

BLOCKCHAIN COUNCIL REPORT TO THE COMMUNITY

COLORADO OFFICE OF
ECONOMIC DEVELOPMENT &
INTERNATIONAL TRADE

JULY 2019



COLORADO
Office of Economic Development
& International Trade



**THE COLORADO
BLOCKCHAIN COUNCIL**



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INTRODUCTION

The Colorado Council for the Advancement of Blockchain Technology Use was created by Governor John Hickenlooper in June 2018 following the 2018 legislative session, during which the Colorado General Assembly considered several bills related to blockchain technology and virtual currency. Ultimately, only one bill related to data-sharing passed while the rest failed. Perhaps the most symbolic activity surrounding blockchain legislation was one particularly dramatic bill whereby three lawmakers changed their votes at the last minute over clarity and uncertainty of impact, thus flipping the bill from passage to failure.¹

This experience suggested that additional thought and education around the regulation of blockchain technology is critical. This technology continues to evolve at a rapid pace, making it difficult for outsiders to understand both the potential benefits and the potential risks. When blockchain technology is held up to a regulatory framework that is in some cases based on laws from decades ago, the situation becomes even more complex.

Yet despite the complexity, blockchain technology and innovation has continued to grow in Colorado. Over the past three years, blockchain companies affiliated with Colorado have raised over \$50m in venture capital funding.²

Supporting Blockchain was a priority for Governor Hickenlooper and continues to be under Governor Polis. In his address during Blockchain Day at the Capitol, Governor Polis announced his vision to “make Colorado the national hub for blockchain technology in business and in government.”

Colorado has the chance to be a leader in promoting and supporting healthy innovation in this space. The Colorado Blockchain Council and this report are designed to be the first steps in this effort. The Council was established to support the state in meeting the promise and potential of blockchain. This report provides background to help understand blockchain technology, an outline of the organization and process of the Council, and an explanation of the problems and potential solutions the Council identified and worked to implement.

WHAT IS BLOCKCHAIN

Blockchain, at its most basic, is a digital ledger in which transactions are recorded chronologically and publicly. Different blockchain systems are being built across the world, but each network allows connected computers to validate each other’s data, creating a shared, immutable, and decentralized record. This new technology allows people to transact with one another in a secure and trustless manner, reducing the reliance on third-party intermediaries. This concept has taken the finance world by storm and has led to disruptions across many industries. For a more detailed technical explanation and some examples of industries affected by blockchain, please see the appendix.

WHAT IS CRYPTOCURRENCY

Though often used interchangeably, cryptocurrency and blockchain are different technologies. Cryptocurrencies are digital representations of value that are based on distributed ledgers like blockchains. BitCoin is a cryptocurrency. Though cryptocurrency is one particularly prominent use of blockchain, it is important to understand that blockchain technology has a wide range of potential use case and implications.

¹ <https://www.denverpost.com/2018/05/09/colorado-bill-blockchain-technology-security/>

² Data from Pitchbook

WHAT IS THE BLOCKCHAIN COUNCIL

Governor John Hickenlooper appointed the 16 members of the Council, which operates out of Colorado's Office of Economic Development and International Trade. These appointees include industry representatives, attorneys, leaders of government agencies and elected officials. When Governor Jared Polis came into office in January 2019, several new agency leaders replaced their predecessors on the Council. For a full list of members and their biographies, please see the appendix.

The Council's objective is to recommend a comprehensive legal framework to support blockchain technology, recommend potential government use cases of blockchain and generally support innovation in the space while ensuring that consumers are adequately protected. This report represents the summarized output of these efforts.

From the beginning, the Council adopted several guiding principles:

- ▶ *Do no harm* - the blockchain industry is a dynamic one in the early stages of development. There are still many unanswered questions and situations that cannot be anticipated. The Council worked to avoid creating laws that would prematurely codify regulations or establish requirements that could have potentially adverse consequences for the citizen, the state or businesses in the future. Instead, the Council tried to take an incremental, conservative approach to thorny policy questions.
- ▶ *Provide clarity wherever possible* - one of the primary challenges facing the blockchain community is confusion around how and when to apply regulations and policies to blockchain innovations. In some cases, regulators had established an interpretation, but it wasn't widely known within the industry. The Council worked with regulatory partners to provide clarity around existing laws and regulations before considering potential changes.
- ▶ *Position Colorado as a leader* - the goal of this Council was to provide a thoughtful approach to the regulatory questions that can serve as a model for the rest of the country. Because blockchain technology inherently crosses borders, many of these issues cannot truly be resolved through legislation in a single state. The Council's hope is that our work will be adopted and built upon by other states, and the Council would be happy to support or collaborate with others to do so.

COUNCIL ORGANIZATION

The Council began by identifying the problems facing the blockchain industry in Colorado that exist at this moment in time. It created a broad list of issues and then organized participants into working groups to first, clearly define the problem, then propose possible solutions. Each working group was led by a Council member, but actively solicited participation from the broader community through Slack channel discussions, collaborative Google docs and working group meetings. Ultimately, close to a hundred volunteers participated across the different working groups.

Once the problems were clearly defined, the groups began working on solutions. In some cases, the issues identified turned out to be less substantive than first expected. For example, many (though not all) of the questions community members had about the taxation of cryptocurrency in Colorado had established answers that just needed to be more widely publicized. In other cases, there were some issues that would be difficult or impossible to address at the state level; exchanges are not regulated by

In many of the working groups, however, there was a substantive issue that the Council could work to improve within Colorado. The Council worked with partners across different government agencies and other private organizations across Colorado to determine how to best serve the State and its citizens, businesses, entrepreneurs, users, and customers.

ISSUES IDENTIFIED BY THE COUNCIL



DEFINITION OF TOKENS

Definitions around the various types of tokens and digital assets are unclear and vague. This leaves companies considering the issuance of tokens with a high level of legal risk, given overlapping regulatory regimes. By defining and classifying types of tokens, companies can create token offerings that fit within a clear legal framework. This drastically reduces the company's costs, protects consumers, and gives more visibility to the offering. Additionally, regulators and policymakers would be able to create a cohesive regulatory framework that guides companies and protects consumers.



SECURITIES

The lack of regulatory clarity around token sales leads to uncertainty, and potential criminal and civil liability, for companies and individuals who want to sell or purchase digital tokens.

There is a need for a framework to determine which blockchain-based assets are securities and which are not, and to coordinate said framework with the SEC, CFTC and other state regulatory bodies so that such asset determinations do not run afoul of rules and regulations outside Colorado.



TAXATION

Federal taxation of cryptocurrency is both onerous and somewhat unclear, even after the 2017 tax reforms.

Pronouncements from the Internal Revenue Service indicate that the Treasury will tax cryptocurrency as "property," subject to taxation of gains and losses similar to taxation on securities or collectible property. There is currently no "de minimis" exemption on gains, creating a tremendous burden on taxpayers to track the basis (or cost of acquisition) on every purchase or receipt of cryptocurrency, no matter how great or small. If a citizen buys a digital asset for \$1 and then uses that digital asset to purchase a cup of coffee when the digital asset is worth \$3, the citizen must track, report, and pay capital gains on the \$2 "gain", or increase in value of the digital asset from the date of acquisition to the date it was used in the coffee purchase transaction. If a taxpayer is unable to prove his or her cost basis, the basis is deemed to be zero, resulting in capital gains tax on the entire value of the taxpayer's cryptocurrency. This also appears to be the law in Colorado.

This tax treatment creates a significant chilling effect, discouraging taxpayers from using cryptocurrencies for everyday purchases. In addition, the lack of information available to taxpayers on the tax treatment of cryptocurrencies likely results in significant under-reporting of taxable gains.

There are questions about how payments to employees in crypto will be tracked and recorded given potential price volatility, and how tax filing and withholding would be implemented. This uncertainty makes it difficult for employees or employers who may

want to pay salary in wages to do so and ensure they are in compliance.

The lack of clarity around taxation of cryptocurrency, and the absence of a de minimis capital gains tax exemption in Colorado leads to uncertainty, and potential criminal and civil liability for companies and individuals who accept or use cryptocurrency in commerce.



BANKING REGULATION/MONEY TRANSMISSION

Blockchain businesses conducting value-exchanging transactions on behalf of clients may be deemed money transfer agents, and enforcement actions in this regard have already occurred.

Both general banking and money transmitter regulations are the domain of individual states, the federal government, or both.

Blockchain companies, therefore, operate in a gray legal area, unsure which (if any) financial regulations are applicable to them. The definition of money transmission, for example, varies by state and even with significant legal expense can be difficult to apply to different blockchain businesses.



BANKING SERVICES

Blockchain businesses, particularly those with a cryptocurrency focus, have historically found it difficult to obtain traditional banking services such as simple bank accounts. Due to regulatory and product uncertainty, banks sometimes consider these businesses too risky to accept as customers, making it difficult for cryptocurrency companies to access and store capital.



TRUST/CUSTODY

Blockchain asset custody procedures require specificity in dictating safekeeping and transaction handling based on the unique nature of their composition. Unlike traditional assets, where the physical asset itself or a proxy of the asset is held in custody, blockchain assets cannot be physically held. By definition, Blockchain assets exist on a blockchain - a public, immutable ledger of transaction activity. Because information is public and distributed, transaction reversals are not possible as they are with traditional databases serving as a single point of record between two known parties. This makes the practice of secure transaction handling and verification of paramount importance to proper blockchain asset custody standards.



GENERAL REGULATORY ENVIRONMENT

Emerging and disruptive technologies, such as blockchains, don't always fit neatly within the existing Colorado legal framework of statutory, regulatory, and case law. Companies don't have a clear roadmap or point of contact to help them navigate overlapping regulatory regimes, generating tremendous friction and legal costs for entrepreneurs looking to start businesses and remain in compliance.

Additionally, prior to the establishment of this Council, there was no government entity taking a holistic, focused approach to building a comprehensive legal framework to support the blockchain environment in Colorado.



DEBT PAYMENTS

There is a need for a framework that defines blockchain-related debt transactions, including the incurrence of debts, payment of debts, the use of blockchain assets as collateral and so on, and to ensure that said framework complies with Uniform Commercial Code, Internal Revenue Service Code, and Generally Accepted Accounting Principles as appropriate.



OTHER

Working groups were also set up to address five areas that were seen not as issues, but as potentially beneficial use cases in need of support: Company Incorporation, Smart Contracts, Digital Identity, Government Use of Blockchain and Higher Education.

PROPOSED SOLUTIONS

SUMMARY VIEW

ISSUE AREA	SUMMARY OF SOLUTIONS	SPECIFIC PROPOSALS
<i>Definition of Tokens</i>	No action taken thus far.	
<i>Securities</i>	Colorado Digital Token Act will provide an exemption for digital tokens that meet certain requirements.	1
<i>Taxation</i>	The Council considered the Cryptocurrency Tax Fairness Act to provide de minimis capital gains exemption for small purchases made with cryptocurrencies but ultimately decided that this policy would be too difficult to implement in Colorado at this time. The Council is working with the Department of Revenue to provide clarity on other taxation issues.	2,6
<i>Banking Regulation/Money Transmission</i>	The Banking Commission released interim guidance on September 20, 2018, clarifying that crypto-to-crypto transmitters do not need to apply for a Money Transmission License, but crypto-to-fiat transmitters do.	3
<i>Banking Services</i>	In June 2019, in conjunction with the Department of Regulatory Agencies, the Blockchain Council hosted a banking and blockchain roundtable to begin conversations between the two agencies.	7

<i>Trust/Custody</i>	No action taken thus far	
<i>General Regulatory Environment</i>	The Council has considered implementing a FinTech sandbox and proposes that the idea is revisited during the 2020 legislative session. The Council's transition plan is intended to continue conversations as needed.	4, 9
<i>Debt Payments</i>	No action taken thus far	
<i>Company Incorporation</i>	No action taken thus far	
<i>Smart Contracts</i>	The Council suggested a program to train state judges to better adjudicate smart contracts issues.	10
<i>Digital Identity</i>	The Council recommended a pilot set of use cases to become more familiar with the mechanisms of digital identity and identify the best ways to incorporate them into state government services, birth registries and possibly banking AML/KYC requirements.	11
<i>Government Use of Blockchain</i>	The Council supported the pilot use of a blockchain voting platform during the 2019 Denver municipal election.	5
<i>Higher Education</i>	The Council supported a workforce survey conducted by the Department of Higher Education and this will be a focus on the Council's transition work.	8

LEGISLATIVE PROPOSALS

1. Colorado Digital Token Act - this bill was passed by the Colorado state legislature and signed into action by Governor Jared Polis on March 6, 2019, and will go into effect on August 1, 2019



The impetus behind the Cryptocurrency Exemption Colorado Digital Token Act (Act) was to provide regularity clarity for companies that desire to raise growth capital by issuing digital tokens. This will support innovation and entrepreneurs in the state. The Act is narrowly targeted to create an exemption for digital token offerings that are clearly not securities, while ensuring that consumers remain broadly protected from fraud and misconduct.

a. Issuer Exemption

The Act provides a registration exemption under the Colorado Securities Act for issuers of digital tokens that have a primarily consumptive purpose. A "consumptive purpose" is defined

as providing or receiving access to goods, services or content. An example of this type of digital token could be "Spotify Coin," where Spotify pre-sells subscriptions to new content through the sale of a

digital token, and then uses the proceeds from that sale to actually develop the content. This is similar to crowdfunding platforms like Indiegogo or Kickstarter.

To qualify for this exemption:

- ▶ The issuer of the token must make a notice filing with the Colorado Securities Commissioner
- ▶ The primary purpose of the token must be a consumptive purpose
- ▶ The token cannot be marketed for a speculative or investment purpose
- ▶ The token's consumptive purpose must be available within 6 months of the time of sale
- ▶ The token cannot be resold or transferred until the consumptive purpose is available
- ▶ The buyer must acknowledge that they are purchasing the token to use it for a consumptive purpose

b. Licensing Exemption

The Act provides a licensing exemption under the Colorado Securities Act for online platforms that seek to facilitate the purchase, sale or transfer of digital tokens. An example of this type of platform would be "eBay Token Exchange," where eBay permits the purchase, sale or transfer of digital tokens that have a primarily consumptive purpose.

To qualify for this exemption:

- ▶ The platform must make a notice filing with the Colorado Securities Commissioner
- ▶ The token can be used for a consumptive purpose at the time of purchase, sale, or transfer
- ▶ The platform selling the token must stop permitting the purchase, sale or transfer of the token that does not conform to the requirements of the Act.

c. Additional Terms

The Act authorizes the Securities Commissioner to adopt rules to implement the Act or to provide exemptions or waivers as necessary. The Act also authorizes the Commissioner to enter into agreements with federal, state, or foreign regulators to allow digital tokens issued, purchased, sold, or transferred in Colorado to be issued, purchased, sold, or transferred to another jurisdiction, and vice versa. Finally, the Act makes clear that it is intended to be a "safe harbor" from registration/licensing requirements of the Act, and that there should be no securities violation presumption for issuers or online platforms that don't comply with the Act.

2. Cryptocurrency Fairness Act - This bill was considered by the Council, but ultimately not pursued in the 2019 legislation session due to the potential difficulty of implementation. Due to the way Colorado's Department of Revenue implements its tax code, adding a state-level capital gains exemption would create an additional audit burden for the state. Industry representatives will work with the Department of Revenue to determine if a more workable solution is possible, and will consider proposing legislation for the 2020 session.

This bill would create an exemption from capital gains tax for taxpayers purchasing small goods and services with cryptocurrencies. This bill is almost identical to the Cryptocurrency Tax Fairness Act that then-Reps Polis and Schweikert introduced to the US Congress.

Currently, cryptocurrencies like Bitcoin are taxed as property within Colorado, which means that gains from sale and exchanges are treated as capital gains, not ordinary income. Because there is no de

minimis exemption for small transactions, taxpayers purchasing goods or services, such as a cup of coffee or an MP3 download, with a cryptocurrency must track and report the price of the cryptocurrency at the time of sale to report to the IRS at the end of the year. This creates a lot of friction that discourages the use of cryptocurrencies in everyday purchases.

Under this bill, any cryptocurrency transaction leading to a gain of under \$600 would be exempt from capital gains tax. This mirrors the same kind of exemption that is provided for foreign currency. Transactions above \$600 would still require gains to be tracked and reported, and capital gains tax to be paid.

This bill also includes an inflation adjustment to ensure that it remains relevant over time and an aggregation rule to prevent a hypothetical purchaser from breaking a large purchase into several smaller payments to avoid recognition of gain.

COUNCIL PRIORITIES

3. Money Transmission Guidance

On September 20, 2018, the Colorado Division of Banking released [interim regulatory guidance](#) that clarified that Division's interpretation of how the Money Transmitters Act relates to the transfer of cryptocurrency.³

The interim guidance clarified that transmission systems that do not transfer fiat currency, such as those that only transmit cryptocurrencies, are not considered money transmission and not subject to the Act. Systems that allowed fiat-to-fiat exchanges through the medium of cryptocurrency still require a Money Transmission License.

The Council welcomed this guidance and the majority of the Council members signed on to a formal statement in support of the guidance. This Guidance provides much-needed clarity about the conditions under which cryptocurrency businesses need to be licensed as a money transmitter under Colorado law. Additionally, it provides an interpretation that will allow businesses that engage in exchanging exclusively digital assets to avoid onerous regulations, while ensuring that consumers are protected in cases in which fiat currency is or can be transmitted. Because it is formal guidance but not law, it allows for flexibility and adaptation going forward as the industry adapts.

4. FinTech Point of Contact

The use of emerging and disruptive technologies, such as but not limited to blockchains, may in part fit within the current Colorado legal framework (statutory, regulatory and case law). The State can provide clarity to FinTech companies by appointing a "FinTech Point of Contact" to answer regulatory questions. This move could allow our state to attract innovative finance companies, as well as allow those companies to receive the clarity needed to move forward with building their product.

The duties of this role would include working with regulators to provide regulatory clarity for FinTech companies, establish procedures to reduce the time and cost of compliance for companies that are providing financial innovation, advise the state legislature on potential legislation, and generally promote and support blockchain innovation in Colorado and beyond.

As a pilot for this role, the state of Colorado is creating a Blockchain Industry navigator page hosted by the Office of Economic Development and International Trade (OEDIT) that will answer frequently asked

³ https://drive.google.com/file/d/1MmpksD8aAPkmvdRdW0PztGe_eOceq4lk/view

questions and direct people to the proper resources. Depending on the volume of usage, the state may designate an employee to handle these requests for information.

5. Voting Pilot

The Council is continuing to work with the Secretary of State's office to understand how blockchain can be used to make voting in elections more secure and accessible. Several other local entities around the state are also considering similar work - the city of Denver used a blockchain-based application to provide an opportunity for military and overseas voters to vote via smartphone in the 2019 municipal election.⁵

6. Taxation Clarity

The Council is continuing to work with the Department of Revenue and the Department of Labor & Employment to understand which of the taxation issues can be resolved through clarity and additional guidance, and which need additional legislation to address.

7. Banking and Blockchain Roundtable

In June 2019, the Blockchain Council, OEDIT and the Department of Regulatory Agencies (DORA) hosted a Banking and Blockchain Roundtable with representatives from both the blockchain and financial services industry. The program included an overview of blockchain technology and the regulatory perspective, followed by a discussion between the blockchain industry and financial institutions about their respective challenges. This was intended to be an initial connection point between the two industries, setting the foundation for future potential collaboration.

8. Blockchain Business Workforce Survey

The Colorado Department of Higher Education and the Colorado Workforce Development Council released a "Blockchain Business Survey" in February 2019. This survey collected basic information from businesses about their work with blockchain. It was intended to inform work that is taking place to improve Colorado's blockchain skills pipeline. The Department of Higher Education also separately engaged institutions of higher education (IHEs) on the topic of blockchain as an academic discipline. For more information about the survey results and ongoing efforts, contact the Colorado Department of Higher Education.

OTHER

9. Fintech Sandbox

The council proposes a collaboration with stakeholders such as legislators, regulators, government agencies, and industry leaders to create a potential statewide safe harbor designed to exempt blockchain companies from certain regulations. These moves could allow our state to attract innovative companies and allow them to engage freely as issuers, exchanges, wallet providers without the licensing requirements of the multitude of securities and currency laws. If similar efforts in Arizona and other states prove successful, a proposal for a sandbox could be introduced in the 2020 legislative session.

⁵ <https://www.denvergov.org/content/dam/denvergov/Portals/778/documents/DenverUOCAVAPilotSocial2.pdf>

10. Blockchain Court

The Council considered developing a program to train judges to better adjudicate issues related to blockchains such as initial coin offerings, smart contracts or custody disputes. Ultimately, the goal is to create a program similar to the water courts that currently exist in Colorado, where cases related to water are diverted to a specific set of judges with the technical expertise required to understand these issues.

However, the current demand for such a program is likely low given the relatively small number of blockchain companies and disputes within Colorado. As the industry continues to grow, this idea could be reconsidered, particularly as a small, voluntary program for interested judges that scales over time as needed.

11. Digital Identity

The Council explored the use of digital identity for the citizens of Colorado, across several agencies. The long-term goals are to introduce a secure identity platform using several trust agents such as banks, state agencies, universities; introducing and understanding the impact of digital identity solutions on government services, education, and KYC/AML requirements; and to generally improve services and greater shared consumer control and jurisdiction of this information. The state's Blockchain Solutions Architect may take on this task in the future.

ADDITIONAL WORK

12. Uniform Virtual Currency Bill

The Colorado Commission for Uniform State Laws (CCUSL) considered introducing the uniform law for the Regulation of Virtual Currency Businesses. The Council testified against this bill. The perspective was that the bill would introduce additional regulation that was unnecessary, and encode definitions and regulations in statute, limiting flexibility going forward. This was contrary to the Council's principle of "doing no harm." The CCUSL decided not to introduce this legislation.

13. Blockchain Day at the Capitol

In February 2019, the Council hosted Blockchain Day at the Capitol during which over 15 companies and 100 members of the Blockchain industry were able to share the work with state legislators and their staffs. Governor Jared Polis joined the group to share his enthusiasm for the blockchain industry. This event effectively highlighted the impact and promise of blockchain to state lawmakers, as well as an opportunity to deepen their understanding of the technology.



TRANSITION PLAN

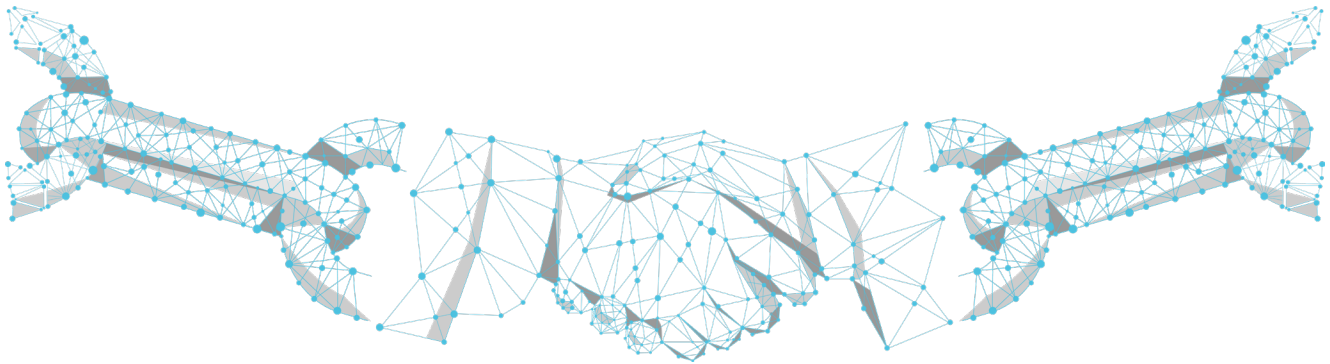
The work of the Council brought stakeholders together and provided a central forum for people to identify and address issues facing the blockchain community. After working for a year, the Council determined that future work would be better handled in a more focused manner. Additionally, the state of Colorado wanted to ensure that the blockchain community had ongoing, mutually beneficial, connections to various government agencies.

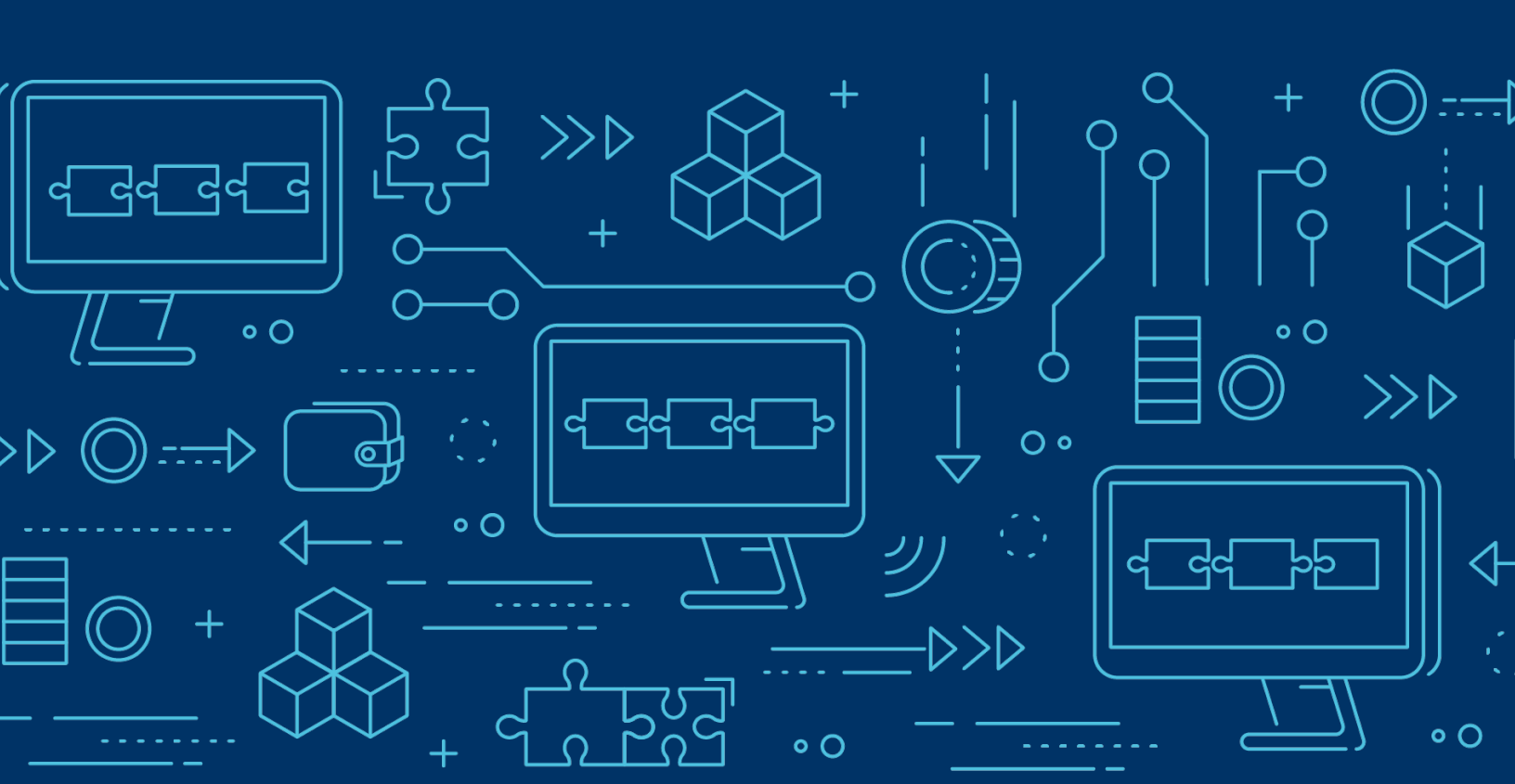
The work of the Council was divided among the five agencies listed below, each of which committed to having at least two forums per year with the industry. “Forums” could be listening sessions, working meetings, presentations, or appearances at existing events like Denver Blockchain Week, but are intended to ensure that lines of communication stay open. To facilitate these forums and ongoing work, we informally nominated an industry and agency lead to serve as the primary coordinator(s). For the most up to date information and event schedule, visit www.choosecolorado.com/blockchain.

<i>Department of Regulatory Agencies (DORA)</i>	<ul style="list-style-type: none">• Policy and regulatory clarity surrounding Securities Laws, Money Transmission Licenses and other topics• Banking services and support
<i>Office of Information Technology (OIT)</i>	<ul style="list-style-type: none">• Blockchain technology solutions for state government
<i>Department of Revenue (DOR)</i>	<ul style="list-style-type: none">• Clarity on taxation of digital assets• Ability to pay taxes using cryptocurrency
<i>Department of Higher Education (CDHE)</i>	<ul style="list-style-type: none">• Building a blockchain-capable workforce• Supporting innovation in higher education
<i>Office of Economic Development and International Trade (OEDIT)</i>	<ul style="list-style-type: none">• General industry support• Overview of other agency work• Identification of pain points that need to be addressed• Tracking other states’ laws and building partnerships as needed

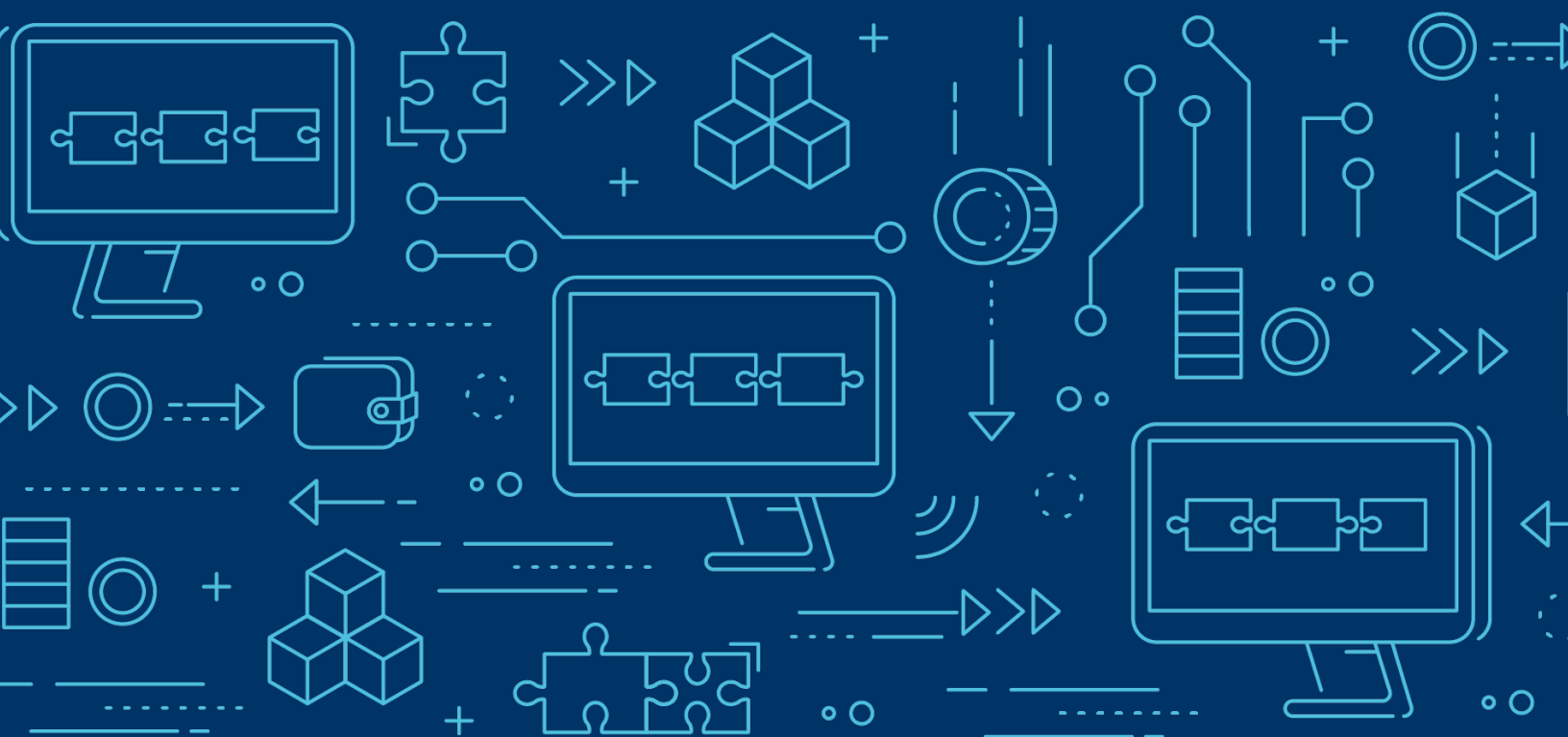
CONCLUSION

Blockchain technology has significant potential to generate innovative use cases and economic growth. In order to realize this potential, however, policymakers need to come together to provide clarity, craft thoughtful and responsible regulations, and support entrepreneurs and innovators. This Council hopes that its work and this report can provide a foundation for ongoing efforts towards these outcomes.





APPENDIX



TECHNICAL EXPLANATIONS AND GLOSSARY

HOW CHANGES GET MADE ON A BLOCKCHAIN

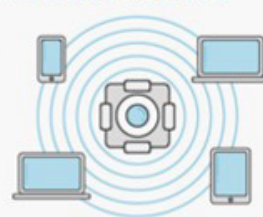
Person A wants to make a **change** to the blockchain.



This change will create a new **"block"**.



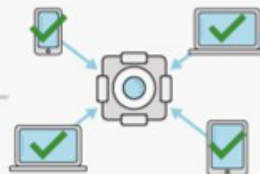
This block is broadcast to every computer on the **distributed network**.



The new block is added to the chain. There is a **permanent record** of the change and it can't be undone.



Those computers **approve** of the change.



BUSINESS INSIDER 5

BITCOIN

Bitcoin is the first decentralised, open source cryptocurrency that runs on a global peer-to-peer network, without the need for middlemen and a centralised issuer.⁶

BLOCKCHAIN

A blockchain is a shared ledger where transactions are permanently recorded by appending blocks. The blockchain serves as a historical record of all transactions that ever occurred, from the genesis block to the latest block, hence the name blockchain.⁷

DIGITAL IDENTITY

A digital identity is an online or networked identity adopted or claimed in cyberspace by an individual, organization, or electronic device.

5 <https://www.businessinsider.com/what-is-blockchain-how-does-it-work-explainer-2017-11>

6 <https://blockgeeks.com/guides/blockchain-glossary-from-a-z/>

7 <https://blockgeeks.com/guides/blockchain-glossary-from-a-z/>

DISTRIBUTED LEDGER

Distributed ledgers are ledgers in which data is stored across a network of decentralized nodes. A distributed ledger does not have to have its own currency and may be permissioned and private.⁸

FIAT

Any money declared by the government to be valid currency, such as USD or EUR.

INITIAL COIN OFFERING

An Initial Coin Offering (also called an ICO) is an event in which a new cryptocurrency sells advance tokens from its overall coinbase, in exchange for upfront capital. ICOs are frequently used for developers of a new cryptocurrency to raise capital.⁹

ORACLE

An Oracle is a secure, curated, trusted agent that provides verified external real-world data or occurrences to a blockchain smart contract because blockchain cannot access data outside their networks. Examples of data include weather, temperature, price fluctuations or payment/settlement.¹⁰

SMART CONTRACTS

Smart contracts encode business rules in a programmable language onto the blockchain and are enforced by the participants of the network.¹¹

TOKEN

Tokens are a digital representation of a particular asset or utility that often resides on top of a blockchain.

WALLET

A designated storage location for digital assets (cryptocurrency) that has an address used for sending and receiving funds to and from the wallet. The wallet can be online, offline, or on a physical device.¹²

⁸ <https://blockgeeks.com/guides/blockchain-glossary-from-a-z/>

⁹ <https://www.blockchaintechnologies.com/glossary/>

¹⁰ <https://www.blockchaintechnologies.com/glossary/>

¹¹ <https://blockgeeks.com/guides/blockchain-glossary-from-a-z/>

¹² <https://www.blockchaintechnologies.com/glossary/>

INDUSTRIES BLOCKCHAIN IS CURRENTLY AFFECTING

CURRENCY

The first widespread consumer use of a blockchain was Bitcoin. Since then, numerous cryptocurrencies have been released, including Ripple, Litecoin, Dash, and DogeCoin. The foundational concept of digital currency is that there is a set amount of the currency that will ever be released into circulation. For example, there are only—and will only ever be—21 million Bitcoins. There is no central party, such as the Federal Reserve, that can arbitrarily make more or fewer coins or change the valuation of the coins. Additionally, the technology allows for one person to transact with another using just the network, without the intermediary of a bank, money transmitter, or another application. This is meant to reduce transaction fees, increase security, and allow a global network of transactions without borders.

After the advent of Bitcoin and other cryptocurrencies, there is a new type of U.S. dollar representation of what has been termed stable coins. A stable coin, which represents the value of a dollar, is built using blockchain technology to give the same benefit of trustless transactions; there is no need for a bank or money transmission service. One example is Circle, which is backed by the investment banking firm Goldman Sachs.

COMMODITIES

Blockchain tokens have also been created to represent commodities, such as oil, coffee, and gold. Tokenizing commodities increases supply chain efficiency—when tokenized, a product like a diamond can be tracked from the mining operations all the way to the point of sale at a jewelry store, ensuring and validating quality along the way. Furthermore, the trading and exchange of commodity tokens make it much easier to exchange the commodity at any given time and create futures on the commodities using smart contracts.

SUPPLY CHAINS

Blockchain is fast becoming the go-to technology for a business to ensure the ethical sourcing of component materials in its product or that the coffee beans it is importing have been grown organically. Several major companies, including Walmart, are also using blockchain in their supply chain to ensure food security. Through the use of Oracles that transmit real-world events to a blockchain for consensus verification and tracking our supply chains are becoming more transparent, trusted, and useful for both businesses and consumers alike.

DIGITAL ASSETS

Another use case of blockchain tokens is representational ownership of land, real estate, vehicle, or other ownership titles. The main benefit is the ability to split the ownership among multiple parties while managing the complexities of joint ownership without having a third party, like a bank, financial institution, or lender manage the transaction. A good example is blockchain technology can be used to drastically improve the efficiency of real estate investment trusts (REITs).

LENDING

Companies are using blockchains to tokenize a borrower's assets, equities, and income, and lend to them in a much more efficient manner. In particular, they can more immediately collect collateral if a loan is defaulted on. Lending platforms, such as SALT Lending in Colorado, are also popping up to loan borrowers U.S. dollars based on their cryptocurrency and digital assets.

SECONDARY MARKETS

Private markets hold a huge amount of value but often struggle with liquidity and transparency of transactions. Public markets were created to protect non-accredited investors and allow them to participate in stocks and equities. The majority of value for equities and stocks are still in private markets where transactions times are lengthy and must go through long approval processes, such as the right of first refusal, second refusal, and co-sale. Securities tokens and smart contracts allow these private equities to be transacted at a much higher rate and bring more potential liquidity to what has been a very illiquid market.

ADVERTISING IDENTITY

Right now, a social media's user identity is siloed in third-party systems, like Facebook, LinkedIn, and Instagram. This can cause problems and create tension between users of a product and the company selling their data to display ads. Innovative ad-tech companies, like the Brave browser, have been creating blockchain solutions that allow users to control their personal data and grant and revoke access to the third parties as they see fit.

GOVERNMENT IDENTITY

Social Security numbers, birth certificates, voter registration, and other government identification systems are critical for governments to operate. To increase security as well as improve efficiency in the issuance of these identities, governments—including Colorado—have been looking into using blockchain solutions. On the international level, Estonia is a leader in creating a true e-society built on blockchains. On particularly effective usage is business regulation. British Columbia, Canada has already added blockchain to their business records systems through the Verifiable Organizations Network (VON) and provides public access to the data through the website <https://orgbook.gov.bc.ca/>. The project has been widely hailed as a net positive in reducing the friction for businesses needing to comply with filing requirements and users needing to verify business identity.

BLOCKCHAIN COUNCIL MEMBERS AND BIOS



DAN BAER (JULY 2018 - JANUARY 2019)

Dan Baer was appointed the Executive Director of the Colorado Department of Higher Education by Governor John Hickenlooper, assuming the role on June 8, 2018. An accomplished advocate for human rights and democracy, he is a diplomat in residence at the University of Denver's Josef Korbel School of International Studies.

Prior to joining the Department, Baer served as U.S. ambassador to the Organization for Security and Cooperation in Europe from 2013 to 2017. He previously served as deputy assistant secretary of state for Democracy, Human Rights, and Labor from 2009-2013. Baer was an assistant professor at Georgetown's McDonough School of Business, a Faculty Fellow at Harvard's Safra Center for Ethics and a project leader at The Boston Consulting Group.

Baer holds a doctorate in international relations from Oxford, where he was a Marshall Scholar, and a degree in social studies and African American studies from Harvard. A Colorado native, Baer lives in Denver with his husband, Brian.



BLAKE COHEN

Blake Cohen is Co-Founder and Chief Business Development Officer at SALT Lending. Previously with Signet Partners, Cohen has worked extensively in emerging markets, complex contractual negotiations, and transactional deal-making, specializing in real estate, networking, and capital formation.



STEPHANIE COPELAND (JULY 2018 - JANUARY 2019)

Stephanie Copeland was appointed by Governor John Hickenlooper as Executive Director of Colorado's Office of Economic Development & International Trade in November 2016. In this cabinet-level position, Copeland was responsible for promoting and developing statewide economic growth and resilience. She joined OEDIT from The Zayo Group, where she served as President of the communications infrastructure services firm. While with Zayo, the 20-year veteran of the telecom industry was part of a leadership team taking the company public, managing full P&L and operational responsibilities for Zayo's network services. Previously, she served as Chief Operating Officer at WildBlue, where she was responsible for the operations of the \$500 million rural broadband business. Upon completing her service with the Hickenlooper cabinet, Copeland was named CEO of the national non-profit The Governance Project and also assumed a partnership role with Colorado-based rural investment fund Four Points Funding.



STEPHEN FENBERG

Steve Fenberg was elected to the Colorado Senate in 2016 and currently serves as the Senate Majority Leader. Before entering the Senate, Fenberg served for a decade as the founding Executive Director for New Era Colorado, the largest state-based young voter mobilization organization in the country.

Majority Leader Fenberg is a co-owner of Bread Bar in the historic town of Silver Plume. Additionally, he serves on the board of the dZi Foundation, an international development organization in Nepal. Fenberg lives with his wife Lindsay and their dog Ellie in Boulder, Colorado.



PAUL FOLEY

Paul Foley co-founded, built and ultimately sold the tech startup Augur to BounceX and has since turned his attention to investing and venture capital. He runs the Colorado-based angel group Connector Investments and is actively working on a firm to allow anyone to invest in a portfolio of early-stage tech companies with SmartCapital. A Colorado native, Foley grew up in Louisville and has contributed to the development of use cases for blockchain, specifically securities tokens, to move the Venture Capital industry forward.



ERIC KINTNER

Eric Kintner is a partner at Snell & Wilmer where he focuses on providing clients with practical and business-centric legal advice. With more than a decade of experience across a broad range of industries, he is able to combine industry-specific knowledge with innovative solutions to help clients address challenges with complex legal and business issues across their local, regional and global operations.

As co-chair of the Snell & Wilmer blockchain and digital currency group, Eric helps clients fund, develop, protect, and commercialize blockchain technology. Such assistance includes representing investors and funds in raising capital to purchase crypto assets; representing issuers in planning, preparing and executing initial coin offerings; representing a blockchain consortium working to develop public-private blockchain project with major US municipality; representing a publicly-traded company building a token-based remittances network; representing a decentralized cryptocurrency exchange in reviewing and complying with various FinCEN, CFTC and SEC regulations; and representing cryptocurrency mining operations on various operational and regulatory issues.



TRACY KRAFT-THARP

As the State Representative for House District 29 (Arvada and Westminster), Tracy Kraft-Tharp serves as the Chair of the Business Affairs and Labor Committee, the Legislative Audit Committee and the Streamlining Sales Tax Committee. She is also a member of the Appropriations Committee. Kraft-Tharp has also served on the Transportation and Energy Committee in previous sessions. Her main legislative priorities are to encourage economic development and workforce development and to increase access to mental health services. With over 30

years of experience in the private, public, and nonprofit sectors, Kraft-Tharp has dedicated her life to serving the people in our community that need help the most, whether running her own small business or through her experience in social work, nonprofit management, teaching, and legislative advocacy.



BETSY MARKEY (JANUARY 2019 - JUNE 2019)

Betsy Markey was appointed by Governor Jared Polis to his cabinet as Executive Director of the Colorado Office of Economic Development and International Trade in January 2019. She has over 30 years of leadership experience in government and the private sector. She has served as a Member of U.S. Congress, a senior federal executive, and the co-founder and CFO of a high tech company.

Markey was appointed by President Obama to serve as the Regional Administrator for the U.S. Small Business Administration (SBA) based in Denver in 2016. In 2011, she was appointed by the President to serve as the Assistant Secretary for Intergovernmental Affairs for the U.S. Department of Homeland Security (DHS) in Washington DC.

Markey was elected to serve as a Member of Congress in Colorado's 4th Congressional District in 2008, and represented over 700,000 constituents in one of the country's largest congressional districts in the 111th Congress. She served on the Committee on Transportation and Infrastructure and the Committee on Agriculture.

In the late-1980's, Markey and her husband launched a successful technology company, Syscom Services. She holds a bachelor's degree from the University of Florida and a Master of Public Administration from American University.



MATTHEW MCCLINTOCK

Matt McClintock is a founding partner of Evergreen Legacy Planning, LLP, a national law firm based in Evergreen, Colorado. He helps entrepreneurs and affluent individuals and families manage their affairs privately in protective, tax-efficient structures. His practice focuses on complex issues for business owners in disruptive industries, implementing creative legal solutions to maximize protection and privacy and minimize tax liability. McClintock is admitted to practice law in Colorado, Wyoming, and Alaska, and is available for co-counsel with other attorneys.



SUMANA NALLAPATI (JULY 2018 - JANUARY 2019)

Sumana (Suma) Nallapati is an accomplished technology and people leader with experience in establishing and executing value-driven global IT service strategy and delivery. Appointed as Colorado's Secretary of Technology and Chief Information Officer in June 2014, Nallapati successfully positioned the Governor's Office of Information Technology as a leader in IT innovation for state government. A champion of collaboration, breaking silos and achieving excellence, she is passionate about innovating everyday solutions for customers. Nallapati earned a master's degree in nuclear physics from the Andhra University India and holds certificates in Professional Management and Project

Management. Suma completed her government service in December of 2018 when named Chief Digital Officer and Senior Vice President of Dish.



ANGIE PACCIONE (JANUARY 2019 - JUNE 2019)

Dr. Angie Paccione was appointed executive director of the Colorado Department of Higher Education by Gov. Jared Polis, assuming the role on Jan. 10, 2019, and unanimously confirmed by the Senate Education Committee on Jan. 17, 2019.

Paccione has more than 20 years of experience in secondary and postsecondary education. She was a high school teacher, coach and administrator at Smoky Hill High School in the Cherry Creek School District before earning a Ph.D. in education and human resource studies from Colorado State University (CSU). There, Paccione served on the CSU faculty for nine years as a teacher educator in the "Project Promise" program, a nationally recognized program of excellence in teacher preparation for mid-career professionals.

Paccione left higher education to pursue public service and was elected to two terms in the Colorado House of Representatives, rising to become house majority caucus chair. She served on the Education Committee during all four years in the legislature, helping guide the education environment for the state of Colorado. In 2006, she ran for U.S. Congress and came within 2.5 percent of unseating the incumbent.

From 2007 to her appointment as executive director, Paccione worked for Verus Global where she specialized in the areas of leadership development, diversity and inclusion, talent development and change management. Paccione has co-authored two books on leadership: *One Team: 10-minute Discussions that Activate Inspired Teamwork* and *Do Big Things: The Simple Steps Teams Can Take to Mobilize Hearts and Minds, and Make an Epic Impact*.



HANNAH PARSONS

Hannah Parsons serves as Chief Executive Officer of Exponential Impact, a technology accelerator focused on blockchains, artificial intelligence and cybersecurity. Exponential Impact is a non-profit organization designed to promote the adoption of emerging technologies; provide education, mentoring and resources to entrepreneurs; and increase venture funding to startups in Colorado. Prior to joining Exponential Impact, Parsons served as the Chief Economic Development Officer for the Colorado Springs Chamber & EDC where she led the economic development office and strategic planning process. Parsons also led the government affairs teams and initiatives for the Chamber & EDC.

Having owned and operated several businesses, she has long been involved with the entrepreneurial community in Colorado. In 2011, she co-founded Epicentral Coworking with the goal of creating space for entrepreneurs to meet and grow great companies. Parsons holds a Bachelor of Science in Business Administration with an emphasis in International Business and a Master's of Business Administration from Georgia State University with a concentration in Entrepreneurship. Deeply committed to community engagement, Parsons serves as a board member for the Colorado State Internet Portal Authority, Colorado Springs Downtown Partnership, and Thomas MacLaren School.



PAUL QUIGLEY

Paul Quigley is the CEO/ Founder of BlocLab Enterprises and is the Managing Partner of Cornerstone Healthcare Consulting, a healthcare technology and consulting firm in Boulder. He has national as well as international corporate experience in more than 20 high growth and complex turnarounds in several industries including banking and healthcare. He is excited by the promise and benefits of digital identity in both the human as well as the machine (IoT) economies.

Quigley spent more than 10 years at the International Consulting firms of Ernst & Young and Accenture as a Senior Manager in the Healthcare and Emerging Technology Practices. He is an Instructor at Harvard University's Graduate Extension School and co-teaches a graduate course about Innovation and Blockchain. He is presently a member of the Hyperledger Healthcare Workgroup, the Swiss Crypto Valley Association and advises several Colorado blockchain startups.

He is an Honors graduate of the Massachusetts Institute of Technology (MIT) Fintech/Blockchain Certificate Program, has his MBA in Entrepreneurship and Finance from the F.W. Olin Graduate School of Business, Babson College and is an Honors graduate of Northeastern University, College of Health Sciences. He is an active member of the WY Blockchain Coalition and helped bring five landmark pieces of legislation into WY, and the United States for an Open Blockchain that defined a Utility Token - as a unit of value for purchase of goods and services - not cryptocurrency.



SCOTT SANDERSON

Scott is a Colorado attorney and registered US Patent Attorney with a solo law practice focusing exclusively on cryptocurrency and blockchain clients. He loves participating in peer-to-peer networks and learning about blockchains and cryptocurrency every day. Scott hopes to make his law firm the first US law firm to be organized as a decentralized corporation. Scott has advised this council and prepared testimony on issues including the proposed securities act, proposed changes to tax policy, and the blockchain statute proposed by the Uniform Law Commission. Working on this council has been a highlight of Scott's professional career, and he extends his thanks to all the members of the council, all the community members, and all the State employees who contributed to help improve the State's legal framework in view of new blockchain technology.



THERESA SZCZUREK (JANUARY 2019 - JUNE 2019)

A serial technology entrepreneur and role model for technology leaders, Dr. Theresa M. Szczurek was appointed in January 2019 to lead the Governor's Office of Information Technology. She oversees a 900+ team in the operation and delivery of information and communications technology services for 31,000+ state employees and executive branch agencies with missions critical to "serving people serving Colorado." As a member of Governor Polis' Cabinet, Szczurek has jumped boldly into making a meaningful difference in the lives of Coloradans through innovation.

Szczurek is a dynamic and award-winning senior business leader in telecommunications, software, and technology industries with experience producing extraordinary results. She co-founded and led three technology ventures - Boulder-based Radish Systems, LLC, Radish 2.0, an award-winning private enterprise software firm, RCS (i.e., Radish 1.0), a telecom start-up she turned into a thriving firm that sold for over \$40 million, and the consulting firm Technology and Management Solutions, LLC. She began her career at AT&T and Bell Labs.

Szczurek holds an M.S. in Operations Research from Stanford University and an MBA and Ph.D. in Business Administration (with focus in Marketing & Organization Development) from the University of Colorado. She is also a Certified Management Consultant (CMC®) with the Institute of Management Consultants. Her latest book is Pursuit of Passionate Purpose: Success Strategies for a Rewarding Personal and Business Life.



SASHA SHTERN

As a teenager, Sasha Shtern started an e-commerce business that sold home improvement products on eBay, becoming one of the first dealers of luxury bathtubs online. That business evolved into Bath & Granite, a home improvement product distributor that added advanced manufacturing capabilities for stone products. His tenacity and drive for innovation saw Bath & Granite through many bumps and turns, including the great recession. And as his business grew, so did his interest and involvement in the Denver entrepreneurial community.

Shtern has been an active leader in Entrepreneurs Organization (EO) of Colorado, which provides support to entrepreneurs in the form of learning events and tight-knit forums. After three years of board work, he was named the president of the EO board. While serving EO, he traveled across the country speaking to small business owners looking to grow their businesses to over \$1mil in sales. Shtern used that experience to segue into angel investing and, a few years later, founded Zero G Capital.

In addition to entrepreneurship, Shtern is passionate about education policy and healthy eating for kids. He is a member of Colorado Succeeds and band member of Veggie Beats (veggie-beats.com), where he stars as the disgruntled imaginary accordion player. In 2015 he co-founded Impact Makers Table, a nonprofit dedicated to channeling data-driven philanthropy. In 2016 he founded Distributed Giving Project, which donated Bitcoin to homeless people who otherwise have no access to traditional banking.

His passion for technology and monetary policy led him to early involvement in Denver's blockchain scene. He is a co-organizer of Ethereum Denver and co-founder of Rocky Mountain Blockchain, bringing together some of Denver's brightest minds.

Shtern is fluent in Russian and studied Mandarin in university. He holds a Bachelor's Degree in Finance from the University of Colorado at Denver. In his free time, he enjoys teaching his puppy new tricks, running around Sloan's Lake, and playing basketball.



LANG SIAS (JULY 2018 - JANUARY 2019)

Lang Sias was an original council appointee, but did not participate in the Council's 2018 Engagement or this published work.

He is an Arvada husband, father, decorated combat veteran and citizen-legislator in the Colorado House of Representatives. Sias and his wife Rene have lived in Arvada for over sixteen years. They have three children currently attending Jefferson County public schools. He previously served on the board of directors of Excel Academy, a public charter school in Arvada. During his career in the private sector, Sias is proud to have helped many Colorado entrepreneurs grow their businesses. A former Navy fighter pilot and TOPGUN instructor, he also served in the Air National Guard, and recently retired as a lieutenant colonel. He works as a 777 pilot for FedEx.



JOHN A. TATE

Senator Jack Tate represents Senate District 27 which encompasses Centennial, Inverness, Cherry Creek, Dove Valley, and parts of Aurora.

Tate has spent his 25-year technical and business career developing, evaluating, and managing significant capital projects related to capital investment. His company has completed many projects for commercial building owners, hospitals, institutions, and state agencies that address critical needs in such a way that they are self-funding, without requiring the use of scarce capital.

Originally from Nashville, Tennessee, Tate attended Duke University in North Carolina and graduated with a Bachelor of Science Degree in Engineering. He continued his education at Vanderbilt University, the University of Missouri, and the University of Colorado, Denver completing work for an MBA in Marketing, as well as a Master of Science in Finance. Tate is committed to cutting wasteful government spending, reducing bureaucratic red tape, opposing new taxes, and encouraging job growth in Colorado.



ERIK VOORHEES

Erik Voorhees is among the top-recognized serial Bitcoin advocates and entrepreneurs, understanding Bitcoin as one of the most important inventions ever created by humanity. Having been a featured guest on Bloomberg, Fox Business, CNBC, BBC Radio, The Peter Schiff Show, and numerous Bitcoin and industry conferences, Voorhees humbly suggests that there is no such thing as a "free market" when the institution of money itself is centrally planned and controlled. He founded ShapeShift AG in August 2014 as an elegant, secure, and fast solution to digital asset exchanges. Prior to the creation of ShapeShift, buying digital assets was a lengthy process that required account creation and forfeiture of personal data to the service provider. Voorhees was most recently featured on the 2016 documentary, "Banking on Bitcoin." His past blockchain company affiliations include: BitInstant, Coinapult and, most notably, SatoshiDice, which was responsible for most of the Bitcoin transactions in 2012 and 2013.

ACKNOWLEDGEMENT OF VOLUNTEERS

The Council is extremely grateful for the support we received from the Blockchain community in Colorado and beyond. Nearly 100 experts and enthusiasts put in countless hours of work to help us define and understand the problems we were trying to solve and develop thoughtful and creative solutions. Our work so far would not have been possible without these efforts and we look forward to continued collaboration.



COLORADO
Office of Economic Development
& International Trade



**THE COLORADO
BLOCKCHAIN COUNCIL**

Colorado Office of Economic Development and International Trade
1600 Broadway, Suite 2500 | Denver, Colorado 80202 USA
Phone: 303.892.3847 | www.choosecolorado.com

For questions or more information about the Blockchain Council, please contact
Jana Persky
jana.persky@state.co.us

