

Introduction to Blockchains and Cryptocurrency

Implications for Oregon

Oregon State Legislature

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ETHERISC +



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Technologist/Consultant

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Blockchain Advisor

Matt Chwierut



Co-founder
Head of Research



Research Fellow



Research Advisor

What are blockchains?

To understand blockchains, let's start with email...



Impact of New Technology

<u>Protocol</u>	<u>Rails for:</u>	<u>Impact</u>
HTTP (websites)	Content	Advertising
SMTP (email)	Messages	Communications
Blockchains	Value	Payments Insurance Financial Markets Supply Chain Personal Data

What is a Ledger?



clay tablets



papyrus

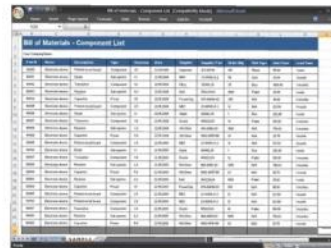


tally sticks



double entry book keeping

spreadsheets



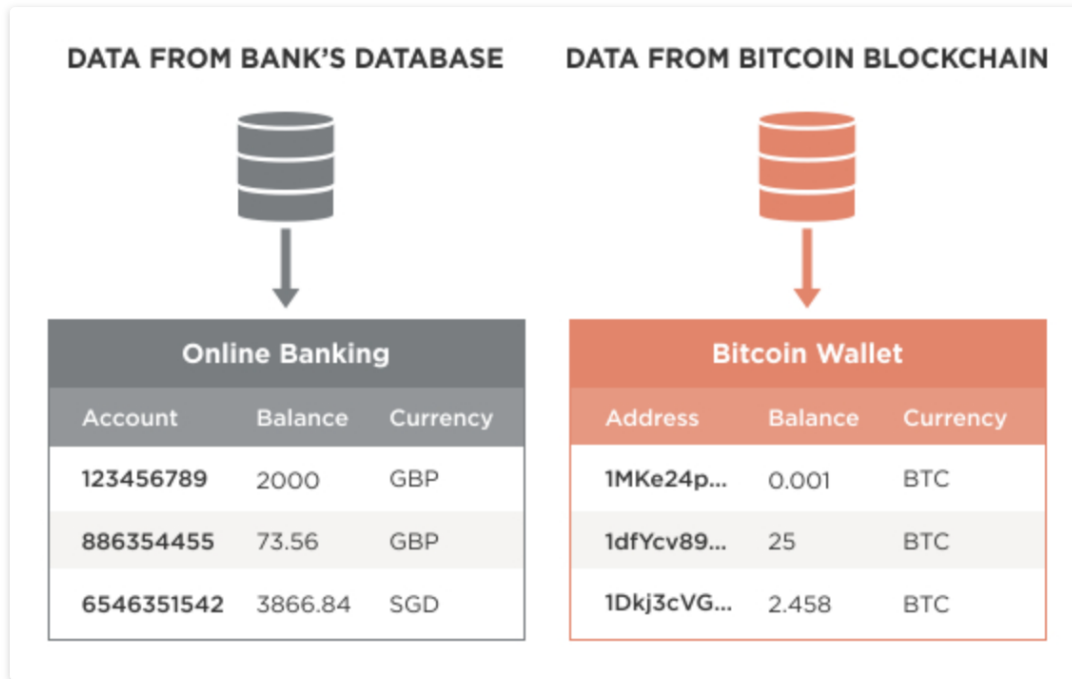
A ledger is a list of events or transactions.

In the case of asset ownership we might record...

- Buyer
- Seller
- Amount
- Timestamp

A ledger establishes a consensus about facts.

What is blockchain?

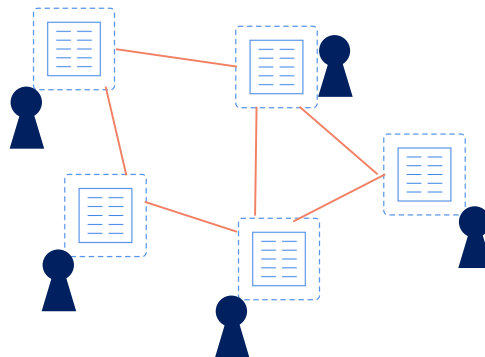
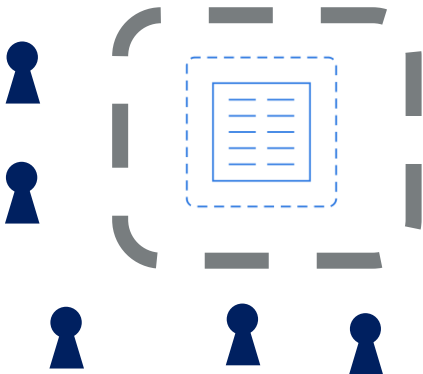


Transactions are immutable.

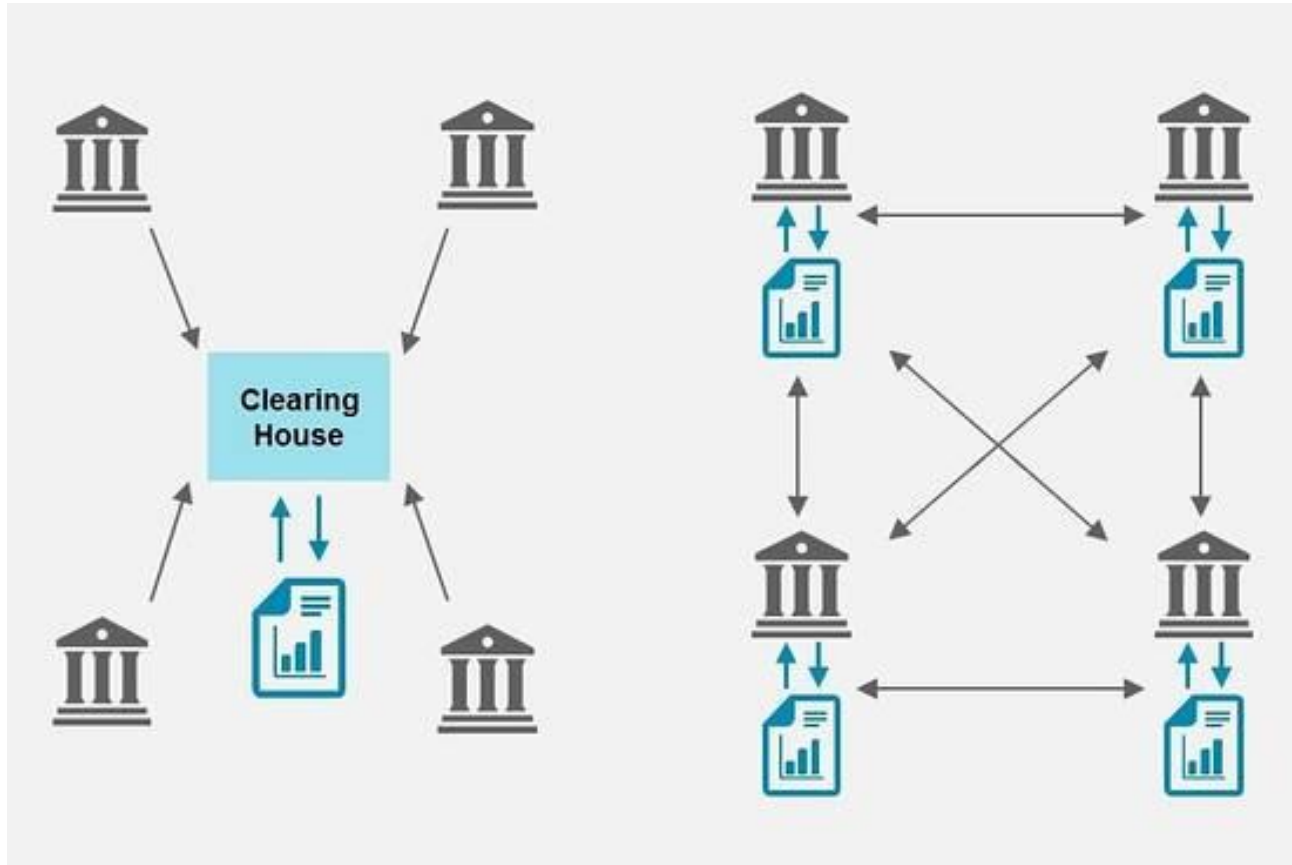
There is no disagreement about who owns what.

The ledger of transactions is visible to everyone.

Everyone's copy of the ledger is identical.



Intermediation of Transactions

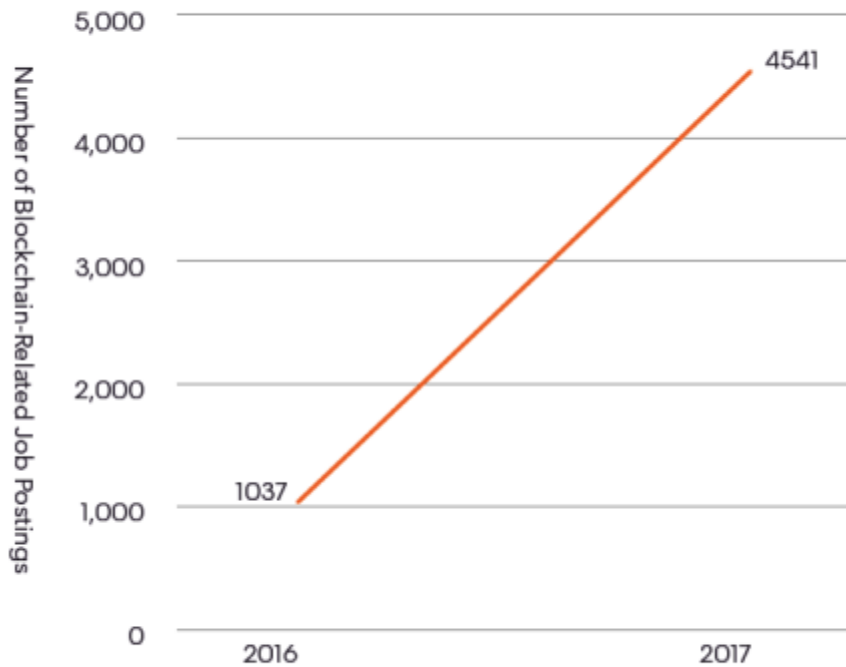


Blockchain allows the exchange of value without a 3rd party intermediary.

Implications for Oregon

Tremendous Job Growth

Blockchain-Related Jobs on LinkedIn increased Fourfold in 2017



Source: LinkedIn; Data retrieved in mid December

Bloomberg Law

Source: bna.com



Tremendous Job Growth

The newly released [LinkedIn 2018 U.S. Emerging Job Report](#) reveals that blockchain developer has been by far the fastest-growing job from 2014 to today.

The demand for blockchain developers has grown by an astounding 3,300%, nearly three times more than machine learning engineer, the No. 2 job on the list.



Technology

Exclusive: Leading cryptocurrency exchange to open Portland office, 70-plus jobs possible

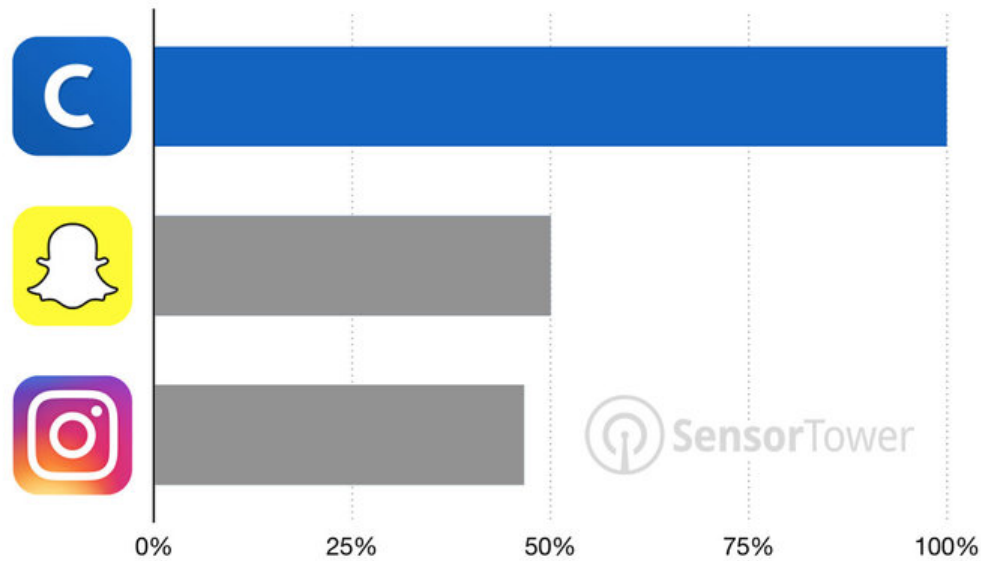
San Francisco-based Coinbase, a market for trading bitcoin and other cryptocurrencies, said Thursday it has signed a seven-year lease for a downtown Portland office and plans to hire up to 100 people.

Coinbase [announced last month](#) it would open a customer service office in Portland amid frustrations over delayed transactions and reports of poor service. The Portland Business Journal [reported in May](#) that Coinbase will be in a building just south of Pioneer Courthouse Square.

Economic development agency Greater Portland Inc., which helped recruit Coinbase, said the company received no public incentives for the new office.

Coinbase, which claimed \$1 billion in revenue last year, is a trading platform and storage service for a variety of digital currencies that exist only online.

Coinbase Downloads vs. Snapchat and Instagram U.S. App Store, Indexed



First-time installs for December 5 through December 12, 2017.

Source: Sensor Tower Store Intelligence

 Sensor Tower Data That Drives App Growth

sensortower.com

\$150B+

Digital currency exchanged

42

Countries supported

20M+

Customers served

Technology September 13, 2018

Nike, Intel, R/GA part of new program to put Oregon at center of blockchain industry

Venture capitalists say blockchain, a distributed ledger technology, will transform business as we know it. Portland seeks a leading role in that revolution.

A partnership backed by [R/GA Ventures](#), Nike, OHSU, Intel, Oregon's economic development agency Business Oregon and blockchain research firm [Smith & Crown](#), is taking shape this month. The venture studio, based in Portland's Pearl district, aims to attract out-of-state blockchain leaders to apply the emerging technology to business and policy conundrums.



[Business](#) | [Education](#) | [Nation](#) | [Nation & World](#) | [Northwest](#)

University of Oregon gets funding from cryptocurrency outfit

Originally published June 7, 2018 at 2:07 pm | Updated June 7, 2018 at 2:46 pm



MIT

[Visit Site](#)

Potential Concerns

Tax evasion?

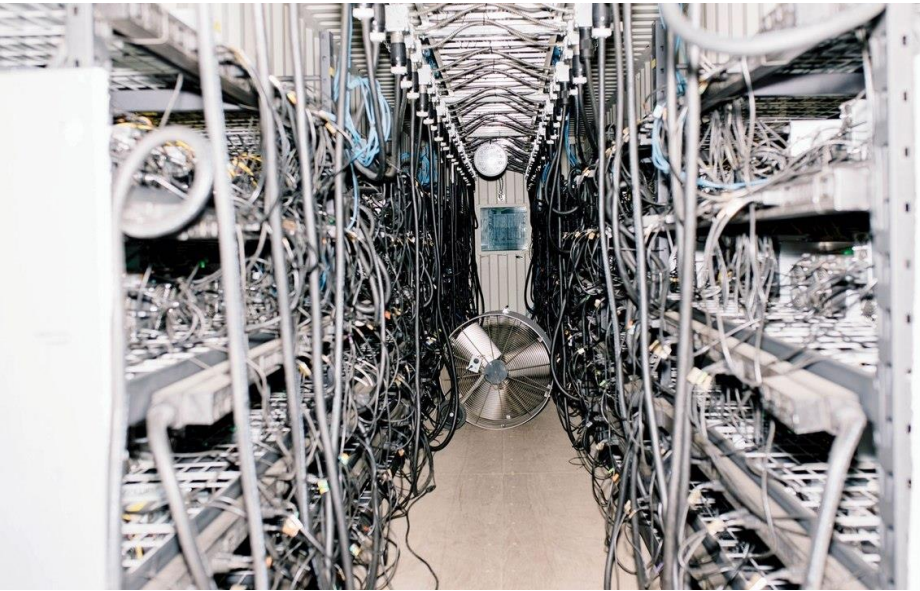




Bitcoin Miners Are Flocking to Oregon for Cheap Electricity. Should We Give Them a Boost?

The arrival of cryptocurrency miners in The Dalles offers a strange opportunity for the state—and a big environmental threat.

By Katie Shepherd | Published February 21, 2018 • Updated February 21, 2018



Considerations for Legislature

Regulatory Approaches

- Wait-and-see/Learning
- Guidance
- Sandboxing
 - Encourage experimentation
- Internalizing
- New legislation

Finck, Michele, Blockchain Regulation, German Law Journal, 2018

Blockchain State Regulation

- Securities law
- Tax law
- Money transmission
- Government uses of blockchain
- Data standards



uniform law commission

better laws. stronger states.

State money transmission statutes

The following states are unlikely to currently regulate virtual currency sales under state money transmission statutes:

CA, ID, IL, KS, LA, MD, MO, MT, NH, NC, TN, TX, WI and WY.

The following states are likely to regulate virtual currency sales under state money transmission statutes:

AL, CT, HI, NY, VT, and WA.

The remaining states (AK, AZ, AR, CO, DC, DE, FL, GA, IN, IA, KY, ME, MA, MI, MN, MS, NE, NV, NJ, NM, ND, OH, OK, OR, PA, RI, SC, SD, UT, WV) have not yet weighed in on the issue.

Source: [github.com/LawDEX/50-State Survey of the Regulation of Token Sales under State MTAs/](https://github.com/LawDEX/50-State-Survey-of-the-Regulation-of-Token-Sales-under-State-MTAs/)

Questions

Appendix Slides

Quarterly Skills Index

The top 20 fastest-growing skills, Q3 2017

1

ROBOTICS

Develop machines that can substitute for humans such as opening doors or making a cup of coffee.



2

BLOCKCHAIN

A Distributed Ledger Technology (DLT) that verifies and records bitcoin transactions.



3

BITCOIN

A cryptocurrency and peer-to-peer digital payment system that aims to remove friction from transactions.



4

PENETRATION TESTING

Test computer systems, networks and web apps to find vulnerabilities.



5

REACT.JS

A javascript library for building user interfaces.



6

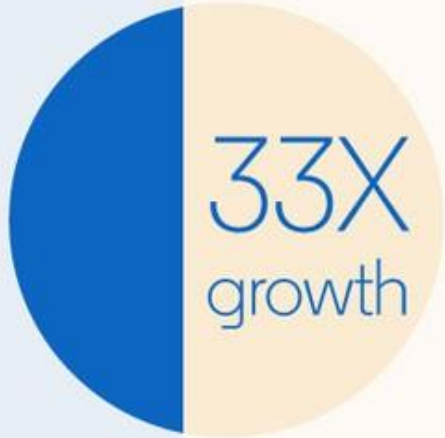
AMAZON WEB SERVICE LAMBDA

Run code without provisioning or managing servers and pay only for the compute time you consume.



ADDITIONAL SKILLS

- 7 Augmented Reality
- 8 Deep Learning
- 9 Instagram Marketing
- 10 Final Cut Pro X
- 11 Swift Development
- 12 AngularJS Development
- 13 Salesforce
- 14 Vulnerability Assessment
- 15 Natural Language Processing
- 16 HubSpot Marketing
- 17 Machine Learning
- 18 Objective-C Development
- 19 Learning Management System (LMS)
- 20 jQuery Development



Blockchain Developer



Machine Learning Engineer

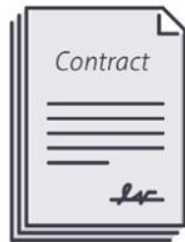
Bitcoin ATM returns to Pioneer Place



What are Smart Contracts?

The basic idea behind smart contracts is that many kinds of contractual clauses can be embedded in our hardware and software, and make breach of contract expensive for the breacher.

Examples: collateral, bonding, delineation of property rights, etc.

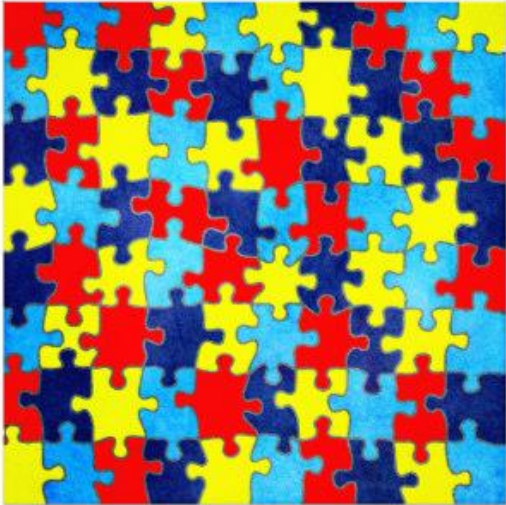


“The primitive ancestor of smart contract is the humble vending machine”

...the vending machine is a contract with bearer: anybody with coins can participate in an exchange with the vendor. The lockbox and other security mechanisms protect the stored coins and contents from attackers, sufficiently to allow profitable deployment of vending machines in a wide variety of areas.” (Nick Szabo 1997)



How is a blockchain kept secure?



If a miner finds the solution to the puzzle, those transactions are added to the chain and the miner gets a “block reward” as payment.

This is how new bitcoin is created.

Then the process starts over again and all the miners try to find the solution to the next puzzle.