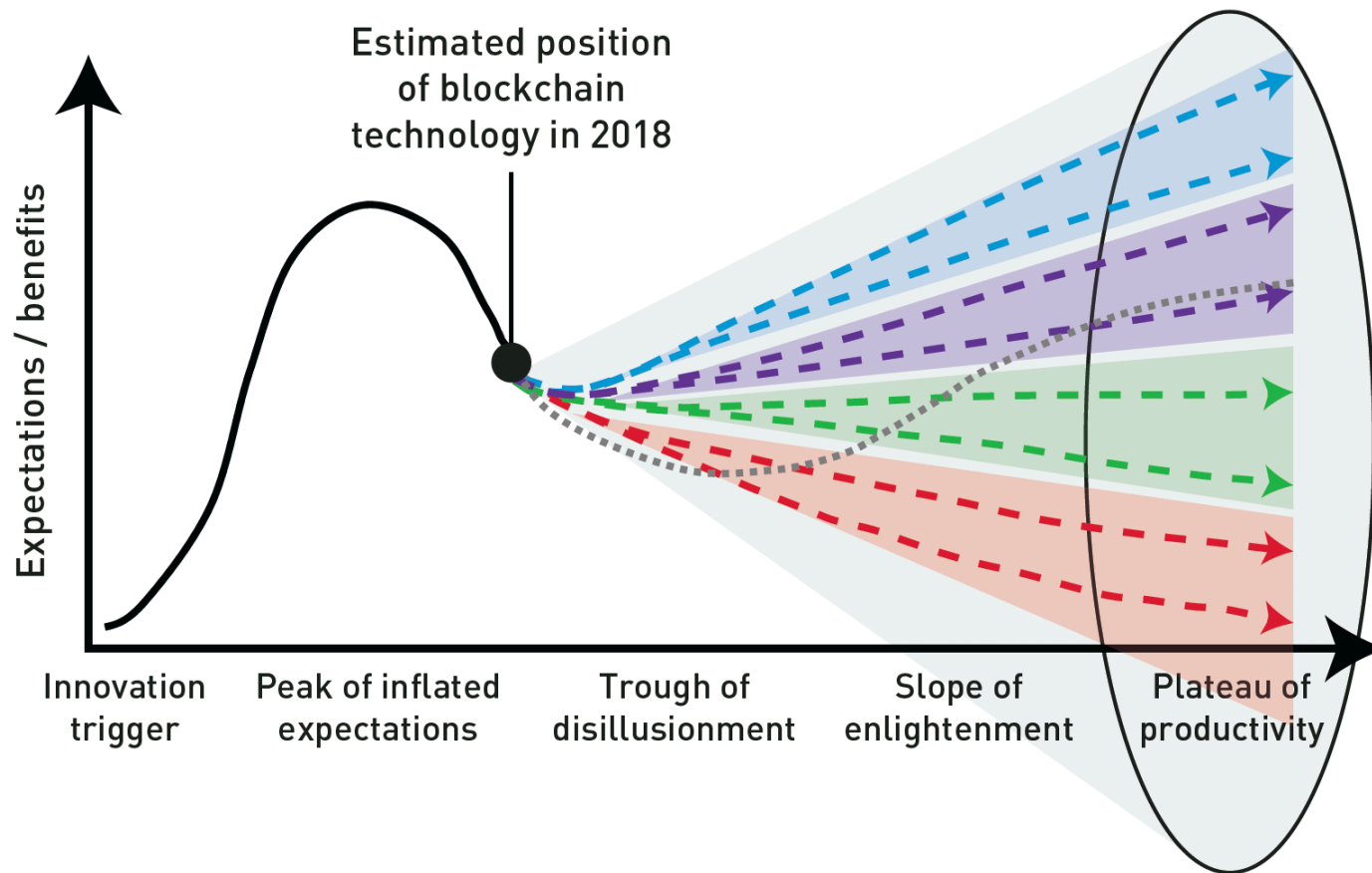
# REGULATING BLOCKCHAINS

- **G20 Leaders' Summit**  
(Buenos Aires, November/December 2018)
- **OECD Blockchain Week**  
(Paris, September 2019)
- **Regulatory Sandboxes**  
(e.g. ASIC Innovation Hub)
- **Senate Inquiry**  
(FinTech and RegTech)
- **Blockchain 2020**  
(Melbourne)
- **Standards Australia**  
(Blockchain Working Groups, Blockchain Committee)
- **Australia's Blockchain Roadmap**  
(Blockchain Australia)



Source: CSIRO Data61 (2019)

# WHERE ARE WE AT, AND WHERE ARE WE GOING?



Source: CSIRO Data61 (2019)



# BLOCKCHAIN CONSIDERATIONS AND CHALLENGES

## Immutability

- Append only ledger: correcting entries must be made



## Transparency, confidentiality & privacy

- Public blockchains: “open network”
- EU GDPR: right-to-be-forgotten
- Private blockchain



## Input data validity, accuracy, completeness & quality

- No guarantee for valid, correct, unfraudulent data/transactions
- “garbage in, garbage out”



## Resource intensity

- Bitcoin: 0.26% of the world’s annual energy consumption
- Private blockchains: energy consumption not an issue

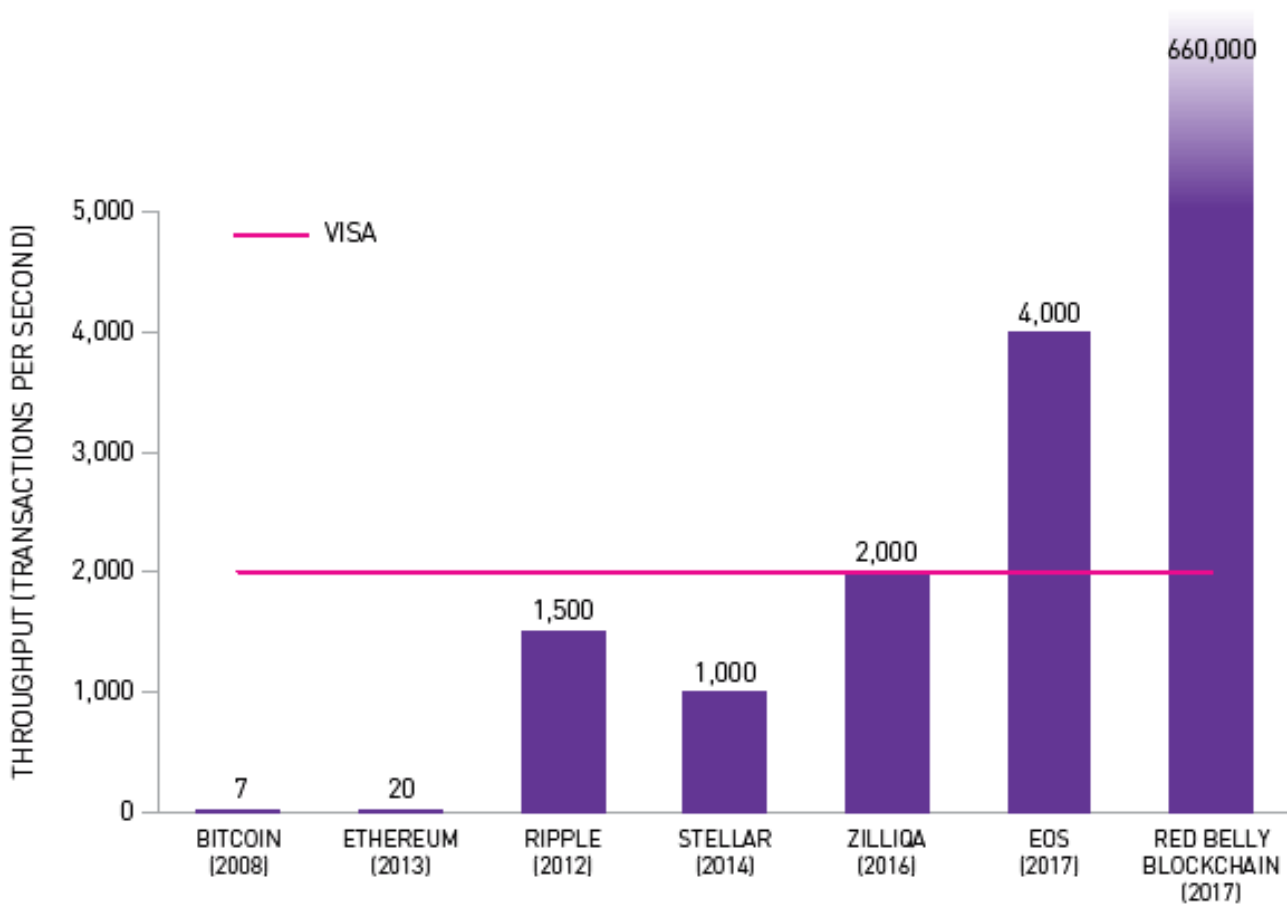


## Scalability

- Public blockchains (Bitcoin: approx. 7 transactions per sec.)
- Australia’s Red Belly Blockchain: approx. 660,000 transactions per sec.



# NUMBER OF TRANSACTIONS PER SEC. ACROSS DIFFERENT BLOCKCHAINS



Source: CSIRO Data61 (2019)

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# THANK YOU