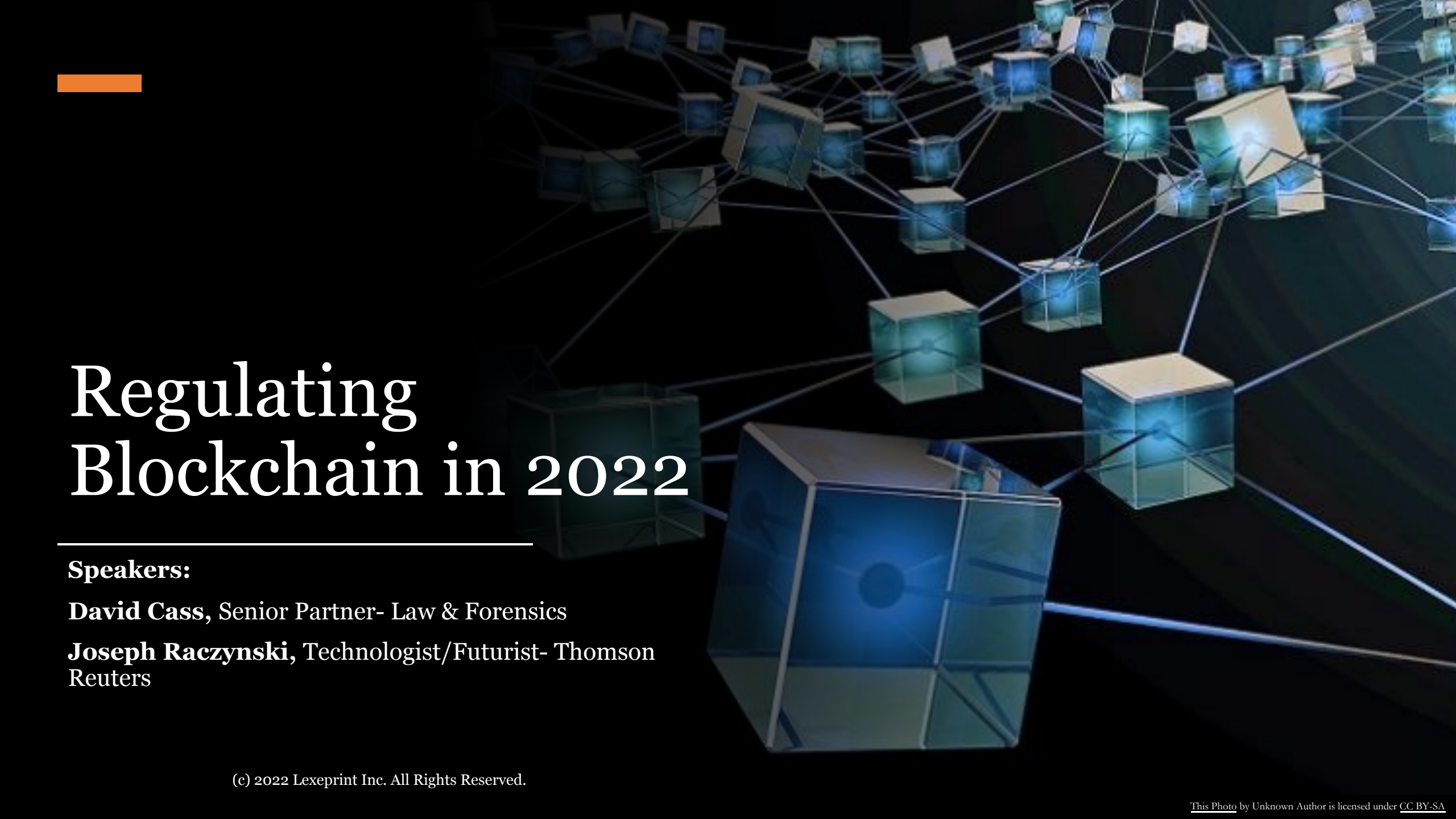


Regulating Blockchain in 2022

Speakers:

David Cass, Senior Partner- Law & Forensics

Joseph Raczynski, Technologist/Futurist- Thomson Reuters

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Speakers



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Agenda

- What is Blockchain?
- What is Bitcoin?
- Governance and Risk Issues
- Regulation of Blockchain and Cryptocurrencies
- Case Law
- The Future of Blockchain

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Blockchain and Bitcoin

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What is Blockchain?

- "Blockchain is a decentralized ledger of all transactions across a pier to pier network."*
- "Think about a blockchain as a distributed database that maintains a shared list of records. These records are called blocks, and each encrypted block of code contains the history of every block that came before it with timestamped transaction data down to the second. In effect, you know, chaining those blocks together. Hence blockchain."**

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Blockchain Technology Explained

- Uses cryptography and digital signatures to prove identity, authenticity and enforce read/write access rights
- Is replicated (distributed) across a number of systems in near real-time over a peer-to-peer network.
  - Every participant "owns" the same copy of the ledger and gets updates when any transaction is added
  - Every participant helps determine the intrinsic "immutability" of all existing records

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Blockchain Technology Explained

Enables transaction automation via smart contracts, allowing even greater transactional efficiency and savings; and

Can be anonymous or identification if participants

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Examples of Blockchain

- Data management
- Cross Border Transactions
- Smart Contracts
- Digital IDs
- Non-Fungible-Tokens (NFTs)
- Stock trading
- Prediction markets
- File storage
- Supply chain auditing
- COVID-19 Pandemic
  - Manufacturing and Tracking Vaccines
  - Health-care Management Systems

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What is Bitcoin?

- Bitcoin is a cryptocurrency, a form of electronic cash. It is a decentralized digital currency without a central bank or single administrator that can be sent from user-to-user on the peer-to-peer bitcoin network without the need for intermediaries.

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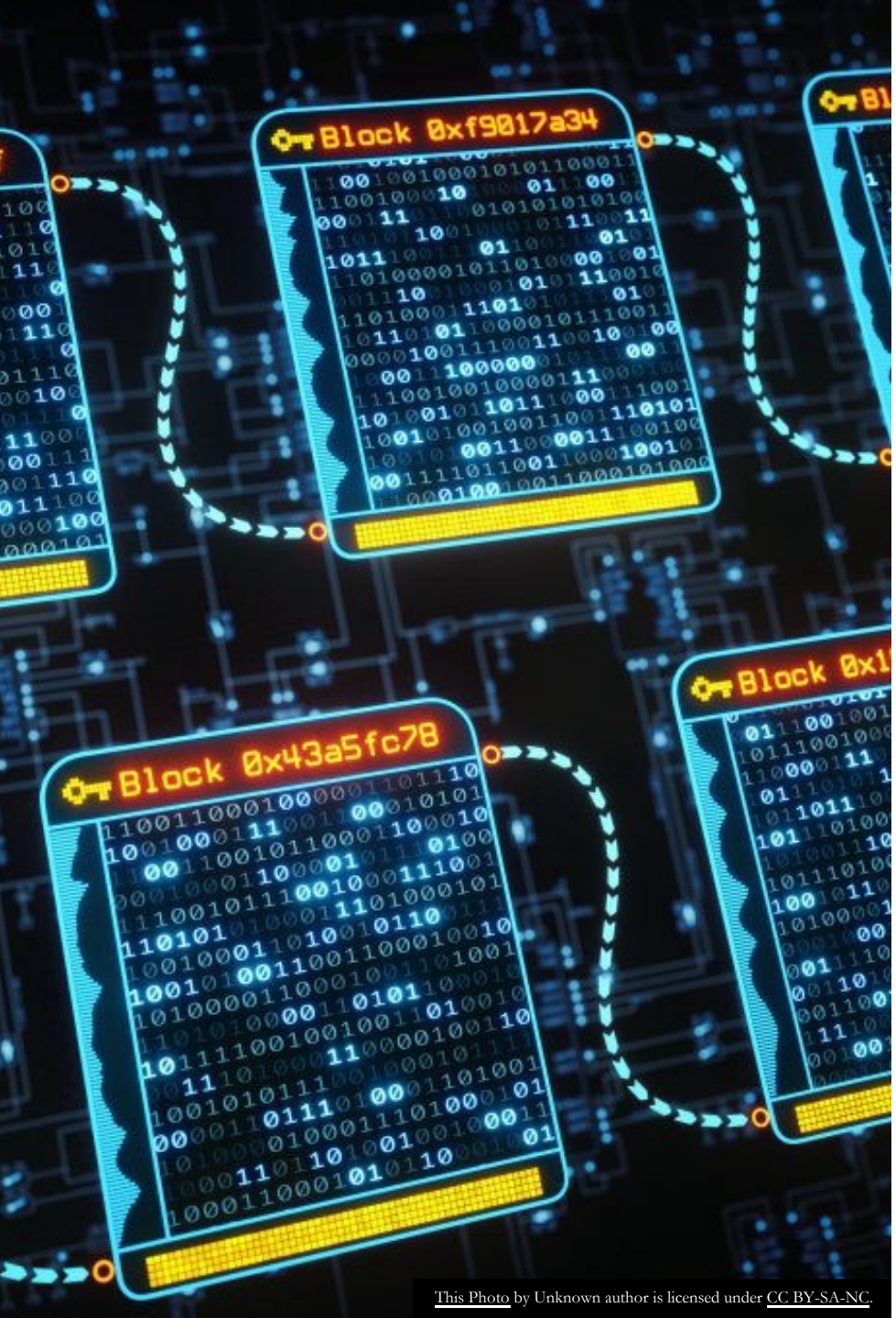


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How does Bitcoin work?

- Each Bitcoin is basically a computer file which is stored in a 'digital wallet' app on a smartphone or computer.
- People can send Bitcoins (or part of one) to your digital wallet, and you can send Bitcoins to other people.
- Every single transaction is recorded in a public list called the **blockchain**.

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How does Bitcoin work?

- **Blockchain** is comprised of units of information about every transaction and makes it possible to trace the history of Bitcoins to prevent users from spending coins they do not own, making copies or reversing transactions.

- Since blockchain is decentralized - allowing anyone tocontribute to it - blocks added to the Bitcoin blockchain need to be verified by the majority of all Bitcoin holders
    - Increases the security and credibility of Bitcoin

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Bitcoin vs. Blockchain

- Bitcoin is a type of unregulated digital currency, also known as a "cryptocurrency."
- Bitcoin transactions are stored and transferred using a distributed ledger on a peer-to-peer network that is open, public and anonymous.
- Blockchain is the underpinning technology that maintains the Bitcoin transaction ledger

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Governance issues

- Regulations
- Standards
- Transaction rules
- Smart Contracts
- Security
- Legal
- Privacy
- Compliance
- Identity
- Authentication

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Governance issues

- **Transaction Rules**
  - Since nodes can span multiple locations around the world, it is difficult to establish which jurisdictions' laws and regulations apply to a given application

- **Privacy**
  - Since there is no single party responsible for the security of a blockchain network, there are claims that blockchain technology is incompatible with privacy laws
    - Example: EU General Data Protection Regulation and GDPR

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Governance issues

- **Data Security**
  - Public blockchains are at risk of tampering at each node which can lead to the dissemination of misleading or false information
    - Example: attackers can divert cryptocurrency wallet destinations and amounts of payments under the guise of the intended transaction

- **Smart Contracts**
  - Traditional contract law will likely apply to the underlying transactions embodied by smart contracts
  - However, poorly written software code can result in the exploitation or incorrect execution of a transaction

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Governance issues

- **Accountability**
  - In relation to decentralized systems, a key question is who should be held accountable for breaches of law and regulation
    - Example: the network of users or the system owner?

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Other Risks

- Decentralized access control and a reduced role for trusted intermediaries
- Non-trusted participants can join the blockchain
- Cyber-security attacks are expected to increase as the technology matures and scales

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Other Risks

Trust is established by majority consensus, not a designated central authority

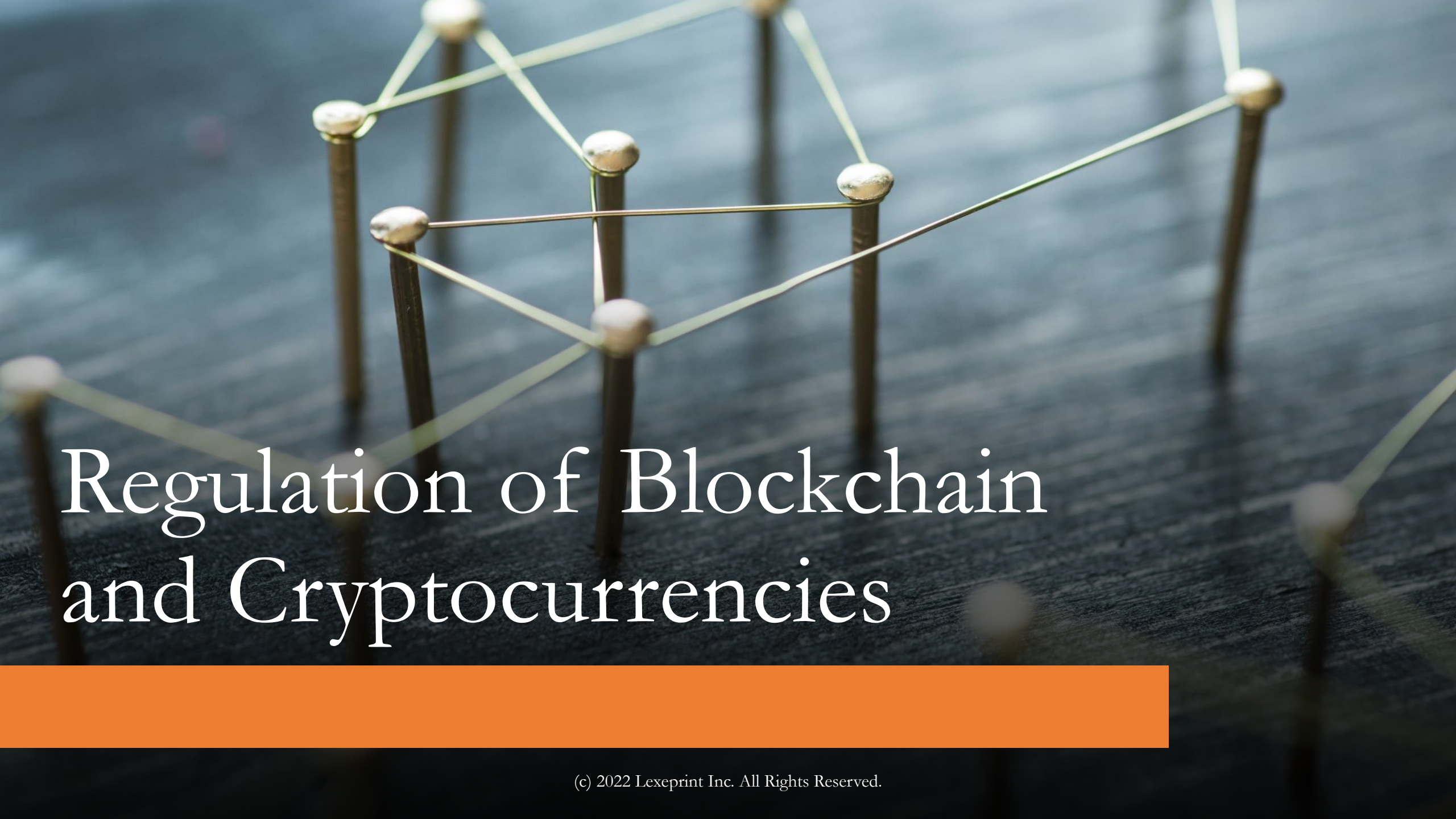
Lack of standards

Current regulations may prove ineffective

Compliance and enforcement frameworks will need to keep up

Traditional assurance and auditing approaches will no longer be effective

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Regulation of Blockchain and Cryptocurrencies

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Blockchain in the United States

- The U.S. federal government has not exercised its constitutional preemptive power to regulate blockchain to the exclusion of states (as it generally does with financial regulation) or even expressed intention to do so.
- The U.S. Commodity Futures Trading Commission has granted LedgerX, a cryptocurrency trading platform operator, approval to become the first federally regulated digital currency options exchange and clearinghouse in the U.S.
- Several U.S. states have enacted or proposed legislation validating the use of blockchain technology in commerce.
- States include:
  - Vermont
  - Nevada
  - Delaware and
  - Wyoming



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Vermont

- Blockchain to be considered a regularly conducted business activity establishing a presumption that the information in blockchain is correct

- Cryptocurrency is legally categorized as property instead of currency the Vermont Money Services Act (VMSA):
  - "virtual currency owned by the licensee is permissible to the extent of outstanding transmission obligations received by the licensee in the identical denomination of virtual currency."

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Nevada

- Recognizes blockchain as a form of electronic records satisfying the requirement for a written record in city and county government (Uniform Electronic Transactions Act)

- Nevada Senate Bill 163 (2019):
  - Revises the definition of “electronic transmission” to include the use of a blockchain or public blockchain
  - Authorizes certain business to store records on a blockchain

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Delaware

- Authorizes registration of shares of Delaware companies in blockchain form.

- The Delaware General Corporation Law (2017) authorizes:
  - the use of blockchain for the administration of corporate records
  - the use of blockchain for the electronic transmission of stockholders' communications

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Wyoming

- In 2019, Wyoming became the first state to enact blockchain-enabling legislation

- Wyoming Digital Asset Statute (amended 2021)
  - Establish the treatment of digital assets as intangible property under Article 9 of UCC
  - Makes digital assets property subject to the UCC – allowing security interest to be perfected, opposable in all U.S. jurisdictions

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Regulation of Blockchain Activities

- A variety of state and federal agencies and international bodies have shown interest in regulating blockchain-related activities, with a focus on virtual currencies.
- The widespread application and relative novelty of blockchain technology make it difficult to conclusively determine which agencies are likely to investigate any particular blockchain activity.

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Blockchain and the Financial Industry

- Businesses and regulators are increasingly using blockchain to conduct and provide oversight of cross-border banking and finance activities.
- The visibility offered through blockchain is currently being used to track provenance and document financial transactions in multinational arrangements, ranging from supply chain to trade finance.

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Global Regulation of Blockchain and Cryptocurrencies

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Blockchain Globally

- With blockchain use cases and applications expanding in scope and number, regulators around the world, including the US, Canada, Switzerland, the UK, China, Japan, Singapore, and Australia, have expressed interest in regulating blockchain to protect consumer and the market from fraud and other illegal conduct.

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Blockchain in Commerce - Global

- In 2017 Japan's Ministry of Internal Affairs and Communications announced a blockchain/smart contract solution that would allow companies to interact with the government.

- In 2019, the National Bank of Ukraine completed a national digital currency pilot, the e-hryvnia, which will be considered a legal tender

- In 2020, The Reserve Bank of Austrailia announced a partnership between the Commonwealth Blank, National Bank and blockchain technology companies for the potential use of a wholesale CBDC

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Global Regulators

- As demand for cryptocurrency grows, global regulators are divided on how to keep up.
- Most digital currencies are not backed by any central government, meaning each country has different standards.
- Each country does however differ on their regulations for bitcoin exchanges and their views on bitcoin as legal tender.

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Global Policies on Bitcoin as Legal Tender

- Legal Tender
  - Japan
  - Switzerland
  - Certain European Union members

- No Legal Tender
  - United States
  - Canada
  - South Korea
  - The United Kingdom
  - China
  - Vietnam
  - India
  - Egypt

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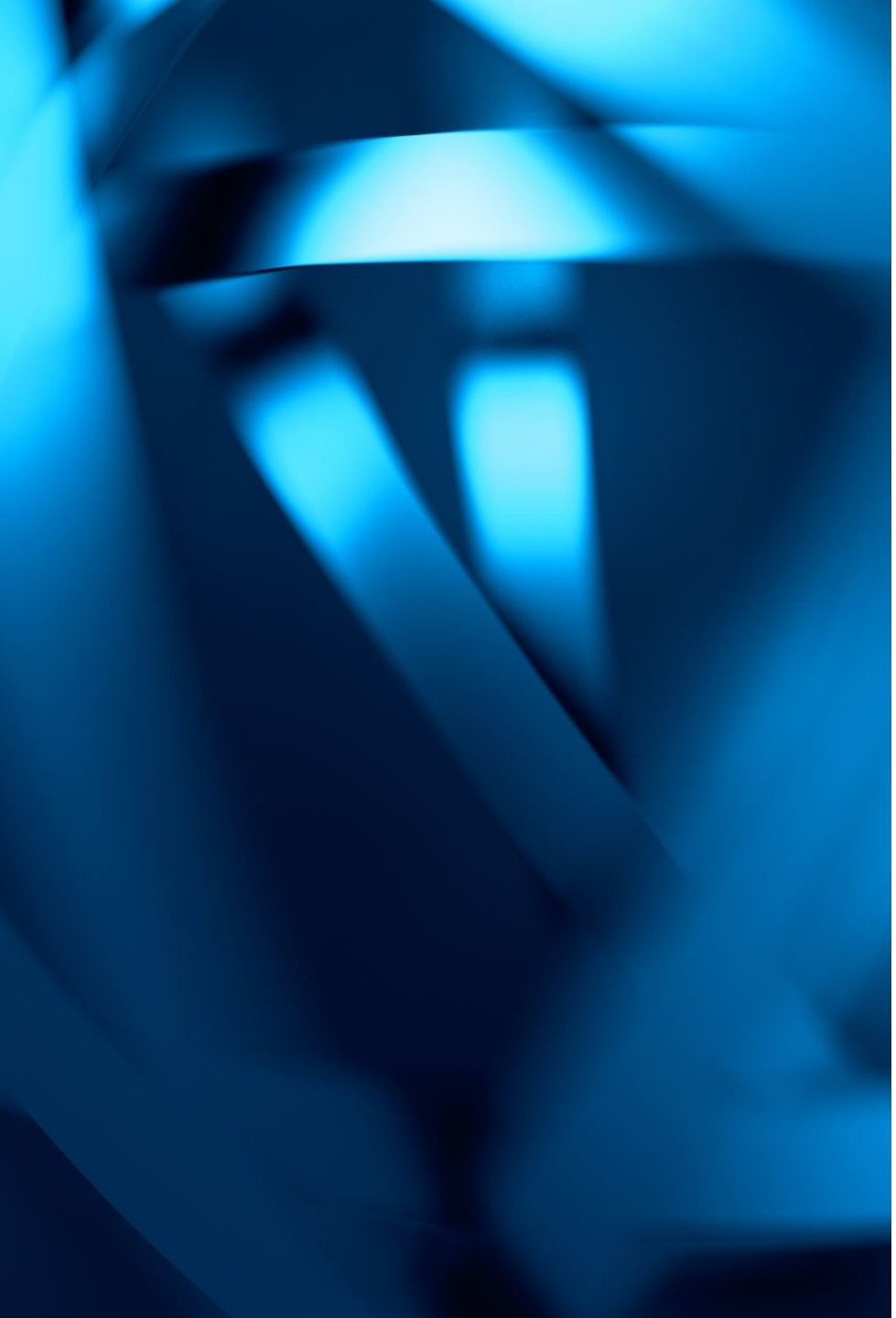
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Legal

- Japan
  - In 2016, Japan's Payment Services Act (PSA) recognized Bitcoin and crypto as legal tender
  - However, under the PSA, only businesses with a competent local Financial Bureau are allowed to operate as a cryptocurrency exchange

- Switzerland
  - The Swiss Federal Tax Administration (SFTA) considers cryptocurrencies to be property or assets: they are subject to Swiss wealth, income, and capital gains taxes and must be declared on annual tax returns.

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Non-Legal

Not a legal tender, but cryptocurrency exchange is permissible:

- 103 countries including the United States, Canada, The United Kingdom, South Korea, Singapore, etc...

Implicit Bans on Cryptocurrency:

- 42 countries including Vietnam, India, Macao, Libya, Georgia, Algeria, Bangladesh, and Bolivia

Explicit Bans on Cryptocurrency:

- China, Egypt, Iraq, Qatar, Oman, Morocco, Algeria, Tunisia and Bangladesh

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Global Policies on Bitcoin Exchanges

- **Japan-** Exchanges are legal if they are registered with the Japanese Financial Services Agency
- **The United States-** Exchanges are legal, depending on the state. The SEC views digital currency as a security, the CFTC views it as a commodity and the IRS views it as property.
- **The United Kingdom-** Exchanges are legal and need to be registered with the Financial Conduct Authority. Regulated under AML and counter- terrorism standards.
- **The European Union –** Exchanges are legal depending on the country.

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Global Policies on Bitcoin Exchanges (cont.)

- **South Korea –** Legal but use of anonymous bank accounts for virtual coin trading is prohibited. Needs to be registered with South Korea's Financial Services Commission.
- **China-** Illegal. In 2017 the government banned ICO's and shut down domestic cryptocurrency exchanges.
- **Singapore-** Legal, may fall under regulatory purview of Monetary Authority of Singapore.
- **India-** Legal. **T**he Indian government has issued warnings but does not currently regulate exchanges.
- **Switzerland-** Legal, need to register with the Swiss Financial Market Supervisory Authority

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Japan

- Exchanges are legal if they are registered with the Japanese Financial Services Agency

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The United States

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South Korea

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China

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Singapore

- Legal, may fall under regulatory purview of Monetary Authority of Singapore.

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India

- Legal. The Indian government has issued warnings but does not currently regulate exchanges.

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Switzerland

- Legal, need to register with the Swiss Financial Market Supervisory Authority

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Case Law

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In the Matter of Tomahawk Exploration LLC and David Thompson Laurance, Securities

- Facts: On August 14, 2018, the U.S. Securities and Exchange Commission (SEC) issued an order against Tomahawk Exploration LLC (Tomahawk) and its principal, David Thompson Laurance, regarding an ICO for Tomahawkcoins that Tomahawk engaged in during mid-2017
- Holding: the SEC found that the virtual tokens being offered by Tomahawk were securities under the *Howey* test. While the part of the Order discussing unregistered sale of securities, fraud and misrepresentations to investors is rather obvious, the Order also discussed additional issues that significantly affect token sales worldwide. According to the SEC:
  - ICO bounty programs involve the sale of securities; and
  - Tokens can be treated as equity securities and considered "penny stock.

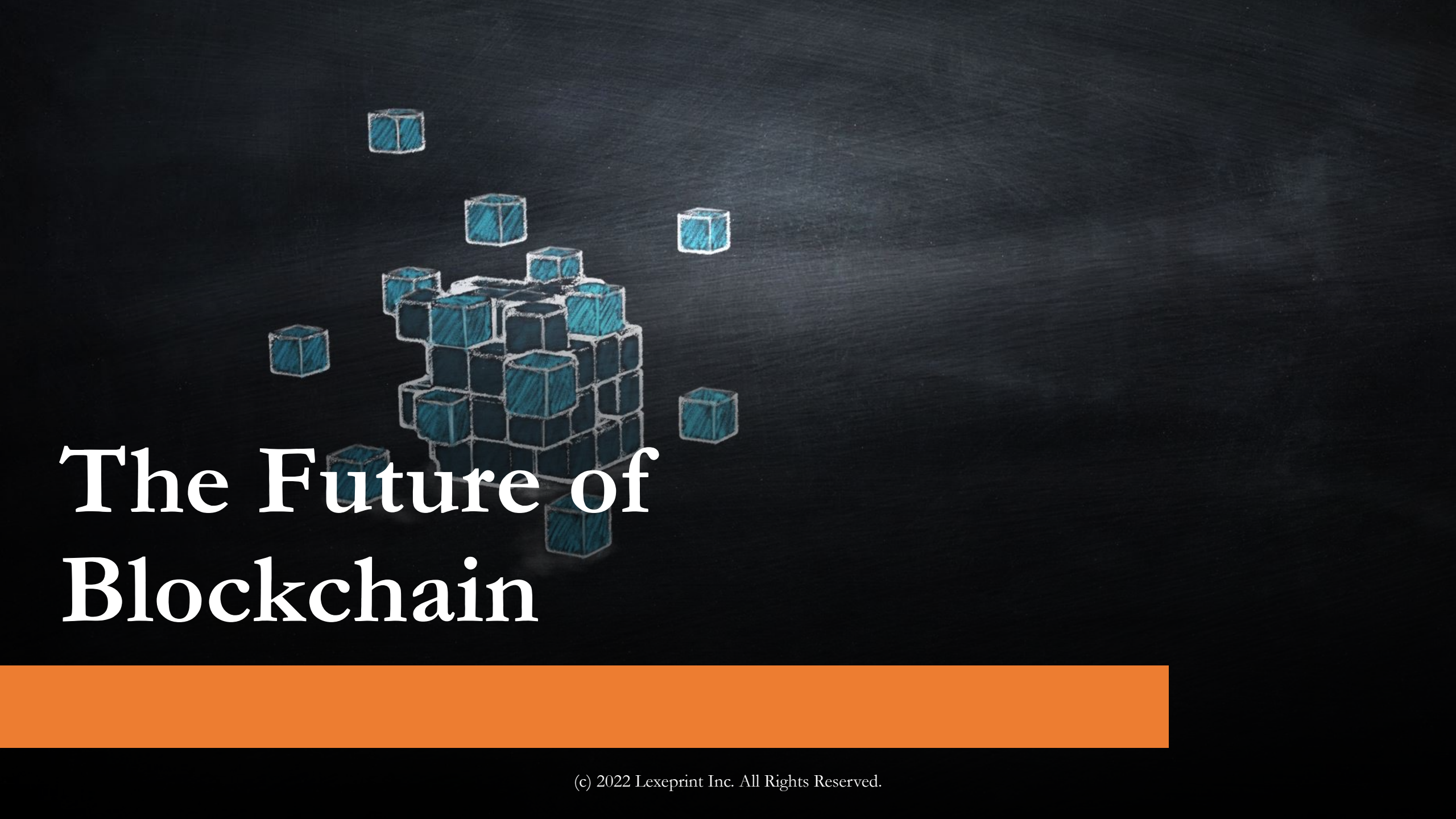
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Commodity Futures Trading Commission v. Gelfman Blueprint, Inc., and Nicolas Gelfman

- Facts: In September 2017, the CFTC filed a complaint against Gelfman Blueprint, Inc. and its CEO Nicholas Gelfman for operating a bitcoin Ponzi scheme. According to the Complaint, the Defendants used falsified performance reports and promises of significant payouts to solicit more than $600,000 from 80 customers between 2014 and 2016.
- Holding: In October 2018, a judge order Gelfman and Gelfman Blueprint, Inc. to pay a combined total of over $2.5 million in fines and restitution. In addition an injunction was placed on Gelfman that permanently bars him from trading.

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The Future of Blockchain

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Is Blockchain here to stay?

"It looks like blockchain is here to stay, I think it's going to be a powerful technology for modern society." – Reid Hoffman, Co-Founder & Executive Chairman, LinkedIn.

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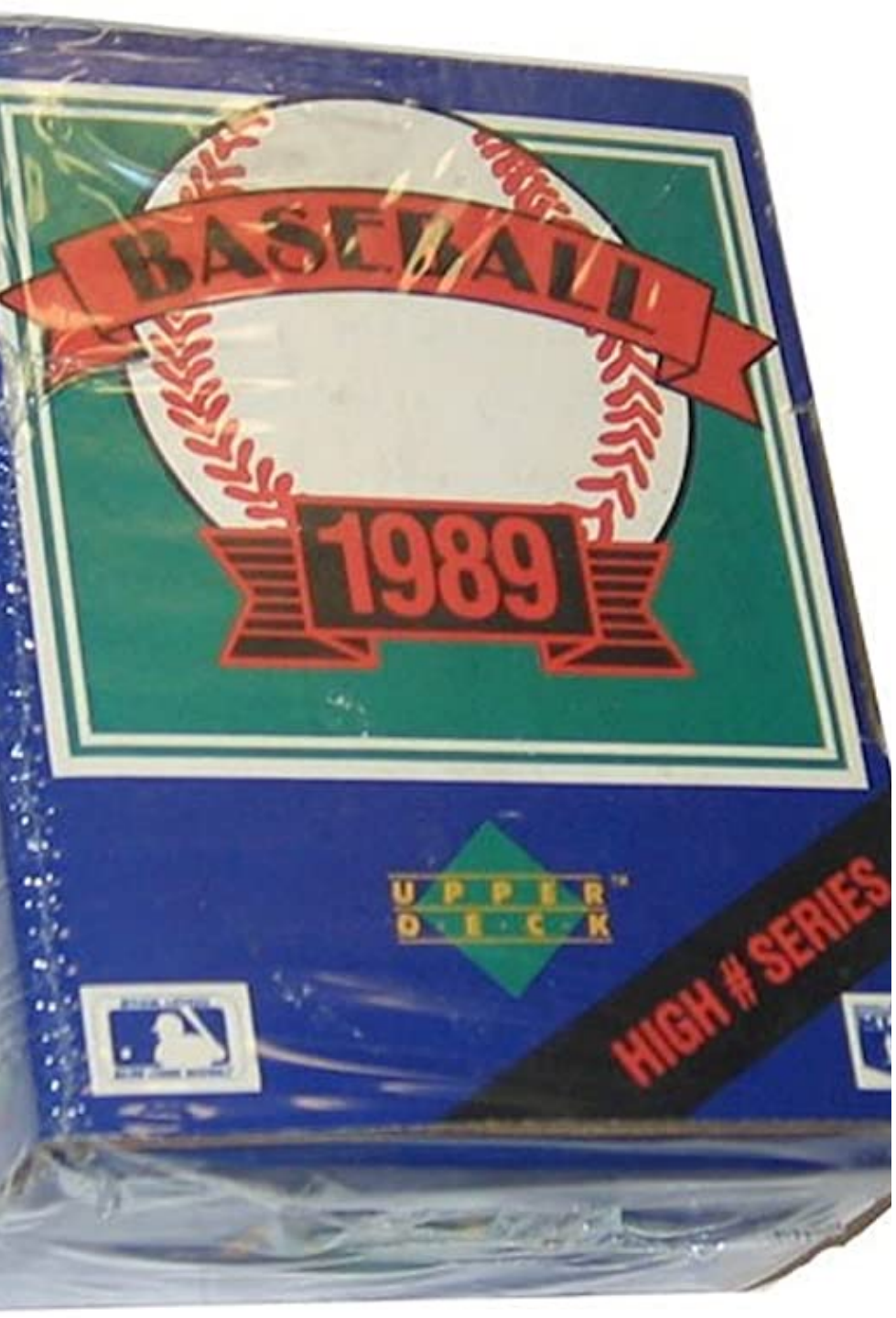


Unified Regulatory Consensus

At present, it may seem as if there is more friction than unity between regulatory bodies and industry experts about how the space should develop.

- With an uncertain road ahead, a unified regulatory framework for blockchain and cryptocurrency will be crucial to utilizing these exciting technologies to their full potential.
- This has already begun. In March, members of the G20 convened to discuss the future of cryptocurrencies on the international stage. While no consensus was reached, members acknowledged the unique value proposition of the industry, and pledged to publish a formal proposal in July.

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New Digital Asset Classes Like NFTs

- Non Fungible Tokens represent a new mechanism for buying and selling digital assets – digital collectibles.
- NFTs are unique and can't be replaced or swapped — they can only be purchased, sold, traded, or given away by the original owner/creator of that asset.

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Digital Identiy

- Passwords and authentication questions are the common mechanisms to establish who an individual is online and blockchain is likely to replace this with a digital identity that is safe, secure, and easy to manage.
- Digital identity will be based on a unique random set of numbers assigned to each user on a blockchain network.
- Making hacking an identity a great deal more challenging, faster KYC (time to buy house), purchase a car, voting, etc.

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David Cass is a senior partner at Law & Forensics LLC where he leads the Cryptocurrency and Digital Banking Practice and is a member of the Cyber Security and Forensics Practice. He has extensive experience in financial services regulation, cryptocurrency, digital assets, blockchain, cloud, and digital banking.

He most recently served as a lead regulator for the Federal Reserve Bank of New York where he was a member of the Large Institution Supervision Committee (LISCC). Prior to this appointment, David was the CISO & Global Partner of IBM's Cloud Security Service Unit where he was responsible for its security practices, processes, and policies.

He has been an active contributor of the FS-ISAC and the European Banking Federation on Cloud Compliance and Security for financial services firms and has worked closely with US and international regulators. He was part of the team that introduced the first financial services blockchain initiative utilizing public cloud supported by 10 major international banks.

Previously, he served as SVP & CISO for Elsevier where he led an organization of experienced legal, risk, and security professionals who provided data protection, privacy, security, and risk management guidance on a global basis. He also served as Elsevier's HIPAA officer.

David has an MSE from the University of Pennsylvania, and an MBA from MIT. He is a frequent speaker at high-profile conferences and served on a public corporation's Board of Directors. He also is an editorial board member for The Journal of Law & Cyber Warfare and serves as a board member for the UCLA Extension Silicon Beach Innovation Lab. He is a faculty member for the non-profit Global Cyber Institute, and an adjunct faculty member for Harvard and at the Rutgers Law School. He is a member of the New York City Cyber Critical Services & Infrastructure team organized by the NYPD and the office of the NY District Attorney.

In his free time, David is a volunteer firefighter & Swiftwater Rescue Technician.



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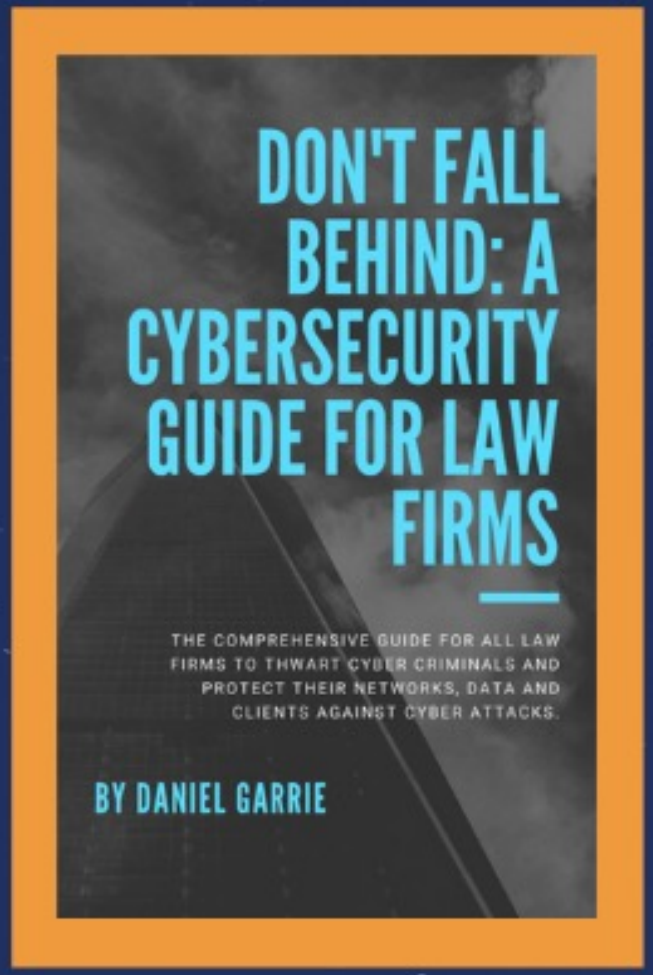
THOMSON REUTERS

Joseph is an innovator and early adopter of all things computer related. His primary focus is around the future of technology, and speaks globally about Legal Technology, Cybersecurity, Blockchain, Artificial Intelligence, Cryptocurrency, and Robotics (drone technology). He also writes about the future of technology as it impacts the crossroads of our personal and professional lives, especially in the legal sector. Under the umbrella of Thomson Reuters, The Hearing a Legal Podcast, Joseph hosts a show with a technology focus. He also serves as a mentor with the Columbia | IBM Blockchain Accelerator, a Cybersecurity Committee Member at the University of South Florida, and is a presidential committee appointee to the American Bar Association, Center for Innovation Governing Council.

Joseph founded wapUcom, LLP, consulting with companies in web and wireless development. As a side project DC WiFi was created to help create a web of open wireless WiFi access points across cities and educate people about wireless security.

Currently Joseph is with Thomson Reuters Legal managing a team of Technologists for both the Large Law, Corporate, and Government divisions in the US. Joseph serves the top law firms in the world consulting on legal trends and customizing Thomson Reuters legal technology solutions for enhanced workflows. He graduated from Providence College with a BA in Economics and Sociology and holds a Masters in eCommerce and MBA from the University of Maryland, Global Campus.

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Blockchain and Associated Legal Issues for Emerging Markets

By John Salmon and Gordon Myers

Blockchain, or distributed ledger technology (DLT), is a tamper-evident and tamper-resistant digital ledger implemented in a distributed fashion.[1] This emerging technology, which enables direct transactions within a ledger without need for a central authority or trusted intermediary, has the potential to re-engineer economic models and enable the creation of markets and products previously unavailable or unprofitable across emerging markets. However, in considering the potential benefits of blockchain, organizations must also consider the associated risks and how they can be managed.

These risks include jurisdictional challenges, crypto assets, privacy and data protection, double spending, and distributed denial-of-service (DDoS) attacks. Several risks have been identified and overcome at similar innovative leaps in the recent past, including the commercialization of the Internet and cloud computing. It is essential that enterprises understand all risks inherent in blockchain systems, including being able to clearly identify who is accountable and legally responsible.

Blockchain's key characteristics present challenges to the existing legal and regulatory framework. It is comprised of digitally recorded data in "blocks" that are linked together in chronological order in a manner that makes the data difficult to alter once recorded, without the alteration of all subsequent blocks and collusion of a majority of the network.

Each node on the network generally contains a complete copy of the entire ledger, from the first block created—the genesis block—to the most recent one. Each block contains a hash (a fixed length alphanumeric string generated from a string of text) pointer as a link to a previous block, a timestamp, and transaction data. By its nature, distributed ledger technology allows for transactions and data to be recorded and shared across a distributed network of participants without the need for a trusted intermediary. The original instance of blockchain (bitcoin) was to enable peer-to-peer transactions without the requirement for, or cost of, a central party.

Organizations wishing to develop a decentralized application on a blockchain therefore face a new set of risks and issues to manage. Most of these stem from the fact that we live in a world where centralized governance and control is the norm. Accordingly, the vast majority of countries' laws and regulations envision centralized businesses or structures with a singular seat of control and responsibility. Deviating from this arrangement poses a challenge from a legal and regulatory perspective and raises enforcement issues.

This is particularly the case when it comes to regulated sectors such as financial services. In this sector there has traditionally been some form of central counterparty, which often is regulated. Within a particular system or process, that central party is accountable and takes responsibility for the provision of the services to all of the other participants through a contractual framework underpinned by the legal and regulatory structure. An example of this would be the role of a central bank or other institution in clearing and settlement processes.

About the Authors

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Creating Markets, Creating Opportunities

BLOCKCHAIN TYPES			Read	Write	Commit	Example
	Open	*Public permissionless*	Open to anyone	Anyone	Anyone*	Bitcoin, Ethereum
		Public permissioned	Open to anyone	Authorized participants	All or a subset of authorized participants	Sovrin
	Closed	*Consortium*	Restricted to an authorized set of participants	Authorized participants	All or a subset of authorized participants	Multiple banks operating a shared ledger
		Private permissioned ("enterprise")	Fully private or restricted to a limited set of authorized nodes	Network operator only	Network operator only	Internal bank ledger shared between parent company and subsidiaries

*Requires significant investment either in mining hardware (proof-of-work model) or cryptocurrency itself (proof-of-stake model)

FIGURE 1 Main types of blockchains segmented by permission model

Source: Hileman, Garrick and Michel Rauchs. 2017. "Global Blockchain Benchmarking Study." Cambridge Centre for Alternative Finance.

However, in many blockchain use cases there is no such centralized party that takes responsibility for the provision of services or controls associated data sets. Instead, each party in the blockchain network holds a copy of the data, rather than relying on a single central party to hold and maintain a master copy. For example, blockchain technology is being used to simplify cross-border payments, removing the need for transfers to pass through multiple parties (with associated charges) before reaching their destination.[2] While such decentralization can bring benefits, it also poses a legal and regulatory challenge if there is no central party that is responsible and can be held accountable.

The key issues that present risks to firms using blockchain, which are explained further below, are: blockchain systems spanning multiple jurisdictions; crypto assets; data protection; privacy compliance; and cyber attacks.

Jurisdictional problems

As the nodes of a decentralized ledger can span multiple locations around the world, it is often difficult to establish which jurisdictions' laws and regulations apply to a given application. There is a risk that transactions performed by an organization could fall under every jurisdiction in which a node in the blockchain network is situated, resulting in an overwhelming number of laws and regulations that might apply to transactions in a blockchain based system.

In a public blockchain system it will be important to consider what law might apply to transactions and consider appropriate risk management that should apply. However, with a permissioned or private system it is easier to create some form of legal framework and internal governance structure that will dictate the governing law that will apply to transactions. In private systems it would also be beneficial to consider some form of agreed dispute resolution process.

Crypto assets

The difficulties of applying the existing regulatory regime can be seen clearly when it comes to the use of crypto assets. We currently see a huge range of opinions from regulators on crypto assets, from outright scepticism and bans in some countries,[3] to more cautious investor warnings from others,[4] while yet other countries have introduced regimes to attract more crypto activity.[5]

These divergences of opinion and the resulting pitfalls are well documented in the example of Initial Coin Offerings, or ICOs. The popularity of selling tokens via ICOs as a means of start-up fundraising has exploded in the last few years. Figures show approximately $21.7 billion has been raised through some 935 ICOs over the period from January to November 2018 alone, dwarfing the amounts raised for blockchain projects via traditional venture capital during the same period.[6] However, given the divergence of regulator opinion on the specific legal implications of a token sale, organizations that fail to consider at the outset whether their token sale may be compliant in the jurisdictions in which they plan to offer tokens may face an uncertain future.

Organizations may also have to ensure that the sale of tokens is limited to buyers in their desired jurisdictions in order to remove the risk of the offer extending to jurisdictions that are more heavily regulated or have outright bans on ICOs. In the United States, the Securities and Exchange Commission (SEC) has expressed concerns that many ICOs are either scams or attempts to raise money without complying with investor protection laws.

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Other countries' policy makers and regulators have sought to clarify the position by agreeing that not all ICOs would be required to comply with the same investor protection laws as would be the case with an initial public offering.

This has led to real difficulties for organizations that wish to use tokens in a legitimate way and are committed to complying with the regulatory regime wherever the token is made available. These organizations must deal with varying approaches across different countries, and the position also looks set to change—potentially very significantly—over the next few years.

These problems are particularly stark when one considers the reasons organizations wish to adopt cryptocurrency as part of their infrastructure. The traditional methods of raising capital to fund the growth of a business are debt financing and equity financing. This is clearly seen by both sides as a transaction in which the lender or investor should expect some form of return if the business is successful, but with an appreciation of the risk involved, particularly with early stage businesses.

An organization wishing to sell tokens may be seeking investment, yet it may also be attempting to build a user base through a network effect. If the organization is looking for an investment, it is perfectly reasonable for regulators and policy makers to expect it to comply with the usual investor protection laws; it would not seem equitable for an organization using cryptocurrency to circumvent these laws where the money raised from the tokens is an investment.

However, it is often the case that organizations using a token model want to build a network of users by offering cryptocurrency to use within the particular ecosystem being built. The objective in this case is to encourage people to become users of the organization's services, with the cryptocurrency used to pay for their provision. If the organization proves successful, the value of the token should increase accordingly, as usually there is a finite amount of the new currency sold. In this way, it is the users of the ecosystem who can contribute to and benefit from its success (and popularity), rather than equity investors. These types of tokens are often referred to as utility or consumer tokens, in that they are designed not as an investment but rather a device (or currency) to consume or use a particular service.

In many jurisdictions, regulators have acknowledged that there is a place for such tokens, and that they may not be regulated as an investment. A difficulty arises when organizations wish to sell tokens both to potential users of the system (utility tokens) and to organizations that do not intend to use the prospective service (for example, an investment bank or a venture capital company). Other challenges arise when the purchaser of the token buys many more tokens than the purchaser could possibly use or where there is no usable service at the point when the token is issued. Utility tokens that are sold as investments blur the line between what is regulated and what is not regulated, making it uncertain which regulations an organization must comply with in each jurisdiction in which a token is offered for sale.

These issues, together with the lack of a consistent global regulatory environment, can make it very challenging for those organizations that wish to benefit from the creation of their own crypto asset. There are many reasons why such organizations may want to create their own crypto asset, such as the payment and settlement systems example and the benefit of the network effect mentioned above.

Privacy and data protection

The issue of privacy and blockchain technology has been intensely debated. Many practitioners and academic commentators have claimed that blockchain technology is incompatible with privacy laws such as the EU General Data Protection Regulation, or GDPR.[7]

As mentioned above, the original purpose of blockchain was to facilitate peer-to-peer transactions without the need of a central party. In a permissionless public blockchain system, no single party takes responsibility for the availability or security of a particular blockchain network, and all users of the system may have access to the data on the network. These attributes conflict with the thrust of privacy laws, which require the party controlling personal data of an individual to safeguard the security and privacy of that data on behalf of the individual or "data subject."

Both a controller (the party that determines the purposes and means of processing particular personal data) and a processor (a party responsible for processing personal data on behalf of a controller, such as an outsourced service provider) have distinct obligations under the GDPR, making it important to determine whether a party qualifies as a controller or a processor when processing personal data. With a cloud computing system, typically those uploading personal data to the cloud environment are the controllers and the operator of the cloud system is the processor. This is a key area in which blockchain systems differ. Many blockchain systems are operated by all the users in a peer-to-peer network environment, which makes it difficult to define whether users are controllers or processors. It is necessary to consider to what extent the different participants in the blockchain network are controllers based on their respective activities.

Participants who submit personal data to the blockchain are more likely to be considered controllers under GDPR, as they determine the details of processing, whereas nodes that only process personal data are more likely to be processors, as they simply facilitate the blockchain network's operation. However, this determination is not straightforward, as not all blockchain systems operate in the same way, and there can be different types of participants carrying out various activities.

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The nodes in a blockchain system might be compared to autonomous systems on the Internet. Each autonomous system receives packets and routes them autonomously to another node, repeating until the packets reach their destination. The kind of processing that blockchain nodes perform is arguably similar. The only purpose of the nodes is to ensure the integrity of the blockchain and to validate the addition of supplemental blocks. Privacy can be further protected through blockchain systems that use zero-knowledge proofs. This allows nodes in the system to verify transactions without the details of the transaction or the public key, ensuring personal data is not processed by nodes.

In the same way that a cloud service provider may not know what data a customer uploads to its cloud environment, administrators of a blockchain will not necessarily know whether personal data is present on the blockchain. Generic blockchains can be put to a wide variety of uses, and there can be different data and configurations, making it very difficult for the developer to build in privacy protections adapted to the nature of the data processed on the blockchain.

At best, governance rules can regulate users of the blockchain to respect privacy laws when they upload personal data to the blockchain. For private or permissioned blockchains, for particular purposes, governance rules can be much more developed, for example, by prohibiting users from uploading particular types of data to the blockchain.

Transfer of data

There have been debates in the cloud industry about when personal data is "transferred" overseas for privacy law purposes, and blockchain is likely to raise similar questions. For example, if a copy of a hash derived from personal data is made in Singapore, does this mean that data has been "transferred" to Singapore for the purposes of privacy law? In the sense that data may be transferred to a node in any location, data put on a public blockchain is similar to data posted to the public Internet.

The reasoning of the European Court of Justice (ECJ) in the Bodil Lindqvist case may apply to the question of transfer, although this case was in respect of the European Data Protection Directive, which preceded GDPR.[8] The ECJ held that it cannot be presumed that the word "transfer," which is not actually defined in the Directive, was intended to cover the loading by an individual of data onto an Internet page. A similar pragmatic approach is required for data on a blockchain to ensure that it is not "transferred" to every jurisdiction in which a node is present, causing unnecessary breaches of privacy regulations. As there is no single model for blockchain systems, each project will have to be analyzed on its own distinct merits.

Data security on blockchain

Blockchain technology is often referred to as "tamper proof." This is generally because each new digital 'block' containing a record of transactions is connected to all preceding blocks. In order to tamper with any of the records contained in a block, a dishonest participant would need to change all subsequent blocks in the chain to avoid detection.

Given that blockchain is a decentralized ledger, there is no single point of failure that dishonest participants can override. Instead, they would require a huge amount of power to override and alter every node simultaneously. This is especially prominent in public blockchains where there can be any number of nodes existing anywhere in the world. Blockchain therefore presents a lower risk of attack than with centralized systems, in which key servers can be targeted and altered without trace.

Blockchain also uses advanced public key cryptography to secure its data, which relies on users having two cryptographically matched keys. When someone wants to send a user a file, they send the file to a user's public key. The file can then only be opened by the user's correlating private key. Together these features make blockchain a very secure method of recording data. There is relatively low risk of data tampering or data being intercepted compared to traditional methods of transfer and storage, making blockchain a risk management system.

Risk of cyber-attack

Despite the high level of security that blockchain systems provide to the data recorded on them, there are some key cybersecurity risks that remain.

The unique challenge to decentralized systems, particularly public blockchains, is that data input can be from any number of nodes, meaning there is a risk of tampering at each node. The benefit of using a 'tamper proof' technology is negated if the information stored on the ledger is compromised to begin with. This type of attack is not aimed at the blockchain itself, but at external systems such as cryptocurrency wallets. There is a risk that individuals might target the data input point (rather than the ledger itself), leading to the dissemination of inaccurate information. Users operating on the blockchain would then unknowingly rely on misleading or false information. A 15-year-old boy from the United Kingdom proved this attack possible by developing a proof-of-concept code that allowed backdoor access into hardware wallets sold by Ledger.[9] Using this approach, it would be possible to change wallet destinations and amounts of payments. An attacker could divert payments to his own account while making it appear to be the intended destination, ensuring the attack is undetectable to verifying nodes.

Another way data on a blockchain can be compromised is by a targeted brute force attack on certain nodes. In some blockchain networks, a concentrated number of nodes carry

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out almost all of the processing. If someone were to identify and attack the nodes covering the required consensus level, the chain could be compromised. However, such an attack requires an enormous amount of computing power.

In some systems an attack would only need to control more than half of the computing power of all nodes. Such attacks are more likely to be successful if the attacker specifically attacks the nodes with the highest computing power in which most transactions are concentrated.

Double spending and DDoS attack

Double spending attacks occur when the same currency unit is assigned to multiple users, enabling them to use the same coin simultaneously.

A distributed denial-of-service, or DDoS, attack is a type of cyber-attack in which a perpetrator attempts to render a service unavailable to its users by overwhelming its bandwidth, often by flooding it with traffic. Blockchain systems are less susceptible to these kinds of attacks than are traditional centralized systems, given the lower numbers of potential points of failure and ability to include denial of service prevention. However, where ledgers are concentrated on a few high-performing nodes, the likelihood of a successful DDoS attack is increased.

Smart contracts

Smart contracts are self-executing software code that runs on a blockchain. They are not in themselves contracts, and often are not particularly smart. Contract law will likely apply to the underlying transactions between the parties using smart contracts, assuming that the arrangement between the participants otherwise fulfils the requirements for contract formation.

The code in the smart contract defines the terms of an agreement on an "if" and "else" basis and then automatically enforces those terms if and when the specific criteria programmed into the code are met. For example, the execution of a smart contract can be verified by the network of users on a blockchain system, removing the requirement of a trusted third-party intermediary. Smart contracts therefore have the potential to reduce costs in areas that typically rely on an intermediary today, such as clearing and settlement.

As demonstrated in 2016 by the hack of the Decentralized Autonomous Organization (DAO) public blockchain, it is possible to target smart contracts that are run on blockchain systems.[10] In the instance of DAO, the hacker was able to move approximately $50 million in investor funds to a sub-contract that the hacker controlled. This type of attack is less likely to occur in private blockchain systems due to the number of users that have access to the smart contract; however, features should be built into the smart contract to ensure that any hack can be corrected retroactively.

As mentioned above, traditional contract law may well apply to the underlying transactions embodied by smart contracts and, as such, the same liability issues apply to smart contracts. Software developers could therefore be liable for poorly written software code that results in a loss for their client, either through exploitation such as the DAO hack, or as a result of the code executing in a way not intended by the parties to the transaction.

Governance Impacts

Accountability

In relation to decentralized systems, a key question for regulators is who should be held accountable for breaches of law and regulation. This is similar to the problem of determining accountability on the Internet before the emergence of blockchain. Accountability of the various parties carrying out relevant activities on the Internet has been a vexing problem since its inception. Prior to the Internet, information and other content, such as music and video, could only be published through existing publishers with an established distribution network. Where there were legal issues about content, for instance issues with copyright infringement and defamation, the publisher was clearly accountable.

In the case of Google Spain v AEPD, the Court of Justice of the European Union (CJEU) ruled that a search engine could be held accountable for the protection of personal data in respect of third party websites accessible through its service.[11] It was emphasized in this case that the search engine's activities could be clearly distinguished from those of the original publisher of the data. The harm to the data subject was not a result of the publication, but rather from the widespread availability of this information through a search engine.

In a public blockchain system, by contrast, there is no one easily held accountable in the same way as a search engine. In a private blockchain system, where there is clear ownership and responsibility, regulators might expect those running the system to be accountable for data added to the system by all the network users. The system owner could be seen as enabling the distribution of data through the blockchain in a comparable way to a search engine. It would then be the system owner's responsibility to protect this data, despite not publishing the personal data itself. The owner would likely have to put in place a set of operating conditions on the private blockchain that comply with regulations, which all users would in turn agree to comply with.

Taxation challenges

The application of existing tax frameworks to a digitalized economy has posed significant challenges to national and global tax authorities. For example, digital economy concerns are at least partly within the scope of the OECD's Base

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Erosion and Profit Shifting (BEPS) concerns. In some cases, governments have suggested that broad-based "virtual" profit allocation rules, rather than existing permanent establishment concepts, should apply. India has introduced an "equalisation levy" on payments made to certain non-resident on-line service providers.[12] The European Union has considered similar measures. Over the longer run, a "virtual permanent establishment" concept is envisaged.

These ongoing discussions may have significant implications for blockchain and distributed ledger technology platforms. For example, it seems evident that cryptocurrency transactions will be taxed as assets, that is, on a capital gains basis, without application of VAT. However, issuances of utility tokens, for example, to employees, may be more appropriately taxed as income. Similarly, for policy reasons, government authorities may prefer to defer revenue recognition until disposition, or provision of the underlying services, as is the case in Israel. These are complex matters that, even within a BEPS framework, may promote competitive tax practices that other authorities may view with concern.

In the case of non-cryptocurrency platforms, BEPS-type concerns may well influence industry and governance structures in unintended ways. For example, industry DLT platforms for supply chain management may tend towards centralization, so that they are owned and nominally governed (consistent with BEPS limitations) from low-tax jurisdictions. Similarly, "smart contracts" more efficiently executed on-chain, may be moved off-line to centralized operations to ensure favorable tax treatment of ledger transactions. This solution may achieve compliance, however, at the cost of the efficiencies and certainty argued to arise from using a blockchain-only architecture.

Regulators working with the industry

To allow the financial industry to enjoy the full benefits of blockchain technology, it will be necessary for regulators to work with the industry to ensure that compliance with regulation can be achieved while still allowing blockchain technology to be used to maximum potential. In some jurisdictions, regulators may be required to move away from the use of detailed and prescriptive rules in favor of broadly stated principles that set the standards at which the industry must operate. This would allow regulations to be flexible enough to encompass the wide variety of systems that blockchain allows for. Even in these jurisdictions, however, regulators should work closely with stakeholders to ensure that their thinking on acceptable industry practices is transparent. As in Singapore and the United Kingdom, these efforts can support innovation by providing "bright line" certainty to new and non-traditional industry entrants.

One opportunity to adapt regulatory compliance to distributed ledger technology could be the use of regulatory sandboxes. These provide the ability to test services with real customers in a controlled environment without incurring regulatory consequences. Regulators can gain an understanding of the function of the blockchain systems and cooperate with the industry to identify and develop methods for compliance. This would help regulators develop a level of regulation that encourages and enables innovation while ensuring adequate protection for users—and would encourage development of technology solutions (such as electronic identification, authentication, and trust services that mitigate, for example, anti-money laundering and ultimate beneficial ownership concerns). One challenge of regulatory sandboxes is ensuring they are attractive to start-ups. Sandboxes should encourage innovation and allow for start-ups to grow, rather than merely offering value for the regulator.

Another opportunity to adapt regulatory compliance may lie in careful application of existing regulatory principles to the blockchain environment. For example, regulators will inevitably favor more centralized blockchain and DLT platforms that provide a "home" for regulatory supervision. Alternatively, in decentralized systems, they may take the view that all participants are liable for compliance issues. A more nuanced approach also may be possible. For example, in relation to regulation of privacy issues in unpermissioned systems, France recently took the view that only active participants—those actively inputting data into the system, and not mere "nodes" or "miners" providing verification of transactions to the platform—are responsible as data controllers.[13] This approach may more effectively balance the public interest in large-scale "trustless" systems, by ensuring meaningful accountability for privacy and personal data practices.

Finally, tax issues may continue to challenge the industry. Absent global agreement on "digital economy" principles, one can surmise a fragmented global tax environment, consisting on one hand of aggressively low-tax environments targeted at attracting "producers," and on the other hand, aggressively extraterritorial jurisdictions, targeted at realizing offshore income they believe has been derived from "consumption" in their home territory. Such a tax environment is uncertain for innovation, generating risky tax structures and deterring investors.

Meeting governance objectives

Blockchain system designers may seek to incentivize good behavior by participants in order to meet governance objectives and reduce the risk of non-compliance with regulation by the blockchain network. This may be done by setting rules that ultimately induce the right behavior. Bitcoin, for example, incentivizes miners to verify legitimate transactions by rewarding them with bitcoins. Bitcoin mining is difficult and inefficient by design, making it costly for any node that deviates from the correct protocol and fails to receive a reward.

Designers of blockchain systems could ensure compliance with the legal and regulatory framework by building it into

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the system. For example, participants could be locked out of the system unless and until they had been through an appropriate anti-money laundering compliance check.

Beyond blockchain and DLT platform design, decentralized systems pose significant governance and capacity challenges for participants and platforms alike. Fortunately, the industry and regulators have coalesced around key principles for digital platforms and outsourced information technology operations, providing a strong basis for risk governance. Key elements include careful management of information assets; board oversight of resilience and business continuity; development of operational risk metrics and integration with robust enterprise risk management capacity; and considered protocols for management of data incidents.

The proposed European Banking Authority outsourcing guidelines for banks in Europe are a good example of how regulators expect banks to manage outsourced risk, whether based on new technologies such as the cloud or on more traditional models. It is inevitable that regulators will expect the same level of risk management, due diligence, and ongoing monitoring of suppliers of blockchain based systems. Where there is no "supplier" as such (as for a public blockchain), regulators may be hard-pressed to establish oversight responsibilities beyond assuring robust diligence, risk governance, and reporting by users.

We can safely assume that regulators will want to ensure that transparency and understanding of smart contracts are embedded into blockchain and DLT applications. We can similarly surmise that legacy entities participating in blockchain and DLT platforms will want to "flow down" their requirements to governed platforms with a single point of accountability. This would suggest at least that even open permissionless systems will require thoughtful user understandings and allocations of liability, perhaps resembling governing organizations for open source software, to attract commercial users. For the immediate future, it may also suggest that use of permissioned and limited applications is more likely.

Two other governance areas will require resolution if the opportunities inherent in open, trustless systems are to fully emerge. First: decentralized autonomous organizations may present an entirely new mechanism for the organization of capital and commercial activity. Yet the structuring of these vehicles—with regard to risk management, minority protections, and transparency—remains an area for research and evolving practice. Second: there are concerns that the lack of a single point of accountability in a blockchain or DLT platform makes that platform an unincorporated joint venture in which all participants are jointly and severally liable for outcomes.

This is partly reflected, for example, in the French GDPR decision discussed earlier. While, as with the French decision, courts may ultimately limit this exposure to active participants and contributors, this will not be the argument made by plaintiffs' counsel. It is possible that some combination of a strict liability regime, together with statutory liability limitations and support of an appropriate insurance product, will be required. However, as in some public permissionless systems, this approach may be problematic when identity is not apparent, making apportioning liability difficult. This is yet another reason why we view entirely pseudonymous systems as unlikely to be acceptable to regulators, at least in regulated or sensitive settings.

A number of recent articles suggest that development of significant, impactful blockchain applications remains several years away. We do not believe this to be the case. At least for permissioned, governed systems, the regulatory and governance principles allowing public and private players to implement and operate these principles, on a risk assessed basis, are in place.

The more significant concern is that the continued relevance of these principles may deter realization of the full range of opportunities inherent in open, trustless systems. **Our discussion suggests that the application of these frameworks effectively requires a point of accountability for governance and liability, or in the alternative, some measure of joint and several liability by all participants.** More radical decentralization may require more interesting "compliance by design" elements, such as digital identifiers and ultimate beneficial ownership verification; agreed risk reporting available to participants and regulators, embedded in the platform's information architectures; and perhaps some form of overarching liability allocation framework, possibly comprising strict liability principles paid from a pool established by participants and supported by insurance and liability limitations.

The alternative position is that—at least in the short term—an accountable intermediary will be required. One option is that industry foundations, similar to those that exist for key open source software and content licenses, can facilitate the transition to more comprehensive decentralization. Another option is that a private sector technology company takes responsibility for the provision of the blockchain system (some of which might be provided in a permissionless way) in the same way that private companies provide open source software. This option may defeat the entire purpose of using a decentralized blockchain system, as it effectively centralizes the platform and requires users to trust that the provider is acting honestly (and will likely require that they pay a fee for the provision of the system). A partially, but perhaps more effectively, decentralized model may include a consortium of private sector providers who share responsibility, cost, and allocation of liability.

Conclusion

It is clear there are a number of important risk management concerns for any organization wishing to adopt blockchain technology. However, we have seen many of these

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challenges before in the adoption of the Internet generally, as well as other technologies such as cloud computing. The key is for the organization to truly understand the risks inherent in the system and to ensure that these are adequately managed and mitigated where necessary. The critical remaining issue is that the structure of contractual frameworks and associated regulation was not designed for the decentralized data world of blockchain. In particular, understanding who is accountable and legally responsible is a major challenge. It is clear to us that the adoption of the technology would be treated like any other form of outsourcing. For those wishing to adopt this new technology, there are three potential models to consider:

One. Private or permissioned models where a single party or group of parties takes responsibility for operating the system. This is the easiest path and would be no different from existing outsourcing/cloud arrangements. A node controlled by a regulator could also be included to act as a neutral party.

Two. Public blockchain systems where there is a clear contractual framework between the participants—one which reflects a more "joint venture" approach and which looks to allocate liability and accountability to the parties. This could be accomplished effectively by a kind of end-user license agreement that conditions use of the public platform on adherence; or perhaps even something that feels like an open-ended fund, where anyone can join but there is a clear legal structure and risk allocation. In general, it would seem that this model would have to be implemented on the inception of the system.

Three. Public blockchain systems where an organization takes on the responsibility and liability for running the system. This could be through open source systems such as Hyperledger, which has a core framework in place and the ability for organizations to alter the network according to their needs, grant permissions to those who need it, and keep out those who don't.[14]

It will likely be difficult for any organization that has to ensure effective risk management to consider a purely permissionless blockchain system without some additional protections. Of course, not all organizations have the strict requirements of financial services companies and other organizations in highly regulated sectors. Regardless of the model adopted by those seeking to use blockchain, it is important that regulators remain flexible in their approach to this emerging technology—and avoid viewing it through a lens designed for more traditional, centralized platforms.

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Additional Reports and EM Compass Notes about Blockchain: *Blockchain – Opportunities for Private Enterprises in Emerging Markets* (report), IFC, October 2017; *Blockchain Governance and Regulation as an Enabler for Market Creation in Emerging Markets* (Note 57); *Using Blockchain to Enable Cleaner, Modern Energy Systems in Emerging Markets* (Note 61).

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Delaware Blockchain Legislation Status

Delaware Cryptocurrency Laws

Regulation of Digital Currencies: Cryptocurrency, Bitcoins, Blockchain Technology

Delaware	SB 89 *Signed by governor 6/19/19, Chapter 46*	This bill continues the practice of amending periodically the Delaware Revised Uniform Limited Partnership Act (the "Act") to keep it current and to maintain its national preeminence. Section 1. This section amends §17-101 of the Act in several respects. New definitions are added for "document" and "electronic transmission," which terms appear in new §17-113 among other places in the Act. Section 4. This section amends §§17-104(d) and 17-104(e) of the Act to include references to protected series and registered series, as appropriate, and §Section 17-104(g) to conform with the addition of the defined term "electronic transmission" in §17-101. Section 7. This section adds new §17-113 of the Act, which establishes non-exclusive, safe harbor methods to reduce certain acts or

		transactions to a written or electronic document and to sign and deliver a document manually or electronically. The terminology in §17-113(a) is based on analogous provisions in existing §§17-302(e) and 17-405(d) of the Act, the Delaware Uniform Electronic Transactions Act ("UETA"), and the Model Business Corporation Act, with modifications. Section 17-113(a) permits limited partnership transactions (such as entering into agreements of merger not filed with the secretary of state) to be documented, signed, and delivered through "Docusign" and similar electronic means. The §17-113(a) safe harbor provisions apply solely for purposes of determining whether an act or transaction has been documented and whether a document has been signed and delivered, in accordance with the Act and the partnership agreement. Section 17-113(a) does not preempt any statute of frauds or other law that might require actions be documented, or that documents be signed and delivered, in a specified manner. Section 17-113(a) clarifies how its provisions operate in connection with a transaction conducted pursuant to UETA. To the extent UETA does not apply to a transaction (under §12A-103 of UETA) because the transaction is governed by the Act, the parties to the transaction can satisfy the Act by complying with §17-113(a). Section 17-113(b) addresses certain actions and documents that are not governed by §17-113(a). There is no presumption that these excluded items are prohibited from being effected by electronic or other means, but §17-113 may not be relied on as a basis for documenting an act or transaction, or signing or delivering a document if the exclusions set forth in §17-113(b) apply. Certain of these excluded items are governed by separate provisions that facilitate the use of electronic media, including documents filed with the secretary of state (governed by §17-206(a)). Section 17-113(b) permits partnership agreement provisions that restrict the use of §17-113(a), but those restrictions must be expressly stated. A provision merely specifying that an act or transaction will be documented in writing, or that a document will be signed or delivered manually, will not prohibit the application of §17-113(a). Section 17-113(c) addresses the interaction between the provisions of the Act and the Electronic Signatures in Global and National Commerce Act (the "E-Sign Act"). Section 17-113(c) evidences an intent to allow the Act to govern the documentation of actions, and the signature and delivery of documents, to the fullest extent the Act is not preempted by the E-Sign Act. Sections 23 and 24. These sections amend §17-302(e) and §17-405(d) of the Act to conform with the addition of the defined term "electronic transmission" in §17-101.
Delaware	SB 90	This bill continues the practice of amending periodically the

Signed by governor 6/19/19, Chapter 47

Delaware Revised Uniform Partnership Act (the “Act”) to keep it current and to maintain its national preeminence. Section 1. This section amends §15-101 of the Act to include definitions for “document” and “electronic transmission.” These terms appear in new §15-124 among other places in the Act. “Electronic transmission” previously was defined in §15-407(d) of the Act, and the new definition provides specific statutory authority for Delaware partnerships to use networks of electronic databases (examples of which are described currently as “distributed ledgers” or a “blockchain”) for “electronic transmissions.” Section 4. This section adds new §15-124 of the Act, which establishes non-exclusive, safe harbor methods to reduce certain acts or transactions to a written or electronic document and to sign and deliver a document manually or electronically. The terminology in §15-124(a) is based on analogous provisions in existing §15-407(d) of the Act, the Delaware Uniform Electronic Transactions Act (“UETA”), and the Model Business Corporation Act, with modifications. Section 15-124(a) permits partnership transactions (such as entering into agreements of merger not filed with the secretary of state) to be documented, signed and delivered through “Docusign” and similar electronic means. The §15-124(a) safe harbor provisions apply solely for purposes of determining whether an act or transaction has been documented, and whether a document has been signed and delivered, in accordance with the Act and the partnership agreement. Section 15-124(a) does not preempt any statute of frauds or other law that might require actions be documented, or that documents be signed and delivered, in a specified manner. Section 15-124(a) clarifies how its provisions operate in connection with a transaction conducted pursuant to UETA. To the extent UETA does not apply to a transaction (under Section 12A-103 of UETA) because the transaction is governed by the Act, the parties to the transaction can satisfy the Act by complying with §15-124(a). Section 15-124(b) addresses certain actions and documents that are not governed by §15-124(a). There is no presumption that these excluded items are prohibited from being effected by electronic or other means, but §15-124 may not be relied on as a basis for documenting an act or transaction, or signing or delivering a document, if the exclusions set forth in §15-124(b) apply. Certain of these excluded items are governed by separate provisions that facilitate the use of electronic media, including documents filed with the secretary of state (governed by §15-105(c)). Section 15-124(b) permits partnership agreement provisions that restrict the use of §15-124(a), but those restrictions must be expressly stated. A provision merely specifying that an act or transaction will be

		documented in writing, or that a document will be signed or delivered manually, will not prohibit the application of §15-124(a). Section 15-124(c) addresses the interaction between the provisions of the Act and the Electronic Signatures in Global and National Commerce Act (the "E-Sign Act"). Section 15-124(c) evidences an intent to allow the Act to govern the documentation of actions, and the signature and delivery of documents, to the fullest extent the Act is not preempted by the E-Sign Act. Section 5. This section amends §§15-403(c) of the Act to provide specific statutory authority for Delaware partnerships to use networks of electronic databases (examples of which are described currently as "distributed ledgers" or a "blockchain") for the creation and maintenance of partnership records. Section 6. This section amends §15-407(d) of the Act to conform with the addition of the defined term "electronic transmission" in §15-101.
Delaware	SB 91 *Signed by governor 6/19/19, Chapter 48*	This bill continues the practice of amending periodically the Delaware Limited Liability Company Act (the "Act") to keep it current and to maintain its national preeminence. Section 1. This section amends §18-101 of the Act to include definitions for "document" and "electronic transmission," and to amend the definitions of "manager" and "member." The terms "document" and "electronic transmission" appear in new §18-113 among other places in the Act. The changes to the definition of "manager" confirm that the term includes a manager of the limited liability company generally and a manager associated with a series of the limited liability company, and the changes to the definition of "member" confirm that the term includes a member of the limited liability company generally and a member associated with a series of the limited liability company. Section 3. This section amends §18-104(g) to conform with the addition of the defined term "electronic transmission" in §18-101. Section 4. This section adds new §18-113 of the Act, which establishes non-exclusive, safe harbor methods to reduce certain acts or transactions to a written or electronic document and to sign and deliver a document manually or electronically. The terminology in §18-113(a) is based on analogous provisions in existing §§18-302(d) and 18-404(d) of the Act, the Delaware Uniform Electronic Transactions Act ("UETA"), and the Model Business Corporation Act, with modifications. Section 18-113(a) permits limited liability company transactions (such as entering into agreements of merger not filed with the secretary of state) to be documented, signed, and delivered through "Docusign" and similar electronic means. The §18-113(a) safe harbor provisions apply solely for purposes of determining whether an act or transaction has been documented and whether a document has been signed and delivered, in

accordance with the Act and the limited liability company agreement. Section 18-113(a) does not preempt any statute of frauds or other law that might require actions to be documented, or that documents be signed and delivered, in a specified manner. Section 18-113(a) clarifies how its provisions operate in connection with a transaction conducted pursuant to UETA. To the extent UETA does not apply to a transaction (under §12A-103 of UETA) because the transaction is governed by the Act, the parties to the transaction can satisfy the Act by complying with §18-113(a). Section 18-113(b) addresses certain actions and documents that are not governed by §18-113(a). There is no presumption that these excluded items are prohibited from being effected by electronic or other means, but §18-113 may not be relied on as a basis for documenting an act or transaction or signing or delivering a document if the exclusions set forth in §18-113(b) apply. Certain of these excluded items are governed by separate provisions that facilitate the use of electronic media, including documents filed with the secretary of state (governed by §18-206(a)). Section 18-113(b) permits limited liability company agreement provisions that restrict the use of §18-113(a), but those restrictions must be expressly stated. A provision merely specifying that an act or transaction will be documented in writing, or that a document will be signed or delivered manually, will not prohibit the application of §18-113(a). Section 18-113(c) addresses the interaction between the provisions of the Act and the Electronic Signatures in Global and National Commerce Act (the “E-Sign Act”). Section 18-113(c) evidences an intent to allow the Act to govern the documentation of actions, and the signature and delivery of documents, to the fullest extent the Act is not preempted by the E-Sign Act. Section 5. This section amends §18-206(b) of the Act to clarify that the certificate of formation or certificate of registered series, as applicable, shall be amended, corrected or restated upon the filing of a certificate of the amendment (or judicial decree of amendment), certificate of correction, corrected certificate or restated certificate, and to confirm that a certificate of registered series is canceled upon a certificate of conversion of such registered series to protected series becoming effective. Section 6. This section amends §18-210 of the Act to provide that a plan of division may provide for contractual appraisal rights and that contractual appraisal rights may be made available in connection with any merger or consolidation in which a registered series is a constituent party, any division of the limited liability company, any conversion of a protected series to a registered series of the limited liability company, and any conversion of a registered series to a protected series of the limited liability company. Sections 14 and 15.

These sections amend §§18-302(d) and 18-404(d) of the Act to conform with the addition of the defined term “electronic transmission” in §18-101.

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How Bitcoin Works

By DAVID FLOYD Updated November 29, 2021

Reviewed by JULIUS MANSA

Fact checked by PETE RATHBURN

How exactly to categorize Bitcoin is a matter of controversy. Is it a type of currency, a store of value, a payment network, or an asset class?

Fortunately, it's easier to define what Bitcoin actually is. It's software and a purely digital phenomenon—a set of protocols and processes.

It is also the most successful of hundreds of attempts to create virtual money through the use of cryptography. Bitcoin has inspired hundreds of imitators, but it remains the largest cryptocurrency by market capitalization, a distinction it has held throughout its decade-plus history.

Like standard currency, Bitcoin is produced and has processes and safeguards in place to prevent fraud and ensure appreciation in its value. The main building blocks of Bitcoin are blockchain, mining, hashes, halving, keys, and wallets. They are discussed in detail below.

(A general note: According to the Bitcoin Foundation, the word "Bitcoin" is capitalized when it refers to the cryptocurrency as an entity, and it is given as "bitcoin" when it refers to a quantity of the currency or the units themselves. Bitcoin is also abbreviated as BTC.[1] Throughout this article, we will alternate between these usages.)

KEY TAKEAWAYS

- **Bitcoin miners run complex computer rigs to solve complicated puzzles in an effort to confirm groups of transactions called blocks.** Upon success, these blocks are added to the blockchain record, and the miners are rewarded with a small number of bitcoins.
- Other participants in the Bitcoin market can buy or sell tokens through cryptocurrency exchanges or peer-to-peer.
- The Bitcoin ledger is protected against fraud via a trustless system; Bitcoin exchanges also work to defend themselves against potential theft, although high-profile thefts have occurred.

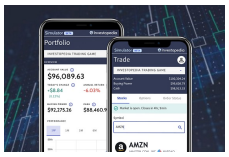


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The Blockchain

Bitcoin is a network that runs on a protocol known as the blockchain. While it does not mention the word blockchain, a 2008 paper by a person or people calling themselves Satoshi Nakamoto first described the use of a chain of blocks to verify transactions and engender trust in a network. [2]

The blockchain has since evolved into a separate concept, and thousands of blockchains have been created using similar cryptographic techniques. This history can make the nomenclature confusing. Blockchain sometimes refers to the original Bitcoin blockchain. At other times, it refers to blockchain technology in general, or to any other specific blockchain, such as the one that powers Ethereum.

Any given blockchain consists of a single chain of discrete blocks of information, arranged chronologically. In principle, this information could include emails, contracts, land titles, marriage certificates, or bond trades. In theory, any type of contract between two parties can be established on a blockchain as long as both parties agree on the contract. This takes away any need for a third party to be involved in any contract and opens up a world of possibilities including peer-to-peer financial products, such as loans or decentralized savings and checking accounts, wherein banks or any intermediary are irrelevant.

Blockchain's versatility has caught the eye of governments and private corporations; indeed, some analysts believe that blockchain technology will

In Bitcoin's case, the information on the blockchain is mostly transactions. Bitcoin is really just a list. Person A sent X bitcoin to person B, who sent Y bitcoin to person C, etc. By tallying these transactions up, everyone knows where individual users stand. It's important to note that these transactions do not necessarily need to take place between humans.

Bitcoin's blockchain network creates vast possibilities for the Internet of things. In the future, we could see systems in which self-driving taxis or Uber vehicles have their own blockchain wallets. The passenger would send cryptocurrency directly to the car, which would not move until the funds were received. The vehicle would be able to assess when it needs fuel and use its wallet to facilitate a refill.

Another name for a blockchain is a "distributed ledger," which emphasizes the key difference between this technology and a well-kept Word document. Bitcoin's blockchain is distributed, meaning that it is public. Anyone can download it in its entirety or go to any number of sites that parse it. This means that the record is publicly available, but it also means that there are complicated measures in place for updating the blockchain ledger. There is no central authority to keep tabs on all Bitcoin transactions, so the participants themselves do so by creating and verifying "blocks" of transaction data. See the section on mining below for more information.

You can see the status of blocks, and their associated transactions, on sites. Such sites list the address identifier for the transacting parties, dates, the date on which the transaction took place, and the time of the transaction. [3]

The long strings of numbers and letters are addresses, and if you were in law enforcement or just very well informed, you could probably figure out who controlled them. It is a misconception that Bitcoin's network is totally anonymous, although taking certain precautions can make it very hard to link individuals to transactions.

Post-Trust

can't protect it by locking it in a safe or burying it in the woods. In theory, all a thief would need to do to take it from you would be to add a line to the ledger that translates to "you paid me everything you have."

A related worry is double-spending. If a bad actor could spend some bitcoin, then spend it again, confidence in the currency's value would quickly evaporate. To achieve a double-spend, the bad actor would need to make up 51% of the mining power of Bitcoin. The larger the Bitcoin network grows, the less realistic this becomes as the computing power required would be astronomical and extremely expensive.

To further prevent either from happening, you need trust. In this case, the accustomed solution with traditional currency would be to transact through a central, neutral arbiter such as a bank. Bitcoin has made that unnecessary, however. (It is probably no coincidence that Nakamoto's original description was published in October 2008, when trust in banks was at a multigenerational low.) Rather than having a reliable authority to keep the ledger and preside over the network, the Bitcoin network is decentralized. Everyone keeps an eye on everyone else.

No one needs to know or trust anyone in particular in order for the system to operate correctly. Assuming everything is working as intended, the cryptographic protocols ensure that each block of transactions is bolted onto the last in a long, transparent, and immutable chain.

Mining

The process that maintains this trustless public ledger is known as mining. Undergirding the network of Bitcoin users who trade the cryptocurrency among themselves is a network of miners who record these transactions on the blockchain.

Recording a string of transactions is trivial for a modern computer, but mining is difficult because Bitcoin's software makes the process artificially time-

transaction in the blockchain and pile so many trivial transactions on top of it that untangling the fraud would become impossible.

By the same token, it would be easy to insert fraudulent transactions into past blocks. The network would become a sprawling, spammy mess of competing ledgers, and Bitcoin would be worthless.

Combining "proof of work" with other cryptographic techniques was Nakamoto's breakthrough. Bitcoin's software adjusts the difficulty miners face in order to limit the network to a new 1-megabyte block of transactions every 10 minutes. That way, the volume of transactions is digestible. The network has time to vet the new block and the ledger that precedes it, and everyone can reach a consensus about the status quo. Miners do not work to verify transactions by adding blocks to the distributed ledger purely out of a desire to see the Bitcoin network run smoothly; they are compensated for their work as well. We'll take a closer look at mining compensation below.

Halving

As previously mentioned, miners are rewarded with Bitcoin for verifying blocks of transactions. This reward is cut in half every 210,000 blocks mined, or, about every four years. This event is called the halving or "the halvening." The system is built-in as a deflationary one for the rate at which new Bitcoin is released into circulation.

This process is designed so that rewards for Bitcoin mining will continue until about 2140. When all Bitcoin is mined from the code and all halvings are finished, the miners will remain incentivized by fees that they will charge network users. The hope is that healthy competition will keep fees low.

This system drives up Bitcoin's stock-to-flow ratio and lowers its inflation until it is eventually zero. After the third halving that took place on May 11, 2020, the reward for each block mined became 6.25 bitcoins.

Here is a slightly more technical description of how mining works: The network of miners, who are scattered across the globe and not bound to each other by personal or professional ties, receives the latest batch of transaction data. They run the data through a cryptographic algorithm that generates a "hash"—a string of numbers and letters that verifies the information's validity but does not reveal the information itself. (In reality, this ideal vision of decentralized mining is no longer accurate, with industrial-scale mining farms and powerful mining pools forming an oligopoly. More on that below.)

Given the hash 00000000000000000c2c4d562265f272bd55d64f1a7c22ffeb66e15e826ca30, you cannot know what transactions the relevant block (#480504) contains. You can, however, take a bunch of data purporting to be block #480504 and make sure that it hasn't been subject to any tampering. If one number were out of place, no matter how insignificant, the data would generate a totally different hash. For example, if you were to run the Declaration of Independence through a hash calculator, you might get 839f561caa4b466c84e2b4809afe116c76a465ce5da68c3370f5c36bd3f67350. Delete the period after the words "submitted to a candid world," though, and you get 800790e4fd445ca4c5e3092f9884cdcd4cf536f735ca958b93f60f82f23f97c4. This is a completely different hash, although you've only changed one character in the original text.

A hash allows the Bitcoin network to instantly check the validity of a block. It would be incredibly time-consuming to comb through the entire ledger to make sure that the person mining the most recent batch of transactions hasn't tried anything funny. Instead, the previous block's hash appears within the new block. If the most minute detail had been altered in the previous block, that hash would change. Even if the alteration was 20,000 blocks back in the chain, that block's hash would set off a cascade of new hashes and tip off the network.

computing power, pass off fraudulent transactions a few blocks back in the chain. So the Bitcoin protocol requires proof of work.

It does so by throwing miners a curveball: Their hash must be below a certain target. That's why block #480504's hash starts with a long string of zeroes. It's tiny. Because every string of data will generate one and only one hash, the quest for a sufficiently small one involves adding nonces ("numbers used once") to the end of the data. So, a miner will run [thedata]. If the hash is too big, she will try again. [thedata]1. Still too big. [thedata]2.
Finally, [thedata]93452 yields her a hash beginning with the requisite number of zeroes.

The mined block will be broadcast to the network to receive confirmations, which take another hour or so, although occasionally much longer, to process. (Again, this description is simplified. Blocks are not hashed in their entirety but broken up into more efficient structures called Merkle trees.)

(Minutes, 7-day average)

of one new block every 10 minutes. As of November 2021, the current difficulty is around 22.465 trillion, up from 1 in 2009. As this suggests, it has become significantly more difficult to mine Bitcoin since the cryptocurrency launched a decade ago.[4]

Mining is intensive, requiring big, expensive rigs and a lot of electricity to power them. And it's competitive. There's no telling what nonce will work, so the goal is to plow through them as quickly as possible.

Early on, miners recognized that they could improve their chances of success by combining into mining pools, sharing computing power, and divvying the rewards up among themselves. Even when multiple miners split these rewards, there is still ample incentive to pursue them. Every time a new block is mined, the successful miner receives a bunch of newly created bitcoins. At first, it was 50, but then it halved to 25, and then it became 12.5. The fourth halving in bitcoin's history occurred on May 11, 2020, and now the reward is set at 6.25.

mined, and miners will depend solely on fees to maintain the network. When Bitcoin was launched, it was planned that the total supply of the cryptocurrency would be 21 million tokens. [5]

The fact that miners have organized themselves into pools worries some. If a pool exceeds 50% of the network's mining power, its members could potentially spend coins, reverse the transactions, and spend them again. They could also block others' transactions. Simply put, this pool of miners would have the power to overwhelm the distributed nature of the system, verifying fraudulent transactions by virtue of the majority power it would hold.

That could spell the end of Bitcoin, but even a so-called 51% attack would probably not enable the bad actors to reverse old transactions because the proof of work requirement makes that process so labor-intensive. To go back and alter the blockchain, a pool would need to control such a large majority of the network that it would probably be pointless. When you control the whole currency, with whom can you trade?

A 51% attack is a financially suicidal proposition from the miners' perspective. When GHash.io, a mining pool, reached 51% of the network's computing power in 2014, it voluntarily promised to not exceed 39.99% of the Bitcoin hash rate in order to maintain confidence in the cryptocurrency's value. Other actors, such as governments, might find the idea of such an attack interesting, though. But again, the sheer size of Bitcoin's network would make this overwhelmingly expensive, even for a world power.

Another source of concern related to miners is the practical tendency to concentrate in parts of the world where electricity is cheap, such as China, or, following a Chinese crackdown in early 2018, Quebec. Bitcoin mining consumes massive amounts of electricity, and this has led some governments to curtail access to power or designate special rates for Bitcoin miners. This, coupled with the Chinese government's repeated attempts to crack down on mining systems located in that country, has led to a dispersion of miners across the globe. As of

Bitcoin Transactions

For most individuals participating in the Bitcoin network, the ins and outs of the blockchain, hash rates, and mining are not particularly relevant. Outside of the mining community, Bitcoin owners usually purchase their cryptocurrency supply through a Bitcoin exchange. These are online platforms that facilitate transactions of Bitcoin and, often, other digital currencies.

> **Important:** El Salvador made Bitcoin legal tender on June 9, 2021. It is the first country to do so. The cryptocurrency can be used for any transaction where the business can accept it. The U.S. dollar continues to be El Salvador's primary currency.[7]

Bitcoin exchanges such as Coinbase bring together market participants from around the world to buy and sell cryptocurrencies. These exchanges have been both increasingly popular (as Bitcoin's popularity itself has grown in recent years) and fraught with regulatory, legal, and security challenges. With governments around the world viewing cryptocurrencies in various ways—as currency, as an asset class, or any number of other classifications—the regulations governing the buying and selling of bitcoins are complex and constantly shifting.

Perhaps even more important for Bitcoin exchange participants than the threat of changing regulatory oversight, however, is that of theft and other criminal activity. Although the Bitcoin network itself has largely been secure throughout its history, individual exchanges are not necessarily the same. Many thefts have targeted high-profile cryptocurrency exchanges, often resulting in the loss of millions of dollars worth of tokens.

The most famous exchange theft is likely from Mt. Gox, which dominated the Bitcoin transaction space up through 2014. Early in that year, the platform announced the probable theft of roughly 850,000 BTC worth close to $450 million at the time.[8] Mt. Gox filed for bankruptcy and shuttered its doors;[9] to

Keys and Wallets

For these reasons, it's understandable that Bitcoin traders and owners will want to take any possible security measures to protect their holdings. To do so, they utilize keys and wallets.

Bitcoin ownership essentially boils down to two numbers, a public key and a private key. A rough analogy is a username (public key) and a password (private key). A hash of the public key called an address is the one displayed on the blockchain. Using the hash provides an extra layer of security.

To receive bitcoins, it's enough for the sender to know your address. The public key is derived from the private key, which you need to send bitcoins to another address. The system makes it easy to receive money but requires verification of identity to send it.

To access bitcoins, you use a wallet, which is a set of keys. These can take different forms, from third-party web applications offering insurance and debit cards, to QR codes printed on pieces of paper. The most important distinction is between "hot" wallets, which are connected to the internet and therefore vulnerable to hacking, and "cold" wallets, which are not connected to the internet.

In the Mt. Gox case above, it is believed that most of the BTC stolen were taken from a hot wallet. Still, many users entrust their private keys to cryptocurrency exchanges, which is essentially a bet that those exchanges will have stronger defenses against the possibility of theft than one's own computer would.

The Bottom Line

Bitcoin, the digital currency and payment network, is actually software and a purely digital phenomenon—a set of protocols and processes. The main component of Bitcoin is blockchain, a series of digital blocks that are linked together as a list and maintain records of all transactions occurring in its

transactions.

The Bitcoin network is undergirded by mining operations that confirm and process transactions. Miners receive bitcoin as a reward for their effort, and the number of bitcoin awarded to miners is halved every four years in an event known as halving or halvening.

Cryptocurrency exchanges are also important to making Bitcoin work because they enable ordinary users to purchase or trade bitcoins, thereby increasing the number of transactions on its network. Finally, cryptographic keys and wallets are necessary to access and store bitcoin.

How does Bitcoin work?

The most important element to making Bitcoin work is its blockchain—a series of linked blocks that store a record of all transactions conducted in its network. Other important elements of Bitcoin include cryptographic keys and wallets that are essential for access to the cryptocurrency and processes like halving that induce inflation into its network by reducing the number of bitcoin in existence.

How does blockchain make Bitcoin trustless?

Bitcoin's blockchain is a distributed ledger, a series of linked blocks containing transaction records, that is undergirded by complex mining processes to ensure the integrity of transactions. The blockchain is public, meaning anyone can view transactions occurring on it. In this way, in Bitcoin's blockchain, everyone keeps an eye on everyone else, making it extremely difficult for fraud to occur unless there is large-scale collusion between transacting parties.

How does hashing ensure validity of a block?

A hash enables the Bitcoin network to instantly ascertain the validity of a block by checking for the previous block's hash in a new block. The hash must be below a certain target, making it difficult and time-consuming for bad actors to

How are keys and wallets used in Bitcoin?

There are two types of keys in Bitcoin. A public key is used to identify an address on a blockchain and can be likened to a username. A private key is used to access your bitcoin and can be likened to a password that must not be shared with anyone. A wallet is a set of keys and can take on various forms such as QR codes. There are two types of wallets. A hot wallet is connected to the internet, while a cold wallet is not connected to any network.

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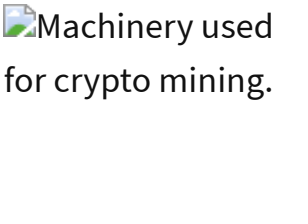
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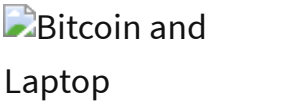


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What Happens to Bitcoin After All 21 Million Are Mined?

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Is Bitcoin Mining Still Profitable?

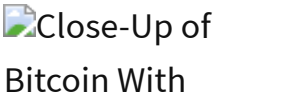


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Bitcoin vs. Bitcoin Cash: What Is the Difference?

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Bitcoin Years Later: Was the Nakamoto White Paper Right?



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Bitcoin Mining

Breaking down everything you need to know about Bitcoin mining, from blockchain and block rewards to proof of work and mining pools. more

What Is ZCash (ZEC)?

ZCash (ZEC) is a decentralized and anonymous payment system. It is an enhanced, transaction-shielded fork of Bitcoin. more

Blockchain Explained

A blockchain is a digitally distributed, decentralized, public ledger that exists across a network. It is most noteworthy in its use with cryptocurrencies and NFTs. more

What Is Double-Spending in a Blockchain?

Double-spending is a potential flaw in cryptocurrency systems that refers to the possibility of a digital currency being spent more than once. more

DigiByte (DGB)

DigiByte (DGB) is a blockchain platform and cryptocurrency. The DigiByte platform processes transactions quickly and uses multiple types of proof of work. more

Bitcoin Definition: How Does Bitcoin Work?

Bitcoin is a digital or virtual currency created in 2009 that uses peer-to-peer technology to facilitate instant payments. more



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Nevada Blockchain Legislation Status

Nevada Cryptocurrency Laws

Regulation of Digital Currencies: Cryptocurrency, Bitcoins, Blockchain Technology

Proposed Laws & Regulations

Nevada's Money Transmitter Act does not explicitly include "virtual currencies" or "monetary value" and the State's Department of Business and Industry has not published guidance on virtual currency regulations.

Two bills adopted in June 2019 seeking to define “virtual currency” in different existing laws. A.B. 15 adds provisions governing crimes related to certain financial transactions to include “virtual currency” in the definition of a monetary instrument, which would make it unlawful for a person to conduct a financial transaction using virtual currency if it is derived from any unlawful activity.

Enacted Laws & Regulations

Nevada became the first state to ban local governments from taxing blockchain use when it enacted Senate Bill No. 398, which established various provisions relating to the use of blockchain technology. Signed in June of 2017, SB 398 defines blockchain as “an electronic record, transaction, or piece of data which is uniformly ordered, redundantly maintained or processed by multiple computers, and validated by the use of cryptography.” With respect to the collection of sales and use tax, state law, N.R.S. 372.764-54 asserts that a person is a “marketplace facilitator” if that person provides, “a virtual currency that buyers are allowed or required to use to purchase tangible personal property.”

Nevada’s 162
Signed by governor 6/7/19, Chapter 474

Relates to electronic transactions; includes a public blockchain as a type of electronic record for the purposes of the Uniform Electronic Transactions Act; provides that a person who uses a public blockchain to secure information does not relinquish any right of ownership related to that information; requires a governmental agency to accept a certified copy of a record in electronic form under certain circumstances; authorizes the secretary of state to adopt regulations specifying attributes required for a certified copy of a record in electronic form; prohibits a local government from taxing or imposing restrictions upon the use of a public blockchain; and provides other matters properly relating thereto.

Nevada’s 163
Signed by governor 6/7/19, Chapter 475

Relates to business entities; revises the definition of “electronic transmission” as it relates to certain communications of certain business entities to include the use of a blockchain or public blockchain; authorizes certain business entities to store certain records on a blockchain or public blockchain; revises provisions authorizing the secretary of state to adopt regulations to define certain terms to allow certain business entities to carry out their powers and duties using the most recent technology available to include the use of blockchains or public blockchains; and provides other matters properly relating thereto. Nevada’s 488Relates to technology; creates the Emerging Technologies Task Force within the Department of Business and Industry; prescribes the membership of the Task Force; sets forth the powers and duties of the

Task Force; authorizes the director of the Department of Business and Industry to create an Opportunity Center for Emerging Technology Businesses as part of the Office of Business Finance and Planning; and provides other matters properly relating thereto.

Laws & Regulations Not Passed

Senate Bill 195 would have established a Uniform Regulation of Virtual Currency Businesses Act and the Uniform Supplemental Commercial Law for the Uniform Regulation of Virtual-Currency Businesses Act, however, it failed to pass in June of 2019.

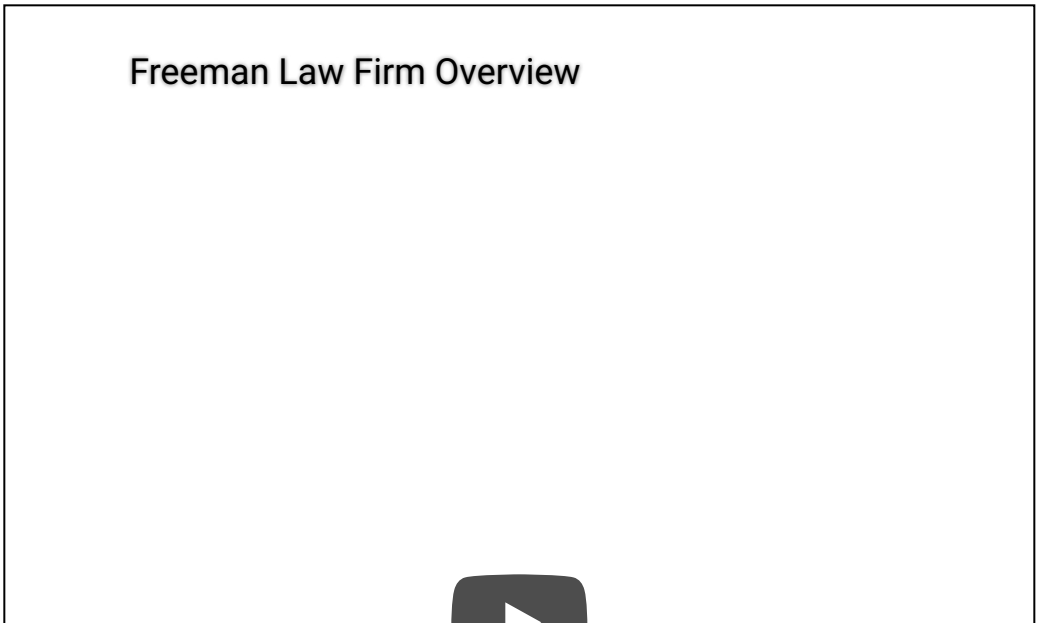
Blockchain Information & Resources:

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- Blockchain Attacks: Is No One Safe in the World of Cryptocurrencies?
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- Digital Currency Transmission Laws and Regulations by State
- Hard and Soft Forks: A Detailed and Simplified Explanation of How Blockchains Evolved
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See More Information on Blockchain

Is cryptocurrency legal in Nevada?

Do you have Cryptocurrency or Blockchain Issues or questions?
Freeman Law is dedicated to staying at the forefront as these emerging technologies continue to revolutionize social and economic activities. Contact Freeman Law to Schedule a consultation or call (214) 984-3410 to discuss your cryptocurrency and blockchain technology concerns.



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Vermont Blockchain Legislation Status

In the state of Vermont, cryptocurrency is legally categorized as property instead of currency. Under the Vermont Money Services Act (VMSA), “virtual currency” is defined as a digital representation of value that: (1) can act as a medium of exchange, a unit of account, or a store of value; (2) has an equivalent value in money or acts as a substitute for money; (3) may be centralized or decentralized; and (4) can be exchanged for money or other convertible virtual currency. Presumably, cryptocurrency tokens that satisfy these requirements will be within the scope of the VMSA’s statutory definition of “virtual currency.” In contrast, “money” is defined as a medium of exchange authorized or adopted by the United States or a foreign government. Presumably, cryptocurrency is not outside the legal definition of money under the VMSA because the United States government does not adopt it.

Furthermore, the VMSA directly lists cryptocurrency as a permissible investment under Vermont law. Specifically, the VMSA holds that “virtual currency owned by the licensee is permissible to the extent of outstanding transmission obligations received by the licensee in the

identical denomination of virtual currency." Accordingly, citizens of Vermont are legally authorized to invest in cryptocurrency under the perspective of the state government.

Although the statutory definition notes that virtual currency can be a substitute for money, cryptocurrency failed to satisfy the technical definition of money under the VMSA at the time the amendments were passed because, during its legislative process, no country authorized or adopted cryptocurrency. However, the VMSA must be revisited because a foreign country recently adopted cryptocurrency. In 2021, El Salvador's Congress approved a proposal to make it the first country worldwide to adopt bitcoin as legal tender. Consequently, there is an argument that virtual currency should now be recognized as money under the VMSA because a foreign government adopted it as legal tender. Since a country has now authorized and adopted bitcoin, cryptocurrency may now be considered currency under the statutory definition of the VMSA.

Regardless, legislative action will need to be taken by Vermont's legislators before cryptocurrency can officially be recognized as money under state law. Until then, there will be legal ambiguity as to whether cryptocurrency satisfies the statutory definition of money since Bitcoin is now considered legal tender in El Salvador. Despite being adopted by the national government of El Salvador, cryptocurrency will remain classified as property rather than money until the state legislature of Vermont addresses this issue through new legislation.

Vermont – BBLLCs

On May 30, 2018, the government of Vermont enacted Senate Bill 269 (SB 269). The short title of SB 269 is "An Act Related to Blockchain Business Development." SB 269 became effective law on July 1, 2018. The Act aims to stimulate economic development in Vermont by promoting the adoption of blockchain technology. Specifically, the government of Vermont intends to attract blockchain companies to move to the state by providing a favorable legal environment. According to Vermont's governor, Phil Scott, the law aims to create new jobs and spur economic innovation by encouraging blockchain businesses to move to the state of Vermont.

The Act is designed to promote cryptocurrency and its underlying technology, known as the blockchain. Several Vermont legislators recognize the benefits of blockchain technology because the decentralized verification ability of blockchain provides excellent security since the online ledger is immutable. In other words, the blockchain is presumably secure because once a transaction has been entered on the blockchain, it cannot be reversed or altered. According to state legislators, blockchain's security benefits offer widespread opportunities for applying blockchain in many contexts other than just cryptocurrencies. If this hypothesis is correct, cryptocurrency may eventually permeate several industries as the novel technology becomes mainstream in commercial markets.

The Advancement of Blockchain Technology

To illustrate how blockchain could eventually permeate into other industries, one publication notes that blockchain can address issues in the healthcare industry. For example, the Health Law Handbook proposes that blockchain can improve the healthcare industry by increasing health data security, privacy, and interoperability. In other words, there is a reasonable argument that blockchain can make the health care industry more secure, more private, and more efficient by making healthcare software more interchangeable and easier to use.

Due to the benefits that blockchain offers beyond the realm of cryptocurrency, the state of Vermont is zealously advocating blockchain enterprises to operate from Vermont. To attract these companies, the Act authorizes entities to be authorized as blockchain-based limited liability companies (BBLLCs). Under the Act, limited liability companies are permitted to be designated as BBLLCs as long as they: (1) specifically elect to function as BBLLCs in their articles of organization, and (2) satisfy specific legislative requirements. Under the Act, BBLLC's are authorized to customize their governance structures by utilizing blockchain technology. In addition, BBLLCs are permitted to implement any reasonable algorithm to validate records, requirements, processes, and procedures for conducting its operation. Consequently, BBLLCs provide a legal avenue for companies to integrate blockchain into their business models and may contribute to the emergence of cryptocurrency technology outside of the fin-tech industry.

To legally operate as a BBLLC, companies must comply with SB 269's registration requirements. The elective requirements concern formation, operating agreements, roles of members and managers, governance, and relationship to other laws. First, entities applying for BBLLC status must state in their articles of organization that it has elected to become a BBLLC. Second, its operating agreement must include a summary of its mission and purpose.

Third, the operating agreement must outline the company policies for access and permission protocols, including: (1) whether the BBLLC's blockchain will be fully or partially decentralized or fully or partially public or private; (2) the extent of a participant's access to information and read and write permissions; (3) how the BBLLC will respond to system security breaches or other unauthorized actions affecting the blockchain technology's integrity; and (4) the rights and obligations of each participant group within the BBLLC. Finally, the operating agreement must set forth voting procedures.

In addition, one reasonable presumption is that state legislators aim to incentivize blockchain companies to operate within Vermont's borders by providing a favorable tax regime for cryptocurrency-affiliated companies. Under Vermont's current legal framework, BBLLCs are taxed similarly to regular LLCs. According to the text of the Act, "this subchapter does not

exempt a BBLLC from any other judicial, statutory, or regulatory provision of Vermont law or federal law . . . Except to the extent inconsistent with the provisions of this subchapter, the provisions of the Vermont Limited Liability Company Act govern."

Accordingly, BBLLCs are taxed as partnerships under the state laws of Vermont law and under the federal rules of the Internal Revenue Code. However, BBLLCs are permitted to be taxed as corporations instead of partnerships under both the IRC and Vermont law if they elect to be taxed as a corporation by "checking the box." If they do not elect to be taxed as a corporation, then the BBLLC's taxes flow to its partners, and income will be apportioned at the partner level for income tax purposes.

Partnership or Corporate Tax

The decision to be taxed as a partnership or as a corporation is significant because it will determine whether or not taxes will pass through to individual shareholders. Generally, corporations are subject to corporate income taxes. In contrast, S corporations, LLCs, and partnerships are generally subject to state personal income taxes because they are pass-through entities. Pass-through entities, also known as flow-through entities, are legal business entities that do not pay corporate taxes because they pass all taxable income to owners, shareholders, and investors. In contrast, corporations are not pass-through entities because both the corporation and individual shareholders must pay taxes on income generated by a BBLLC. Assuming that a BBLLC wants to avoid double taxation, companies can limit their tax liability by electing to be taxed as a partnership rather than a corporation.

Vermont Corporation Tax

In Vermont, pass-through entities are especially appealing because the state has one of the highest corporate tax rates nationwide. Specifically, corporations in Vermont are taxed at a maximum marginal rate of 8.5%. In contrast, Vermont's personal income tax rate can be as low as 3.55%. Accordingly, BBLLCs can reduce their tax liability by half as long as they elect to be taxed as a partnership instead of a corporation. Therefore, companies in Vermont are incentivized to organize their entity as a pass-through entity, which includes: (1) S-Corporations, (2) LLCs, including BBLLCs, and (3) Partnerships. By allowing blockchain companies to enlist as pass-through entities by organizing as BBLLCs, the government of Vermont intends to incentivize cryptocurrency companies to organize within the state by providing a favorable tax framework for blockchain entrepreneurs.

Nexus Tax

However, one issue raised under the new Legislation is whether the Act presents any nexus issues with out-of-state members of BBLLCs. Specifically, the Act announces that members or managers who interact with BBLLCs through several roles are not deemed to occur in Vermont because the BBLLC is organized within the state. Consequently, out-of-state members may have to pay Vermont taxes and other state taxes when their income is passed through to their respective personal income taxes, depending on where their business activities occurred. Indeed, the tax framework for multistate businesses, including what constitutes a nexus with a state for the purpose of various taxes, is highly complicated. Therefore, out-of-state members in Vermont BBLLCs should consult with tax professionals to ensure that taxes are correctly filed.

Blockchain Resources:

- Anti-Collusion I What Is Obfuscation?
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- Digital Currency Transmission Laws and Regulations by State
- Hard and Soft Forks: A Detailed and Simplified Explanation of How Blockchains Evolved
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Wyoming's Digital Assets Law and How to Use it

USA | January 18 2022

I. Executive Summary

Wyoming, a northwestern U.S. state with a population of approximately 580,000, the smallest among U.S. states, has since 2019 become a cryptocurrency and digital assets paradise, leading the way among all U.S. jurisdictions in providing a clear - and advantageous – legal, regulatory, tax and investor privacy regime for investment vehicles focused on digital assets, including non-fungible tokens ("NFTs"), cryptocurrencies, digital certificates and other similar asset classes. While the U.S. Securities and Exchange Commission ("SEC") is still developing its treatment of digital assets that are securities ("Digital Asset Securities"), and the Commodities Futures Trading Commission ("CFTC") is doing the same for digital assets that may be treated as commodities, we expect the existing securities regime to generally apply to Digital Asset Securities. That framework assumed, Wyoming has developed a really advantageous and cutting-edge regime for investment in digital assets. This advisory will first review Wyoming's attributes as a jurisdiction to base a corporation, limited partnership ("LP") or limited liability company ("LLC"), and then review Wyoming's unique (in the United States) attributes for investments and investment vehicles focused on digital assets and cryptocurrency.

II. Wyoming as a Jurisdiction

We reported briefly on Wyoming's attractiveness as a fund and trust domicile in our recent "Special Purpose Vehicles ("SPVs"): Uses and Abuses," available at available at Kurtin PLLC Whitepapers and Advisories. Wyoming is one of several U.S. states with no income tax (the others are Alaska, Florida, Nevada, New Hampshire, South Dakota (itself become a favorite trust domicile for U.S. and non-U.S. investors by reason of its highly protective privacy laws), Tennessee and Texas. Wyoming also offers several other attractive outside investor attributes irrespective of whether digital assets are the object of the business to be formed:

- Wyoming corporations, LPs and LLCs can be formed online, from anywhere else within or outside the U.S., using a Wyoming registered agent and then liberally structured in their charter documents to optimize their structure for investor, investment asset, tax, accounting, governance and other business objectives.
- Wyoming corporations, LPs and LLCs can be formed, owned and managed by natural and legal (i.e. companies) citizens of other states and other countries, with limited liability protection for equity holders: a corporation's shareholders, an LP's limited partners and an LLC's members.
- Wyoming corporations, LPs and LLCs can be vertically and horizontally "chained" - affiliated – with other corporations, LPs and LLCs, whether from Wyoming, other U.S. jurisdictions or offshore jurisdictions, and have governing organizations domiciled in other jurisdictions, onshore or offshore. For example, a Wyoming LP could have a Delaware LLC as its required general partner (or a Wyoming LLC could have a Delaware LLC as its managing member) to preserve Wyoming advantages while taking advantage of Delaware's highly developed statutory scheme and jurisprudential interpretation of that scheme for company governance certainty and the potential attractiveness of that certainty for investors; and also have a British Virgin Islands

("BVI") or Cayman Islands or other offshore jurisdiction company as its parent, with tax, accounting and further privacy advantages for investors, both onshore and offshore.

- Wyoming LPs and LLCs can be formed, including as trusts, without any public record disclosing settler or beneficiary. Wyoming also permits trusts with generation-skipping transfer taxes and "self-settled" trusts (trusts formed by a person who also becomes the trust beneficiary).

What makes Wyoming unique among U.S. states so far, however, is its leading 2019 and 2021 laws enabling, facilitating and governing treatment of blockchain and digital assets, including cryptocurrencies, non-fungible tokens (NFTs) and other digital assets.\

III. Wyoming's Digital Asset Laws

In 2019, Wyoming became the first state to enact blockchain-enabling legislation and to establish the treatment of digital assets such as cryptocurrencies and non-fungible tokens ("NFTs") as intangible property under Article 9 of the Uniform Commercial Code ("UCC"), which is enacted in all states and the District of Columbia. The 2019 Wyoming Digital Asset Statute (W.S. 34-29-101 et seq.), as amended in 2021, defines a digital asset as "a representation of economic, proprietary or access rights that is stored in a computer readable format and is either a digital consumer asset, digital security or virtual currency." In so doing, Wyoming has recognized digital assets as property – general intangible property – within the general Wyoming scheme of property rights, property protection and enforcement, sale, lease, licensing, assignment and any other disposition of property available to other forms of intangible property. The 2019 Act makes digital assets property subject to the UCC in which a security interest can be perfected, opposable in all U.S. jurisdictions.

The 2019 Act further makes provision for use of "smart contracts" by secured parties in digital assets, algorithm or other code-controlled automated transactions, including transferring and taking proprietary control of a digital asset.

The 2019 Act further establishes an opt-in framework for bank custodial services for digital assets and a jurisdictional framework of Wyoming courts over digital asset disputes. The opt-in for bank custodial services enables use of Wyoming SPVs as investment fund vehicles holding blockchain digital assets, NFTs and cryptocurrency as fund assets, in which investors within and without Wyoming can invest. Anti-money laundering, accountant and audit provisions are also included.

The 2019 Act provides for a Wyoming bank providing custodial services to enter into an agreement with its customer as to the nature of its custodial arrangement: (i) whether the custody is a bailment, whether of a fungible or non-fungible digital asset, in which case the bank must strictly segregate the digital asset from other assets; or (ii) a statutory bailment authorizing the bank to enter into transactions with the digital asset based on customer instructions. Further, the bank and its customer must agree in writing specifying the source code version the bank will use for each digital asset and each digital asset's treatment under the UCC, with any ambiguity to be resolved in favor of the customer. Various notice requirements on behalf of the bank to its customer are also included. Finally, the 2019 Act authorizes each bank opting in to digital asset custodial services to operate a trust department to perform those services.

The 2021 Amendment clarified aspects of perfection of security interests in digital assets, making clear, among other things, that perfection of security interests may be achieved by control of the digital asset.

IV. How to Use the Wyoming Laws

To put all this together, an investment fund of whatever kind can form a Wyoming SPV, whether a corporation (perhaps to serve as an onshore blocking entity, since Wyoming has no income tax), an LP or an LLC, and create a fund vehicle to buy and hold digital assets of whatever kind, whether cryptocurrency, digital certificates, or fungible or non-fungible tokens, and engage a Wyoming bank to perform custodial and/or brokerage services typically needed by such a fund. The Wyoming SPV formed as the investment vehicle can be a standalone entity or chained to a hierarchy of onshore and/or offshore entities; in either case, it, its owners and its investors will benefit from leading edge privacy. The enacted bank regulations and court jurisdiction give a regulatory and enforcement framework for running the investment vehicle and fund with certainty and security.

Until other U.S. jurisdictions catch up, for anyone seeking to form an investment fund or vehicle to buy, hold, trade or sell digital assets, including cryptocurrency, Wyoming has to be a very favored choice and destination.

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