BUILDING BLOCKS OF CHANGE: THE BENEFITS OF BLOCKCHAIN TECHNOLOGY FOR SMALL BUSINESSES

HEARING

BEFORE THE

COMMITTEE ON SMALL BUSINESS
UNITED STATES
HOUSE OF REPRESENTATIVES

ONE HUNDRED SIXTEENTH CONGRESS

SECOND SESSION

HEARING HELD
MARCH 4, 2020

Small Business Committee Document Number 116–076
Available via the GPO Website: www.govinfo.gov

U.S. GOVERNMENT PUBLISHING OFFICE
39–892 WASHINGTON : 2020

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BUILDING BLOCKS OF CHANGE: THE BENEFITS OF BLOCKCHAIN TECHNOLOGY FOR SMALL BUSINESS

WEDNESDAY, MARCH 4, 2020

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SMALL BUSINESS,
Washington, DC.

The Committee met, pursuant to call, at 11:30 a.m., in Room 2360, Rayburn House Office Building. Hon. Nydia Velázquez [chairwoman of the Committee] presiding.

Present: Representatives Velázquez, Finkenauer, Davids, Delgado, Chu, Chabot, Houlahan, Evans, Schneider, Bishop, and Spano.

Chairwoman VELÁZQUEZ. Good morning. The Committee will come to order.

I want to thank everyone for joining us this morning, especially our witnesses for taking time to travel here to testify before our Committee.

The key to long term growth in our economy is to make sure we are creating an environment that encourages innovation. That is why since last January we have held hearings on how the digital ecosystem promotes entrepreneurship, how small firms are leading the way in the clean energy economy, and solutions to decrease barriers for women and minorities seeking patents and trademarks. Today's hearing is another topic I am excited to explore, which is how blockchain technology is being used to support entrepreneurship and small business growth.

I know that when most people hear about blockchain, they automatically think of cryptocurrency and bitcoin. While blockchain is the technology that enables the existence of cryptocurrency, by no means is that its only use. As a member of the Financial Services Committee, I have heard firsthand how blockchain technology is being utilized in payment processing by large banks and insurance companies.

Today, we have an opportunity to hear from small businesses that are using blockchain technology to reduce costs, increase efficiencies, disrupt industries, and grow their businesses. As we all know, the Internet, once the realm of hobbyists and cutting-edge tech experts, has grown into a mainstream driver of economic growth and efficiency.

Yet, much of the power of the Internet is concentrated in a few multibillion-dollar companies such as Facebook, Google, and Amazon, who gather large amounts of data on consumers, and dominate

marketplaces. In fact, many small businesses rely on these large corporations for advertising, E-commerce, distributing their products, cybersecurity, and cloud computing. Much like when a Walmart comes to town, it is challenging for small businesses and entrepreneurs to compete against these massive corporations.

Blockchain technology can help small businesses compete on a more level playing field with larger corporations by streamlining operations, reducing reliance on costly third-party intermediaries, and boosting cybersecurity networks. By deploying blockchain effectively, the technology can have a positive financial impact on small businesses.

Over the last decade, there has been a frenzy of investment and entrepreneurship around blockchains. Innovators and small businesses are at the forefront of a wide variety of blockchain-based technological applications in nearly every sector of our economy, including healthcare, the clean energy sector, financial services, transportation, and logistics.

The international competition has begun.

Many other countries have invested in blockchain research and initiated coordinated frameworks. Congress must do our part to make sure that the United States remains a leader in blockchain development and engagement.

Because blockchain technology has a wide variety of applications, both in government and in the private sector, there are a number of federal agencies that have been looking at the uses of blockchain technology including the SEC, CFTC, and even the IRS.

However, many of these efforts are not coordinated between agencies, leaving uncertainty for businesses and entrepreneurs. We must make sure that the federal government adopts policies that support blockchain technology as it becomes a driver of wider economic growth and efficiency. There is a need for a coordinated framework to balance the need for regulation, while still supporting innovation, and providing clarity and predictability for businesses and entrepreneurs.

Today's hearing is a chance for us to go beyond the hype to understand the benefits and challenges of blockchain technology. Our panel today represents a diverse set of expertise and viewpoints that will provide insight into some of the areas where blockchain is having an impact on small businesses. I look forward to the testimony and discussion.

I would now like to yield to the Ranking Member, Mr. Chabot, for his opening statement.

Mr. CHABOT. Thank you, Madam Chairwoman.

Technology is continuously being developed to meet the needs of a rapidly changing world. From the development of the assembly line, to the credit card, to the virtual universal use of the Internet, businesses are continually adapting to the world around them in order to remain competitive and provide for their customers.

Businesses embrace technological advancements in order to reduce costs, streamline processes, increase productivity, and maximize customer satisfaction. Though technological advancements may be difficult for some to learn and adopt, our most innovative minds are searching for ways to do better. Our free market thrives on this continued innovation.

Blockchain technologies are one of the newest advancements with a potential to create a positive impact on businesses, consumers, and our economy. It is important to examine this growing field in order to learn more about the potential security benefits and cost reductions. Of course, as with all new technologies, we must be aware of any potential challenges that could adversely impact individuals or businesses, especially small businesses.

Today, we will hear what the complex world of blockchain technology has to offer our small businesses and gain a broader understanding of the benefits and challenges associated with this technology.

I want to thank the Chairwoman for holding this hearing and for inviting one, in fact, two witnesses from America's greatest state, Ohio.

Thank you, and I yield back.

Chairwoman VELAZQUEZ. The gentleman yields back.

If Committee members have an opening statement, we would ask that they be submitted for the record.

I would like to a minute to explain the timing rules. Each witness gets 5 minutes to testify and members get 5 minutes for questioning. There is a lighting system to assist you. The green light will be on when you begin, and the yellow light will come on when you have 1 minute remaining. The red light will come on, and that means that the time is up, and we ask that you stay within that timeframe to the best of your ability.

I would now like to introduce our witnesses.

Our first witness is Mr. Shane Bigelow, the CEO of Ownum. Ownum companies aim to bring more efficiency to vital records by converting paper-based processes to digital formats using blockchain technology. Prior to joining Ownum, Mr. Bigelow was a Senior Vice President and Managing Director at Bear Stearns where he managed U.S. business and served on the firm's Responsible Investment Committee. Thank you for being here.

Our second witness is Ms. Dawn Dickson. Ms. Dickson is the CEO of PopCom, an automated retail company that uses Blockchain to help collect customer insights. As a serial entrepreneur with over 16 years of experience in marketing and business development, Ms. Dickson has launched four successful companies since 2002. Her most recent ventures include Flat Out of Heels and PopCom. Thank you for your testimony and for being here today.

Our third witness is Mr. Marvin Ammori, the General Counsel of Protocol Labs. Protocol Labs is a research, development, and deployment institution for improving Internet technology. Using an open source approach to creation, Protocol Labs focuses on building systems and tools to improve how the Internet works. Mr. Ammori is a leading First Amendment lawyer and Internet policy expert. Prior to joining Protocol, he was a legal fellow at the New American Foundation, an affiliate scholar at Stanford Law School, and law professor in Nebraska. He was also the head lawyer for Free Press and has been a leading legal advocate in advancing network neutrality. We appreciate you being here today.

Now I yield to the Ranking Member, Mr. Chabot, to introduce our final witness.

Mr. CHABOT. Thank you, Madam Chairwoman.

Our final witness is Jim Harper. He is not one of our two Ohio witnesses, but he is still pretty good. Mr. Harper is a visiting fellow at the American Enterprise Institute (AEI). Before joining AEI, he worked at the Competitive Enterprise Institute and the CATO Institute. Previously, he served as counsel for the House Judiciary Committee Subcommittee on Commercial Administrative Law and is counsel for the Senate Committee on Homeland Security and Governmental Affairs. Mr. Harper received his B.A. from University of California, Santa Barbara, and his J.D. from University of California's Hastings College of Law. And we welcome you here this morning, Mr. Harper. We welcome all the witnesses.

Chairwoman VELAZQUEZ. Mr. Bigelow, you are now recognized for 5 minutes.

STATEMENTS OF SHANE MCRANN BIGELOW, CEO, OWNUM, LLC,; DAWN DICKSON, CEO, POPCOM; MARVIN AMMORI, GENERAL COUNSEL, PROTOCOL LABS; JIM HARPER, VISITING FELLOW, AMERICAN ENTERPRISE INSTITUTE

STATEMENT OF SHANE MCRANN BIGELOW

Mr. BIGELOW. Good morning Chair Velázquez, Ranking Member Chabot, and members of the Committee. Thank you for inviting me to speak on this important topic.

I am Shane McRann Bigelow, the CEO of Ownum. Today, I am appearing on behalf of the Chamber of Digital Commerce, as well as my company, Ownum, to offer our specific experiences in starting a small business that improves the lives of consumers by providing quicker and more efficient access to vital records and enhances public safety in doing so.

In the United States, our vital records are used to demonstrate ownership, citizenship, birthright, and much more. However, acquiring these important documents is cumbersome because these records are largely paper based. For most Americans this is an annoyance at best and debilitating at worst. For the poorest in our Nation, a group disproportionately tilted towards minorities, vital record acquisition and maintenance can represent the worst in life.

From a mother who is trapped in an abusive relationship with her husband because he is holding hostage her and their children's birth certificates and other important documents to a title loan store that is pressuring a downtrodden individual to relinquish his or her vehicle title in exchange for an exceedingly high interest rate loan, vital records are regularly at the epicenter of physical and economic disadvantage in our most vulnerable communities. Further, our government process today requires considerable paperwork and more importantly time spent in line at the DMV or Department of Health in each state in our Union. This requires time away from employment and is an event that requires transportation, something that studies indicate our poorest communities lack in quality form in much of our Nation. It could easily be said that the process to acquire vital records in this country is discriminatory.

The question of course becomes why, in this age of technology where cell phones are abundant and internet access is readily

available, do we still require such antiquated processes as filling out paperwork, spending hours in long lines, and physically showing up at inconvenient locations, all while missing work?

We have failed to become fully digital because there has been no incentive to change. The ecosystem around vital records—banks, insurance companies, hospital systems, etc.—have accepted the legacy process of using paper as a cost of doing business. That was acceptable 20 years ago when our technology could not fully support a digital process, but that is unacceptable today.

At Ownum, we aim to change all of that. Ownum is a holding company, that was started by Bernie Moreno and me, approximately 2 years ago. Under Ownum, other companies are created, each with a similar goal. That goal is to digitize a particular vital record and the process to acquire it—no paper, anywhere, anytime.

Our first company is Champ Titles, which can be found at champtitles.com, where we are digitizing vehicle titles. The second company is Vital Chain, found at vitalchain.com, which is digitizing birth and death certificates. Each uses blockchain technology to improve accuracy and efficiency, and fight fraud.

Ownum's use of blockchain technology is why we are invited to be here today. But sadly, the use of blockchain is often a source of confusion and one of the biggest delays for governments. Unlike in the 1990's and 2000's when government promoted business and fostered the internet boom, today our governments seem to be doing the opposite with anything related to blockchain. This is where this Committee can be of great help to any small business or start-up working with blockchain technology today. If state governments were encouraged to pursue digitization, like what the IRS did when they allowed a multitude of vendors to replace paper tax filing with digital filing, that would be a great step forward.

The states need an incentive to allow vendors like us to send in and transact completely in digital form the information they currently acquire and transact in paper form.

Ideally, the outcomes Ownum seeks are as follows:

Help the poorest in our country to gain better access to their vital records in a secure way by encouraging Federal and state governments to allow for the digitization of not only their vital records, but the process to acquire them; use this Committee's paper reduction authority to promote the digitization of paper-based vital records at the state and Federal level in areas where government services are involved; provide financial aid to small businesses seeking to provide digitization of records; incentivize state governments to adopt digitized vital records; and affirm publicly that the Federal ESIGN Act applies across all 50 states to blockchain technology and other emerging tech.

By recommitting, as we did during the internet boom, to focus our government, at all levels, on what a technology enables, we will help our government to pursue digitization strategies for vital records. Doing so will enable many startups and small businesses like us to build the next generation of the innovative and entrepreneurial culture in America.

Thank you, and I look forward to your questions.

Chairwoman VELAZQUEZ. Thank you, Mr. Bigelow.

Now, Ms. Dickson, you are recognized for 5 minutes.

STATEMENT OF DAWN DICKSON

Ms. DICKSON. Thank you, Chairwoman, Ranking Member, members of the committee, it is an honor to be here today to represent the great state of Ohio.

I am Dawn Dickson, a small business owner for 20 years. I am what most call a serial entrepreneur. I am driven and passionate about business ownership and identifying resources to move my companies forward.

Like many small business owners, I have benefitted greatly from SBA programs, including SCORE and Bixel Exchange. In 2016, I won $20,000 in the SBA innovateHER Challenge, and last year I won $125,000 in the MEDA $1 Million Pitch Competition that is also SBA funded.

I own four small businesses but today I will focus on one, PopCom, where I am leveraging blockchain technology for specific aspects of my business.

PopCom is a small B2B tech startup that develops software and IoTconnected hardware for self-service retail. This includes vending machines and kiosks used to dispense products and perform transactions.

At PopCom, we are using blockchain to optimize machine-driven transactions for government-regulated products that require identification verification, sales compliance, supply chain information, or a combination of all three. There is tremendous opportunity in this space, over $3 trillion in global revenue, growing to $5 trillion by 2022.

I want to clarify that PopCom is not a blockchain company. We are a technology company that uses facial recognition and artificial intelligence in our software. I am simply using specific blockchain applications for my business. This is an important distinction.

Blockchain is not a silver bullet. However, it can solve problems that small businesses face. Instead of buying our own proprietary product, we partner with CIVIC, a secure blockchain identity management platform to age gate customers, to execute purchases of regulated products, such as cannabis from a vending machine.

As a company, we believe that the most secure way to check and confirm a customer's identity, while ensuring their personal data remains secure, is to have the customer verify their information on their mobile device and store that data on the blockchain. We never collect or have access to any of their personal data. We know nothing about or from the customer, and that is the power of blockchain.

Blockchain is more than a business tool. It can also be leveraged for fund-raising. I know first-hand the challenges that small businesses face when raising traditional and nontraditional capital.

In 2016, after I won the SBA InnovateHER Challenge, I still could not qualify for an SBA loan, despite already generating revenue and having excellent credit history.

Federal programs are ineffective if they are not accessible to the very small businesses they were created to empower.

In 2018, I made the tough decision to turn down $1.5 million in VC investment because it would have meant giving up over half of my business ownership. After we completed our seed round, bringing our funding to close to over $1 million from Angel and VC, I

decided to do a secure token offering to raise capital and to give people in my community the opportunity to invest in my business.

Blockchain technology made this possibility through the tokenization of my cap table. A token represents a digital share stored on the blockchain, and it is treated no differently than a traditional stock certificate. However, the token is proof of investment that lives on the blockchain ledger forever and cannot be erased or retracted. This gave people comfort and security knowing that their money is safe.

In 2019, I became the first female CEO globally to raise over $1 million using equity crowdfunding under Title III, Reg CF of the JOBS Act. I leveraged my personal network to raise capital through the STO, instead of relying solely on VCI and Angel investors to fund my business.

Access to capital for small businesses has come a long way since I started my first company in 2001. However, more needs to be done to increase this access in order for entrepreneurs to continue to grow, bring products to market, and create jobs.

Congress is in a position to address these issues and this Committee can lead the way.

There are few financial institutions that will capitalize enterprises that are using blockchain. The National Policy Network of Women of Color in Blockchain have developed a legislative proposal to create a federally-backed SBA 7(a) loan for entrepreneurs and small businesses who are using blockchain technology. This unique SBA 7(a) loan could help level the playing field for all businesses.

Congress should consider blockchain and cryptocurrency as a part of the solution and advance policies that will benefit small business owners like me.

I hope you will continue to engage diverse forces as you deliberate legislative priorities to ensure entrepreneurs can innovate, build, and grow right here at home.

Again, thank you for the opportunity to contribute to this important debate on behalf of the millions of constituents across the Nation that this Committee is tasked to empowering.

Chairwoman VELAZQUEZ. Thank you, Ms. Dickson.

Mr. Ammori, now you are recognized.

STATEMENT OF MARVIN AMMORI

Mr. AMMORI. Thank you, Chairwoman Velázquez, Ranking Member Chabot, and other members of the Committee for inviting me here today.

I am Marvin Ammori, testifying on behalf of the Blockchain Association.

I head Legal and Policy at a member company called Protocol Labs. Protocol Labs was founded in 2015, and now has more than 117 employees and contractors across 36 states and 16 countries.

This year my company plans to launch the Filecoin protocol, which is software designed to create a vibrant marketplace for online data storage. And Blockchain technology is one key enabler of that marketplace.

So, let's begin with blockchain technology.

When you cut through the hype, a blockchain is essentially a data structure. So, think of a database, a ledger, or a spreadsheet.

Now, why is there so much hype for a better spreadsheet? Because a blockchain stays up-to-date and in sync based on software rules and community agreement. So, one person or one company does not choose how to update the entries in the spreadsheet; rather all (or a specified number) of the computers in a network will ?agree to make the update together.

So, you might prefer a blockchain instead of a traditional database or ledger. If you would rather trust a consensus of multiple actors versus trusting one single recordkeeper. It is that simple.

So the invention of blockchain technology can affect industries far beyond money listed in a ledger, including health care, supply chain, vital records, and anywhere else you would want multiple people making the consensus, including enabling competition in Internet infrastructure, such as services like cloud storage.

So, the Filecoin network will be a marketplace for buying and selling cloud. For decades, computer scientists and law professors have written about the resilience benefits of a programmable, efficient market for storing data, where people who have extra hard drive space on their phone or in their data center could rent that storage, securely and efficiently, to others who wanted access to that storage. Our software will be open source, and anyone will be able to download it for free to broadcast their desire to buy or sell hard drive space.

In the Filecoin network, a blockchain will record the storage market's transactions. As a result, nobody will be needed as a middleman, including us, to manage the marketplace. Anyone can rely on software rules and underlying that, mathematics for the marketplace.

So how can Filecoin and the Blockchain underlying it benefit small businesses?

First, creating a marketplace in online storage may drive down the cost of data storage, which is a real cost for almost every business in every sector. Businesses need reliable and secure places to store data as much as they need electricity, and many of them pay cloud storage providers to hold and serve that data from their data centers. If Filecoin drives down storage costs through enabling more competition, small businesses will save money, which they can invest in jobs and R&D. Further, more small businesses would be able to afford the digital file cabinets needed to innovate in data-hungry new fields, such as virtual reality, healthcare imaging, and artificial intelligence.

Second, and just as importantly, Filecoin will enable small businesses to compete directly in the cloud storage market. Today, Amazon is the largest provider of cloud computing through its Amazon Webservices Division. This is actually Amazon's biggest business, accounting for more than 2/3 of Amazon's operating income with high margins. We hope that an open storage marketplace can help all the smaller and mid-size players to compete more effectively, not based on brand recognition or large enterprise sales teams but by competing on costs, speed, and security.

We are not the only company using blockchain data structures to create open marketplaces for Internet infrastructures, which we hope will decrease the power of today's large Internet platforms, and some would say decentralize the Internet. Others include new

browsers, privacy-protective advertising exchanges, video encoding marketplaces, identity solutions such as mentioned by Ms. Dickson, and highly-distributed computing.

In sum, blockchains are novel data structures. They may be useful in many industries where multiple players prefer collectively updating records instead of relying on one central updater. One of those industries is Internet infrastructure, including our project which we hope will benefit many small businesses, and there are many other use cases.

Thank you. I look forward to your questions.

Chairwoman VELÁZQUEZ. Thank you, Mr. Ammori.

Mr. Harper, you are now recognized for 5 minutes.

STATEMENT OF JIM HARPER

Mr. HARPER. Chairwoman Velázquez, Ranking Member Chabot, and members of the Committee, thank you for the opportunity to testify before you today despite my woeful lack of Ohio roots.

When I was counsel with the House Judiciary Committee in the latter part of the last century, I had the opportunity to collaborate with a lot of Small Business Committee staff, so I have a lasting affection for the Committee. I do not think any of those folks are still here, but I am glad to see consistency in the leadership.

I am Jim Harper, visiting fellow at the American Enterprise Institute, and senior research fellow at the University of Arizona, James E. Rogers College of Law.

Since I left the House in 2000, I have been a student of technology, including blockchain and cryptocurrency since 2011. In my time I came to believe that you really have to understand a technology fairly deeply to gather what the consequences of the technology are and what might come from any regulatory intervention. So my written testimony is fairly heavy on blockchain as a technology, the processes by which blockchains are created and the use of cryptocurrency in some cases to secure blockchains, such as when there are higher value uses or larger scale blockchain applications.

I am going to spare you that lecture here today. You should be happy to know that. And I will skip to the consequences that I perceive for small businesses.

You have heard from my co-panelists about specific implementations that illustrate the benefits of blockchain. I perceive them breaking down into three categories. One, already mentioned, just simple efficiency. Blockchains may allow various business functions to be conducted at lower cost. On the theory that each dollar saved is more precious to a small business than it is to a larger business, I think that is a distinct and important benefit for small business.

Second, blockchains may allow for diversified and open-market structures that support more niches and specialties. Because I like the example so well, I focused my written testimony on an effort called Beefchain. Along with saving on costs and losses when meat supply may be tainted, a Beefchain may allow small producers of specialty meats to serve national markets. What a boon for small businesses and consumers who might enjoy greater options than what is available through commodity meat production.

Finally, I think blockchains may reduce the competitive advantage that large businesses have in the world of data. This relates pretty well, Chairwoman Velázquez, to the reference you made to the bigger players in tech right now. Large companies, not only in tech but throughout industry, have the resources and heft to set data standards for their industries. These standards may benefit the large businesses themselves. And of course, they have access to more data about markets, products, customers, and so on.

Blockchain can bring large communities together to create data commons, unowned, nonproprietary stores of data. These projects more likely have data structures that serve all use cases, including the uses of small business, and they may give small businesses access to data that they did not previously have. This would give them the ability to use advanced analytics and make other uses of data that are now reserved only to bigger businesses. So blockchain may lower barriers to entry and innovation.

My friends in the cryptocurrency world may poo-poo the benefits of mere blockchain. The larger cryptocurrency projects may have world-changing consequences, and that is exciting stuff. But I think about it this way: The Internet, when it came along, was an amazing tool for communication. When I left The Hill 20 years ago, I do not think even I imagined that we would have video conversations on our hand-held phones. I did not think we would have a language of emojis and gifs that we use. I did not think I would be able to keep in touch with high school friends from 35 years ago the same way I keep in touch with my neighbors. All that is because of the communication medium that the Internet created.

Well, what the Internet itself did for communication, blockchain and cryptocurrency may do for recordkeeping and administration. That means big changes in how business and government are conducted. Big shifts in power, including, hopefully, lower power and fewer concentrations of power in society, including in those larger businesses. That is important, even if it is mostly still potential.

There will be a lot of consequences to sort through. One could argue that the challenges we face in online privacy exist because the Internet grew a little too fast for our society to absorb it. The net benefits are great though, and they will continue to accrue.

The same goes for blockchain and cryptocurrency. They hold out substantial benefits for all sectors of society and the world. You are wise as a Committee to be examining this now and making this Committee part of the process of ingratiating the technology into society so that we can get the benefits from blockchain while controlling the costs and the risks.

Thank you again for having me here today. I look forward to any questions you may have of me or my co-panelists.

Chairwoman VELAZQUEZ. Thank you. Thank you to all of the witnesses for great insight that you have provided to us today.

Mr. Bigelow, small businesses often rely on third-party intermediaries or middlemen when conducting business. Can blockchain help eliminate multiple intermediaries in certain industries, thereby increasing efficiencies and reducing costs for small businesses?

Mr. BIGELOW. Chairwoman, thank you very much for a great question.

The short answer is yes. An example comes to mind from an experience recently that might shed light on how this could occur. I had to get from a meeting to an airport as is commonly the case with my travel. I could not take an Uber or a Lyft, so instead I arranged for a car service. I was in the car on the way to the airport, and I started talking to the driver and I asked is this part of a fleet? He said, the owner started it and there are six or seven cars in the fleet. And I asked, how often do you cycle through the vehicles? And he said, more often than you think. We put a lot of miles on them. And I asked, who takes care of that? And he said, every time we have to sell the car, the owner gets involved, and he has to go through the whole process. I asked, what sort of involvement does that require? He said, as far as I understand it, we sell three or four cars a year, and every time they do that they have to go down to the DMV and take the title, convert the title into the new owner or get the title from the lender if they just paid off the loan, and they spend anywhere from 3 to 4 hours either in line or getting to and from the location. I asked, does the owner also drive the cars? He said, yes, he is a crucial part of our fleet. I said, for the totality of that time, that owner is out of pocket. The owner probably makes somewhere in the neighborhood of $50,000 to $60,000 per year. If you presume that the cost of that time is anywhere from 3 to 4 hours per instance and there are 3 or 4 instances per year, it is very easy to equate that to somewhere in the neighborhood of about $500 or $600 per year. That is 1 percent of their earnings. That is effectively a tax on that individual.

With blockchain as the intermediary, immediately the car title can be shifted from the bank back to the owner. The owner can then give it to somebody else.

Chairwoman VELAZQUEZ. Is there any industry where this can have the most impact?

Mr. BIGELOW. It is self-serving for me to say, but I believe there are two places. For car titles, the example was not accidental. This is the low-hanging fruit that exists right now in a place where the government can be helpful. Anyplace where there is a government-based vital record, if we convert that to a digital form, it will help all of the businesses around it. Banks and insurance companies, are particularly burdened with the cost of titles so vehicle titles are the first place.

Chairwoman VELAZQUEZ. Thank you.

Ms. Dickson, for all small businesses, improving customer service is critical for success. How is blockchain technology being used by small businesses to learn more about their customers?

Ms. DICKSON. Thank you, Chairwoman, for the question.

What comes to mind immediately is our use of blockchain for identity management when we use facial recognition. So, as you know, face recognition is becoming very big across multiple industries and everywhere in the world, really. And on our vending machine platform we offer facial recognition to understand the customer demographic profile. So, understand male, female, approximate age, and your engagement ring. However, the privacy concerns around are you taking that person's identity data and using that for anything, that has been a big concern and that is why we utilize the blockchain so that when we do need to confirm that

identity for a regulated product or for a prescription or alcohol, that we can verify they are a confirmed identity, of age, and able to purchase that product, but never take their identifying information.

Chairwoman VELÁZQUEZ. Thank you.

Ms. DICKSON. Okay. Yes.

Chairwoman VELÁZQUEZ. I do not have much time left, but I would like to ask a question to Mr. Ammori.

Do you believe that blockchain, or the use of blockchain, by small firms will level the playing field allowing them to compete against the big tech, like Amazon, or Google?

Mr. AMMORI. Well, that is definitely our hope, and I think it is the hope of several large investors in the country. Andreessen Horowitz and Union Square Ventures essentially have a thesis around using cryptocurrency and Blockchain to compete with a large platform.

Chairwoman VELÁZQUEZ. Thank you.

New industry allows policymakers the opportunity to put in place rules and guidelines designed to increase equity and diversity. What can be done to ensure that communities of color and women are leaders in this industry, and that we do not end up with an all-boys club that exists in a sector like the financial sector?

Yes, sir?

Mr. AMMORI. I think there is a whole range of different initiatives that would cut across all venture capital. I think one thing would be to reduce the general risk around cryptocurrency and Blockchain. There are several good rules that are being proposed, including tax fairness and clarity around securities. And I think if you reduce the risk you will get more money in and that will go across the entire diverse American economy.

Chairwoman VELÁZQUEZ. My time has expired. Thank you so much.

The Ranking Member is recognized.

Mr. CHABOT. Thank you, Madam Chair. And I will begin with you, Mr. Harper.

What, if any, challenges are there that may be discouraging or preventing any small businesses out there from adopting block chain technology?

Mr. HARPER. Well, there are many across a wide range. There is a lot of uncertainty. Blockchain and cryptocurrency are sort of category-busting. They do not fit into the old boxes. I think most of the agencies are doing a creditable job of trying to figure out how old rules apply. And that is generally the case, that old rules probably apply, and they just have to figure out exactly how. There are little gaps where there might be challenges.

But the lack of certainty around how existing regulation applies to various blockchain applications is probably a hindrance. Even today, I think the IRS is holding a session to hopefully do better on how it categorizes and how it works with cryptocurrencies, the value of cryptocurrencies. There are ways its done right, which is establishing pretty much that cryptocurrencies are property, and you get capital gains if you sell at a gain. And there are other cases where it has sort of missed and does not fit well with the tech-

nology. So a lot of certainty needs to grow up around blockchain and cryptocurrency so that people can move forward confidently.

Mr. CHABOT. Mr. Ammori, somewhat related to the question I just asked, is Blockchain ready to be fully embraced would you say? Or are there still areas that should be worked out before mass adoption?

Mr. AMMORI. I think it is ready. I think some of the areas that need to be worked out on the technical side is we really need to improve user interface and usability so that all small businesses could use it. On the legal side, as Mr. Harper mentioned, the tax treatment at the moment is very complicated. If you want to just spend bitcoin on a coffee this morning you would have to keep track of what you paid for the bitcoin and how much it was worth the moment you spent it and pay the capital gain or loss on every single transaction. Doing your taxes for crypto is the worst nightmare.

And so, if we could have a di minimis tax exception which has been proposed, the virtual currency Tax Fairness Act, I think all of you should support that. And then we should also have a little more clarity around the CFTC's role versus the SEC's role. And they are both trying very hard, but more certainty would be very helpful.

Mr. CHABOT. Thank you very much.

Ms. Dickson, did you make the right decision in turning down that $1.5 million from the venture capital fund? I hope the answer is yes.

Ms. DICKSON. Yes. I appreciate the Ranking Member's question.

Mr. CHABOT. If so, tell us about it.

Ms. DICKSON. No, it was an excellent decision because it allowed me to let other investors from around the community invest. So, in the case of venture capital that is one fund or a few funds that come together and they are credited, and they are already wealthy, and they can invest. But using a STO would allow me to leverage friends, family, peers, social media, the community, our customers, to invest at as low as $250. So instead of having two investors in a round or three, we have 2,200. But the way it is structured with the token is that it is considered as like a syndicate, so it is only one line item on my cap table. So, it was a great decision.

Mr. CHABOT. Great. Thank you.

Mr. Bigelow, you mentioned the auto title function, and the Chair mentioned some other businesses. Are there some other governmental agencies or functions that you could envision either at the local level or state level or at the Federal level that you think would make sense for your technology that you have described?

Mr. BIGELOW. There are. Expanding on auto titles, they have an impact on not only the banking industry and the insurance industry when it comes to total loss, but they also have an impact on the way consumers can use that asset to either acquire a loan or value it as part of their total assets for other purposes. Birth and death certificates are another great place. If you think about the example in my opening testimony, we do have a problem in poor and minority communities where those assets are very dif-

ficult to come by, and the time that is spent to acquire them often leads to missed work and sometimes can even lead to someone losing his or her job because he or she was not there. It is a disproportionate tax on that person because the time he or she has to spend in line costs them much more as a percentage of their income than it does for perhaps someone on this panel to actually spend that time in the line.

If the government determined that we should be digitize all of our paper-based assets that are vital records, that would be a great use of time and a great benefit to society.

Mr. CHABOT. Thank you very much.

Madam Chair, my time is getting ready to expire, so I yield back.

Chairwoman VELÁZQUEZ. The gentleman yields back.

Now we recognize the gentlelady from Kansas, Ms. Davids.

Ms. DAVIDS. Thank you, Chairwoman, Velázquez, and Ranking Member Chabot for holding this hearing.

I know blockchain offers some pretty exciting possibilities for small businesses looking for security and autonomy, and so I am really glad we are getting the chance to focus on this today.

We have seen some pretty fundamental security issues with Internet and privacy issues. Sometimes the small businesses are particularly vulnerable to these things. I am curious if you could talk a little bit about just what kind of protections implementing blockchain technology in small businesses could provide? And I am particularly thinking just about personal data.

And so, Mr. Bigelow and Ms. Dickson, you both have touched on whether it is facial recognition or our vital records, if you could talk a little bit about the future of privacy protection there.

Ms. DICKSON. I am happy to answer that question, Congresswoman.

Again, just storing the data on the blockchain and allowing the customer to grant that access to whether it is a retailer or a doctor, the customer, the individual has control over the data and that is how they can use the blockchain. And a business can use a blockchain even as far as managing human resources and any sensitive information about our employees or about our customer. So that is what comes to mind immediately is just as Mr. Ammori talked about that ledger, that secure database, that database that not one person controls. And that is really important as it comes to transferring data to multiple sources.

Mr. BIGELOW. To add to that, if you think about your data today, it is being used by the large companies that the Chairwoman referenced in her opening comments. Blockchain offers a path. As Mr. Ammori mentioned, it is a ledger on which data can be stored. Because of the transparency often associated with public blockchains, you can see how that data is being used.

In the permissioned world, which is where my company spends most of its time, it is the protection around that data that is crucial. Blockchain is generally not the issue when it comes to security. It is the applications on top of blockchain where there are vulnerabilities that are created. Blockchain itself tends not to be vulnerable.

Ms. DAVIDS. And Mr. Ammori, I would just like to follow up because you mentioned earlier the need for probably an additional

user, the UX, the user interface and how do we make sure that people understand. So if they have the ability to control the permission or they are granting authorization, how far along are we in developing out whether it is the apps that help people navigate that or the different businesses that are moving in that direction?

Mr. AMMORI. There are actually multiple attempts at the moment to centralize identity or sovereign identity. I do not think there has been a lot of uptake quite yet because I do not think we have solved the UX problems.

But the question about security on the Internet comes because when the internet was invented and created, there was asset of open protocols anyone could use. Right? The Internet protocol. The transmission control protocol. All these protocols for email and transmission. Security was not built into the protocols of the Internet. Identity was not built into the protocols of the Internet. And so, a few large companies came along, and one of them kind of owns our identity on the Internet, Facebook. Facebook is this giant database of all of our names and our friends and our relationships and it is controlled by one company. And if you could take that database and make it an open blockchain where it is not controlled by one platform but you could use encryption and authentication to identify yourself, and instead of logging in with Facebook everywhere on the Internet, you could log in with Civic or some other blockchain application. You could actually take that identity and not controlled by certain platforms, and you could do the same with security as well.

Ms. DAVIDS. So, Ms. Dickson, I know in your testimony you mentioned having participated—I do not want to get it wrong, sorry—with a delegation of 25 industry leaders to address blockchain issues. I know it was a Women of Color in Blockchain congressional briefing. And I am curious if you can tell me if you feel as though we have done up to this point a very good job. Or what do we need to continue to do to make sure that we are opening those avenues up and hearing what is going on as it relates to small businesses and blockchain, particularly with women of color?

Ms. DICKSON. Thank you, Congresswoman.

You know, you are doing it here today by giving us all the platform to be here and speak on it. By giving us the opportunity to hold that briefing in October. And just hear us. Hear what we have to say. Give us the opportunity to share.

So, my position is showing the use case. Since we do not bill blockchain like my fellow panel members do today, we use it. The things that they are building, we need. And I am here to be a voice for all of the companies that are really excited about what Mr. Bigelow is building and Mr. Ammori are building and waiting for us to be able to put those in a practice. So, by you doing what you are doing today, you are doing enough, and more of this definitely needs to continue.

Ms. DAVIDS. Thank you. I yield back.

Chairwoman VELAZQUEZ. The gentlelady yields back.

Now the gentleman from Pennsylvania, Mr. Evans, Vice Chair of the Committee, is recognized.

Mr. EVANS. Thank you., Thank you, Madam Chair.

Ms. Dickson, I want to follow up a little bit on some of the questions, for example, that have been raised with you. Like, what are the other benefits for businesses considering using ICOs or STOs to raise capital?

Ms. DICKSON. Thank you for your question.

Speaking from just personal experience, the benefit for our company was to be able to have a wider pool of investors. You know, I live in Ohio. It is no secret I am a black woman, and I went to the Ohio State University, but that is not an Ivy League school. You know, I did not go to school to be an engineer, so my network was really concentrated from 20 years of being a business owner and the reputation I built in my community. And I wanted to be able to leverage those relationships to raise capital and everyone was not accredited. And it came down to accredited versus nonaccredited investors. So, the benefit of being able to use a secure token offering, which I did not do in ICO. I wanted to make a distinction between a secure token offering, which is legal under the SEC Jobs Act, Title III, and you can raise up to $1,070,000 a year that way. And it really allows businesses to leverage their networks, their personal networks, nonaccredited investors.

Mr. EVANS. So do you think only certain types of businesses, such as tech businesses for using ICOs or STOs?

Ms. DICKSON. So, you know, the ideal type of business to raise capital in this way are high-growth businesses. So, of course, if it is a small business that does not have a 10X potential or above, they definitely can look into many other funding that is available. There are also other types of crowdfunding that exists that are not inclusive of equity. So, I would encourage businesses that have high-growth potential to have the opportunity and the potential to return high investment yields to their investors. So those would be the ideal companies to do that.

But it is an option for any business. However, the very extensive due diligence that is required, including financial reviews, including being compliant with many of the regulations around it, it is not just that anybody can do it. So, the SEC has definitely put things in place to make sure that the businesses are compliant, they are solid businesses, and they have great potential.

Mr. EVANS. Do you have any concerns relating to the security of these type of exchanges?

Ms. DICKSON. Can you please clarify the question when you say "exchanges", please?

Mr. EVANS. In other words, you state that investor tokens cannot be sold because the SEC has not approved alternative trade exchanges. Can you further, you know, in terms of the approval?

Ms. DICKSON. Yes, sir. So initially, when raising the secure token offering in which 2018 was the first year that this was legal under the Jobs Act, with the understanding that after a 12-month holding period the investors would be able to trade those tokens on an ATS and be able to get liquidity earlier and not have to hold them for maybe the standard 10-year period that a venture capital or institutional investor would have to hold them.

So, since there has not been an ATS Exchange approved yet for the trade of these secure tokens that companies like myself have

done, the investors are still holding onto those tokens until that is approved by the SEC.

Mr. EVANS. Mr. Harper, you have several years of experience. What are your thoughts on the security of these exchanges and what the government can do to improve security?

Mr. HARPER. Well, the industry is young, and it is new. And there are, unfortunately, a lot of businesses that are immature. And actors that are immature. So, it is right to be concerned about the security of exchanges, just like the security of any application provider. The question that came earlier about the security of blockchains in an application setting is very important. One of the advantages that blockchain has, I think, is simplicity. Blockchains, although they are a little bit complex, are really ultimately rather simple. They are also open. That is, a lot of eyeballs can be on the software and the blockchain itself. And that will cut down on security risks, though it certainly does not eliminate them.

So, a lot of the problem in security has not been the blockchain itself but it has been the applications on top of the blockchain. Some of the smart contracts that people have tried to write to run on a blockchain like a Ethereum. There are a lot of things to work out in this area. And so, I do not think people should rush in, but be careful about the exchanges and about the applications that sit on top of any blockchain.

Thanks for the question.

Mr. EVANS. Thank you, Madam Chair. I yield back the balance of my time.

The gentleman yields back.

And I would like to go to a second round and ask some questions myself and then if the Ranking Member has any other questions, he will be recognized for 5 minutes.

So, I would like to ask this question to the panel. And Mr. Bigelow, you mentioned, right, that we should incentivize state government to use blockchain and to deal with some of the paperwork and so on.

So, my question to you is what conditions are needed to help encourage the U.S. government to realize the economic potential of blockchain technology?

Mr. BIGELOW. The easiest way to think through it is to look at examples. This past winter, the Department of Transportation, reissued their statement on the Federal odometer statement. They clarified that it could be completely in electronic form.

You would think that ESIGN from years ago would have already clarified this. You might even think that their 2016 revision would have already clarified it. But because titles are done at the state level, the Federal government had to be very clear about how their one piece of paper that happened to be within the titling system but was Federal instead of at a state level. They had to be very clear how it could be executed at the state level. That clarity is particularly important. By being clear, now states are able to move to a more electronic process around odometers. Further, the focus was not on the technology. They mentioned blockchain as a valid path to go down for this electronic record. However, they focused on the function, not the technology itself. This is also outlined in the Chamber of Digital Commerce's National Action Plan that the real

focus should be on function, not on technology. If our government can do that, we will unlock a lot of value that is currently right now unable to be unlocked due to a lack of clarity because people are focusing on the tech and not the function.

Chairwoman VELAZQUEZ. Thank you.

Mr. Ammori and Mr. Harper?

Mr. AMMORI. I am not sure if this directly answers your question, but I believe that the U.S. government should embrace a digital dollar, especially if China embraces a digital renminbi. I think that will help China compete with their Silk Road Initiative and other investments in Africa. And I think if we care about the dominance of the U.S. dollar, we should really think about what other countries are doing as well.

Chairwoman VELAZQUEZ. Okay. Mr. Harper?

Mr. HARPER. There are a couple of examples that I have come across of Federal government agencies using blockchain, even just experimenting with blockchain, which I think has value because it will familiarize people in the agencies with how blockchains work.

At the Treasury Department, if my recollection is correct, they are using blockchain to track devices. So, if someone is issued a phone or a computer by the agency, software in the computer, the phone is programmed to check in from time to time whenever there is a login and say I am here. I am in the possession of my employee or the employee that works for the agency. What a great savings over sending someone around, person to person, office to office, to find 70,000 different devices as a physical matter? So, it is not the superlative use of blockchain, but it is the agency familiarizing itself with blockchain. And they will find uses that really take advantage of the open data capability of blockchain. That is, things that they can put on the blockchain and make open so that people can see how the government is operating and see in real time what the functions of the government are. I think there is a real opportunity there for open government.

Chairwoman VELAZQUEZ. Ms. Dickson?

Ms. DICKSON. Thank you. The only thing that I would add as a business owner is just making funding more accessible to small businesses that use blockchain and also making the barrier to entry easier for companies that would like to utilize token offerings.

Chairwoman VELÁZQUEZ. Thank you.

Mr. Chabot?

Mr. CHABOT. Thank you, Madam Chair.

I hesitate to ask this question, but I will.

Mr. Harper, you started out at the beginning saying that you were not going to bore us with how this thing actually works technology-wise. And as you notice, this is being broadcast and there are probably tens of people out there watching. And so for that one guy that is out there at home or will see this down the road, that technology nerd or the lady that is out there watching this that understands—her mom she just said—how does it work in like just a couple of minutes if you could?

Mr. HARPER. I like to say the same thing but a different way. I say, figuratively thousands of people are watching.

Think of a blockchain as an e-ledger. The blockchain name is kind of confusing. It might be forbidding to people. We can understand what email is. It is electronic mail. This is an electronic ledger, and it is a way that participants across the Internet or any kind of community that is created by Mr. Bigelow's company or Mr. Ammori's, they come together, and they post information that goes into a ledger. A block is essentially a ledger page.

Cryptography and techniques that I will insist on not describing here because I will probably get it wrong, but my written testimony might be a pretty good resource. People go to the Small Business Committee website and download it there. Cryptography ties the blocks together and assures that they are not going to be changed. And it ties new blocks to old blocks. So, you get a string or chain of blocks that become an authoritative record of whatever transaction or whatever event is recorded on that blockchain. So, cryptocurrency, like the bitcoin blockchain, that is a blockchain that records transfers of this asset. And you have an immutable record that lasts forever. Thanks to cryptography, it is highly secure. There are always attacks and concerns about ways that that immutable record could be undermined. But there is pretty clever cryptography that secures the blocks in and of themselves and then secures the blocks together to make a chain. And it is kind of amazing, I think, to create a system for worldwide recordkeeping, worldwide administration. It is not owned, or government controlled. It is not corporate. It is not governmental. It is people getting together and deciding how to do things. So, it might be identity. We all exist separate from our driver's licenses. Honest, we do. And there are ways of doing identity that can prove relevant things about you without giving away your eye color, address, height, and weight. You need to prove that you are over 21. You need to prove that you have passed a certain security check. You can do so at the airport, for example, without sharing who you are and where you are traveling. They can be assured that you are safe without getting a big record of where everybody has traveled. So, there is a lot of potential out there.

That is not the complete technical description but hopefully it gets people a little further.

Mr. CHABOT. Very good.

And you can tell your mom, "You are welcome."

Thank you. I yield back.

Chairwoman VELAZQUEZ. The gentleman yields back.

The gentleman from Pennsylvania, Mr. Evans, is recognized.

Mr. EVANS. You spoke about smart contracts in your testimony and I am concerned about the legal implications of using smart contracts. Can you please speak to some of the legal issues such as jurisdiction with smart contracts that are essentially borderless?

Mr. HARPER. Yes. I will do a little bit of the technology behind smart contracts.

A block captures events and transactions generally, but smart contracts, such as on the Ethereum blockchain, the notations in the ledger are actually code that can operate. And so, the example I give in my testimony is that a farmer might want insurance against bad weather. They can set up a smart contract that grabs information from an oracle, that is a reliable source. So, if there is

bad weather during harvest season, they get a payout that helps compensate them for lost crops. That kind of thing. So, it is really computer code planted in the block chain. They will operate automatically to carry out whatever measure people decide they want to do.

"Smart contracts" is actually a misnomer. It is just code. A contract is when two people enter into an agreement and they have to carry out that agreement one way or another. The legal issues arise when someone decides not to or when they do not understand the terms of their agreement. This code executes the code, no matter what it is. And sometimes it goes badly, and there have been examples of smart contract code going badly.

The legal issues, and I might invite Mr. Ammori, also a lawyer, to chime in with others. The legal issues may include what the legal consequence of a given smart contract is in different jurisdictions. You could have someone in Asia enter into a smart contract deal with someone in New York, and things go wrong. How is that going to get resolved in courts if the Asian party believes that their laws should apply and the New York party thinks that their laws should. In a way, the Internet, but especially blockchain, kind of lifts things off of territorial jurisdiction and opens really difficult questions about what laws apply, if they can apply at all in these kinds of situations.

So, it is a great question and I have an incomplete answer, I am pretty sure.

Mr. EVANS. Yes, do you want——

Mr. AMMORI. Thank you for the question.

So, I think there are ways to address that issue. One, when it comes to a smart contract, let's say. Let's say you and I have a smart contract and if, you know, there is crop damage because of weather, you will pay me some insurance. If that smart contract executes but there was something wrong with the deal or if there is a dispute, we could still go to the same courts. You could go to the courts. The problem is the money has already been prepaid. So, if you believe in the Roman dictum that possession is 9/10 of the law, right, you would be the one who would have to pursue the dispute versus me being the one who would have to pursue the dispute. And sue my insurance company might be the other way around. So, the legal system would still apply.

And if you are dealing with a system where there is Chinese and African and American and Canadian, people all using the same blockchain, you could in theory write into the code a choice of law provision. So, all disputes regarding the smart contracts will be solved through an arbitration, right, if there is enough money involved. So, there are ways to actually embed real law in the code that is the smart contract. But I agree with Mr. Harper. Smart contract is kind of a misnomer. It is too highfalutin. It is just code.

Mr. EVANS. Thank you. I yield back my time.

Chairwoman VELAZQUEZ. The gentleman yields back.

Let me take this opportunity to thank all of you for your testimony and for helping to shed light on the numerous applications of block chain technology. Blockchain technology's ability to streamline processes, promote transparency, increase security, and decrease costs has the potential to transform the way we do busi-

ness. As these technologies continue to develop worldwide, we want to ensure that innovators and entrepreneurs have the opportunities to expand upon the enormous potential of blockchain technologies to support small businesses and spur economic growth. It is clear that there is a role for both businesses and government in enabling innovation.

I look forward to working with my colleagues on both sides of the aisle to address the opportunities and challenges facing the use of blockchain technology.

With that, I will ask unanimous consent that members have 5 legislative days to submit statements and supporting materials for the record.

Without objection, so ordered.

If there is no further business to come before the Committee, we are adjourned. Thank you.

[Whereupon, at 12:33 p.m., the Committee was adjourned.]

APPENDIX

Testimony for the U S House Committee on Small Business

Building Blocks of Change The Benefits of Blockchain Technology for Small Business

Shane McRann Bigelow, CEO of Ownum

On behalf of the Chamber of Digital Commerce

March 4, 2020

Good morning Chair Velazquez, Ranking Member Chabot and Members of the Committee Thank you for inviting me to participate on this important topic – the benefits of blockchain technology for small business Today, I am appearing on behalf of the Chamber of Digital Commerce and my company, Ownum,[1] to offer our specific experiences in starting a small business that improves the lives of consumers by providing quicker and more efficient access to vital records and enhances public safety in doing so

In the United States, our vital records are used to demonstrate ownership, citizenship, birthright, and much more However, acquiring these important documents is cumbersome because these records are largely paper-based For most Americans this is an annoyance at best, and debilitating at worst For the poorest in our nation, a group disproportionately tilted towards minorities,[2] vital record acquisition and maintenance can represent the worst in life

Access to important records can help stop financial and domestic abuse and unethical business practices From a mother who is trapped in an abusive relationship with her husband because he is holding her and their children's birth certificates and other important documents hostage, to a title loan store that is pressuring a downtrodden individual to relinquish his or her vehicle title in exchange for an exceedingly high interest rate loan, vital records are regularly at the epicenter of physical and economic disadvantage in our most vulnerable communities Further, when a new or replacement vital record is required – perhaps to sell a car, or to prove birthright for benefits access, or even to prove identity – our government process today requires considerable paperwork and, more importantly, time spent in DMV lines or lines at Departments of Health in each state in our Union This requires time away from employment and is an event that requires transportation – something many studies indicate our poorest communities lack in quality form in much of our nation [3]

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[1] Ownum, www ownum io (last visited Mar 02, 2020)

[2] *See* U S Bureau of the Census, *Income and Poverty in the United States 2016* (2016), https //www census gov/content/dam/Census/library/publications/2017/demo/P60 259 pdf (hereinafter, Census Report)

[3] *See* Mikayla Bouchard, *Transportation Emerges as Crucial to Escaping Poverty*, NY TIMES (MAY 7 2015) https //www nytimes com/2015/05/07/upshot/transportation emerges as crucial to escaping poverty html (referencing a Harvard University study on economic mobility)

The question of course becomes why, in this age of technology where we have an abundance of cell phones and readily available internet access, do we still require such antiquated processes as filling out paperwork, spending hours in long lines, and physically showing up at inconvenient locations, all while missing work? Is it the security of physically proving one's identity? That cannot be the case as the most monetarily meaningful transaction we all make in filing taxes is done with very few of us ever having met an agent of the IRS, as we can all file our taxes online with relative ease and low or no cost Is it because physical assets need to be seen or inspected by an agent of the government to validate ownership? No, as rarely does anyone at the DMV need to leave their desk to walk outside and look at the cars in the lot to prove ownership

Rather, we have failed to become fully digital because there has been no incentive to change The ecosystem around vital records – banks, insurance companies, hospital systems, etc – have accepted the legacy process of using paper as a cost of doing business That was acceptable twenty years ago when our technology could not support a fully digital process, but that is unacceptable today

In fact, the process to acquire a vital record could be called discriminatory in its current form, due to the negative impacts non-digital vital records can have on our poorest citizens who are most often minorities according to the Census Bureau [4] From having to take time off work, to requiring access to transportation to acquire the vital record, to the mere cost of the transaction to acquire a vital record as a percentage of one's income, the poor in our country are disproportionately negatively impacted by a paper process

At Ownum, we aim to change all of that Ownum is a holding company, under which companies are created, each with a similar goal That goal is to digitize a particular vital record and the process to acquire it – no paper, anywhere, anytime Our first company is Champ Titles – www champtitles com which is digitizing vehicle titles The second company is Vital Chain – www vitalchain com which is digitizing birth and death certificates Each uses blockchain technology to improve accuracy, efficiency, and fight fraud

Bernie Moreno and I founded Ownum in 2018 Bernie immigrated to the U S from Colombia at the age of 5 and through sheer brute entrepreneurial force and hard work, his two parents and 6 siblings became a shining example of living the American Dream Bernie built a successful business in the automotive retail space, that started, as so many have, as a small business As an immigrant and minority in the U S , his path was not always easy, but he persevered and succeeded I come from a middle-class family and started my first company when I was 21 and sold it a little over 4 years later I then went on to a small public company which we sold to a larger public company, and then left that company to spend 13 years on Wall Street, only to return to my entrepreneurial roots approximately two years ago to start this company with Bernie These experiences have shaped this testimony today

[4] *See* Census Report *supra* note 2

Further, we are proud to be a member of the Chamber of Digital Commerce for much of the time we have had this company [5] The Chamber is the world's largest blockchain trade association Its mission is to promote the acceptance and use of digital assets and blockchain technology, and it is supported by a diverse membership that represents the blockchain industry globally Through education, advocacy, and close coordination with policymakers, regulatory agencies, and industry across various jurisdictions, the Chamber's goal is to develop a pro-growth legal environment that fosters innovation, job creation, and investment for businesses of all sizes The Chamber helped shape our points of view on the legislative and regulatory environments here today

For each business under the Ownum flag, we must gain approval in over 50 states and territories to offer our services, as vital records are primarily issued and regulated at the state level In most cases, we are not seeking to be a vendor to these state governments Instead, using vehicle titles as an example, most states have invested a lot of resources into their vehicle titling system States must allow for technological advancement that helps our government processes and consumer access to those benefits If state governments were encouraged to pursue digitization like what the IRS did when they allowed a multitude of vendors to replace paper tax filing with digital filing, that would be a great step forward The states need an incentive to allow vendors like us to send in and transact completely in digital form the information they currently acquire and transact in paper form

Imagine a world where the government has enabled a service for all citizens – a service that protects our poorest and most disadvantaged - merely by allowing a digital form to replace a paper form of submission Just as the paper-to-digital transformation in tax filing has shown us, consumers will gravitate toward a digital solution, the data would be of higher quality for the agency receiving it, the transactions would have a higher degree of traceability, and incidences of fraud would be reduced Digitizing vital records will allow people to store their own records through a blockchain-based system It is through this system that the mother can escape her abusive situation and take her documents with her on her phone or retrieve them anywhere she can find access to the internet The poor no longer have to take off of work to acquire these vital records for themselves or for their children The cost savings for consumers will amount to billions of dollars each year!

However, the benefits of digital records are not limited to the poor and disadvantaged Public safety is served when crucial data held mostly in paper form is moved to a digital ledger Vehicle recalls are a great example NHTSA, the National Highway Traffic Safety Administration, notes in a recent study that 42% of all vehicles recalled are not being repaired [6] This represents a material risk to all drivers on the road today Further, and unfortunately, the larger the recall

[5] Chamber of Dig Commerce, www digitalchamber org (last visited Mar 2, 2020)
[6] U S Dept of Transp Nat'l Traffic and Highway Safety Admin , *Vehicle Safety Recall Completion Rates Report* (2018), https //www nhtsa gov/sites/nhtsa dot gov/files/documents/18 3122 vehicle safety recall completion rates report to congress tag pdf

the worse that repair rate becomes If you have ever received a recall flier in the mail for a car you owned long-ago that is now being recalled, you know why these figures are so high - it is because the car ownership data is not accurate That data is not accurate because paper processes mean state systems have millions of orphaned or incomplete records as people move from state-to-state or transfer vehicle ownership in paper form Therefore, when the state releases its title data so manufacturers can conduct a recall, that data is not accurate, and many people unwittingly continue to drive a vehicle with an unaddressed safety risk embedded within it Digitizing vehicle records helps to eliminate this risk as the data and points of contact could be easily verified, enabling cleaner data and improving public safety

Ownum's use of blockchain technology is why we are invited to be here today But sadly, the use of blockchain is often at the source of the most confusion and biggest delays for governments Unlike in the 1990's and 2000's when government promoted business growth and fostered the internet boom, today our governments seem to be doing the opposite with anything related to blockchain This is where this Committee can be of great help to any small business or start-up working with blockchain technology today

At present, people do not understand the benefits of blockchain – whenever the word "blockchain" is used, people hardly think of digitizing vital records or car titles Something that they typically think of is cryptocurrency, but that is only its first mainstream use case At its heart, blockchain is just a really sophisticated ledger that is extremely secure, the track record of the activities occurring on it are immutable, and it is great for handling lots of transactions [7] Further, there are essentially two types of blockchains The first is permissionless, which is great for cryptocurrency because just like cash, it allows everyone to participate in its use for things such as payment The Bitcoin blockchain is an example of this type of permissionless blockchain The second, is permissioned blockchain – it has all the merits of a permissionless blockchain, except that one needs permission to transact on it This type of blockchain is particularly good for activities related to vital records and to businesses who do not want the information on their blockchain networks to be publicly available Over time the market will dictate which form is ideal For our purposes today, the important question is how blockchain technology in general is regarded by government

The federal government's focus towards this technology has mainly been that of enforcement -- locating the bad actors and mitigating against any potential risks We and the Chamber are committed to compliance and are actively assisting industry to succeed Nevertheless, only focusing on risk misses the transformative benefits of this technology By failing to research and develop those benefits, we are driving innovation overseas and ceding our technical leadership to other nations

The use of the word "blockchain" often leads to confusion and confusion begets delays Those delays often force small businesses to abandon their business plans due to the cost of waiting

[7] For more information, *see* CHAMBER OF DIG COMMERCE, LEGISLATOR'S TOOLKIT FOR BLOCKCHAIN TECHNOLOGY (2018), https //digitalchamber org/state legislators toolkit

on government Ideally, however, government would regard blockchain as merely a new technological innovation and instead focus on what the technology does and how it can transform and enhance the services we provide our citizenry Thus, the problem we see on a federal and state level is that government is reluctant to engage with this technology for reasons that are not commensurate with the benefits it can bring For this reason, we are grateful for the opportunity presented by this hearing, which can help bring to light the extraordinary benefits blockchain technology can bring for governments, for businesses, and for consumers

The following list defines the problems we see in bringing this technology to market

1 Fragmented state laws create confusion among policymakers and innovators as to what activities are permitted,
2 Some state agencies are reluctant to approve new programs if blockchain technology use is not affirmed expressly in the law, despite the technology neutral application of the federal Electronic Signatures In Global and National Commerce Act (ESIGN Act) that recognizes the legality of digital signatures and records, and pre-empts inconsistent state laws, all of which created the framework for electronic records and signatures in e-commerce in 1999 and 2000
3 As the Chamber of Digital Commerce noted in their publication – "Smart Contracts Is the Law Ready?"[8] the Uniform Electronic Transactions Act (UETA) and the federal ESIGN Act provide the legal framework for smart contracts and blockchain use Both laws were designed and intended by their drafters to assure that the use of electronic media, in whatever form, would not affect the enforceability of commercial transactions

Unfortunately, these points of confusion all create inaction Lack of government understanding of the benefits of this technology is precisely how innovation and technological progress are halted today, particularly at the state level

The federal government and this Committee, however, can help By having this hearing and opening the dialogue on these important topics, you have taken the first step Understanding the benefits of this technology, supported by government, are a crucial factor in enabling progress The next step is to create a dialogue and a fast-track path towards our government, at the federal and state levels, to embrace doing business with blockchain-related companies and to work to find ways to support these companies bringing innovation to our citizens, particularly in cases where government involvement is required – such as is the case with vital records

Ideally, the outcomes Ownum seeks are

- Help the poorest in our country, who are also disproportionately minorities, to gain better access to their vital records in a secure way by encouraging federal and state

[8] CHAMBER OF DIG COMMERCE, SMART CONTRACTS – IS THE LAW READY?, 49 (2018), https //digitalchamber org/smart contracts whitepaper

governments to allow for the digitization of not only their vital records, but the process to acquire them

- Use this Committee's paper reduction authority to promote the digitization of paper-based vital records at the state and federal level in areas where government services are involved
- Providing financial aid to small businesses seeking to provide digitization of records
- Incentivize state governments to adopt digitized vital records
- Affirm publicly that the federal ESIGN Act applies across all 50 states to blockchain technology and other emerging technologies

Further, we encourage government adoption of many of the principles outlined in the Chamber of Digital Commerce National Action Plan for Blockchain [9]

- Adopt a light touch regulatory approach, as this country did for the internet, while the industry establishes key innovations,
- Policy and regulation should be clear and established prior to enforcement,
- Any regulation should be based on the function performed, not the technology

In conclusion, we are delighted to see the Committee on Small Business take this important step forward to recognize the business applications of blockchain technology by holding this hearing today By encouraging and incentivizing all levels of state and federal government to digitize their paper processes and vital records, we will improve the lives of our poor and help to level the playing field for them Additionally, we will help improve public safety through more accurate data, particularly in the vehicle title arena Finally, by recommitting, as we did during the internet boom, to focus our government, at all levels, on what a technology enables, we will help our government to pursue digitization strategies for vital records Doing so will enable many start-ups and small businesses like us to build the next generation of the innovative and entrepreneurial culture in America today

[9] *National Action Plan for Blockchain*, CHAMBER OF DIG COMMERCE, https //digitalchamber org/blockchain national action plan (last visited Mar 2, 2020)

UNITED STATES HOUSE

COMMITTEE ON SMALL BUSINESS

Hearing Entitled *"Building Blocks of Change The Benefits of Blockchain Technology for Small Businesses*

Testimony of Dawn Dickson, CEO, PopCom

March 04, 2020

Thank you Chairwoman Velazquez, Ranking Member Chabot, and the members of the committee I am pleased to be here today to testify about how innovators, entrepreneurs, and small businesses are using blockchain technology to boost productivity, increase security, open new markets, and change the way business is done

I will start by highlighting my 20-year journey as a small business owner

I was born and raised in Columbus, Ohio I am a graduate of Ohio State University and studied Information Technology at DeVry University

I am what most call a serial entrepreneur Like many small business owners, I have benefitted from the various programs that the Small Business Administration (SBA) offers, including working with SCORE in Miami to draft financial projections and plans and participating in the Bixel Exchange in Los Angeles, which is a Center for Innovation & Technology hosted at the Los Angeles Area Chamber of Commerce

In 2017, I entered and won $20,000 in the SBA InnovateHER challenge and in 2019 I won $125,000 in the Metropolitan Economic Development Agency (MEDA) $1 million pitch competition in Minneapolis, which receives SBA funding

I am driven and passionate about entrepreneurship and identifying resources to move my businesses forward

Since starting my first business in 2001, I have consistently adapted and iterated my business strategy to align with new technologies that can help position me for greater success

In 2001, I attended DeVry University to optimize my skills in technology applications and management in order to be a more effective leader in a tech driven economy

As a small business owner, I own four companies D1 Consulting Group, Flat Out Heels, Lifestyle Cafe, and PopCom

D1 Consulting Group is a marketing and business development consulting agency that I founded in 2005 to help companies of all sizes develop scalable growth strategies, leveraging online and offline tools

At Flat Out Heels, we design rollable flat shoes for women that can easily fit in a purse for relief after hours of wearing high heels We utilize wholesale, e-commerce and vending machines for distribution, and have generated more than $1 million in revenue since its launch in 2011

Lifestyle Cafe is a plant based vegan restaurant in my hometown of Columbus, Ohio that utilizes technology automation for faster service

PopCom is an automated retail technology company with a hardware and software solution for self-service retail

Today, I will focus on PopCom,[1] where I am leveraging blockchain technology for specific aspects of my business

PopCom is a small B2B technology company that develops software as a service (SaaS) and IoT-connected hardware for self-service retail, including vending machines and digital kiosks used to dispense products and perform transactions

We're using blockchain to optimize machine-driven transactions for government-regulated products that require identification, sales compliance, supply chain information, or a combination of all three There is tremendous opportunity in this space - over $3 trillion in global revenue, growing to $5 trillion by 2022 - which is severely underserved by automated transactions[2]

The PopShop Kiosks with PopCom SaaS, are affordable for any team, from Fortune 500 to single-founder e-commerce brands Over two-thirds of retail customers now prefer to self-[3]serve and over 75 million people purchase goods and services from vending machines or kiosks each day in the U S

PopCom is Not a Blockchain Company

I want to clarify that PopCom is not a blockchain company I am not building a blockchain product We also use facial recognition and artificial intelligence software in our platform I am simply using specific blockchain applications in my business This is an important distinction

Blockchain is not a silver bullet But it can solve problems that small businesses face

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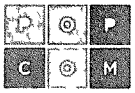
[1] Link to view demo of PopCom's technology https //youtu be/GDEDf9Q2Eis

[2] http //pharmaceuticalcommerce com/business and finance/global pharma market-will-reach 1 12 trillion 2022/

[3] http //www balancedforlife net/pdf/About%20Vending pdf



At PopCom, we seek to reduce the friction in automated retail transactions and allow retailers to collect data from and about their customers Customers often share sensitive identity information, which requires an additional layer of protection to secure consumer data and privacy

Instead of building our own proprietary product to secure customer identity data, we have partnered with Civic - a secure blockchain identity management platform - to verify identity and age in order to execute purchases of regulated products, such as cannabis and alcohol, from a vending machine

As a company, we believe that the most secure way to check and confirm a customer's identity, while ensuring that their personal data remains secure, is to have the customer verify their information securely on their mobile device and store that data on blockchain We generate a QR code for them to scan at the machine to confirm that they are a verified customer and compliant to purchase the product being sold We never collect or have access to any personal data from or about the customer - only that they are verified The customer can use their personal device to take a picture of their identification (driver's license, state ID or passport) and capture an image of their face for additional confirmation This is very similar to what Clear does for airport security

Civic has already built the blockchain service to accomplish this, and we license their decentralized solution to allow us to bring our turn key service to market faster

Flexible Federal Programs Can Help Innovative Small Businesses

My journey exploring non-traditional ways of raising capital started in late 2017 after we completed our seed round for PopCom, bringing our funding total close to $1 million from angel and venture capital (VC) investors

Like many tech founders, I have a highly technical product that requires significant capital in order to reach its true market potential Access to large amounts of capital has been challenging for me for a combination of factors 1) investors know little about my industry 2) I did not have access to many high net worth individuals 3) like most founders, particularly female founders of color, I've been at the mercy of the Silicon Valley machine Although I have been successful at raising venture capital, it is an exhausting and time-consuming cycle of convincing venture capitalists of the massive potential of the self-service retail industry and why they should invest The time spent pitching is time spent away from running my company and selling to customers

I decided on a security token offering (STO) because it has emerged as a powerful and valuable alternative to private equity and venture capital financing Additionally, STOs have an expected growth of up to $10 trillion in 2020[4]

A security token can be backed by the company's assets, such as shares, the right to receive dividends or grants for voting power This clearly provides a much more solid and safe investment for the investor who believes in the company's future A security token has a lot of advantages

[4] https //hackernoon com/ico or sto who wins fd43c3ee7b8d

since financial regulators consider them securities Ultimately, this protects token holders They also mitigate the divergence of interests between project investors and project users Finally, they give real rights to the token holders

For PopCom, we chose a popular option for STOs - using the exemption Regulation Crowdfunding (CF), which is an offering for the general public Both accredited and non-accredited investors can participate in the offering, with the caveat being that there is a limit to how much an STO can raise in a given year - $1,070,000

Using a blockchain backed token to raise capital through a security token offering, I was able to leverage my personal network to raise capital instead of relying solely on VC and accredited angels This is an important pivot I believe it is compelling that I was able to oversubscribe the round and raise the maximum amount under Reg CF, while leveraging an emerging technology to launch a tokenized security offering I became the first female CEO globally to raise over $1 million using equity crowdfunding under Title III (Regulation CF) of the JOBS Act, which allows private early-stage companies to raise money from around the world We have over 2,200 investors from 12 countries and 42 states and the offering went viral

Educating investors was a tremendous aspect of our offering - communicating about blockchain and digital assets and how they compare to traditional fundraising instruments A token represents a digital share and is treated no differently than a traditional stock certificate, however, the token is proof of investment that lives on the blockchain ledger forever and can't be erased or retracted This gave people comfort and security that their money was safe

I am here before you as proof that raising funds in this manner is essential to growing small businesses that are traditionally overlooked and trying to navigate an evolving digital world, particularly because it allows entrepreneurs to leverage their personal networks that have money to invest

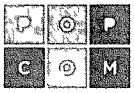
Regulatory experts view the new rule as a step in the right direction "I liked the idea of building a community and helping people raise money they otherwise wouldn't have been able to access, to grow their businesses," notes crowdfunding and JOBS Act expert Maureen Murat who helps entrepreneurs navigate the regulatory environment as Principal at Crowdie Advisors [5]

Challenges of Raising Traditional & Non-traditional Business Capital

As a result of this intense process, I have emerged as a thought leader in the space and I have been able to educate countless founders and investors Now, more than ever, founders are seeking non-traditional ways of raising capital and I have been humbled to impart my knowledge

I am proficient in raising traditional and non-traditional business capital and know firsthand the challenges small business owners face along these tracks

[5] https //getwerkin com/blog/werkin with maureen murat attorney business owner-and mentor



There is value in securing venture capital to drive a tech-driven business model But data shows that entrepreneurs end up owning less than 20% of their businesses upon exit Plus, this avenue can also be a costly distraction When I went down this path, I realized that in the midst of the hustle and bustle, 15% of my time was being spent on my business, while 85% was spent fundraising For me, spending 85% of my time acquiring debt and only 15% of my time acquiring customers was not fiscally viable

In 2017, I made the tough decision of turning down a $1 5 million VC investment because it would mean giving up more than half of the ownership in my business

Traditional fundraising also comes with difficulties

In 2016, I received $20,000 as the 2nd place winner of the SBA InnovateHER challenge, a nationwide business competition to highlight innovative products and services created and launched by cutting-edge entrepreneurs This was a rewarding accomplishment but I still could not qualify for an SBA loan for my business – Flat Out of Heels - despite already generating sales and having a good personal and business credit scores and credit history

Federal programs are ineffective if they are not accessible to the very small businesses they were created to empower

To further illustrate this gap, after I successfully raised over $1 million in the security token offering under the Title III of the JOBS Act, I was blocked by regulatory hurdles and federal red tape that have impeded my plans My vision for the tokenizing the cap table and raising capital through an STO was to offer liquidity options to investors after the mandatory twelve month holding period Unlike institutional investors, individual investors may not be able to wait ten or more years to receive a return on their investment after a start-up company has exited through acquisition or IPO Issuing digital assets meant that investors could trade their PopCom tokens on a ATS secondary exchange and cash out when needed It gave them more freedom and flexibility around their investment, similar to traditional stocks sold on public markets The valuation of my company has increased significantly since the STO and my investors tokens are worth more than they purchased them for However, the Securities Exchange Commission (SEC) has not approved any ATS exchanges so there is no platform to trade the tokens despite having a market for them and investors who want to purchase This continues to be a challenge for all companies who have issued security tokens

More needs to be done to increase access to various types of capital in order for entrepreneurs to continue to bring products to market and create jobs Further, funding for research and development and resources for training programs must be a greater priority in the innovation economy

Congress is in a position to address these issues and this Committee can lead the way

Legislative Proposal for A New SBA 7a Loan

Before I close, I want to highlight a few policy points

Last October, I was part of a delegation of 25 industry leaders that convened in Washington for the inaugural Women of Color in Blockchain Congressional Briefing organized by the National Policy Network of Women of Color in Blockchain The goal was to ensure Members of Congress hear from the inclusive voices within the blockchain community Women of color who are leveraging blockchain technology is the fastest growing demographic in the crypto ecosystem

The delegation included industry leaders who are geographically, culturally, and even professionally diverse I was able to speak on behalf of entrepreneurs and small business owners who are not crypto insiders and are not building new blockchain products – but are simply tapping specific applications to enhance their existing business model

Because I leveraged a federal program – JOBS Act – for the security token offering, this was a very relevant and timely experience for me

Since that briefing, the National Policy Network of Women of Color in Blockchain has developed a legislative proposal outlining action that Congress can take now to direct the Small Business Administration to create a federally-backed 7a loan for entrepreneurs and small businesses using blockchain technology

As, I've shared, it is very difficult for entrepreneurs of color to get VC funding Additionally, there are few financial institutions that will capitalize enterprises using blockchain This unique SBA 7a loan could help level the playing field

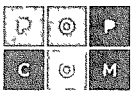
Small Business Still the Engine of America's Economy

I commend the Committee for convening this first hearing to discuss the benefits of blockchain technology for small businesses

In the 21st century, small businesses continue to be the engine of the American economy Therefore, it is particularly important that they are armed with the tools to compete in the global marketplace The emerging crypto-economy can be a game changer for traditional and technological enterprises

Congress should consider blockchain and cryptocurrency as part of the solution, take steps to foster innovation, and advance policies that will benefit small business owners like me

I am also concerned that prolonged regulatory uncertainty will have an impact on diversity and gender inclusion



I hope you will continue to engage diverse voices as you deliberate legislative priorities to ensure small business owners like me can continue to innovate, build, and grow right here at home

America can be a global leader in the innovation economy!

Again, thank you Chairwoman Velazquez, Ranking Member Chabot, and the members of the committee for the opportunity to add to this important debate

House Small Business Committee Hearing
"Breaking the Chain The Benefits of Blockchain Technology for Small Businesses"
March 4, 2020
Testimony of Marvin Ammori, Protocol Labs

Thank you, Chairwoman Velazquez, Ranking Member Chabot, and members of the committee, for inviting me here today

I'm Marvin Ammori, testifying on behalf of the Blockchain Association, a trade association for organizations responsibly building and investing in the next generation of digital services I am the General Counsel of Protocol Labs This year, my company plans to launch the Filecoin network, which is software designed to create a vibrant marketplace for online data storage And blockchain technology is an enabler of that marketplace

Protocol Labs was founded in 2015, and now has more than 117 employees and contractors across 36 states and 16 countries We are a fully remote, distributed team, just like the internet we're working to improve Investors in our projects include some of the most respected venture capitalists in the nation

Before we dive into what we're building, I want to take a moment to discuss blockchain technology itself

Blockchains have a lot of hype, but they are essentially data structures So think of a database, a ledger, or a spreadsheet, but better for some purposes Why is there so much hype for a better spreadsheet? Because a blockchain stays updated and in sync based on software rules and community agreement One person, or one company, does not choose how to update the entries in the spreadsheet, rather all (or a specified number) of the computers in a network *agree* to make the update together You might prefer a blockchain to a traditional database or ledger when you would rather trust the consensus of multiple players rather than having to trust a single record-keeper

The invention of blockchain technology can affect industries far beyond money listed in a ledger, including health care, supply chain, law, and enabling investment and competition in internet infrastructure services such as cloud storage

This year, Protocol Labs will help launch the Filecoin network, a marketplace for buying and selling cloud data storage For decades, computer scientists and even law professors have written about the resilience benefits of a programmable, efficient market for storage, where people with extra hard drive space on their phone or in their data center could rent that storage, securely and

efficiently, to others who wanted access to that storage Our software will be open source, and anyone will be able to download it to broadcast the desire to buy or sell hard drive space

We may succeed in our ambitious, difficult project where for years others have failed, partly because we benefit from the invention of blockchains In the Filecoin network, a blockchain will record the storage market's transactions Nobody will need to trust a central party to manage the marketplace They can rely on software rules and underlying that, mathematics

Let's dive deeper into how Filecoin may benefit small businesses

First, creating a marketplace in online storage may drive down the cost of data storage, a real cost for almost every business in every sector Businesses need reliable and secure places to store data as much as they need electricity, and many of them pay cloud storage providers to hold and serve that data from their data centers Cloud storage is a multi-billion dollar market with high margins If the cost of storage falls, small businesses will save money – money that they can invest in hiring, or R&D, or office space Some businesses will save money on their cloud computing costs and others will be able to move to the cloud for the first time through lower costs and added convenience This transition to the cloud would benefit small businesses, most of whom have not yet transitioned their data storage to the cloud They still rely on anachronistic corporate IT closets that are single-points of failure, with high capital and operating costs

And if we drive down the cost of storage, more small businesses and innovators can create entirely new business models and technologies in emerging, data-hungry areas such as virtual reality, healthcare imaging, artificial intelligence, or other research involving giant data sets

Second, and just as importantly, Filecoin will enable small businesses to compete directly in the cloud storage space Today, Amazon is the largest provider of cloud computing Amazon's cloud services, called AWS, is Amazon's biggest business, accounting for more than two-thirds of Amazon's operating income Five companies control the vast majority of the global cloud computing market We hope that an open, software-based storage marketplace can help all the smaller and mid-sized players in the market to compete more effectively not based on brand recognition, large sales teams, or spending more in marketing, but by competing on cost, speed, reliability, and security If a smart, young entrepreneur has a cost-saving way to connect more storage to the Internet, she can immediately profit from that breakthrough based on merit rather than existing market share

We are not the only company using blockchains to try to create open marketplaces for Internet infrastructure or to reduce the control of today's central Internet platforms People sometimes

call these tools for a "decentralized web " They include new browsers, privacy-protective advertising exchanges, video encoding, and distributed computing

In sum, blockchains are novel data structures They may be useful in many industries beyond digital money particularly when multiple players prefer collectively updating records One of those industries is Internet infrastructure, including our project, the Filecoin network, targeting a market in online data storage to hopefully drive down the costs of storage and increase the quality for all small businesses

Thank you I look forward to your questions

Statement before the House Committee on Small Business
On "Building Blocks of Change The Benefits of Blockchain Technology for Small Businesses"

Understanding Blockchains and Their Benefits for Small Business

JIM HARPER
Visiting Fellow

March 4, 2020

Executive Summary

Blockchain is a data structure that facilitates the operation of widely distributed digital ledgers It contains records of recently occurring events or transactions "Blocks" are pages in the ledger They are strung together using cryptography, which fixes them in order and prevents changes to earlier blocks Peer-to-peer creation and distribution of blocks results in a widely distributed, reliable accounting of whatever a given blockchain is meant to record

Internet-native recordkeeping on blockchains may have important consequences Blockchains may allow many organizations and organizational processes to be replaced with software, similarly to how email superseded postal mail for distribution of written messages Blockchain systems may streamline and improve business processes and help create new business lines and categories These benefits may particularly aid small businesses

As the community around a given blockchain grows larger, the ability to trust contributors generally falls, so it becomes more advantageous to secure such blockchains using cryptocurrency A cryptocurrency ecosystem can set up virtuous incentives that make various forms of misuse and abuse costly and unlikely The original global public blockchain is the Bitcoin blockchain, of course, which is a ledger recording transactions in the original cryptocurrency

A notable dimension of blockchain technology is the possibility that the entries contained in blocks can be executable computer code themselves The "Ethereum" blockchain is the leading example of a system that allows instructions in computer code, called "smart contracts," to be automatically processed once secured in a blockchain

There are three advantages of blockchain I can identify for small business First, simple efficiencies may produce lower costs for small businesses Second, blockchains may allow for diversified and open market structures that support more niches and specialties

Finally, blockchains may reduce the competitive advantage that large businesses have in the world of data Large companies have the resources and heft to set data standards for their industries These standards may advantage these large businesses And, of course, they have access to more data about markets, products, customers, and so on Blockchains can bring large communities together to create data commons—unowned, non-proprietary stores of data Blockchain projects are more likely to have data structures that serve all use cases, and blockchains may give small businesses access to data they did not have previously This would give them opportunities to deploy advanced analytics and make other uses of data that are now reserved to only bigger businesses now

Chairwoman Velazquez, Ranking Member Chabot, and members of the committee,

Thank you for the opportunity to testify today on the benefits of blockchain technology for small business. My name is Jim Harper, and I am a visiting fellow at the American Enterprise Institute, a public policy think tank dedicated to defending human dignity, expanding human potential, and building a freer and safer world. I am also a senior research scholar at the University of Arizona James E. Rogers College of Law, where I focus on the intersection between privacy and technology.

I have been a student of blockchain and cryptocurrency for many years. I first discovered Bitcoin and began dabbling with it in 2011. After two years of study, I wrote my first tentative piece about it in 2013.[1] As Global Policy Counsel with the Bitcoin Foundation in 2014, I worked with technical, business, and legal leaders to explain and advance this very interesting technology among various audiences. The "crypto" world has gotten much more complicated since then, but the basics of the technology and its potential are unchanged.

In my testimony today I will try to detail in non-technical terms how blockchains work and how cryptocurrency ecosystems can secure them. I will also observe how blockchain technology may benefit small business. First, the simple efficiencies that blockchain systems may produce will lower costs for small businesses. Second, blockchains may allow for diversified and open market structures that support more niches and specialties. Finally, blockchains may reduce the competitive advantage that large businesses have in the world of data.

This technology is complicated and its full meaning for society is hard to predict. In many ways, blockchain and cryptocurrency do not fit into familiar legal and economic categories. I believe the easiest entree to them, though, is through familiar concepts such as email.

What Blockchains Are and What They Do

When email was invented, it was certainly nice that the name its inventors settled on was indeed "email."[2] That name signaled to non-technical people that a familiar process was being extended into the electronic and digital realm. Ordinary people could understand the basic idea that email was an electronic—or "e"—version of a highly familiar messaging system, postal mail. Email now has billions of users around the world.

Blockchain does not introduce itself in so friendly a way. That strange new word, "blockchain," makes the technology a little bit forbidding. It might be easier to think of blockchain as "e-

[1] Jim Harper, "What is the Value of Bitcoin?," Cato at Liberty blog, April 5, 2013, https://www.cato.org/blog/what-value-bitcoin.

[2] Email was invented over a long time, through a variety of technologies. *See*, Phrasee, "A Brief History of Email Dedicated to Ray Tomlinson," March 10, 2016, https://phrasee.co/a-brief-history-of-email/.

ledger" technology Blockchain is an Internet-based record-keeping technology that captures events and transactions in chronological order, like a ledger

A "block" is a page in a ledger The contents of a block may be any kind of entry and there may be any number of entries in a block Those things are all defined in the software written for any given blockchain Entries may update material in earlier blocks, but earlier blocks do not get changed Added to the ledger from time to time as prescribed in the software, blocks are linked in a way that fixes them in order and that largely prevents tampering with earlier blocks (I discuss how encryption does this below) Block after block linked together form a chain of blocks, or blockchain

It is an essential custom that blocks are added by propagating them across a peer-to-peer network of nodes Each node independently verifies that the blocks and their contents are valid according to the terms defined in the software The rules for data synchronization among nodes are often called the "consensus algorithm " Thus, a blockchain becomes a widely held repository of information Blockchains create the potential for collectively controlled global data repositories that have impressive capabilities, but the community of participants and the terms of participation in a blockchain project can be defined by the leaders of more modest projects

There is much more to it, of course, but that is the essence of the blockchain data structure and the peer-to-peer system that supports the creation and distribution of blocks and blockchains It is a technology for operating a widely distributed e-ledger Distributed ledger technology has interesting consequences, much as email did in its time

Replacing Organizations and Organizational Functions with Software

Email did not replace postal mail entirely, of course, but the essence of mail, person-to-person communication, is now provided by software on the Internet as much as it is provided by a central organization such as the US Postal Service That small structural change has some important consequences It is cheaper, easier, and faster to send an email, obviously There is also no longer a single institution through which our written communications pass The power of that institution and some risks of relying on it are reduced, while other institutions and the risks of relying on them may have grown

Blockchain is similarly structured—or de-structured, if you will There are different ways of administering blockchains, but in the classic open public blockchain, there is no single organization that maintains the ledger Rather, anyone can publish material to the system of peer-to-peer nodes for inclusion in the blockchain If the material fits the parameters dictated by the ledger's software, it is included in a block that is added to the blockchain

There is no "ledger service provider " There is no one organization that controls all the data, though there might be an organization or consortium that leads the blockchain project This

makes for greater openness and accessibility in blockchain data and less reliance on single, large companies or institutions Blockchain may flatten out the power hierarchies that data and data standards can otherwise create In other words, blockchain-based systems can reduce some advantages that larger businesses enjoy and disadvantages that small businesses suffer

Hungry? Blockchain Fixes This

A 2019 article by Michael Castillo in *Forbes* illustrates how blockchain can improve business processes with particular reference to small businesses—in this case small beef producers

"The provenance of the food on your plate matters," Castillo writes, "and if a blockchain can give you details on the French farmer who grew your tomatoes or provide a glimpse of the prairie grasses that went into your rib eye, it just might make your meal taste sweeter—and command a higher price There are also important health and safety reasons for tracking food via blockchain Food-borne illnesses make thousands sick every year and cost businesses an estimated $90 billion in lost revenue "[3]

We have benefitted greatly from large-scale food production and distribution But that system requires commoditization standardized production and distribution of foodstuffs, including beef Producers in such a system find that there are few quality-grades and few opportunities to distinguish their products The opportunities for up-scale production in the beef example are limited to such things as "grass-fed," a blunt category which requires, simply, grass feeding

Blockchain tracking allows for specialization and thus higher earnings A rancher in Wyoming can produce animals that are better fed or better treated than others and get paid more for that beef by consumers who are able to see and appreciate its provenance The system Castillo writes about is called BeefChain [4]

The other major benefit of blockchain tracking in this application is that contaminated products can be eliminated from the food supply more precisely and quickly If some food is bad, all product in a large lot does not have to be thrown out—and all producers do not have to take a loss This helps small producers more as they will tend to have thinner reserves and credit lines and thus less capacity to bear losses

It is not a given that blockchain or the BeefChain project are the best or most efficient way to achieve these ends There is a good argument that an ordinary database system will serve applications like these When leaders of a small consortium of beef producers give out permissions to operate nodes and add to their blockchain, they are extending trust to one

[3] Michael Castillo, "Blockchain's Movable Feast How The Tech Is Changing Food Supply Chains, Forbes com, January 8, 2019, https //www forbes com/sites/michaeldelcastillo/2019/01/08/blockchains moveable feast how the tech is changing the way we eat 2/#7053872e17f3

[4] *See* BeefChain com web site, https //beefchain com/

another—sensibly If they trust each other enough to run a blockchain together, they can just as well agree on running a plain vanilla database There are a good number of people who salivate at the chance to debunk blockchain hype on this basis, and they are right to do so in many cases [5]

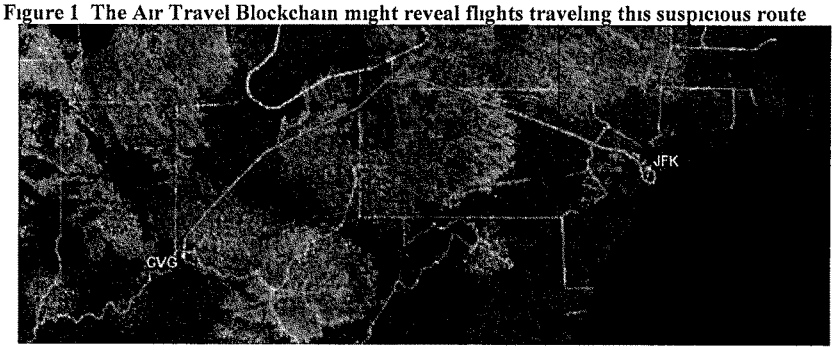
That way of administering a blockchain is often referred to as "permissioned" because an authority of some kind gives out permission to contribute data and run nodes The administrator must trust users, and users must trust the administrator That's fine for many applications

Below, though, I will discuss a wholly fictional blockchain project to illustrate more technical details of blockchain while showing how a blockchain can be secured for use among larger groups that are not necessarily able to trust one another The bigger the circle of participation, the stronger the case for using a blockchain and for securing it using a cryptocurrency ecosystem

Taking Flight with the "Air Travel Blockchain"

To illustrate how a blockchain might bring a community of strangers together to record events, imagine a blockchain project dedicated to recording the movements of airplanes around the world With wide enough participation, it could act as an interesting catalog of global trade and commerce separate from government and corporate information channels It could open new windows onto clandestine travel, for example, which is an interesting topic to some researchers [6]

Figure 1 The Air Travel Blockchain might reveal flights traveling this suspicious route



Hobbyists and professionals across the globe might participate in the Air Travel Blockchain by publishing their sightings of planes using blockchain software, written for the purpose by

[5] Pun intended *See, e g* , Jill Carlson, ' Trust No One Not Even a Blockchain ," Slate, January 25, 2020, https //slate com/technology/2020/01/blockchain trust response essay html

[6] *See*, Sam Raphael et al , "Tracking Rendition Aircraft as a Way to Understand CIA Secret Detention and Torture in Europe," The International Journal of Human Rights (2015)

motivated coders and dedicated to open-access use Participants would contribute information in a format dictated by the software Let us say the required format includes precise specifications for time and date, the airport code, each plane's tail number, and an identifier for the person or entity adding the report

To submit a report to the blockchain, the report's author publishes it for dissemination across the peer-to-peer network The report is collected by nodes, which examine reports as they come in and confirm that they conform to the standards of a report, including a valid time and date, valid airport codes, and valid tail numbers

The nodes may de-duplicate multiple reports of the same plane in the same place They may also validate the meaning of the data by checking to see that the same airplane is not reported in two different places at once, for example, or that sightings are not back-dated or post-dated

To help ensure in-person sightings, they may check that the same author is not reporting from multiple locations at the same time When a conflict or inconsistency exists among reports, they may flag reports to indicate potential or likely inaccuracies

Every ten minutes, one of the nodes bundles together the most recent valid reports as a block To establish sequence among blocks, the header of each block contains a unique cryptographic hash produced from the reports in that block and the hash published in the header of the previous block Because it hashes the hash in the previous block, the new block could not exist before the previous block existed

When a node publishes a block to the network, the other nodes validate the block by replicating the hash in the block's header If they find it valid, they accept the new block and store it as the latest addition to the ledger

Now there is a data set that anyone can draw from to gather the movement of planes around the world, to check open observations of air travel against the reports of governments and

CRYPTOGRAPHIC HASHING

A cryptographic hash is produced when data, such as a file or password, is scrambled to produce a value of uniform length called a checksum The exact same data run twice through the same hashing algorithm will always produce the same checksum But even the smallest change to the data will produce a dramatically different checksum A good algorithm makes it effectively impossible to calculate the original data from the checksum

Hashing allows for proof that computer programs or other data have not been altered since they left the control of the publisher Hashing allows web sites to confirm that they are seeing their users' passwords even though they do not store copies of them Instead of keeping passwords, they store hashes and compare hashes of incoming passwords to the stored hashes

In blockchains, hashing proves that the content of a block is unchanged By hashing hashes from previous blocks, blockchains prove the order in which blocks were created

corporations, and so on It is the product of a very rudimentary blockchain, and it illustrates a utility of the blockchain data structure

Securing Blockchains with Cryptocurrency

The "Air Travel Blockchain" is only a rough sketch, and it is at risk from various forms of attack For example, there is little reason not to file false reports Anyone wanting to monkey-wrench the system could easily do so by "spamming" the blockchain Also, there is little incentive to maintain node

There are ways to create virtuous incentives that counter these threats and make the system more reliable using cryptocurrency

The specification discussed above said that the author of reports would include an identifier Let us make that identifier the public key in a public-private key pair Public keys are used as cryptocurrency wallets

When the author of a report submits it to the network, it also posts a small "bond" guaranteeing the veracity of the report This takes the form of a certain small amount of cryptocurrency sent by the wallet to the address of a wallet dedicated to support of the system The requirement for posting a bond makes it expensive to spam the blockchain When a node confirms a report, it might be allocated some of the cryptocurrency that the author posted as bond, and some of the bond might be returned to the author's wallet This system can reduce errant reports by declining to return funds to authors of inaccurate reports

Meanwhile, the blocks themselves could be encrypted such that they could only be decrypted by the payment of a certain reasonable amount of cryptocurrency to the wallet that supports the project Those payments could be distributed among the nodes and the authors of reports such that a reasonable fee for accessing the data pays everyone a little bit for making accurate reports and collecting those reports in timely blocks

PUBLIC KEY CRYPTOGRAPHY

Public key cryptography is a technique for communicating secret information on open communications channels Asymmetric key algorithms allow the creation of an encryption key, which can be made public, and a decryption key, which must be kept private It is impossible without stupendously huge computing power to calculate the private key from the public one

The sender of a message will use the recipient's public key to encrypt the communication Provided the private key is kept private, the recipient alone can decipher the message using the private key

Public key encryption is used to control the transfer of cryptocurrencies Cryptocurrency holdings are recorded in terms of their association with a public key, which is called a "wallet " Transfer of any unit of cryptocurrency can only be initiated by someone who knows the private key associated with that wallet

We have now tightened up the security of this blockchain project to limit inaccurate reports and create incentives for creating blocks But this sketch of a blockchain system for capturing records of airplanes at airports is still woefully insufficient There would have to be some very careful tuning to make sure that false reports are scrubbed (their "bonds" forfeited) and that only a minimum of true reports suffer that fate The economics of the payment system would have to be tuned to reward nodes and authors of reports in the right amounts But we have a sense of how a blockchain works, and how it can be designed to bring strangers together into an essentially leaderless data-collection enterprise

In a truly leaderless enterprise, of course, the software on which the blockchain runs is open source The parameters of reports and the economics of the system are decided by the community of coders and users when they write and adopt the software that they prefer The dynamics of governance in open public blockchains are interesting and challenging [7]

Bitcoin and "Proof of Work"

The original open public blockchain, of course, is the Bitcoin blockchain [8] It is a ledger that records the transfer of units of value, called bitcoins It is "fueled" and secured by an award of bitcoins to the creators of blocks, as well as per-transaction payments that users offer to these "miners" when they publish their Bitcoin transactions

That award going to Bitcoin miners solves another problem in blockchains Which node should get credit for creating the authoritative block? And which block should the other nodes build on?

Bitcoin addresses this question by creating an artificial difficulty around creating blocks In Bitcoin and many other cryptocurrencies, a block is "found" through a lottery-like contest having to do with the hashes that go in block headers

Most hashes have a roughly even distribution of characters, but the rules of Bitcoin specify that a valid hash must have a certain number of leading zeroes (e g , 000000000000000000000d19d8ce9a0fe3ca22b1886ce55b39c14bc1a9ea54232) A hash with this peculiar characteristic is very hard to produce Miners search for a satisfactory hash by adding random character strings (called "nonces") and hashing them with the block's contents and the prior block's hash When a nonce is found that produces enough leading zeroes, a valid block has been produced, and the contest has a winner The miner publishes the block, including the nonce, to show that the work of discovery has been done That system is called "Proof of Work "

[7] For a snapshot into open blockchain governance at an interesting juncture in Bitcoin's history, *see* Jim Harper, "A Bitcoin Constitutional Amendment," Cato at Liberty blog (Aug 19 2015) https //www cato org/blog/bitcoin constitutional amendment 0

[8] *See* Satoshi Nakamoto, "Bitcoin A Peer to Peer Electronic Cash System," https //bitcoin org/bitcoin pdf

Across the Bitcoin network, miners currently do this hashing exercise at a rate of over one hundred million trillion hashes per second [9] Bitcoin's software adjusts the number of leading zeros that is required, and thus the difficulty of finding a block, so that the mining community finds blocks about every ten minutes

Rarely are two blocks created near one another in time When they are, a continuation of the contest is to see which block has additional blocks built on top of it The ultimate victor is the block and the version of the chain with the most "hash power" behind it

Bitcoin is a highly developed blockchain, with an intricate system of incentives to secure what is a very valuable ledger indeed an accounting of billions of dollars-worth of cryptocurrency Not all blockchains need to be quite so intricate or highly developed But there is another type of blockchain that is important to understand, exemplified by the Ethereum blockchain

"Smart Contracts"

A notable dimension of blockchain as an "e-ledger" technology is the possibility that ledger entries themselves can be executable computer code Ethereum is a prominent blockchain that competes with Bitcoin for primacy in the blockchain and cryptocurrency world because it supports code and serves as a platform upon which to develop applications The nodes on this type of blockchain not only record ledger entries, they also execute the instructions embedded in the entries to produce the results encoded by their authors

On open public blockchains such as Ethereum, the code is essentially secure and unchangeable The execution of the code cannot be stopped, not by any natural disaster or loss of power, not by theft or vandalism, and not by any court injunction, theft, or seizure of computers

USING SMART CONTRACTS

Say a farmer wants to insure against the crop losses that are predictable from bad weather during the harvest month She and an insurer can record a "smart contract" on the Ethereum blockchain that will make a payout of a certain amount to the farmer if defined bad weather conditions, such as freezing temperatures or heavy rainfall, exist during the harvest period they define They must define an "oracle," of course, to supply the weather data If the "contract" is coded correctly, the farmer and insurer will both get the benefit of their bargain automatically based on the weather that later occurs

Coding smart contracts correctly is an important challenge One of the most notorious early smart contracts was called "The DAO"—short for "distributed autonomous organization " It was to be a venture capital fund existing only as code This gave it the interesting properties of having no corporate form and no susceptibility to any government's regulations or controls

Unfortunately for the project's participants, errors in the code allowed some participants to drain the project of contributed funds Ultimately, the Ethereum community decided to "unwind" their blockchain to restore Ether to its holders prior to the attack on The DAO This was controversial, as an important dimension of public blockchains is their immutability

[9] *See* Blockchain com, "Hash Rate" web page, https //www blockchain com/charts/hash rate

The upshot is an unbreakable platform for the execution of "smart contracts." If an arrangement can be reduced to code, any deal that two parties want to make can be posted on the Ethereum blockchain and made a bullet-proof commitment. Ethereum nodes will execute the code and deliver the results required by its terms.

The term "smart contract" is a slight misnomer. A true legal contract is a promise made in exchange for something of value. Agreeing to participate in a smart contract may involve an exchange of promises, but smart contract code itself does not involve any promises. When smart contract code is published to a blockchain, the results follow the terms of the code. They do not turn on the promised actions or inactions of the parties.

The Benefits of Blockchains for Small Business

With the mechanics of blockchains and cryptocurrency in hand, it is possible to observe some strengths they have that may particularly benefit small business.

Efficiency

The first benefit of blockchains, evident from the discussion above, is simple efficiency. Efficient systems benefit all, of course, but small businesses arguably benefit more from a given unit of efficiency gain.

Small businesses do not have the economies of scale that large ones have, so an inefficient process is proportionally costlier to small businesses than to large ones. Take automobile titling, an example inspired by one of my co-panelists today. A large enterprise may be able to dedicate a full-time staffer to the intricacies of titling from state to state. In a smaller enterprise, someone without expertise may have to spend a disproportionate amount of his or her time on the problem, time that would be better spent on more productive work. If titling is taken care of with a clean software interface on top of a blockchain recordkeeping system, this will do a good turn to the smaller businesses by taking away a pain-point.

Diversified and Open Market Structures

The BeefChain example and another of my co-panelists today inspire the point that blockchains may alter market structures favorably for small business. As noted above, beef production has been largely a commodity business. Ranchers have been limited to producing whatever the feedlots and processors will support. But now blockchain-based provenance tracking can allow for the sale of specialty products in national markets. That is a huge boon to small, niche producers, to say nothing of consumers nationwide, who now may enjoy a proliferation of choices to enjoy.

In a similar way, FileCoin opens up to small competitors a market that is currently quite limited Cloud storage is a commodity business dominated by a few of the largest tech companies At the same time, there are computers and servers throughout the country and world with vast amounts of unused storage space That space may be rented out using the FileCoin system FileCoin may bring into use tens or hundreds of millions—perhaps billions—of dollars-worth of capital that is now sitting idle Small businesses may benefit by putting their capital to use, and they also may benefit as buyers of storage because they may have more options, plus price competition that lowers their costs

Reduced Competitive Advantage

The final benefit to small business I can identify is slightly more speculative and diffuse, but I think it is real That is the potential that blockchain applications may reduce the competitive advantage that big companies enjoy from setting data standards and collecting data Blockchain may allow all in a community of interest—big firms and small—to take advantage of data they produce collaboratively

As noted above, blockchain is traditionally used peer-to-peer Indeed, it has essentially no value if not used peer-to-peer By nature, then, contributors of data are also given access to data That means that data stores are not just owned by the leading firms in a given field They are a shared resource for all in that community of interest

Using a data commons—shared data—produced via blockchain projects, small businesses may be able to apply advanced analytics, artificial intelligence, machine learning, or whatever technique they please to generate new information, ideas, and innovations Data will not just be the province of big companies In this way, blockchain may contribute to more vibrant, competitive, and inclusive markets

To illustrate the status quo and the possibilities, think of four concentric circles that roughly describe data-using communities from small to large

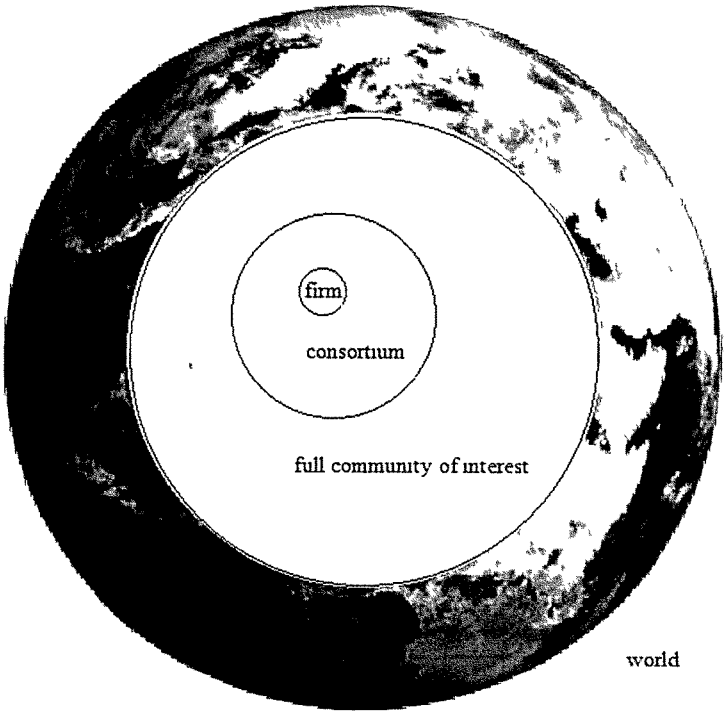
- The first and smallest community is the firm Inside a business organization, data standards are set by fiat according to the use cases that best fit that firm Data is shared according to those standards throughout that enterprise This is the status quo in many industries today

- The second, larger community is the consortium That is the group of like-minded or allied industry actors with the resources to participate in standards-setting Their participation ensures that the standards meet their use cases Each collects and uses data internally according to the standards, and they sometimes share or trade data for mutual advantage Small businesses, generally on the outside of this community, may use the data standards, of necessity, and may benefit from general efficiencies standards create

But they are largely contributors of data to their larger counterparts, and they do not have as much access to data This status quo data dynamic obviously favors bigger businesses

- Lacking a better phrase, I will call the third, yet larger community the "full community of interest " A blockchain project devised to gather supply chain data, air travel data, or what-have-you from every relevant actor will be more likely to incorporate the interests of all, including small businesses Their data structures are more likely to accommodate all use cases because that makes participation attractive The offer to all actors in a given field or industry is "You contribute your data, and you will get access to the data pool "

Figure 2 Visualization of data-using communities (not to scale)



Foresighted large players may lead such projects involving the full community of interest because they recognize that a data commons can vitalize an entire industry What they

might lose in advantage over other industry players, they will more than make up in leading a bigger industry Or such projects may start with small businesses that strengthen their hands by creating a data commons One can imagine this kind of development happening in the beef example, where an entire high-margin category of meat production and distribution could come into existence

- The fourth community is the entire world Global participation among strangers requires the elegant economic systems that cryptocurrencies facilitate This is the possibility with cryptocurrency-secured blockchains like Bitcoin and Ethereum, which make possible Internet-native value transfer, decentralized finance, and many other fascinating and powerful applications, including FileCoin

People with global ambitions for blockchain and cryptocurrency sometimes deride simple blockchain applications Sometimes they are right, because some things proposed for blockchains would be better done with traditional databases and power dynamics But there is potential in the blockchain data structure—given its crucial peer-to-peer production—to change power dynamics for the better, making industries more diverse, competitive, and friendlier to small business This is all a bit forward-thinking and speculative, but imagination, technological innovation, and the will to read through a very long congressional testimony can sometimes pay dividends

March 12, 2020

Attn: Members of the House Committee on Small Business

Engine is a non-profit technology policy, research, and advocacy organization that bridges the gap between policymakers and startups. Engine works with government and a community of thousands of high-technology, growth-oriented startups across the nation to support the development of technology entrepreneurship. To that end, Engine welcomes the opportunity to provide comments for the record on the discussion held at the March 4, 2020 hearing on "Building Blocks of Change: The Benefits of Blockchain Technology for Small Business."

We appreciate the committee's acknowledgement of the various ways in which blockchain technology can serve as a game-changer for startups and small businesses. Wider adoption of blockchain as a mainstream technology will provide numerous benefits to a range of industries. Indeed, blockchain technology can already provide startups with the tools needed to address some of the most pressing issues affecting the tech sector, including data privacy, user security, and access to capital concerns.

First, blockchain technology can help startups strengthen their existing privacy and data security measures. In discussing Protocol Labs' work with the Filecoin network, a marketplace for buying and selling cloud data storage, Marvin Ammori—testifying on behalf of the Blockchain Association—explained how blockchain technology can reduce the overall costs associated with protecting user data, and offer more effective approaches for startups to take when safeguarding user privacy.[1]

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[1] See testimony of Marvin Ammori, Counsel, Protocol Labs, available at: https://smallbusiness.house.gov/uploadedfiles/03-04-20_mr._ammori_testimony.pdf

When it comes to data security, it is the emerging startups that lack wide name recognition or longstanding consumer relationships that will be impacted the most by data breaches or privacy violations. Cloud storage options for securing data that are powered by blockchain are often a better choice for startups who want to establish and maintain user trust. This is because blockchain data structures are secure when compared to traditional corporate IT infrastructure, which can be vulnerable to "single-points of failure" and require "high capital and operating costs."[2] This technology could help startups and small businesses effectively meet the data and privacy security needs of their users, and also position them to better compete against more established cloud data storage companies.

Ammori also noted that blockchain technology would make cloud-based data storage more accessible to small and mid-size firms, allowing them to compete on "cost, speed, reliability, and security," rather than "brand recognition" or "spending more in marketing."[3] This technology could serve as an equalizer, leveling the playing field and providing startups with the necessary tools to secure users' trust when it comes to issues of data privacy. We encourage lawmakers to adopt policies that strike a balance between meaningful privacy and data security protections, and also safeguard the ability for startups to innovate in ways that benefit users.

Blockchain-powered networks, such as Filecoin, could open up the cloud storage market by increasing competition and providing more options for businesses to reliably and securely store their data. Increased competition in this industry will make data cloud storage options more affordable and will drive down the costs associated with this type of business expense. The average startup launches with only $78,000 in outside funding, and entrepreneurs often have to rely on personal loans and credit cards to secure the needed investments.[4] Freeing up additional resources by utilizing blockchain for data storage needs could relieve some of the financial pressure that startups deal with, potentially leading to increased innovation and growth. This point echoes Engine's stance when it comes to privacy and data security—the responsible use and protection of user data is make-or-break for startups.

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[2] See testimony of Marvin Ammori, available at: https://smallbusiness.house.gov/uploadedfiles/03-04-20_mr._ammori_testimony.pdf

[3] Id.

[4] Evan Engstrom, Primer: Access to Capital (2019), available at: https://www.engine.is/news/primer/accesstocapital

Blockchain technology could also pave the way for greater access to capital for startups and small businesses. Dawn Dickson, the CEO of PopCom—a technology company aimed at providing hardware and technology solutions for self-service retail—cited some of the impediments that startups face when securing capital. These include getting loans from traditional sources such as banks, relying on venture capital and angel investments, and putting in the time and energy needed to effectively raise funds.[5]

It is vital for startups to secure outside funding in order to launch. The enthusiasm and demand for crowdfunding since the passage and implementation of the Jumpstart Our Business Startups (JOBS) Act has highlighted the need for new sources of capital for startups, particularly for underserved entrepreneurs. While opening up crowdfunding was a good start, the rules governing this type of capital formation have proven to be too restrictive for most founders. The current restrictions are driving companies to look more closely at technological innovations, like digital token offerings, to overcome the artificial handicaps placed on their ability to raise capital. More needs to be done, however, to ensure that crowdfunding and digital token offerings are effectively benefiting the startup community.[6]

Through blockchain technology, startups can potentially reduce their reliance on traditional funding sources such as banks, VCs, and angel investors by raising funds through a security token offering (STO). As Dickson noted, an STO "can be backed by the company's assets, such as shares, the right to receive dividends or grants for voting power."[7] This type of equity crowdfunding, made legally possible by Title III (Regulation CF) of the JOBS Act, allows private early-stage companies to raise money from around the world.[8] The intended goal of crowdfunding through blockchain-powered STOs is to make it easier for both startups and investors to collaborate. Dickson described how blockchain-powered crowdfunding options can

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[5] See testimony of Dawn Dickson, available at: https://smallbusiness.house.gov/uploadedfiles/03-04-20_ms._dickson_testimony.pdf

[6] Engine, Financing the New Innovation Economy: Making Investment Crowdfunding Work Better for Startups and Investors (Oct. 2015), available at: http://static1.squarespace.com/static/571681753c44d835a440c8b5/57323e0ad9fd5607a3d9f66b/57323e14d9fd5607a3d9fb53/1462910484566/Crowdfunding-White-Paper.pdf

[7] See testimony of Dawn Dickson, available at: https://smallbusiness.house.gov/uploadedfiles/03-04-20_ms._dickson_testimony.pdf

[8] Jason Fritton, How the JOBS Act opens deal flow for non-accredited investors (Feb. 6, 2017), available at: https://aaplonline.com/how-the-jobs-act-opens-deal-flow-for-non-accredited-investors/

help startups and small businesses go even further, with the STO market growing to upwards of $10 trillion in 2020.[9]

Equity crowdfunding—like STOs—offers liquidity options to investors after a twelve month period. This is far less than the ten or more years that institutional investors have to wait for a return on their investment, when startups are typically acquired or go through the IPO process.[10] Instead, the digital assets from an STO could be cashed out when needed—similar to stocks sold on a public market, but instead sold on Alternative Trading System (ATS) exchanges.[11] This would offer investors more freedom and flexibility, and potentially a greater incentive to invest in early-stage startups. At this time, the SEC has not approved any ATS exchanges, despite the fact that the market for STOs is present and growing. Regulatory hurdles and impediments to investment such as this will only serve to stifle the growth of startups and small businesses that seek to harness the power and potential of blockchain technologies.

However, there are some positive developments when it comes to crowdfunding. The SEC earlier this month announced a proposed amendment to increase the Regulation CF to $5 million.[12] While Engine supports the spirit of this proposal—as the current $1.07 million limit does not reflect the true fundraising potential of most startups—a $5 million crowdfunding limit may still be too low.[13] Because of the high costs associated with soliciting funding through an equity crowdfunding platform, capping crowdfunding at $5 million could still limit the number of startups that are able to participate in Regulation CF to raise capital.[14] We believe a higher crowdfunding limit, in the range of $20 million, would make equity crowdfunding—including STOs—more cost-effective and accessible to a wider range of startups.

We appreciate the committee's attention to the issue of blockchain technology and its potential to have a positive impact on the startup and small business community. We look

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[9] See testimony of Dawn Dickson, available at: https://smallbusiness.house.gov/uploadedfiles/03-04-20_ms._dickson_testimony.pdf

[10] Id.

[11] Id.

[12] SEC Proposes Rule Changes to Harmonize, Simplify and Improve the Exempt Offering Framework. (2020), available at: https://www.sec.gov/news/press-release/2020-55

[13] Engine, Financing the New Innovation Economy: Making Investment Crowdfunding Work Better for Startups and Investors (Oct. 2015), available at: http://static1.squarespace.com/static/571681753c44d835a440c8b5/57323e0ad9fd5607a3d9f66b/57323e14d9fd5607a3d9fb53/1462910484566/Crowdfunding-White-Paper.pdf

[14] Id.

forward to working with the committee to find solutions that support and encourage the growth of startups and small businesses in order to further our nation's economic growth and innovation.

TESTIMONY OF SHAMSH HADI
CEO OF ZORROSIGN, INC.

BEFORE THE U.S. HOUSE COMMITTEE ON SMALL BUSINESS

HEARING ON "BUILDING BLOCKS OF CHANGE: THE BENEFITS OF BLOCKCHAIN TECHNOLOGY FOR SMALL BUSINESSES."

MARCH 4, 2020

Chairwoman Velazquez and Ranking Member Chabot — thank you for affording me the opportunity to submit testimony to the committee as part of the committee's hearing on the benefits of blockchain technology for small business. My name is Shamsh Hadi and I am the CEO of ZorroSign, Inc. - a small company based in San Francisco, CA. ZorroSign is the pioneer of electronic signature technology and the developer of ZorroSign DTM, a unified platform, a complete Electronic Signature, Digital Signature and Digital Transaction Management solution. ZorroSign's unique Document 4n6 (forensics) technology offers post-execution fraud detection and verification and authentication of electronic signatures and documents using blockchain tokenization.

Throughout my career in the high-tech industry, and especially through my work as CEO of a technology company that lives and breathes consumer data privacy and security, I have come to learn that blockchain has a critical role in helping small businesses in the United States take full

advantage of advances in cyber commerce and maximizing their ability to have a high level of security and ensure the privacy of their customers.

According to a paper issued in February of 2019 by the National Institute of Standards and Technology (NIST Annual Manufacturing Series 300-6), *"blockchain is a distributed storage framework that is virtually tamper resistant, has a native synchronization-discrepancy-resistance mechanism and is already highly praised in the financial world."*

In its simplest form, blockchain is a shared fixed ledger for recording transactions. The concept of blockchain can and has been extended to have the highest levels of security and privacy protecting the sensitive information and identities of authorized individuals in a network who have permission to access the content stored in the ledger.

Blockchain is a digital record where all transactions are recorded in the order of occurrence and where the next record is linked and related to the previous record. It is a continuous database of records that can only be added to and never edited or deleted. In layman's terms, blockchain allows government agencies and businesses to secure and validate a digital asset, like a contract, enabling the enforcement of ownership or authenticity.

The noteworthy characteristics of a blockchain are:

- Indelible: The most important and distinctive property of blockchain. Once a transaction is written into a block, it can never be erased or modified by anyone, including the person who wrote the transaction.

- Globally Readable: Anyone who has permission to view the transaction can read what it contains and everyone sees exactly the same content.
- Accept Rules Based Rights: Any chosen party can write into the blockchain if it respects the predetermined rules set out for that transaction.
- Strictly Ordered: There is no ambiguity of the transaction. The audit trail will clearly show which block of data came first and which came second.

In its February 2019 paper, NIST noted that because blockchain *"...is tamper resistant and the blocks are timestamped, a blockchain is a robust solution to prove the existence of a specific asset at a certain time during the product lifecycle"* and "*a safe way to track both the existence and ownership of a digital asset at a certain time."*

There are many practical applications of blockchain in the real world:

- Banking: Financial transactions from opening an account to money transfers.
- Health care: Medical records and drugs composition.
- Real Estate: Track real estate transactions and tracking maintenance and upgrade of properties.
- Supply Chain Management: Tracking food supply from "farm to dining table."
- Contract management: Chain of Custody, Audit trail, and entitlement tracking.
- Retail: Protect consumers against issues of product authenticity. Using blockchain retail consumer goods can be tracked, eliminating the risk of consumers receiving counterfeit goods.
- Electronic Voting: Voter registration, personal identity, and voting records.
- Digital Identity: Securing and keeping track of your Personally Identifiable Information (PII).
- Diamond Industry: Using immutable tamper proof digital ledger, record: color, carat, certificate number (inscribed by laser on the crown or girdle of the stone), and origin in

order to increase supply chain efficiency and eliminate conflict diamonds from market. Makes it possible to track diamond from origin to consumer.

Please note that blockchain is NOT Bitcoin. Cryptocurrency like Bitcoin uses blockchain, but they are not the same. Blockchain is not cryptocurrency or Bitcoin. Rather, Bitcoin uses blockchain to secure transactions and publicly record them in a distributed ledger.

Blockchain is important because it has unique qualities that set it apart from other transaction database management systems. Specifically, blockchain is being used today in private, permissions-based decentralized systems that are secure, trusted and automated with bank grade security. Ultimately, blockchain technology helps make digital transactions more secure, faster and less expensive.

One of the conclusions of the February 2019 NIST paper was that *"Due to its tampering resistance, blockchain is an ideal candidate to record and secure data exchanges."* As someone who has spent the better part of my career working on and with blockchain, I wholeheartedly agree with NIST's conclusion.

My company, ZorroSign, has made extensive use of blockchain technology to provide its customers with state-of-the-art electronic signature, digital signature and data transaction management services. ZorroSign's 4n6 (forensics) Token uses a private permissions-based blockchain to deliver verification, security, and audit trail. Users who access a ZorroSign'ed document through appropriate permissions can scan the 4n6 Token and request access to view

the documents audit trail. For the 4n6 Token, the individuals in the workflow always have access to the document. Access to any external parties is limited to viewing the content of the document, its attachment, and audit trail and is based on permissions approved by the originator of the transaction.

Two months ago, ZorroSign announced multiple advancements in the platform's security and identity protocols and overall product enhancements. First, the platform will be passwordless, providing users the ability to use multi-factor authentication. In 2019, One Time Password (OTP) was enabled for basic two-factor authentication. Second, as part of ZorroSign's Identity as a Service (IDaaS) feature roll-out, as an additional security protocol, US-based corporate customers will now be able to purchase a premium service that will allow for Knowledge Based Authentication (KBA) in order to validate a user. Third, users can now use advanced secure mobile biometrics to sign documents.

Currently, using a username and password is the main means for authenticating users. This protocol often leads people to use passwords that are simple, because when passwords get complicated users forget them. As a result, people use the same password or copy and paste passwords. This leads to security vulnerabilities. Passwordless environments provide total security without users having to remember complex passwords.

ZorroSign users can use the passwordless feature by scanning a QR code on the login screen. Once the QR code is scanned the mobile device will prompt for biometric verification. If the

device doesn't have biometric capability the user will receive a pin code via email or text. When authenticated the user will be logged in automatically, achieving a passwordless environment for increased security. Users will have the option to turn on the passwordless feature using the ZorroSign mobile app.

For ZorroSign, TRUST is everything. Security and privacy are the cornerstones of everything we do. Blockchain technology is at the center of the exciting services we offer to our customers. The future of privacy and security is here. My company is committed to providing the most advanced, secure, accessible, privacy focused, electronic and digital signature platform on the market, while maintaining our own digital certificates placed on the blockchain at a competitive price.

The ZorroSign advanced Digital Business Platform uses Digital Transaction Management principals to streamline end-to-end digital transactions built on blockchain. ZorroSign's real (patented) Electronic Signature technology is not just an image of a signature super-imposed on a document capturing only the "intent to sign." ZorroSign users actually electronically or digitally sign a document.

Leading into the first half of 2020, ZorroSign will release a digital signature solution recognized by all global Certifying Authorities (CAs), which will use a cryptographic technique that helps secure the signed document and the data that is associated it. The principle of a digital signature is that of a validation, like notaries in the past. Digital signature is the online equivalent of a

notary that can be verified electronically and instantly. ZorroSign's impending digital signature solution will include digital security certificates that never expire.

Also, looking to the first quarter of 2020, ZorroSign is focused on Identity as a Service (IDaaS) and working to release really exciting technologies, specifically in the space of Artificial Intelligence (AI) and Machine Learning (ML). One of these include the ability to use ML in areas like identification, facial recognition and to recognize a true signature. Further, ZorroSign is working on partnerships that will permit users to use a technology product to sign and compare current signatures to previous signatures.

Again, these new services and initiatives are all made possible by ZorroSign's use of blockchain technology.

In summary, as I have laid out in my testimony, one of the most exciting benefits of blockchain technology is its unique ability to help small businesses cost-effectively secure transactions and protect their customers' personal information. Without consumer confidence and trust, small businesses will not be able to compete in the global cyber-economy. This is where blockchain can be a vital component of the continued growth and resiliency of American small businesses.

Thank you for your time and consideration. I would be happy to answer any questions committee members might have, either in person or in writing.

ZorroSign

eSignature & Digital Transaction Management

Shamsh S. Hadi

CEO and Co-Founder ZorroSign, Inc

Shamsh Hadi, CEO and co-founder of ZorroSign, is an award-winning visionary in all things related to Digital Business Platforms and providing organizations the necessary tools to transform their businesses into efficient digital powerhouses. Before devoting his career to ZorroSign in 2015, Hadi was Managing Director of various organizations, leading teams and honing his authentic leadership style. Observing top business professionals, Shamsh learned how to effectively lead a business into financial success, at the same time improving the professional and personal lives of his employees.

ZorroSign, Inc. the pioneer of electronic signature technology and the developer of ZorroSign DTM, a unified platform, a complete Electronic Signature and Digital Transaction Management solution. ZorroSign's unique patent pending Document 4n6 (forensics) technology offers post-execution fraud detection and verification and authentication of electronic signatures and documents using Blockchain tokenization.

Hadi is focused on ZorroSign's long-term vision to be the most advanced eSignature and Digital Transaction Management solution in the market, and to always put security and privacy first. Shamsh wants to continue to offer services and products that are real, mission critical, and legally acceptable in any court of law.

Shamsh is a strong believer that, "necessity is the mother of invention," and feels efficiency is key, but not at the expense of smart, secure solutions. Evolving and developing necessary solutions to everyday business challenges, while holding the organization to the highest standards, Hadi feels he will help change the digital macrocosm in ways that have yet to be imagined.

A graduate of the University of Waterloo, ON, Canada, with a degree in Honors Economics and Business, Shamsh is a lifelong learner, earning many professional certificates from Cornell University in everything from Strategic Hotel Management to Blockchain for Business.

Shamsh has a deep commitment to his family, wife and children, and is empirically driven by a strong esteemed reflex to steer with trust, transparency, and tenacious leadership.

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