Washington Blockchain Work Group - Report Deliverable on Blockchain

Tuesday, June 11, 2024

Dear Honorable Members of the Washington State Legislature:

In accordance with Senate Bill 5544, the Washington Blockchain Work Group hereby submits its report on the potential uses and impacts of blockchain, including impacts on existing industries, utilities, demand for electricity, and demand for computer processing capacity and recommended policies that facilitate the development of blockchain applications in Washington for consideration by the Washington State Legislature.

Respectfully submitted,

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Executive Summary

Background

Blockchain technology has garnered interest from a wide variety of people, extending beyond its original proponents in the tech and cryptocurrency communities. The concepts of decentralized control, reduced governance layers, individual data sovereignty, and enhanced privacy appeal to those who favor less centralized authority and greater personal empowerment. Recently, the applications of blockchain technology have proliferated in both the public and private sectors, particularly where regulatory compliance is a key to success. Washington state, with its vibrant ecosystem of both large and small innovative tech firms, coupled with a politically progressive electorate and leadership, is ideally positioned to explore the convergence of blockchain technology and its potential uses within the public and private sectors.

Senate Bill 5544, the Washington state blockchain work group bill, commissioned a report with legislative recommendations on ways blockchain and blockchain-related technologies could be advantageous to the state and our residents. However, due to budget and timing issues, the legislative mandate establishing the blockchain work group expired before it could even begin, on December 31, 2023.

The Department of Commerce filled the Information and Communications Technology (ICT) sector lead position in November 2023. With this critical role filled, the Legislature agreed to extend the deadline for the report deliverable to summer 2024. Since then:

- The report deliverable team first met on January 18, 2024.
- The report outline was created, reviewed, and finalized by March 8, 2024.
- The report was finalized June 2024.

In the report that follows, the work group for the report (the “Work Group”) presents an introduction, a frequently asked questions section (in the appendix), the uses and impacts for blockchain, and recommended policies to the Washington State Legislature.

The objective of this report is to fulfill the requirements outlined in ESB 5544, which involves evaluating the blockchain environment in Washington state, establishing clear definitions for essential terms, showcasing present and prospective applications, and offering policy suggestions.

Washington Background

Washington state has a longstanding reputation as a global hub for innovation. As the birthplace of many of the tech sector’s iconic companies, its entrepreneurial culture coupled with world class educational institutions and workforce serves as a natural incubator for emerging technologies. There are more than 18,000 technology sector companies in Washington and

over 360,000 people are employed in technology related jobs statewide. This ecosystem is further supported by a diverse community of professionals and other service providers. With this robust ecosystem, Washington is at the forefront of the next generation of technological advancements, with innovation and experimentation in quantum computing, web3, artificial intelligence, and blockchain. In recognition of the importance of this sector, the Washington State Legislature has been supportive of advancing policy to support adoption, commercialization, and regulation of emerging technology, particularly around blockchain.

A brief history of policy and regulatory efforts:

- In 2019, the Washington State Legislature adopted ESSB 5638, the **Validity of Distributed Ledger and Blockchain Technology**. This codified the definitions of blockchain and distributed technology by statute — RCW 1.80.010. ESSB 5638: “An electronic record may not be denied legal effect, validity, or enforceability solely because it is generated and or used distributed ledger technology.”
- In 2020, **Uniform Electronic Transactions Act (UETA)** was established by ESSB 6028 which adopted the Uniform Law Commission (ULC) standards for accepting digital signatures. Guidance from the ULC in 2019 explains that UETA provisions adequately encompass signatures secured by blockchain technology and smart contracts.
- In April 2021, Washington’s Department of Financial Institutions (DFI) created and launched the **Center for FinTech Information (CFI)** in response to conversations with the community looking for more support.
- In 2022, the Washington Department of Commerce through the Innovation Cluster Accelerator Program established the **WTIA Advanced Technology Cluster,** focusing on AI, Blockchain and Quantum Computing. The Cluster model is an economic development methodology that convenes startups, enterprises, academia, investors, and government to grow an industry sector.
- In 2022, SB5544 established the creation of the **Washington Blockchain Work Group** to begin work and deliver a report by December 31, 2023.

Introduction

Introduction to the topic

More definitions, information and Frequently Asked Questions (FAQs) are included in the Appendix section of this report.

A brief background on terminology

In discussions about blockchain and cryptocurrency, various terms are often used interchangeably, causing confusion among technologists, lawmakers, and the general public. For instance, "cryptocurrency" or "crypto assets" are broad terms frequently applied to any

asset transferred via blockchain or DLT (distributed ledger technology). However, these terms encompass a wide array of assets with significant differences.

“Blockchain” is used in this report to broadly cover all such blockchain, blockchain-based, and DLT used. However, in simplest terms, not all blockchains are the same.

Additionally, to clarify, "native cryptocurrency" or "intrinsic cryptocurrency" refers to digital currencies that are integral to their blockchain's functioning. Bitcoin and Ether are prime examples; Bitcoin not only facilitates transactions but also secures its network through its proof-of-work mechanism.

"Stablecoins" represent another category of cryptocurrency, designed to maintain a stable value against a specific asset, helping to mitigate price volatility. These come in various forms, each with unique mechanisms and contractual agreements.

Another term, "token," typically describes assets that operate on a secondary layer of a blockchain, often enabled by smart contracts. A specific category within this is the Non-Fungible Token (NFT), which is unique and distinguishable from other tokens of its kind.

While this report uses "digital asset" to broadly cover all such digital assets, including both intrinsic cryptocurrencies and tokens, it specifies particular classes or individual cryptocurrencies when more precise recommendations are necessary. This approach aims to enhance clarity and understanding among stakeholders.

There is a small glossary of additional terms that may be helpful in the Appendix.

What is blockchain?

In 2009, the creation of Bitcoin’s first block, known as the genesis block, marked the beginning of modern blockchain technology. Introduced by an individual or group under the pseudonym Satoshi Nakamoto, blockchain functions as a decentralized digital ledger that records transactions across a network of computers. Its innovative design ensures that altering past records would require an immense computational effort, safeguarding the integrity of the data stored within the blockchain. Blockchain technology provides an effective solution to the long-standing “double-spending” problem, where digital transactions could be fraudulently duplicated or falsely claimed.

Blockchain is a sub-set of a broader category known as distributed ledger technology (DLT), but it has a unique feature: it organizes data into a series of blocks linked by cryptographic hashes. This setup enables secure, peer-to-peer transactions without the need for an intermediary, preventing the unauthorized creation of new records.

Blockchain operates on rules that enable networked computers to track changes in data and collectively agree on the validity of transactions without the need for centralized control. Two common consensus mechanisms used in blockchain networks are proof-of-work and proof-of-

stake. In proof-of-work, participants validate transactions by solving complex cryptographic puzzles, demonstrating their computational effort. Proof-of-stake relies on validators staking their own tokens as collateral to validate transactions, offering a more energy-efficient and potentially faster alternative to proof-of-work.

Why is this report important?

The goal of this report is to meet the intent of ESB 5544, including by providing an assessment of the blockchain landscape in Washington state, create definitional clarity on key terms, highlight current and future use cases, and provide policy recommendations.

State-level blockchain work groups play a crucial role in shaping the future of technology and commerce within their jurisdictions. By bringing together experts from various fields, including technology, law, finance, and government, these groups are able to explore the unique opportunities and challenges presented by blockchain technology. Their work is vital in developing common vernacular as well as informed regulations and policies that support innovation while protecting consumers. These groups also ensure that the state remains competitive in the rapidly evolving digital economy, attracting investments and fostering new business models that can drive economic growth. Unfortunately, Washington state's work group was not able to convene and has since expired. However, there is a very active community of academics, entrepreneurs, educators, investors, policy makers and industry players that are committed to the state's leadership in this technology — who, with the support and assistance of the Department of Commerce, have supported the writing of this report.

Other state blockchain work groups and task forces across the United States have already made significant impacts in their regions. For example, the Illinois Blockchain Initiative has explored the use of blockchain in various government processes, enhancing transparency and efficiency. Similarly, Wyoming's Blockchain Task Force has implemented pioneering blockchain regulations that have made the state a hub for blockchain businesses. Other states (not comprehensive) that have delivered similar reports include: California, North Carolina, Texas, Arizona and Kentucky (some state examples have been included in the Appendix). These examples demonstrate how proactive state-level engagement with blockchain technology can lead to substantial economic and operational benefits, positioning states as leaders in the adoption of new and transformative technologies.

Snapshot of economic impact/current ecosystem in Washington

Commissioned by an initiative of the GBBC (Global Blockchain Business Council), the U.S. Blockchain Coalition produces an annual report documenting the economic impact of Web3 state by state across the U.S. The report aims to identify the strengths and opportunities of each state's Web3 ecosystem across five dimensions. The report also seeks to highlight best practices and opportunities for collaboration within and across states to foster a thriving Web3 ecosystem that can drive economic growth, create jobs, and improve the lives of citizens. Ultimately, the goal of the report is to provide policymakers, investors, entrepreneurs, and

researchers with actionable insights that can inform their decisions and contribute to the continued development and adoption of Web3 in the U.S. The economic activity data was analyzed across five primary dimensions:

1. Startup activity
2. Incumbent activity
3. Investor activity
4. University research
5. Government funding

A complete description of the methodology and terms used can be found in the Methodology Section of the full report. Below, we share some of the key excerpts from the USBC July 2023 State of Web3 report.

Background on the impact of blockchain in Washington:

The image below is a screenshot taken from the full state by state report by the U.S. Blockchain Coalition analyzing the economic impact of Web3 across the US, we took a deeper look at the scorecard for Washington State. The report looked at Web3 related activity across give major activity categories: Startups, Investors, Incumbents, Academia and Government. It identified strengths and opportunities of each state's Weeb3 ecosystem – while also highlighting best practices and opportunities for collaboration within and across states to foster a thriving ecosystem than can drive economici growth, create jobs, and improve the lives of citizens.

The goal of the report was to provide policy makers, investors, entrepreneurs, and researchers with actionable insights that can inform their decisions and contribute to the continued development and adoption of Web3 in the United States. The data was collected and cleaned and normalized. Each feature was ranked individually, and all features within a category were averaged to get a single value between 0 (low) and 10 (high). The methodology was informed by the following:

1. Daniel Isenberg's "Domains of the Entrepreneurship Ecosystem" novel
2. "Innovation Ecosystems" by Thomas and Autio
3. MIT Sloan Heat Map (Strategically Engaging with Innovation Ecosystems)

In the report, the word "Web3" was defined by targeting several key technology areas related to Web3 technologies and industry. A term adjacency map to connected concepts around:

- Blockchain
- Distributed Ledger
- Web3
- NFT/NFT Technology/Non-Fungible Tokens
- Decentralized Finance/DeFi
- Decentralized Autonomous Organization
- Crypto
- Cryptocurrency/Bitcoin
- Digital Asset/Digital Asset Management
- Verifiable Credentials
- Decentralized Identity
- Stablecoins
- Self-Sovereign Identity
- Token
- Tokenomics
- Tokenmetrics
- Crypto Assets

Focusing in on the report for Washington state, Washington (WA) was generally noted as exceling at Enterprise applications of Web3 technologies with strong incumbents, diverse startups, and significant investment.

The median ecosystem ratings for the 2024 report are the following:

1. Startups = 5.1
2. Investment = 5.0
3. Government = 5.4
4. Academia = 4.5
5. Incumbents = 5.3

In comparison, the Washington state ecosystem ratings are the following:

1. Startups = 8.5
2. Investment = 8.6
3. Government = 6.8
4. Academia = 5.0
5. Incumbents = 7.2

WA excels in the realm of startups, investment, and incumbents. WA could do more to engage academia and government.

In terms of the detail on each of these categories:

STARTUPS

Over 239 startups among 310 companies were identified. 2 Companies have raised over $100 million, 17 Merger and Acquisition deals with the notable startups being: 1) EigenLayer founded in 2021 which raised $164 million, 2) Protego Trust Bank in 2018 which raised $104.9 million, and 3) Story Protocol in 2022 which raised $84 million. Most of the startups were founded between 2014 and 2023 – with the height of company formations being in 2017 and 2021, and the low being in 2023.

INVESTMENT

For Investment, over 61 companies with $797 million in Web3 investments were identified in WA state. Capital invested by Deal Type, early-stage venture capital had the most with $369.36 million, seed investment with $274.82, later stage venture with $66.26 million, merger and acquisitions with $30.43 million, and reverse mergers with $10.5 million. Only 7% of the investment was from in-state investors. 44% came from out of state resources, with 36% coming from international sources. 13% was tagged as unknown.

GOVERNMENT/ACADEMIA

Government/Academia had the following focus areas: group-to-group collaboration, privacy and consent management enhancement, secure and confidential identity management. Most of the funding agencies were the National Science Foundation, Department of Commerce and the Department of Homeland Security. The most active universities are the University of Washington, Washington State University and Western Washington University. The top

recipients of government funding are Wicked Co-Op, Xpress Rules, and Social Voter Labs. Over $1.6 million in SBIR/STTRs came to WA state in terms of federal funding.

ADDITIONAL ACTIVITY
In terms of other data that's captured and provided by the report, 100 job postings from several companies were highlighted: Circle, Deloitte, HTC, CashApp (Block), Amazon, Coinbase, among others. Most were identified as remote positions and for job titles like tax manager, Android/iOS software engineer, accountant, and security engineer.

For more information, please visit the U.S. Blockchain Coalition (USBC) website.

Industry SWOT Analysis

Strengths:
Washington possesses robust technological infrastructure and a vibrant community of tech-savvy entrepreneurs and innovators, making it an ideal environment for blockchain development. The presence of major technology companies, coupled with a highly educated workforce skilled in building and working with digital technologies, provides a strong foundation for blockchain initiatives. In fact, Washington is the home to some of the world's best experts in data intelligence, digital identity, cryptography, and trust frameworks. The state's progressive regulatory approach encourages experimentation and innovation in digital technologies, supporting the growth and development of blockchain applications across various sectors including finance, healthcare, and public administration.

Weaknesses:
Despite its strengths, Washington faces certain challenges that could hinder the widespread adoption of blockchain technology. One of the primary issues is a lack of widespread understanding and expertise specific to blockchain among the public and lawmakers, which can lead to resistance from traditional industries and regulatory bodies. Additionally, seemingly at the surface the energy-intensive nature of some blockchain operations, notably those requiring extensive computational power like proof-of-work systems, conflicts with Washington's strong environmental policies and its commitment to reducing energy consumption and carbon emissions.

Opportunities:
Blockchain technology offers numerous opportunities for Washington to enhance its economic and operational efficiency. By integrating blockchain into state government operations, there is potential to improve transparency, security, and efficiency in data management and transaction processing. This can lead to more trustworthy public records systems, more efficient supply chain management, and enhanced security for sensitive information. Moreover, fostering a blockchain-friendly environment could attract new businesses, investments, and startups, positioning Washington as a leader in this cutting-edge industry and creating job opportunities in high-tech sectors.

Threats:
However, the adoption of blockchain technology, if not managed appropriately, potentially presents threats to the industry as a whole. The regulatory landscape for blockchain is still evolving, and potential stringent regulations could stifle innovation and deter companies from investing in blockchain projects within the state. Additionally, the highly competitive nature of the tech industry means that other regions or states could outpace Washington in adopting and benefiting from blockchain innovations. There is also the risk of cybersecurity threats associated

with blockchain technologies and digital currencies, which could lead to significant financial and data losses if not properly managed.

Competitive comparison to other states / regions

Looking at the data which compares states across the United States in terms of the count of startups, by state, the top 10 states were identified, along with the count of startup companies, in the following order (based on the recent 2024 report):

1. California 3000
2. New York 1,780
3. Florida 854
4. Texas 673
5. Delaware 595
6. Illinois 320
7. Massachusetts 297
8. **Washington 239**
9. Wyoming 222
10. Colorado 214

In terms of the venture capital investments, looking at it by state, WA ranked #10. The top ten states for venture capital investments, by state in the billions:

1. California $24,920M
2. New York $9,528M
3. Massachusetts $2,967M
4. New Jersey $2,734M
5. Florida $2,643M
6. Delaware $1,807M
7. Texas $1,537M
8. Illinois $1,000M
9. Georgia $866M
10. **Washington $721M**

Washington is among the top ten states in the number of startups and blockchain activity from incumbent enterprises, it does rank within the top ten in terms of investment capital received by these startups. Compared to the 2023 report, WA did not make the top 10 states for investment, so it is encouraging that it moved to spot #10. Moreover, Washington's level of collaboration with academic institutions in research activities, as well as its engagement with governmental entities in investing in technology, is less than that observed in other states within its competitive group.

Uses of Blockchain

Many use cases highlighted in the section below were drawn from the Global Blockchain Business Council's (GBBC) website. The GBBC is the largest leading industry association for the blockchain technology and digital assets community globally. Launched in Davos in 2017, GBBC is a neutral Swiss-based non-profit, with more than 500 institutional members, and 301 ambassadors across 117 jurisdictions and disciplines. The GBBC does not lobby.

The National Archives and Records Administration released a white paper in February 2019 exploring the benefits of blockchain technology as it relates to archives. The white paper includes useful analysis of the implications of using blockchain with records management.

Government Use Cases

Vital Health Records

According to the World Bank, global health expenditure as a percentage of GDP has steadily increased in the last decade – from 8.5% in 2000 to 10% in 2016. Data from the Organization for Economic Co-operation and Development indicates that the U.S. has the highest health care spending per capita of any country; in 2018 it was USD$10,586 while the figure for second place Switzerland was USD$7,313. While health care spending is a complex issue with a plethora of factors, it is clear that legacy health record systems could be substantially improved, generating savings and efficiencies for both patients and providers.

Estonia has embraced and implemented a revolutionary new approach to patient records: e-Health Records. All patients in Estonia have an online e-Health Record that can be accessed using an electronic ID card. This system uses the KSI Blockchain, a blockchain designed in Estonia that has been widely deployed by the Estonian government. In this instance, KSI ensures that e-Health Records cannot be tampered with and can only be accessed by approved parties. The e-Patient portal allows doctors to access a patient's records and test results, no matter which hospital conducted the test. Estonia has also implemented an e-Prescription system, in which doctors submit prescriptions online and patients can pick them up with an ID card; about 99% of prescriptions are digital.

Estonia has effectively leveraged blockchain technology to dramatically overhaul its entire health care system. Instead of fragmented providers using fax machines to relay information, patients and doctors have secure access to their entire medical history at the touch of a button. Given the program's success, it appears likely that other countries will follow Estonia's lead and begin to implement blockchain healthcare systems of their own.

Remittances

Blockchain technology has demonstrated significant innovation in the realm of international remittances. As a promising tool for facilitating more affordable and efficient cross-border

transactions, blockchain eliminates the need for intermediaries, who typically extract fees from each payment. Companies such as Ripple are at the forefront of developing blockchain-based solutions that could revolutionize the current remittance infrastructure. They have already conducted pilot tests of their technology with major money transfer firms like Western Union and Moneygram.

Secure Digital ID for Global Travelers

According to the UN World Tourism Organization, cross-border travel will increase by 50% in the next decade. As the global population grows and more people are able to travel, it will become more difficult to securely verify traveler identities with existing systems. As it currently stands, cross-border travel can be complex and time-consuming depending on the countries of origin and destination. Further, research conducted by the International Criminal Police Organization (INTERPOL) determined that existing trusted-traveler and registered-traveler programs do not provide a way to a radically streamlined digital identity system, in part due to lack of trust between countries. Blockchain technology can provide a solution to this complex problem.

The World Economic Forum and Accenture, along with other partners, collaborated to propose a paradigm shift to a Known Traveler Digital Identity system that uses blockchain technology and biometrics to create digital identities. Blockchain is perfectly suited for this application, as its distributed nature ensures no central authority has control over the network while cryptography ensures personal information remains secure. Using biometrics, mobile devices will be able to link physical and digital information to verify the legitimacy of a digital identity. The researchers recommend that governments commit to pre-vetting individual travelers to save time and effort. Researchers are currently carrying out pilot tests in real-world environments.

As cross-border travel continues to increase, innovative solutions will become necessary to securely and quickly verify the identity of travelers. Blockchain technology provides unique advantages in this instance: no central authority can control the network, it provides advanced security, and it gives travelers the ability to control access to their personal data. This application must be improved through numerous pilot projects by a range of stakeholders; demonstrations of its efficacy through pilot projects will help convince governments, companies, and organizations to adopt the technology.

Agriculture Provenance and Authenticity of Product Use Cases

Strong Chinese demand for Australian beef and lamb has led to a significant counterfeiting problem in the region. According to Latitude 28°, “consumer demand for premium imported beef is expected to continue to grow, driven by increasing urbanization, disposable incomes, premiumization and health awareness.” As demand grows, counterfeits may become more prevalent and consumers will lose trust if companies do not develop an effective product validation method.

With this in mind, L28 developed a blockchain platform that tracks the products' journey "from paddock to plate." The blockchain database provides an immutable ledger of all transactions on the supply chain, including verification by the Australian government. L28's Direct to Consumer (D2C) model enables consumers to buy directly from the company using a mobile device, eliminating intermediaries and concerns over product sourcing. This model also allows L28 to better understand its customers, thereby improving marketing efforts.

L28 is a useful example of a company using blockchain technology to combat counterfeits and increase the value of its own products. With this application, consumers can be sure that they get what they pay for and L28 can protect the reputation and value of the Australian beef and lamb industries.

Environmental Use Cases

Ocean plastic is one of the most pressing global environmental issues. Scientists estimate that about eight million metric tons of plastic enter oceans every year. Ocean plastic has devastating effects on marine wildlife; plastic has been found in approximately 25 percent of individual fish tested at markets in Indonesia and California. While ocean cleanups are worthwhile, the best way to address this problem is by preventing plastic from reaching the oceans in the first place. Some researchers theorize that developing countries, particularly in Asia and Africa, generate a disproportionate amount of ocean plastic, as these countries generally do not have effective waste management systems.

Plastic Bank developed an innovative blockchain-based solution that simultaneously reduces plastics entering oceans and provides people with a reliable source of income. In partnership with IBM, Plastic Bank created a blockchain platform on a mobile phone app that pays people who bring plastic to recycling centers in cryptocurrency. This process also allows individuals to build credit and eventually receive low-interest loans. The plastic is then recycled and sold to companies that then use it to create other products. Plastic Bank calls this "social plastic" and manufacturers can include a mark on their products to improve eco-friendly branding.

Blockchain technology has made it possible for Plastic Bank to provide people with an income and credit while reducing the flow of plastic into the world's oceans. Plastic Bank's ongoing success in Haiti, the Philippines, Brazil, and Indonesia is an encouraging sign that innovative companies are taking matters into their own hands and helping save the oceans.

Startup Use Cases

Blockchain technology is empowering a new generation of startups to challenge entrenched industry leaders. By leveraging blockchain's unique capabilities to incentivize and reward users and to give them control and ownership of their digital identities and content, these startups are changing consumer expectations and making inroads in many industries long-overdue for innovation. Across industries, startups are using blockchain technology to offer compelling alternatives to established players, disrupting the status quo.

In the social media space, blockchain technology enabled the creation of Warpcast, a decentralized social media platform akin to X (Twitter). Warpcast utilizes Farcaster, an open protocol for a decentralized social network that puts ownership and control over accounts, content, and connections, in the hands of its users. This interoperable protocol works seamlessly with different blockchains, enabling cross-platform interaction. The entire ecosystem is governed by transparent smart contracts — self-executing code that automates platform functions and enforces rules. Anyone can create decentralized applications (dApps) on top of the protocol, fostering innovation and enabling users to build the features they want. This approach to social media differs fundamentally from traditional centralized platforms, where companies typically retain ownership and control over user data and content.

In addition to giving users ownership over their contributions to platforms and community, startups are using blockchain technology to incentivize and reward users. Cupcake, a Web3 game company, rewards players with non-fungible tokens (NFTs) as digital collectibles for achieving milestones such as winning challenges, topping leaderboards, and creating the most popular memes. These NFT rewards not only serve as incentives for active engagement but also provide users with true ownership over the digital assets they earn. Users can display, trade, sell, collect, and own these collectibles, unlocking new possibilities for engaging with digital ownership and value exchange within and beyond Cupcake's gaming ecosystem.

The cloud computing market, long dominated by industry giant Amazon Web Services (AWS), is also facing disruption. Akash Network is leveraging blockchain-based decentralized compute to offer a compelling, cost-effective alternative to AWS’s services. Recent pricing comparisons show Akash delivering an 83% reduction in monthly CPU costs compared to AWS. By harnessing blockchain's unique capabilities, Akash is able to undercut the industry leader on price while still providing reliable, high-performance cloud services. This blockchain-powered startup is well positioned to challenge AWS's market dominance and change consumer expectations in the cloud computing space.

Energy Use Cases

Traditional power grid infrastructure gives little control to consumers: Consumers are unable to choose the source of their energy, and associated infrastructure are often old and susceptible to natural disasters and physical or cyberattacks. Blockchain-enabled Distributed Energy Resources (DER) like solar panels, batteries, and microgrids, can shift control to consumers.

Power Ledger provides a platform in which consumers with solar power and batteries can freely sell their excess energy back to their energy company in near real-time. This platform allows its participants to own and monetize their energy and simplifies the buying and selling process.

Power Ledger calls it a "democratization of power.” As with many other blockchain-based initiatives, decentralization is one of the main pillars of the technology. Run on the Ethereum blockchain, the Power Ledger Platform and Power Ledger Tokens (POWR) allow entities to

trade energy for tokens. This can be used to enable P2P trading, microgrids, and wholesale market settlement. Further, the platform uses the data it collects to more efficiently balance energy loads and optimize delivery.

Power Ledger is an Australian-based blockchain company and leader in the tech-energy industry. For Power Ledger, security and adequate distribution are also key elements that are constantly shaping their strategies. Power Ledger has generated an efficient integration of renewable energies with a platform that helps coordinate the different resources available in the community while improving the accessibility and affordability of energy to all of its members. Power Ledger is currently expanding its energy trading across the world, showcasing its ability to democratize power.

Corporates and Academic Use Cases

As the American Workforce Policy Advisory Board's "White Paper on Interoperable Learning Records" states, "American workers, who are engaged in lifelong learning, deserve to have a way to translate their full education, training, and work experience to a record of transferable skills that will open the doors to higher wage occupations and careers." Education and workforce records are integral to a dynamic labor ecosystem.

Corporate Credential Verification

Ninety-five percent of California employers conduct background checks on applicants, verifying previous employment, past performance, and educational credentials. Once employed, people often need to share their working credentials with others to obtain services such as loans or join professional organizations. Verifying these credentials is often a time-consuming, paper-based process. While the process of generating employment verification letters and salary verification letters has increasingly become digitized, often a paper letter is still required to alleviate concerns about fraud and misrepresentation. Without adequate security and verification, electronic credentials are seen as too easily forged and thus unreliable. The result is a time-consuming system that adds friction in the hiring process, slows down bank loans and other transactions, and is so complex that businesses turn to intermediaries such as background check companies to compile the information. Blockchain-based credentialing systems can help remove existing friction by enabling secure sharing of online credentials, verified for proof and under the individual's control. With blockchain, a party with which a credential is shared can verify both that it was issued by the purported issuer, by verifying the issuer's signature via a public key stored in a blockchain decentralized identifier (DID). Likewise, the party can also determine that the individual sharing the credential is the authorized recipient, again by verifying his or her signature via a public key stored in a DID. Finally, the blockchain can keep a record of revoked credentials, allowing the party relying on the credential to determine whether it is still valid.

Academia Credentialing Example: Texas College Bridge

During the COVID-19 pandemic, Texas school districts adopted various virtual learning policies, impacting student educational outcomes, particularly in college readiness. In response, the Texas Education Agency (TEA) introduced the Texas COVID Learning Acceleration Supports (TCLAS) grant, utilizing federal relief funds to enhance educational activities. This included the Texas College Bridge (TCB) program launched in spring 2021, aimed at improving college preparatory courses in English and math through partnerships between local education agencies (LEAs) and higher education institutions (IHEs).

Under Texas Education Code § 28.014, these partnerships are formalized through a memorandum of understanding (MOU), allowing students who complete these courses to bypass the Texas Success Initiative Assessment (TSIA). TCB standardizes this process by offering a single MOU that LEAs and IHEs can adopt voluntarily, with courses delivered online at no cost thanks to the Commit Partnership, an educational nonprofit that administers the TCB with funding from the TEA.

The courses' effectiveness is further supported by GreenLight Credentials, which provides blockchain-secured certification that students can use across various educational and employment platforms. This integration of blockchain not only ensures the security and portability of student records — it also introduces efficiencies in the application processes for colleges and jobs. However, the use of blockchain has raised concerns among parents about the privacy and control of their children’s data, highlighting the need for careful consideration of technology impacts in educational settings.

Academic records example

Since 2015, MIT has employed blockchain technology to distribute certificates, expanding its use to diplomas by 2017. Other institutions, including Foothill-DeAnza College in California, Arizona State University, and various others have also explored blockchain to enhance student services and support degree completion by managing digital educational records. In 2019, the Dallas County Community College District announced a collaboration with a blockchain technology firm to provide students with lifelong access to their comprehensive academic records, with over 100 educational institutions recognizing these blockchain-verified documents. This technology simplifies processes such as transcript verification, particularly beneficial for community college students transferring to four-year institutions. Additionally, for younger students, such as those who frequently change schools, blockchain could facilitate a more straightforward verification of their academic records.

Impacts of Blockchain (Broad)

General Benefits of Blockchain

Blockchain technology offers a compelling set of advantages that distinguish it from traditional record-keeping and transactional systems. What sets blockchain apart is its innovative decentralized architecture, which enables the following:

1. Enhanced Security and Immutability
2. Increased Transparency and Trust
3. Faster Transactions
4. Improved Efficiency and Cost Savings
5. Enhanced Privacy and Confidentiality
6. Decentralization and Resiliency

1. Enhanced Security and Immutability

Blockchain's cryptographic data structure and decentralized network make it highly secure and resistant to tampering. Each block is cryptographically linked to the previous one, creating an immutable record of all transactions. This prevents unauthorized changes or the deletion of data, enhancing the overall security and integrity of the system.

2. Increased Transparency and Trust

Blockchain's decentralized nature and public ledger provide total transparency, as all network participants can view and verify the transactions recorded on the blockchain. This transparency helps build trust between parties that may not have a pre-existing relationship, enabling new business models and use cases.

3. Faster Transactions

By eliminating the need for intermediaries, blockchain enables faster, more efficient transactions. Settlement times can be significantly reduced, as there is no longer a requirement for third-party verification and approval.

4. Improved Efficiency and Cost Savings

Through the use of self-executing digital agreements, or smart contracts, blockchain enables the automation of various tasks and workflows, leading to increased operational efficiency and cost savings. The elimination of centralized intermediaries promotes the elimination of fees and costs traditionally charged by these intermediaries.

5. Enhanced Privacy and Confidentiality

While blockchain transactions are transparent, the technology also provides privacy and confidentiality. By separating user identities from the transactions, blockchain can offer pseudonymity, protecting sensitive information while maintaining the integrity of the ledger.

6. Decentralization and Resiliency

The decentralized nature of blockchain makes it highly resilient. Data is distributed across multiple nodes, preventing any one party from manipulating the system and no single entity controls the network, protecting it from single points of failure or attacks.

Benefits for Equality

1. Increased Transparency and Accountability

Blockchain's decentralized, transparent, and immutable ledger can help increase accountability and has the potential to reduce bias in various processes, such as voting, hiring, and lending decisions. The transparent nature of blockchain transactions makes it harder to conceal discriminatory practices, as the decision-making process can be audited.

2. Expanding Access and Inclusion

Blockchain-based financial applications, such as cryptocurrency and decentralized lending platforms, have the potential to provide underserved and historically marginalized communities, including racial minorities, greater access to financial services and investment opportunities. This can help bridge the racial wealth gap, as well as other wealth gaps experienced by members of marginalized communities.

3. Mitigating Bias in Evaluation and Promotion

Blockchain-enabled systems can focus on quantifiable, merit-based criteria for evaluating candidates for jobs, college admissions, and promotions, rather than relying on subjective, biased assessments. This can help break down barriers for members of marginalized groups.

4. Cautious Approach to Avoid Unintended Consequences

While blockchain offers promising solutions, the technology must be implemented carefully to avoid potential pitfalls, such exacerbating existing inequities due to the lack of regulation and the volatile nature of the crypto market.

5. Stakeholder Engagement and Community-Driven Design

To ensure blockchain initiatives truly benefit marginalized communities, it is crucial to involve diverse stakeholders, including members of the affected communities, in the design and

implementation phases. This can help align the technology with the specific needs and priorities of these communities.

Workforce Development Benefits

Blockchain technology offers several benefits for workforce development. It securely verifies and stores educational and professional credentials, reducing fraud and speeding up the hiring process while also improving job placement accuracy through decentralized skill matching. Additionally, blockchain tracks ongoing training and skill development, fostering continuous learning and enhancing trust with transparent, tamper-proof records of work and education.

Cybersecurity Benefits

Blockchain enhances cybersecurity by providing a decentralized and immutable ledger, making it difficult for hackers to alter data. It ensures transparency and traceability, enabling the detection of unauthorized changes and reducing the risk of data breaches. Additionally, blockchain's use of cryptographic algorithms strengthens data security and protects sensitive information from unauthorized access.

Transparency and Trust Benefits

Blockchain enhances transparency and trust by creating an immutable, publicly accessible ledger that records all transactions and activities. This ensures that data cannot be altered or tampered with, allowing for full accountability and traceability. By providing verifiable and secure records, blockchain builds confidence among users and stakeholders in various sectors.

Cost Benefits

Blockchain helps reduce long-term costs by streamlining processes and eliminating intermediaries, which reduces transaction fees and administrative expenses. Its automated smart contracts decrease the need for manual intervention, lowering labor costs and minimizing errors. Additionally, blockchain's transparency and traceability reduce costs associated with fraud and compliance by simplifying audits and ensuring accurate record-keeping. Over time, the efficiencies gained from using blockchain technology lead to significant cost savings for businesses and organizations.

Recommended Policies

Definitions

Washington state should update its statutory definitions of emerging technologies like blockchain to align with those of other states and jurisdictions for consistency. The below are examples of two states', Washington and California, definitions of blockchain.

- **Washington Definition:** Blockchain is "a cryptographically secured, chronological, and decentralized consensus ledger or consensus database maintained via internet, peer-to-peer network, or other similar interaction."

- **California Definition:** "Blockchain" is a domain of technology used to build decentralized systems that increase the verifiability of data shared among a group of participants that may not necessarily have a pre-existing trust relationship. Any such system must include one or more "distributed ledgers," specialized datastores that provide a mathematically verifiable ordering of transactions recorded in the datastore. It may also include "smart contracts" that allow participants to automate pre-agreed business processes. These smart contracts are implemented by embedding software in transactions recorded in the datastore.

Education and Workforce

- Washington should prioritize interoperability, security, and scalability in its pilot projects exploring blockchain applications for educational and workforce records.
- The Washington Future of Work Commission should implement recommendations on skills-based hiring and credentialing, ensuring that workers can manage and electronically share their credentials securely and verifiably.
- Washington should support and facilitate a results-oriented forum for showcasing technology demonstrations that enhance public sector applications. This initiative should focus on maximizing the re-use, re-purposing, and enhancement of current efforts.
- Washington should develop a comprehensive framework of key questions, considerations, and strategies for entities engaging with the state's public school system and public services. This framework would aid stakeholders in identifying suitable blockchain-based pilot projects and act as a valuable public resource.
- The state should foster innovative cross pollination across different sectors by incentivizing and creating a conducive environment for open discussions about lessons learned and best practices. By detailing the various stages of technology adoption and fostering conversations about risks, benefits, and necessary readiness levels, Washington can clarify and guide technology developers, policymakers, and adopters towards successful implementations.

Vital Records

- Washington should explore the use of blockchain technology to develop and authenticate digital versions of government-issued documents, ensuring they are secure and tamper-resistant.
- New legislation should be considered to amend relevant sections of the Washington Health and Safety Code to explicitly permit and regulate the application of blockchain technology in managing vital records.

Digital Identity

- The Washington State Legislature should enact legislation permitting public entities to issue identification documents as authorized verifiable credentials as defined under appropriate sections of the Washington Civil Code. This would allow individuals to maintain these identification documents in a secure, digital format under their control. The blockchain would not store substantive personal information but would use decentralized identifiers (DIDs) to confirm the legitimacy of the documents and their consensual sharing.
- In the wake of the COVID-19 pandemic, two immediate opportunities emerge for the state to pilot digital identity and verifiable credentials: Health records and driver's licenses. The ongoing pandemic underscores the critical need for reliable health records. Implementing these as verifiable credentials would ensure they can be shared seamlessly and securely with consent, protecting against forgery. Similarly, driver’s licenses, essential for most residents as proof of identity or qualification, present a broad application scope for a pilot, allowing for the assessment of use cases ranging from basic identification to specific driving qualifications.

Regulatory Sandbox

A regulatory sandbox is a framework that allows businesses to experiment with innovative technologies and business models in a controlled environment, under the supervision of regulators, to assess the need for potential legislative changes.

The workgroup recommends that the Legislature create a regulatory sandbox to support and even accelerate the responsible development of blockchain and other financial technology (FinTech) goods and services in Washington. Other states including North Carolina, Hawaii, and Utah have already done so; Washington risks missing an opportunity to cement itself as a leading venue and steward of socially and economically beneficial products and services.

The creation of regulatory sandboxes promote a variety of policy objectives, including:

- Reducing barriers to entry that otherwise limit innovation. It is difficult to calculate the cost to the economy and society as a whole of products or businesses that are unable to

gain traction or reach full potential due to the cost of compliance with existing legal regimes that regulate the financial, banking, and insurance industries.
- Promoting equality by mitigating barriers to entry that favor the incumbent financial system. In addition, FinTech products and services frequently seek to level the playing field for consumers. A regulatory sandbox can thus serve as an important entry point for products and services that are intended to serve vulnerable and historically marginalized communities.
- Promoting collaboration and information sharing between the private sector and government. For example, in an environment of collaboration and information sharing, government agencies and sandbox participants can derive valuable lessons from each that can lead to more effective regulation on the one hand, and superior products and services on the other.

The primary component of a regulatory sandbox is a limited exemption from certain state laws bestowed upon applicants to the program who receive approval. The program is implemented and supervised by a state agency selected by the Legislature. As noted, several states have already adopted a regulatory sandbox program. Arizona adopted its regulatory sandbox in 2018 and it appointed the state's Attorney General to serve as the responsible agency. In 2020, Hawaii created the Digital Currency Innovation Lab, supervised by that state's Department of Financial Institutions. Hawaii's DCIL was originally designed to be a two-year program, but was extended due to its overwhelming success in helping dozens of companies.

DFI's Center for Financial Information is not a regulatory sandbox. It is a clearinghouse for information. While DFI should be commended for creating a public website that offers direct access to certain regulatory information, DFI's CFI is not a regulatory sandbox, nor does it claim to be. The Legislature could consider taking the next step toward responsible stewardship of this growing area by creating a regulatory sandbox legal framework.

Regional Licensing Passport

The Legislature should consider adopting legislation directing DFI to explore the adoption of a multi-state passport system through which the digital asset licenses offered and approved in other states will be honored in Washington. Such a program would help streamline and standardize the process for digital asset businesses to lawfully operate in multiple states.

Existing DFI programs already acknowledge the importance of streamlining licensure requirements in connection with its participation in the Multistate MSB Licensing Agreement (MMLA). The MMLA began as a pilot program in 2018 and has since been adopted in over 20 states. Under the MMLA, money services businesses seeking to operate in participating states undergo a two-phase application process. The first phase is a general license application that consists of common licensing requirements such as business plans, owner background information, and other financial information and compliance information. The second phase is a state-specific application. Approved applicants receive authorization to operate by each participating state agency.

The Legislature should direct DFI to explore the application of the MMLA model to digital asset licenses granted in other states so that those businesses can lawfully operate in Washington. DFI can rely upon its experience as a leading proponent of the MMLA program, and the program's national success, to tailor a similar program for digital asset certifications.

Health Records

Washington should engage with various stakeholders, including patient advocacy groups, health consortia, health systems, hospital CIOs, executives at payers, and blockchain-for-healthcare platforms. These engagements are crucial for understanding diverse viewpoints and technical considerations. Additionally, conversations should involve government agencies such as the Washington departments of Health and Agriculture, organizations responsible for reviewing immunization records, the Centers for Disease Control, and Immigration and Customs Enforcement.

Washington should develop a comprehensive framework aimed at facilitating patient identity and data interoperability. This framework will empower stakeholders to tackle challenges related to data fragmentation and silos, the absence of a unified patient identity, concerns regarding privacy and security vulnerabilities, and the limitations of a one-size-fits-all approach to healthcare delivery.

Utility Token Exemption from State Securities Laws

The Legislature should adopt legislation defining a "utility token" and adopting a limited exemption from state securities laws for digital assets meeting this definition. Other states, including Montana, have already done so.

Updating Washington law to align with the consumptive purpose of certain digital assets would provide the industry and marketplace with a critical guidepost. Critics of the current regulatory landscape often point to the fact that existing laws are either ambiguous or have been interpreted so broadly to include nearly any digital asset, which makes it difficult if not impossible for companies to deploy blockchain technology without taking on significant regulatory exposure and related financial risk.

The Workgroup believes that the Legislature could provide important clarity to the industry by exempting digital assets that serve primarily a consumptive purpose, as opposed to an investment purpose. The term "consumptive" in this context should be defined to include digital assets that serve practical functionality for customers engaging with the business. One example would be a company's use of digital assets to engage with its customers or users in the same way non-blockchain businesses use loyalty or rewards programs to promote customer engagement and retention.

Conclusion

Washington should continue to embrace emerging technologies and digital innovations, such as blockchain, digital assets, Web3, and artificial intelligence. We have the opportunity to apply lessons learned from models in other states, such as clarifying statutory language, building regulatory sandboxes, and promoting cross-organizational collaboration. Advancements in these technologies have the potential to offer economic benefits, including job creation and potential investments.

Appendix

Examples of reports

Below are some links to states that have produced blockchain reports and recommendations. This is not a comprehensive list:

- Illinois
    - The Illinois Blockchain and Distributed Ledger Task Force was formed in 2018. It was established by the Illinois General Assembly through House Joint Resolution 25. The task force was charged with studying the potential applications of blockchain technology and distributed ledger technology (DLT) across various sectors, including government, business, and nonprofits.
    - The task force comprised members from different entities, including government officials, industry experts, and academics. They convened meetings and conducted research to explore the opportunities and challenges presented by blockchain technology.
    - The task force delivered its final report with recommendations to the Illinois General Assembly in January 2020. The report outlined the findings of the task force's research and provided recommendations for legislative and regulatory actions to support the responsible adoption and development of blockchain technology in Illinois.
    - The recommendations covered various areas, including data privacy, cybersecurity, legal frameworks, and economic development. The goal was to provide guidance to policymakers on how to leverage blockchain technology to enhance transparency, efficiency, and innovation across different sectors of the Illinois economy.
- California
    - The California Blockchain Working Group was formed in 2019. It was established by Assembly Bill 2658, signed into law by Governor Jerry Brown in 2018. The purpose of the working group was to explore the potential uses and risks of blockchain technology and provide recommendations to the California legislature on how to best regulate and support its development within the state.
    - The working group consisted of various stakeholders, including representatives from government, industry, academia, and advocacy groups. They met several times over the course of 2019 and early 2020 to discuss different aspects of blockchain technology, its applications, and potential regulatory frameworks.
    - The final report with recommendations was delivered to the California legislature in July 2020. The report provided insights into the opportunities and challenges presented by blockchain technology and offered recommendations for legislative and regulatory action to support its responsible development and adoption in California. These recommendations covered areas such as data privacy, consumer protection, and fostering innovation in blockchain technology.

    - The report aimed to inform policymakers about the potential benefits of blockchain technology while also addressing concerns related to security, privacy, and regulatory compliance. It serves as a foundation for future legislative and regulatory initiatives related to blockchain technology in California.
- New York
    - In 2019, the New York State Legislature established the "Digital Currency Study Bill," directing the creation of the New York Blockchain Task Force to study and provide recommendations regarding the regulation and use of cryptocurrencies and blockchain technology. The task force was composed of various stakeholders, including technologists, industry experts, and government officials.
    - The task force was responsible for producing a report that outlined its findings and recommendations for how New York State could best approach regulating and fostering the growth of blockchain technology and cryptocurrencies within its borders. The report aimed to provide insights into the potential benefits and risks associated with these technologies and offer guidance on how to navigate this rapidly evolving landscape.
    - No one was ever appointed to the task force and it expired before it could ever meet or produce a report.
- Arizona
    - The Arizona Blockchain and Digital Trust Task Force was established in 2019. It was created through House Bill 2772, signed into law by Governor Doug Ducey. The task force was tasked with studying and providing recommendations on the potential applications of blockchain technology and digital trust in various sectors, including government services, healthcare, finance, and more.
    - The task force consisted of members from government, industry, academia, and the legal profession. They met multiple times over the course of several months to discuss different aspects of blockchain technology, its potential benefits, and challenges.
    - The task force delivered its final report with recommendations to the Arizona legislature in January 2020. The report outlined the findings of the task force's research and provided recommendations for legislative and regulatory actions to foster the responsible adoption and development of blockchain technology and digital trust solutions in Arizona.
    - The recommendations aimed to address various issues, including data privacy, cybersecurity, legal clarity, and economic development. They were intended to guide policymakers in leveraging blockchain technology to improve government services, enhance transparency, and stimulate innovation in Arizona's economy.
- Other reports:
    - Florida
    - Kentucky
    - Texas
    - North Carolina

FAQs (Frequently Asked Questions)

What is distributed ledger technology (DLT)?
Distributed ledgers are a type of database that are spread across multiple sites, countries or institutions. Records are stored one after the other in a continuous ledger. Distributed ledger data can be either “permissioned” or “unpermissioned” to control who can view or operate on it. DLT use cases are far-ranging -- including in healthcare, credentialing, contracts, and supply chain logistics, as well as digital assets and financial systems.

What is blockchain?
Washington state law defines blockchain as “a cryptographically secured, chronological, and decentralized consensus ledger or consensus database maintained via internet, peer-to-peer network, or other similar interaction.”

Blockchain is a specific type of DLT for recording transactions or contracts that are time-stamped, immutable, permissionless, public, and decentralized. It organizes data into “blocks” that are “chained” or connected together chronologically using a tamper-evident cryptographic hash function and confirmed by thousands of computers with copies of the full ledger. A blockchain records transactions with a specific date and time, and the records cannot be edited, known as immutable, are not owned by any one entity, and can be accessed and maintained by anyone. Blockchain use cases are very limited.

The process in a simplified version is something like:

1. Person A requests to send money to Person B. The transaction is recorded in a ledger of information with the amount, date, account number of sender, and account number of recipient.
2. That ledger of information is broadcast to all of the parties in the network.
3. The stakeholders of the network verify the transaction (sometimes called Mining).
4. The ledger of transactions is then added to the full history of transactions in chronological order. This is called blockchain.
5. Person B has received the money from Person A and the transaction is complete. The information is permanently logged in the blockchain ledger.

What is the difference between DLT and blockchain?
Blockchain is a specific type of DLT. Colloquially, many companies and organizations incorrectly use blockchain and DLT interchangeably, conflating the terms.

Blockchain has very specific qualities that differentiate it from other DLT - its immutability, decentralization or lack of centralized managing entity, and permissionless nature are key. There is currently only single use case for blockchain, Bitcoin.

Most other blockchain-based systems are technically closer to DLT, though in many cases they may share some, yet not all, of the characteristics of a blockchain. They are often centralized, privately run by a company or consortium of entities that may or may not allow public access.

What are the benefits of using blockchain-based technology?
Distributed ledger and blockchain-based technology can offer several advantages. Ultimately, the power of this kind of technology is that it:

- reduces manual processes.
- automates complex processes.
- assists when processes involve multiple counterparties.
- creates an auditable trail for tracking and tracing that is cryptographically verified and inherently privacy protecting; and
- removes the need for unnecessary data to be collected by third parties
- allows for the "tokenization" or digitization of assets, providing significant potential in a digitally native ecosystem

What are the potential drawbacks of using blockchain technology?
Blockchain is immutable and cannot be edited. There are extremely few use cases that require blockchain technology, as opposed to DLT, that has all of the following properties: global, decentralized, public, permissionless, time-stamped, and immutable.

What is cryptocurrency?
Cryptocurrency (also known as digital assets or crypto assets) can use blockchain (i.e. bitcoin) or centralized DLT (all other digital assets, tokens). These assets are typically a form of digital currency that is transferred electronically using the encryption techniques, consensus mechanisms, and code inherent within DLT to facilitate the generation of units of currency and verify the transfer of funds.

There are currently over 13,000+ varieties of digital assets. Digital assets can be coins or tokens.

- A coin or altcoin is a representation of digital asset value that is generated via an independent protocol.
- A stablecoin is designed to have a relatively stable price, typically through either being pegged to a commodity or currency, or having its supply regulated by an algorithm.
- A token is a unit of value that can be acquired through a protocol and is a piece of data that stands in for another, more valuable piece of information. Tokens are only useful because they represent something bigger.

Are all blockchains cryptocurrencies?
No, cryptocurrencies or digital assets typically use either blockchain-based technology or DLT, but not all applications of blockchain and DLT are cryptocurrencies. For example, other uses of DLT can include portable credentials and records, smart contracts, internet of things security protections, verifiable credentials, supply chain and other logistics, healthcare, and many more.

What is Bitcoin?
Bitcoin is the first and most well-known cryptocurrency, protocol, and blockchain network with the largest global network effect. It was launched in January 2009 by a person or entity named Satoshi Nakamoto. It is a decentralized currency, secured by blockchain cryptography, which allows people to exchange paperless cash on a peer-to-peer basis. It is the only application that meets all of the criteria in the definition of a blockchain.

What is Bitcoin mining, and how does it work?
Bitcoin mining is the process of adding new “blocks” or bunches of validated transactions to the Bitcoin blockchain to release new bitcoins, known as Proof of Work. It requires the use of specialized, high-power computers (known as ASICs) to verify transactions. When a miner computer verifies one new block in the Bitcoin blockchain, it is rewarded with a new bitcoin. In other words, miners do the data computation to secure the network and release new bitcoins.

A core tenant to the “constitution” of Bitcoin is that there is a finite number of bitcoin. Only 21 million bitcoin will ever exist. Bitcoin is designed to be scarce and disinflationary. The number of bitcoin issued as a result of successful mining is halved every four years. The current estimate for when the final bitcoin will be mined is sometime in 2140. This monetary policy is a core piece of what secures the Bitcoin network.

Do all cryptocurrencies require mining?
No, not all cryptocurrencies require mining. In fact, most do not.

Mining is known as Proof of Work.

Ethereum 2.0, Solana, Tezos, and BinanceCoin (BNB) are common cryptocurrencies that do not require mining but use another method known as Proof of Stake.

These methods are known as “consensus mechanisms” - basically the protocols used to achieve agreement, trust, and security across a decentralized system.

Additionally, there are some cryptocurrencies that do not use any consensus mechanism.

What is the difference between Proof of Work and Proof of Stake?
“Proof of Work” blockchains are secured and verified by miners. Miners are high-powered computers to verify transactions and get rewards. It is the original mechanism for digital assets as we know them today.

“Proof of Stake” protocols use a network for validators who contribute, or stake, their own cryptocurrency in exchange for validating a new transaction and earning a reward. Specifics vary by currency.

The second largest digital asset network and protocol, Ethereum, recently underwent a process of transitioning from Proof of Work to Proof of Stake. Many other digital assets are following this trend towards Proof of Stake as it is very popular amongst digital asset enthusiasts.

What are non-fungible tokens (NFTs)?
A non-fungible token is a digital certificate of authenticity used to assign and verify ownership of a unique digital or physical asset. Unlike fungible tokens, NFTs are not interchangeable with one another. At a basic level, an NFT is a digital asset that links ownership to unique physical or digital items, such as works of art, real estate, music, or videos. The uniqueness of the token is verified using the smart contract capabilities inherent in ledger.

NFTs are distinct from cryptocurrency, which is considered fungible or exchangeable. Often, cryptocurrency is used to purchase an NFT.

NFTs are “minted” by putting a digital file on a digital ledger, turning it into a verified collectable instead of a file that can be easily copied without proof of its authenticity.

Why do we need a blockchain work group?
The work group will assess opportunities for policies and regulations that will help facilitate growth of both blockchain-based uses and blockchain-based businesses in Washington state. This is a model that has proven useful in several states, including California, Connecticut, Colorado, and Texas. The goal is to help Washington state be recognized as a global hub for blockchain innovation, investment, and overall growth for the community in the region.

Is it a goal of a blockchain work group to develop a Washington state token or coin?
The goals of the blockchain work group are to assess the potential uses and impacts of blockchain-based technology and come up with recommendations for policies that will facilitate development of blockchain-based technologies in Washington state. The work group will holistically assess policies and uses that will support use of blockchain more broadly.

Where does the industry stand on regulation?
Blockchain and DLT technologists generally want regulatory clarity, as the speed of the regulation is being passed by the speed of innovation globally. Clarity can be achieved through:

1. Accepted statutory definitions
2. Specific, documented procedures and templates of what is acceptable
3. Consistent application of definitions and procedures across agencies, applications, and organization types