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Testimony before the Pennsylvania House Democratic Policy Committee
On Preparing Pennsylvania for a Digital Future

Submitted by Tonya M. Evans on July 19, 2021

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To Chairman Bizzarro and Representative Nelson:

Thank you for the invitation to participate in this important conversation as Pennsylvania prepares to position itself as a leader in digital innovation to be on the leading edge of the future of work and wealth.

I am an intellectual property and technology lawyer and professor at Penn State Dickinson Law School. My research, scholarship, and teaching focus primarily on the intersection of law and social justice in innovation and new technologies and includes a range of doctrinal and experiential courses; most notably, blockchain, cryptocurrency and the law, information privacy law, and administrative law. I am also founder of the Advantage Evans™ Academy, creator of the From Cash to Crypto™ online digital onboarding course and host of the Tech Intersect Podcast, a weekly show that highlights new and notable experts at the intersections of law, business and technology. Prior to joining Dickinson Law, I served as Associate Dean of Academic Affairs at the University of New Hampshire Franklin Pierce School of Law, where I created and directed the school's Blockchain, Cryptocurrency & Law online professional certificate program and developed and managed its world-class instructor pool and curriculum.

I commend Representative Nelson and the Committee for convening this hearing to explore the potential benefits, challenges, and drawbacks of integrating blockchain technology and crypto assets into the public, private and charitable sectors of the Commonwealth. It is essential for government officials to identify and to consider the myriad local, national, and international policy issues associated with achieving the optimal balance between cultivating a robust, competitive and transparent regulatory environment that also supports and encourages innovation in this fast-paced digital world. Such a goal also serves to protect Pennsylvania's consumers, investors and businesses by enhancing the benefits and mitigating the risks of this emerging and potentially revolutionary technology. This is particularly important at this moment in history as we emerge from the economic ravages of the pandemic, especially for those citizens historically and systemically marginalized and disenfranchised in the current financial and technology sectors.

The Value Proposition

According to Statista,[1] 33% of global organizations say that their companies are working on creating a digital currency using the technology. Additionally, the New York Digital Investment Group (NYDIG) reported recently that approximately 46 million Americans now hold Bitcoin.[2] The NYDIG also found that approximately 75% of survey respondents said they wanted to learn more about Bitcoin annuities and Bitcoin life insurance, with almost 90% being interested in such products having at least some link to Bitcoin (either directly or indirectly).

Mastercard surveyed over 15,000 people from 18 different countries and compiled the results in its "Consumer Appetite for Digital Payments Takes Off" report. The study showed that millennials are the most active in cryptocurrency. But three-fourths of them wanted to understand how cryptos work before purchasing or using them as an alternative means of transacting value. Americans are clearly open and curious but exceedingly cautious, especially given the high volatility, cautionary tales of loss, theft and nefarious uses of crypto, and sensationalized hype-driven headlines that intentionally or unintentionally spread 'fear, uncertainty and doubt' (aka FUD). The major barrier to mass and mainstream adoption of cryptocurrencies is education.

We are at an inflection point in the development of Web 3.0's blockchain infrastructure. In the eleven years since the first blockchain (the Bitcoin blockchain) was created, dramatic, substantial and undeniable inroads have been made to move blockchain technology, cryptocurrencies and decentralized finance into mainstream view. Other United States jurisdictions have taken notice and have proactively seized the opportunity to welcome blockchain innovators to their states to test leading edge product and service development and deployment within the confines of a safe regulatory framework.[3] Arizona (2018),[4] Nevada (2019),[5] Utah (2019),[6] Wyoming (2019),[7] Florida (2020),[8] and West Virginia (2020).[9] Other states have introduced similar legislation: Illinois (2019), South Carolina (2019), Texas (2019), Connecticut (2021), Louisiana (2021), New York (2021), North Carolina (2021), North Dakota (2021), Oklahoma (2021).[10]

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[1] https://www.statista.com/statistics/878732/worldwide-use-cases-blockchain-technology/.

[2] https://www.nasdaq.com/articles/about-46-million-americans-now-own-bitcoin-2021-05-14 (May 14, 2021).

[3] On June 23, 2021, the Mississippi Center for Public Policy (MCPP) released a comprehensive list of states that have created fintech regulatory sandboxes. See https://mspolicy.org/regulatory-sandbox-reforms-advance-across-the-nation/ for more information. On its website, the MCPP explains the value and importance of regulatory sandboxes: "Regulatory sandboxes are a unique solution to prevent government regulations from smothering new technologies and innovations. The programs allow innovative companies to be temporarily exempt from prohibitive regulations until the state can establish an objectively informed regulatory framework for the innovation."

[4] https://www.azag.gov/fintech.

[5] https://business.nv.gov/Programs/Nevada_Sandbox_Program/.

[6] https://legiscan.com/UT/bill/HB0378/2019.

[7] http://wyomingbankingdivision.wyo.gov/home/areas-of-regulation/laws-and-regulation/financial-technology-sandbox.

[8] https://flofr.gov/sitePages/OFRNews.htm?p=ofr-announces-new-fintech-sandbox-license.

[9] https://dfi.wv.gov/fintech/Pages/default.aspx.

[10] https://mspolicy.org/regulatory-sandbox-reforms-advance-across-the-nation/.

Legacy financial institutions have also seized the early-mover opportunity among their peers to innovate in delivering products and services for the digital future by leveraging blockchain technology or offering direct or indirect exposure to crypto to their customers. Visa, Mastercard, Paypal, Venmo, CashApp, Deutsche Bank, Morgan Stanley, and even long-time Bitcoin skeptic JPMorgan, have all recognized the value proposition of crypto and blockchain and started to position themselves for a decided advantage in this new distributed value frontier. Without sufficient investment, education, resources and support, small businesses—especially minority and women-owned businesses—will likely be eclipsed by large enterprises looking to stake their proverbial flags in this new world of fintech advancement.

Government is uniquely positioned to ensure the economic viability of small and mid-size enterprises (SMEs), which have historically been the backbone and lifeblood of societal advancement. Public/private partnerships transform adversarial relationships to cooperative economic opportunities in a way that optimizes competitive innovation while mitigating potential harm to consumers, investors, and businesses.

The Technology: Blockchain and Crypto Assets

Blockchains are digital databases created by software and maintained by a network of computers rather than by a single entity or group. Blockchains rely on network effects and economic incentives to secure the network from fraud or failure. The incentives differ depending on the rules that make up the blockchain's software protocol. These databases are also sometimes referred to as digital ledgers and crypto assets like Bitcoin rely on blockchain's distributed ledger technology (DLT) to maintain a record of transactions and wallet balances.[11]

The first blockchain, the Bitcoin blockchain, was launched in January 2009 by a person or group using the alias "Satoshi Nakamoto".[12] The actual identity is shrouded in secrecy even to this day. Satoshi invented and implemented Bitcoin to empower individuals to control their own money while protecting their privacy and thereby reduce control by governments and powerful private corporations that act sometimes in monopolistic, anti-competitive ways. Satoshi's goal was to eliminate the need for a middle person or centralized authority to complete and settle financial transactions and to solve the double-spending problem for digital currency resulting from fraud or counterfeiting. Satoshi accomplished this by creating a censorship-resistant, verifiable, shared ledger system of purely digital currency that could be exchanged directly in a peer-to-peer manner without the need to pay or to rely on mainstream banking intermediaries that had violated public trust and confidence during the housing and financial crisis in 2007-2009.[13]

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[11] At the time of drafting, CoinMarketCap.com provided the following statistics: Cryptos: 10,905 Exchanges: 389 Market Cap: $1,310,680,329,387 Market Dominance: BTC: 45.5% ETH: 17.2%.

[12] Bitcoin is a decentralized cryptocurrency originally described in a 2008 whitepaper by a person, or group of people, using the alias Satoshi Nakamoto.

[13] In a Sept. 10, 2018, article titled *A Guide to the Financial Crisis—Ten Years Later*, the *Washington Post* described the impact a: "… the worst U.S. economic disaster since the Great Depression. In the United States, the stock market plummeted, wiping out nearly $8 trillion in value between late 2007 and 2009. Unemployment climbed, peaking at 10 percent in October 2009. Americans lost $9.8 trillion in wealth as their home values plummeted and their retirement accounts vaporized.

The data stored on a blockchain can relate to assets, transactions, contracts, and agreements entered into by users of the same blockchain. The ledger, which serves as a single source of truth about the state of the blockchain at any given time, is relayed across hundreds, perhaps thousands of member computers (aka nodes) within an organization, a country, multiple countries or the entire world. Each transaction is replicated in full on each member's computer. Those member-computers confirm that transactions have taken place by a process referred to as consensus. A blockchain is not located in one central place or controlled by one central entity or person. It can be public (open for all to view) or private (viewable only by a closed community). And it can offer open access for all or permissioned access after certain rules have been satisfied.

Blockchains maintain a single source of the true state of the transactions and balances ledger at any given time, like a shared excel spreadsheet or a group text message string. It is highly resistant to change (like read-only memory, or ROM) and it combines in a novel way three existing technologies the Internet, peer-to-peer (P2P) networks and public/private key (PPK) encryption with digital signatures to create a new data structure and a new way of storing information on a computer and synchronizing encrypted data across multiple computers. Encoded consensus mechanisms require that network participants agree on a single truth about the state of the ledger for each new transaction and this agreement maintains trust within a community of people who are strangers to each other.

Blockchains are append-only. Therefore, although new information can be added, once entered it cannot be deleted or reversed. A resulting concern from immutability is that this append-only nature makes stored transactional data impossible to change. They are also pseudonymous (but not anonymous, contrary to common belief), which raises concerns of the possible proliferation of illegal activity (money laundering, terrorist activity, drug sales, trafficking in goods or humans, for example).[14]

Blockchains are disintermediated and transnational and neither relies on any centralized intermediary for transactions to occur nor private or public entity controls. Therefore, public blockchains are censorship resistant. However, this raises concerns that the absence of a central point of accountability and lack of any geographical boundaries can render blockchains extremely difficult to govern.

Finally, the transparent and traceable nature raises concerns about user privacy because public, permissionless blockchains are not anonymous although privacy coins like Monero and coin mixers use heightened encryption to mask addresses.

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'It was such a shock to the economic system that it unleashed dynamics that we still don't understand fully,' said Joe Brusuelas, chief economist at RSM, an audit and advisory firm."
https://www.washingtonpost.com/business/economy/a-guide-to-the-financial-crisis--10-years-later/2018/09/10/114b76ba-af10-11e8-a20b-5f4f84429666_story.html.

[14] Some reports indicate that concerns of the illegal use of cryptocurrencies is vastly overstated. For more information, read the *Forbes.com* article by Hailey Lennon, Esq., *The False Narrative Of Bitcoin's Role In Illicit Activity* (Jan. 19, 2021) https://www.forbes.com/sites/haileylennon/2021/01/19/the-false-narrative-of-bitcoins-role-in-illicit-activity/.

The Goal: The Future of Financial Inclusion

Web 3.0 has the potential to be the decentralized and democratized internet promised when Web 2.0 emerged. An optimally functioning blockchain gives access to all and is fully transparent to mitigate (or in some cases eliminate) the asymmetry of information that plagues the current opaque, privileged financial system.

Given the still relatively early-stage development of blockchain infrastructure, it is imperative that private and public entities work together to explore and enhance those aspects of the blockchain, decentralized finance (DeFi), crypto assets (including non-fungible tokens (NFTs), stablecoins (ex: DAI, USDC), and central bank digital currencies (CBDCs) that empower, include, and uplift all communities, including black and brown communities. A critical and unique opportunity exists to achieve these aspirations, one that has not existed since the dot com era that created enormous Silicon Valley wealth for generations. The reason is because in a decentralized financial environment, it matters not one's race, ethnicity, age, gender, orientation, or any "othered" characteristic.

Bitcoin's rise in price since the early years to recent all-time highs[15] on April 14, 2021 of $64,805.00 turned early adopters, who chose to buy or mine Bitcoin early on and to hold the currency for the long-term (aka HODL), have seen the value of their portfolios rocket beyond Satoshi Nakamoto's wildest dreams. Bitcoin has gone from being valued at little more than one cent in 2009 to what J.P. Morgan Chase bank analysts now say could triple in value and challenge gold.[16] And if one Bitcoin address represents one owner, there are now 74,975 Bitcoin millionaires and 6,066 Bitcoin deca-millionaires (as of 7/16/2021),[17] a staggering statistic when compared to the protracted timeline one ordinarily takes to achieve millionaire status with traditional appreciating assets.

But as I explained in a January 1, 2021, Medium.com article, this new asset class comeuppance has largely benefited the privileged few with exclusive access to tech and finance inner circles that rarely include members of the black community. This is true despite the dogged libertarian principles of maximizing autonomy and political freedom, free association, live and let live individualism and voluntary association, from which Bitcoin emerged.

This year, The Hamilton Project released a comprehensive evaluation of wealth in the U.S.[18] and found evidence of staggering racial disparities in generational wealth accumulation. For example, in 2016, the net worth of a typical white family was $171,000, nearly 10 times greater than that of a black family ($17,150). The report also shows that families with the same income can have dramatically different wealth profiles, thanks to lower debt, past accumulated income, inherited wealth and other liquid assets. This wealth gap can be viewed both as a cause and a

[15] As of the date of this hearing.
[16] https://fortune.com/2020/10/26/jp-morgan-chase-bitcoin-predictions-analyst-jpm-cryptocurrency/.
[17] https://bitinfocharts.com/top-100-richest-bitcoin-addresses.html (7/16/2021).
[18] https://www.hamiltonproject.org/blog/examining_the_black_white_wealth_gap.

symptom of a lack of access to affordable and reliable means to save, borrow and invest, especially when coupled with redlining and predatory loan practices that perpetuate and exacerbate these chronic concerns.

The FDIC.com website defines economic inclusion as when"… all consumers have access to safe, affordable financial products and services." Accordingly, "[o]wnership of a transaction account is a first step toward economic inclusion". Yet, the reality is the current system is broken because it does not serve all Americans equitably. In fact, a 2019 FDIC Survey titled "Key Findings from How America Banks: Household Use of Banking and Financial Services' revealed that 5.4 percent of U.S. households (approximately 7.1 million) were "unbanked" in 2019. Twenty-nine percent of unbanked households reported not having enough money to meet minimum balance requirements", the first-most cited reason, and 16.1 percent cited a lack of trust in the banking system as the main reason for not having an account—the second-most cited main reason. The black community's historical distrust of the centralized power of government, and healthcare and banking systems further compounds problems while widening the wealth gap.[19]

McKinsey & Co reports that "A lack of financial inclusion for black Americans exists at every level of the financial system."[20] And the International Monetary Fund (IMF) describes financial inclusion as the critical bridge between improved economic opportunity and improved economic outcomes. A company report noted that in 2017, nearly half of all black households were unbanked or underbanked.

So what does financial inclusion mean in the digital future for historically excluded communities? The future of financial inclusion is inextricably linked to meaningful access to opportunities in the digital future built on the rails of blockchains.

Use Cases[21]

A wealth of possible uses exists for blockchain technology beyond cryptocurrencies, some with obvious applications like to store public records that everyone can access and no one can change or destroy (for land records, for example). In fact, blockchain technology will impact and improve dozens of industries beyond banking and payments by making systems operate in a more efficient, effective and accessible manner, including supply chain management, insurance, philanthropy, provenance, identity, educational credentialing, government, intellectual property, healthcare, and energy to name just a few.

Social Impact

[19] https://www.forbes.com/sites/ericbrotman/2020/09/30/the-wealth-gap-widens-covid-19s-k-shaped-recovery/?sh=52f453bcce6e

[20] https://www.mckinsey.com/industries/public-and-social-sector/our-insights/the-case-for-accelerating-financial-inclusion-in-black-communities

[21] These use case statistics are curated from a comprehensive 2021 Consensys.net compilation found at: https://consensys.net/blockchain-use-cases/.

Blockchains and blockchain-centric organizations and entities[22] can be leveraged to establish fair competition, access and transparency in a modern economy of continual exploitation. An estimated 20-25% of funds globally are lost to corruption at the government level, intermediaries take up to 7% of remittances, and modern fintech solutions fail to include the 1.7 billion unbanked adults around the globe.

Capital Markets

For capital markets, blockchain unlocks easier, cheaper, and faster access to capital. It reduces the systemic barriers to issuance and enables peer-to-peer trading, faster and more transparent settlement and clearing, reduced costs, decreased counterparty risks, and streamlined auditing and compliance.

Decentralized Finance (DeFi)

DeFi is an umbrella term used to describe a vibrant ecosystem of blockchain-based decentralized applications (dApps) that offer a range of financial services similar to those provided by traditional banks, insurance brokers, and other financial intermediaries. The differentiator is that DeFi services are implemented by software applications powered by a special type of computer code (smart contract code), that automates the performance of various functions. Some are simple and straightforward "if, then" propositions and others are intricate, complex webs of interrelated functions, like decentralized autonomous organizations (DAOs).

Central Bank Digital Currencies (CBDC)

CBDCs are a digital form of central bank money that offers central banks unique advantages at the retail and wholesale levels, including increased financial access for individual customers and a more efficient infrastructure for interbank settlements.

Digital Identity

A blockchain-based digital identity system provides a unified, interoperable, and tamper-proof infrastructure that protects against theft and empowers individuals with greater sovereignty over their data, including portability.

Government and the Public Sector

Distributed ledgers can assists governments to deliver service and manage health, safety and general welfare of citizens in a way that provides greater accountability, transparency, security and responsiveness, along with increased efficiency, all at lower costs.

[22] A prominent example is the work of Emerging Impact, which partners with International NGOs, financial service providers, and government agencies to modernize financial services in emerging markets. EI's vision is to realize economic empowerment of millions of people at a time by leading the fight for inclusive, digital finance through open banking & decentralized microfinance.

Healthcare and the Life Sciences

Blockchain technology can offer faster, more efficient, and more secure medical data management and medical supply tracking. This could significantly improve patient care, facilitate the advancement to medical discoveries, and ensure the authenticity and provenance of drugs circulating global markets.

Insurance

Insurance claims can be efficiently streamlined using blockchains to verify data, process claims, automate disbursement, and reduce processing time significantly.

Media and Entertainment

Blockchain technology can be leveraged to maintain ownership records, and when coupled with NFT standards, can mitigate piracy, fraud, and intellectual property theft of digital items cost the entertainment industry an estimated $71 billion annually. The transparent tracking of an asset over time and infusion of liquidity into secondary resale markets is a Blockchain technology that can track the life cycle of any content, which has the potential to protect digital content, and facilitate the distribution of authentic digital collectibles.

Tokenization of Real-World Assets

The ability to represent real-world asset ownership in a verifiably unique digital form promotes fractionalization of ownership, expanded access to global markets, increased liquidity, and democratized access to real estate investment opportunities.

Conclusion

Web 1.0 was fully centralized. It involved the original client-server data delivery model of the information age; that is, one central database making information available to users who interacted with that server-disseminated information passively. Web 2.0, or the decentralized, interactive, social web involves numerous mini client-server models. In Web 2.0, users are both recipients and users of creative content and, in many instances, creators. However, data is still siloed by powerful, hypercompetitive entities. By contrast, the distributed web—at least in its idealized configuration—has few, if any, centralized intermediaries, especially those engaging in predatory, rent seeking behavior or engaged in biased gatekeeping and cronyism. A Web 3.0 world envisions the consumer not just as an end-user but as a producer and owner, with full agency and autonomy, who controls the flow of information and, most essentially, of value.

Blockchain has been touted as a disruptive revolution. While it has not yet upended Web 2.0 as we know it, it *is* revolutionary. This is particularly true given its impact as an increasingly viable alternative to, and thus a major customer service concern of, traditional, centralized finance. Blockchain is not a single technological solution and that is a core part of its brilliance. The technology is highly versatile and can be customized to meet the needs of its adopters in most

cases, assuming the user or industry can benefit from a decentralized, transparent ledger of transactions.

The future of Web 3.0 has yet to be written. Only time will tell whether blockchain technology will replace the current system of data structures and whether blockchain's impact will be revolutionary or merely evolutionary. Regardless of the outcome, Pennsylvania has an exciting opportunity to discover ways to embrace innovation as the story (and code) are being written. Positioning the Commonwealth and its residents and corporate citizens to be fully prepared for the digital future may yield significant economic, cultural, social, and societal benefits. Education, access, transparency, and inclusion are key. Pennsylvania's digital future is now.

Sincerely,

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