

Deloitte Fireside Chat XIV

Blockchain & Crypto: A Rational Dialogue

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Moderator: Thank you for joining today's webinar entitled Blockchain and Crypto: A Rational Dialogue. Today's presentation is being recorded. The webinar console allows you to customize your experience through actions, like maximizing your slide window or setting it to full screen. Use the Escape key to exit the full screen view. You can also minimize, resize, and move other windows to create a configuration that works best for you. You can open up the Q&A tool from the dock at the bottom of your screen. You can enter a question at any time and click Submit.

Moderator: Now, welcome your host for today's webcast, Dan Sunderland.

Dan Sunderland: Thanks very much. Good afternoon and good morning to everybody. My colleagues and I read a recent headline "Audit Dead in a Decade," and we read on, quoting Professor David Yermac, "The distributed ledger reduces the need for audit by 97%." Well, such precision is laudable, but it's certainly not auditable. Professor Yermac went on to say, "Auditors in the future will be competing on the basis of productivity which will essentially mean who has the fastest hardware and software. And fraud, in classical sense, will all be but impossible."

Dan Sunderland: This is certainly one of the number of extreme statements that we have heard over the last several years about blockchain and its influence on data and its integrity. Certainly closely linked to the blockchain concept is the idea of cryptocurrency or, perhaps more broadly, digital assets. Most of what we've heard about crypto and digital assets, especially from regulatory sphere, is concern again and again and again.

Dan Sunderland: Today, we'd like to separate fact from fiction when it comes to both blockchain and digital assets and truly contemplate what these things are and what they're not. No, the sky is not falling. No, digitized blockchain ledgers have no chance for placing the myriad of judgments that go into a set of financial statements. And no, blockchain ledgers do not necessarily eliminate fraud, yet there are a number of benefits that can accrue from them.

Dan Sunderland: Today, I'm joined by Amy Steele and Will Bible. Both Amy and Will are audit partners who are active in the blockchain and digital asset space. Will has been leading the blockchain technology for the firm for the past three years, amongst many of the other technological innovations he's been working on. Amy, God bless her, has been tasked with trying to find odd solutions to the conundrums

that blockchain and digital assets present. While the auditing standards have not changed as a result of this new technology, the technology challenges us to think hard about how to audit in this environment.

Dan Sunderland: Will, let's take a step back and I'm going to ask you to be our chief historian and entomologist. Could you provide a brief history of blockchain and perhaps define the word for us?

Will Bible: Sure. Thanks, Dan. Let's talk a bit about what blockchain is. You've used the word in your opening remarks "ledger," and so we're going to flip to the first slide. A blockchain, in its fundamental core, is just a data storage technology. It is the ability to record transactions in the database that then is accessible by participants.

Will Bible: Now, what's unique about a blockchain is that it has some certain properties that are different than traditional data storage. When we think about traditional databases we think about technology that's put in place by a person or a company and then controlled within that company. A blockchain flips those concepts on their head.

Will Bible: The idea behind a blockchain is to actually distribute the data ledger. You would give it to as many participants as possible in some cases it, with the goal of making sure that everyone has the same exact ledger. Because those different participants are all competing, they effectively cancel out the ability to change the ledger individually.

Will Bible: The way that the blockchain achieves this is through a number of cryptographic techniques, which we'll talk about, and ways in which it links the data from one set of entries to the next set of entries. Hence, the term "blockchain, it actually forms the ledger.

Will Bible: At its very core, when we talk about blockchain, whether it's digital assets or cryptocurrency or some other implementation, what we're really talking about is data storage. It's a way to store information, but it has different properties than traditional databases that we were all very used to.

Will Bible: What's so different about a blockchain? Well, the fact that multiple people have the same copies means that the concept of control over that ledger is much different than when a single party controls the ledger. That in and of itself is a radical change in the way in which we think about data storage.

Will Bible: How is this achieved? Let's flip to the next slide and we'll talk a little about the process by which information is entered into a blockchain, because that becomes a very problematic concept if everyone has a copy of the ledger. How do we decide who gets to put the next set of information into the ledger? Provided that ledger is keeping track of something at value, each party would have an interest in putting the next entry into that ledger. How do we create

processes and systems and protocols that prevent people from defrauding the system and taking advantage of having a copy of that ledger?

Will Bible: The way the blockchain works is that a person broadcasts entry into the ledger to a community of users of the blockchain. That community of users then will run through a series of validation protocols, which are defined in the underlying software coding of that particular blockchain, and each implementation of a blockchain has different types of validations.

Will Bible: Although you can imagine that, in the case of a cryptocurrency, a validation might be, is the wallet which is trying to transfer funds from itself to another wallet, do those funds exist in the initial wallet or is it going negative? Another set of validation might be, does this wallet exist and does the target wallet exist?

Will Bible: The community at large will receive all the broadcasted transactions over the internet or some other network. They will run the validations on those transactions. They will come to a consensus of which groups of transactions are valid transactions under the protocols of that blockchain. Once they reach that consensus, those transactions are cemented into a block and entered into the ledger, and they're recorded.

Will Bible: There's a whole lot more complexities then to figure out who actually performs that task? We can get into lots of detail on mining and crypto currencies and rewards for performing the set of validations. But in general, you're relying on a distributed community to build consensus that a series of transactions are valid; and once they are valid, they are posted to the ledger.

Will Bible: Importantly, you use cryptographic techniques to link one block to the next. But once a block has been recorded to the ledger, if you try to change that block retrospectively, it would then mess up every subsequent block to it. In that way there is a daisy chaining effect amongst the blocks. Once everyone's agreed, it's recorded to ledger, it's locked in cement, and the network is updated. Now, we have a distributed ledger in which everyone has the same transactions and there's no way to go back in time and change them.

Will Bible: That fundamentally is what the blockchain is, Dan.

Dan Sunderland: Thanks, Will. Amy, maybe you could just clarify things, because I always get confused about this. What's the difference between blockchain and crypto, are they different? Could you maybe embellish on that thought for a few minutes?

Amy Steele: Sure, Dan. You're not alone. We often see the terms blockchain and crypto used in the same context when they are very different. As Will said, blockchain, it's the technology. It is the underlying technology that enabled this real-time settlement of transactions. It allows parties to transact directly with each other through the single distributed ledger. It's a technology.

Amy Steele: The cryptocurrency side of it, this is the medium of exchange. It's a digital or virtual medium of exchange that's created to move the transaction on that blockchain technology. The blockchain technology needs something to be digitized to move it along that blockchain technology, but they're fundamentally very different things.

Amy Steele: Cryptocurrency, also, it's not legal tender. It's not backed by a government. The value of this is really just supported by the laws of supply and demand. In order to use that blockchain technology, you have to digitize something. In the land of cryptocurrency, it's digitizing these this value that's supported by laws of supply and demand so that you can move that digitized medium of exchange along the blockchain.

Amy Steele: One is a technology and one is a use case of that technology.

Dan Sunderland: Thanks, Amy. That's very helpful. Hey, Will, can you maybe speak a little bit to the key ingredients to blockchain and spend a little time on that?

Will Bible: Sure. I alluded to a number of them. The first of which is clearly a peer-to-peer network, so some way to communicate the transactions and the ledger entries across a group of companies or entities or people. So, you need to have a network. Now, the rise of blockchain, we didn't go into much of the history earlier, but it parallels that access to the Internet. As more and more computers came onto the Internet they became easier and easier to access a large peer-to-peer network.

Will Bible: That is fundamentally a key ingredient. Even if you end up with a blockchain implementation that maybe isn't public, and we'll talk about that in a second, you would still always need to have some network capacity because you are trying to keep this ledger updated in near real-time. If you did this by smoke signals or letters, it just wouldn't work. You need to be able to digitally transfer the information, as Amy mentioned.

Will Bible: The second key ingredient is cryptography. Because you've publicized these ledger entries, if we just publicize ledger entries as we're used to them as accountants, it may contain lots of information that is very private and confidential. You certainly wouldn't want everyone to know the names of all the parties who are completing transactions, depending what those transactions are.

Will Bible: The blockchains don't have to, but in many cases have a cryptography built into them. Everyone is given a cryptographic address in the blockchain, as opposed to an email address or a username. When you create a cryptographic address on a blockchain, you are given a key that would unlock it. As long as you possess that key, you're able to use that wallet address.

Will Bible: What's really important here is that these are very complicated cryptographic calculations that are occurring and they need to happen in real-time. This key ingredient is facilitated by the speed of processing power of computers. As we've been able to automate encryption and bring that to the general public, that makes possible to be able to encrypt and decrypt information on a blockchain very quickly while all this consensus process is occurring.

Will Bible: Then, finally, is the consensus mechanism itself. One of the questions that we get is, "Well, who decides the rules?" I mentioned validations. "Well, who made those up?" The answer is not entirely clear in all cases. When we think about something like Bitcoin, the validation rules were established in a white paper that was anonymously published and someone took those validation rules and put them into software. There are other implementations, other use cases where companies might come together and decide on the validation rules and the manner in which they'll gain consensus over the entries to the ledger.

Will Bible: Here, I mentioned specifically the proof-of-work type of validation. Effectively, what that says is, we're going to create an economic competition and the way you win that competition is by expending more and more energy, i.e., work to solve a random puzzle. If you're the first one to solve the random puzzle, we're going to reward you with some compensation. That random puzzle, by solving it, you actually happen to validate all the data in the blockchain at the same time.

Will Bible: That was one mechanism by which some of the first blockchains have been implemented. But other types of consensus protocols are being developed that maybe replace or supplant the proof-of-work. But that is a key ingredient.

Dan Sunderland: Thanks, Will. That's very helpful. Now, Amy, you just talked about what the difference between blockchain and crypto was. As I understand, blockchain comes in a number of different flavors. Could you maybe speak to that?

Amy Steele: Sure. On the next slide, we show the three different flavors, in our holiday theme here, I would say we have vanilla, pumpkin spice, and peppermint here, so very different flavors of the different types of blockchain. First, we'll start with public. I mean, the real difference here with these types of blockchains is the determination of which parties are allowed access to the distributed ledger.

Amy Steele: With our public blockchains, it's permissionless. Any party had that have access to the Internet can really have access to these public blockchains. This is where our blockchain that underscores Bitcoin, that's where this lands, in this public blockchain. If you have connection to the Internet, you could get access to this public blockchain. It is permissionless.

Amy Steele: Then we move toward the right side of the spectrum and we have our two types of permissioned blockchains. We have the one in the middle, which is our hybrid approach. These are most likely set up by consortiums of parties that

collectively benefit from the blockchain. This group will have pre-selected consensus mechanisms. The validation mechanisms that Will have just spoke to, it will be pre-selected by the group of parties that are on this permissioned blockchain. All the participants agree to the rule set, they all agree to the validation mechanisms, they agree to the transaction cost that are set up, and then they collectively benefit from the permissioned blockchain.

Amy Steele: There are a number of use cases here that we've seen in different industries. Real estate having transactions on land and homes all on a particular blockchain that would fall into this group of permissions blockchains. A number of use cases in that space that are very different to the use cases of Bitcoin and the public blockchain.

Amy Steele: Then, on the far right are true private blockchains where it requires permission for all parties to it. There's only one centralized authority that can make the changes. As opposed to the hybrid, this one you only have one centralized authority that makes the changes rather than a pre-selected set of folks that would be able to make those changes. It has a lot of protections from a privacy, but more limited use cases. Really you might not even need a blockchain in these situations because it is highly centralized within one party. It takes away a lot of the benefits that Will had spoken about related to using a blockchain and a distributed ledger across multiple parties.

Amy Steele: Most of the use cases that we're seeing are in that middle bucket of true hybrid permissioned block chains where you have a pre-selected group that all can agree to the different rule sets, the consensus mechanisms, the transaction costs, and form a consortium of parties that collectively benefit.

Dan Sunderland: Thanks, Amy. Let me follow up with one more question. Amy, you do have, I think, an audience of accountants here today and what I always look for is trying to find accounting analogies that allows us to put these things in context. In particular, how would a blockchain ledger interface with a company's own accounting system? Would it make things easier, would replace people, would it replace systems? How does it all play together?

Amy Steele: That's a good question. Again, I think it really depends on the blockchain and how the company is using the blockchain for their particular business. I mean, there's a number of benefits of blockchain and how it can help companies execute transactions. Because if we go back to the definition of blockchain and what it's used for, it's used for the transfer of value of something. Would it replace an entire general ledger? Likely not. Could it be helpful in moving transactions and engaging with customers and suppliers? Absolutely.

Amy Steele: I think the two big benefits for companies are: one, it's near real-time settlement of transactions, so you'll have a reduced risk that a party won't pay; and then, it allows participants to really transact directly with each other, so it eliminates the need for a centralized transaction processor so things are faster and more efficient.

Amy Steele: Some ways it can be used, you could store record of the transaction. Now this would be a record that the transaction occurred and it would show that all of the protocols were met and it and the transaction occurred and was valid. You likely wouldn't have all the contracts and everything behind that stored in the blockchain, because if we go back to what Will said that anything that's on the blockchain others can see it because everybody has the exact same view of that particular ledger. So, you likely wouldn't store all of those contracts. You would have that in your enterprise database. But you could use this as a great mechanism for storing a record of the transaction.

Amy Steele: It's use case. It's used right now with Bitcoin and there's other use cases moving records of value. You can move value across parties in a very quick way. And then, smart contracts is an interesting use case from a business perspective, really thinking about are there ways to put programs into the system that will trigger transfer value under certain conditions? These if-then statements that will allow for automatic execution of transfer of value upon conditions being met, and that could really speed things up.

Amy Steele: But to answer your question, I don't think it will ever replace management's books and records and systems that they currently have in place to account for their transactions. This is a mechanism to carry out those transactions, but it's not going to likely replace management's books and records and everything they currently have in place to support the books and records.

Dan Sunderland: Thanks, Amy. I was sitting in a conversation today relative to investment management and like. We did come across some interesting applications for whatever we want to call blockchain. That was one of the things that auditors need to do when they're dealing with investment management like is look at purchases and sales of securities along the way. As Amy said, you have a transaction by transaction ledger that shows purchases and sales of those securities.

Dan Sunderland: In an ideal world, a custodian or a transfer agent actually has a record of the securities in their own in and out of those securities. In theory, you could match up this distributed ledger that the custodian had to the transactions that you had in your ledger and essentially audit what was going on. I think as we try and see new things coming on board, there are multiple, multiple ways that we can be using it and apply it along the way.

Dan Sunderland: Will, I'm going to come back to you for a second and just ask you sort of a big picture question. What would you regard the true value of blockchain to be? Where would you expect the adoption to be more aggressive?

Will Bible: Sure. Just to play off a little bit of what you and Amy both just said, when you have a situation where you have lots of intermediaries and you're doing reconciliation, the value of blockchain is to help you automate that process.

Will Bible: Let's take an example, the current state and how we manage data, because at the very beginning we said this was all about data. In the current state, you have customers or counterparties that are interacting with businesses. There are a variety different processes and most businesses have developed their own set of systems to interact with those customers. Once they collect data on those customers, they record that data into their traditional databases and keep that data.

Will Bible: Now we know in today's world that data is a tremendous asset and so there's a lot of value in holding that data. If this picture on the screen were really true to form, you would actually see behind these data silos a lot of accountants who are spending time reconciling between these different businesses because that's what businesses have to do to reconcile their accounts receivable or accounts payable or margin positions, and any transaction that becomes potentially contested you start to go through the process of reconciliation.

Will Bible: That reconciliation is time-consuming because it's effectively hunting through these data silos to find that the items that didn't flow through the processes the same way for one reason or another, or maybe one set of processes is slightly different than another.

Will Bible: With blockchain, it's flipping it. We're saying, "Well, customers would interact with this single set of data and it's distributed amongst many different players so everyone has access to it. But on the very front-end we're going to get to data standardization. Once we get to data standardization, now on the back-end, there's not a need necessarily to have the reconciliation points between any of these because we're dealing with a single source of truth.

Will Bible: That's really where the value to an enterprise is with blockchain. This is also the most difficult thing to achieve because in order to achieve this you have to have agreement on what those things are that you're going to capture. When we see challenges in adopting blockchain, it usually comes from the fact that the enterprises can't get together and decide. "Well, these are the things we want to track in a standardized distributed ledger and this is how we're going to do it."

Will Bible: Reaching that conclusion is the hard work and, once you've reached that conclusion, implementing it in a technology framework and then taking advantage of is a little bit easier. But it's very, very valuable because it creates this common data platform, which you can then use to build advanced analytics, even artificial intelligence on top of it.

Will Bible: Now, I will mention that the other challenge with this, and to Amy's point about why it probably won't replace enterprise-wide systems, is that clearly in a distributed network you are tracking data redundantly. Maybe today I've got a file that is 100 megabytes and I've got one version of it and copy of it on my system. Well, if I replicate that file into blockchain with 10,000 nodes, now I have that file 10,000 times 100 megabytes, whatever that is, in data storage.

Will Bible: Blockchain tries to answer that problem by saying, well, the cost of data storage is going down over time. So as data storage costs decrease then more and more things can be tracked on the blockchain. But the reality of it is, as data storage costs decrease, we find more and more things to store. The idea that we'd ever take all the data that's not being collected by enterprises and replicate that across huge blockchain networks is a little bit crazy because you would incur so much cost.

Will Bible: What's really important is to figure out amongst the parties who are entering into these business transactions, what is the data that would be valuable to standardized, and then use the blockchain to track that information amongst the consortium and eliminate some of the back-end processes for reconciliation and build out analytics, artificial intelligence in a more comprehensive way for those areas.

Dan Sunderland: Thanks, Will. Amy, I just want to try and round out the blockchain talk and ask you to perhaps highlight the items that are most important to consider. While you're at it, bust some myths and some general and truths that tend to circulate the media about blockchain.

Amy Steele: Sure thing, Dan. I think we've touched on all four of these, so I'll go through them quickly. The four big myths we have with blockchain and Bitcoin. The first one we hear all the time that blockchain is Bitcoin. The first myth that I hope to bust is that blockchain is not Bitcoin. Blockchain is underlying technology, bitcoin is one use case. Beyond that, there's a number of other use cases for the technology. Number one, blockchain is Bitcoin, that is false.

Amy Steele: The next is, blockchain is not an enterprise database. I think Will covered this really well and explained it on the discussion on data storage cost and why this wouldn't be used. Also, I think it gets back to you wouldn't necessarily want to store some private information or large amounts of company's data on a blockchain because others can see it. It is distributed by its nature. Blockchain is not an enterprise database.

Amy Steele: The third one, blockchain security does not mean inherent data privacy. We hear a lot about blockchain security and how, if everybody has the same view of the distributed ledger and the protocols are set up quick appropriately, we have the security there because everybody sees every transaction, they're being validated or comfortable with the validation protocols. That does not translate to data privacy because, again everybody seeing the same ledger and so it isn't private. Everybody can see what's put on there. It's important to understand the difference between the blockchain security and data privacy.

Amy Steele: Then, the last one, is that blockchain is not always public. The use cases that we often hear are that blockchains that are underlying the cryptocurrencies, the coin and others. But there are a number of other types of blockchains out there that can be quite powerful and really help with the transfer of different types of assets and different types of values. I think that's an important one to

understand is that blockchain is not always the public blockchain that are in the press every day, but there's a number of other types of use cases for this technology.

Dan Sunderland: Well, thanks, Amy, very, very much. Now I think that sort of exhaust the blockchains topic, or at least we flex everybody's appetite relative to it. To me, I always think about the blockchain. About 35 years ago, I remember thinking about FOB shipping point, FOB destination. There were all these goods at the end of the year floating around there that nobody had on their books. Finally, I think we can reconcile those things through a shared blockchain somewhere down the road.

Dan Sunderland: But let's move onto something that gets all the press and a topic that seems to be top of mind everywhere. Of course, my two sons decided they wanted to speculate for cryptocurrency and they held those positions for about a month and then they got out of that quickly. Can you describe again, Amy, what a digital asset is or what a cryptocurrency is, and why it's such a hot topic right now?

Amy Steele: Sure. Simply put, anything that exists in a binary format that has a right to use can be digitized and stored and traded digitally on a blockchain. Cryptocurrency is the one that we often hear about that is digitized, but we could digitize anything. We could digitize art, we could digitize real estate. We had on the press about digitizing mangoes so that we could track mangoes from point A to B to C to D and see how the mangoes are moving. You really could digitize anything to be able to allow it to work on a blockchain.

Amy Steele: Some examples of digital assets and different categories of digital assets. We have our digital tokens. This is a type of digital asset that represents an asset or utility that can be transacted on a blockchain. There's three broad categories of these types of tokens. I say "categories," but there is so much gray between these categories that is important to really think about what the business purpose is that's driving the particular token.

Amy Steele: One of those is a security token, so this is a category of token that may represent financial instruments such as debt or equity claim on an issuer. There is some economic function to them and they could be potentially analogous to equities or bonds or derivatives. They could have rights to them.

Amy Steele: There's utility tokens. This category of tokens provides or promises access to some goods or services. You're going to get some utility out of this particular token that you purchase. There's a lot of gray between securities and security tokens and utility tokens and that's where it's really important to think about the business purpose why is somebody buying this token? What is it actually being used for?

Amy Steele: Then, the third category of tokens is one that represents legal title in some form to an underlying asset. This might be a token that represents real estate or a good, a package or something that's in transit, so this is tied to a particular underlying asset. It goes back to in order to use the blockchain you need to digitize something and these are some broad categories that you may be able to digitize. But then there's a lot of gray between these categories and it gets back to what's the business purpose.

Amy Steele: Then, we get to cryptocurrencies and we talked about this a little bit. Cryptocurrencies is a digital or virtual medium of exchange. Again, they're not backed by government. They're not legal tender and so they're not a form of fiat. Their value is really driven by supply and demand. That those are a form of a virtual value to transact on a particular blockchain.

Dan Sunderland: Thanks, Amy. Will, maybe what you could do is give an idea for us what the ecosystem looks like and who the big players are in this whole crypto consortium, or whatever we want to call it?

Will Bible: Yeah, sure. I think we've established, hopefully, that blockchain is not an entity. We can't say things like, "Well, just go out to the blockchain and buy Bitcoin," because the blockchain has no way to take your dollars. It can track the Bitcoin, but it doesn't do anything with dollars, for example. Blockchain is a purely a data storage, a ledger that is tracking one of the asset types that Amy just mentioned.

Will Bible: Because that's there, so even if it's not an entity, it is an asset of itself. A ledger is valuable. What we have is a number of businesses that have built up business processes around blockchains to perform some of these functions that are really important to make things work. Maybe start with an exchange, so you have a business that has come into being that says, "Well, I will actually give you some Bitcoin in exchange for dollars," and that's one type of business.

Will Bible: Then, along with that, you have a place where you can maybe trade those types of currencies and maybe even enter into financial transactions related to those currencies. So, along the cryptocurrency lines, you start to see businesses pop up who are helping to manage the customer interaction with the blockchain. Because, like I said, you can't just go out and decide to buy Bitcoin for dollars from no one.

Will Bible: Now, along with that, we have a number of companies that are investing. We look at different digital assets as a way to hold value. As Amy mentioned, sometimes digital assets are actually rights to other assets. There have been coins or tokens that have been created that it represents the right to precious metals, for example. So, maybe a way to get access to investing in precious metals is to buy that token and so you have funds you have put together investment dollars to buy into those assets.

Will Bible: You, of course, have the companies that are in the space of actually building the software. Back to the question of who sets up the rules and how do we create the digital backbone behind all of this to make it all work? I think we've been asked the question, is this all just conceptual or is this something that's real?

Will Bible: The answer is it's real because people have taken the conceptual ideas and turn them into software and now are implementing that software in real business processes. Maybe the first one with Bitcoin was a kind of internet collective crowd-sourced project. It's done "free" by some freelancers. But going forward you have software companies. In fact, many of the big names have announced blockchain platforms and different types of software accelerators that allow you to create blockchains for your purpose. So, that that is part of the marketplace as well.

Will Bible: Then, finally, you have a group of companies that are performing the validation themselves. Going back to the public blockchains, in order to perform the validation there's an economic competition that's occurring. You have companies that exist to do the calculations, to validate the transactions, to agree that the blocks are correct, and receive economic compensation for that. You frequently hear about those as miners, is the kind of a term of the industry, but essentially those are companies that are set up purely to validate the transactions before they're written to the ledger.

Will Bible: We'd see a whole ecosystem that's being created around this as both consumers and other legacy businesses put together use cases and start to adopt this technology. But there certainly is a need, because it's decentralized, to have a business that manages the relationship between the blockchain and the customer. So, that has certainly become one of the bigger places.

Dan Sunderland: Thanks, Will, very much. Now, Amy, I guess it's fitting that I asked this question, is crypto auditable? Should investors be worrying about a cryptocurrency asset that's sitting on a balance sheet? What sort of regulatory concerns are there that are currently being expressed? I know that there are many of these things. I know you've had a number of experiences recently, so please, if you could help folks out on that, that'd be great.

Amy Steele: Sure thing, Dan. Challenging question and I think it's important. I mean, I always say that it's important to go back to the business purpose of the particular entity. Will walked us through the different types of entities in this ecosystem and to evaluate. If you can audit them, it's really understanding to understand their particular business purpose, how are they playing in the ecosystem, how are they maintained in their books and records, understand the nature of the underlying blockchain.

Amy Steele: We talked very fundamentally that there's different blockchains and each of those blockchains may have, the nature of the blockchain might be different, there's different agreements between the parties underlying the blockchain, there's likely different consensus mechanisms as to how the transactions get

validated automated controls that the company has, it's maybe in the blockchain. Also, how the company has automated controls that they reconciled to the blockchain? Very fundamentally, how do they maintain their books and records? Are they doing other reconciliations with the blockchain? What are they doing to make sure that they're comfortable with the data?

Amy Steele: When we're assessing, if something's auditable it's really important to get behind the particular entity, understand their business purpose, understand the nature of their underlying blockchain technology. All of that is going to be able to help you answer, one, is it auditable, and then two, when you get to the answer, if you get to the answer, yes, it is, what are the risks that you're concerned about and how do you perform an appropriate risk assessment? Then, that's going to drive your response.

Amy Steele: In the slide, I have a couple areas that are particularly important in this ecosystem when we think about auditing these types of companies. Starting with fraud risks, it's a unique space. I think there's likely going to be some unique opportunities and methods that entities and individuals could perpetrate fraud. It's important to really think about. I mean, I walked through some of the things to think about within particular blockchain, but really get into what are those opportunities and new methods that fraud could be perpetrated.

Amy Steele: On the flip side, there's likely some traditional fraud schemes that all of us auditors have top of mind for traditional companies that may not be an opportunity for fraud in this ecosystem. I think that's really important to think about the unique considerations in this space.

Amy Steele: We talked about the general ledger and how blockchain might intersect with the general ledger. Again, I think that's going to get back to each particular enterprise and how they're taking the data that's stored on the blockchain and reconciling it, and how it's going to fit into their systems of their financial statements and systems. I think it's important to understand that transaction flow to be able to set up an appropriate audit of the financial statements.

Amy Steele: The anonymous nature of the blockchain is interesting. I think there's a lot of focus on this area. Again, it depends on the particular blockchain. I mean, certain blockchains, if we think about the Bitcoin, blockchain are set up with public addresses. You won't necessarily know Amy Steele when you're transacting with me, but you would have my public address. It tends to be more of a pseudo anonymous nature to the blockchain where I would need to give you my public address to transact with me in order to do that transaction.

Amy Steele: I think there's important things for management to evaluate here and for auditors to evaluate as to how do you know who you're transacting with, what are your controls over it, what are your procedures and processes to do, know your customer, the anti-money laundering, and whatnot. I think some unique considerations in the space to really think about who you're transacting with

and make sure that management has the appropriate controls in place to be able to mitigate against fraud-related parties and engaging with any illegal acts.

Amy Steele: Then, the last thing one I wanted to point out is audit evidence. We see this generally, I think as auditors, as mechanisms of data storage and transactions changes over time, the types of evidence that we get is different. It's important here in a blockchain situation to really think about the evidence. Is it going to be sufficient and appropriate for the particular audit?

Amy Steele: Again, I think that a lot of it is going to also come down to management's controls and how they get comfortable with the data. Because the blockchain, while it's a very powerful tool for transacting value and data, it's not going to solve the fundamental issues that we always have with any sort of data storage that if you put garbage in you're going to get garbage out. It's important to really understand that the mechanisms that management has in place to make sure that the information is good information and reliable information.

Amy Steele: Moving onto the next slide, I'll talk about a few unique areas of focus from a financial statement assertion perspective. If we start with existence of assets, the challenge here is that many cases the underlying record of the transaction, it fits on the blockchain without any physical representation of the transaction.

Amy Steele: A lot of assets, how we test existence is we look at it. If the client says, "I have a computer," I can go and I could look at the computer and say that exists. Here, if they say they have a Bitcoin, it's a lot more challenging and because there isn't a physical representation of that particular Bitcoin. It presents some unique challenges for the auditor. Some companies may use a third-party custodian and so there's that help that you could potentially confirm with a custodian. Some of these custodians do have controls at the station reports. But there's some unique challenges to think about from the existence of these digitized assets.

Amy Steele: Rights and obligations is also a very interesting financial statement assertion that we think about in the space. If we think about per our public blockchains and our cryptocurrencies ownership of a private key, equals ownership of the asset. If you don't have the private key, you likely don't own the asset. If you lost the private key, if it's stolen, if it's corrupted and it can't be recovered, the entity will no longer be able to access that digital asset. It's no longer able to establish ownership.

Amy Steele: It's a very unique area to think about how does management make sure that they always have ownership of these private keys, how do they test it, what are their controls and processes? Then, from an auditor perspective, how do we audit that? So, a fun space to evaluate there.

Amy Steele: Related parties illegal acts and fraud, this I touched on the prior slide. It's really thinking through the potential challenges related to the pseudo anonymous

nature. The information, such as names, can't necessarily be determined by looking at just the public address on the blockchain.

Amy Steele: However, there are links between that public address and the identity of participants in the transaction. For example, you might be able to get that link through exchanges or custodians and those types of services. It's just a very important for auditors and management to really think about the controls and their protecting, how management is protecting their books and records from illegal acts and fraud, and that they're not engaging in related party transactions.

Amy Steele: Then, valuation. This is the risk that a digital asset is value using an appropriate techniques or models or that there's potential manipulation of the value due to a lack of liquidity and regulation. Here, it's really important to understand management's process for valuing these assets and what those models are. We might need to involve specialists in this area.

Amy Steele: It's a unique area where we don't have a lot of authoritative guidance on how to value and that there are some questions and challenges related to the liquidity of these assets. It really depends on the type of digital asset it is, is it more frequently traded, is it not?

Amy Steele: Because we talked a lot about Bitcoin, but that's one of any many, many digital assets and so it's important to understand the nature of the particular digital asset and the methods and models and techniques that are being used to value that digital asset. But definitely a financial statement assertion that is top of mind in this space.

Will Bible: Yeah, Dan. I think those are really great product risk. Amy mentioned a little bit earlier, there's also the business risks associated with using blockchains. In particular, we kind of skim the surface on privacy versus security and it probably bears a little bit more attention.

Will Bible: What does that mean? If you go out and you do get a wallet and you do get a key to that wallet and there encrypted a set of information, then you might have a feeling that in fact it is private because you're the only person who has that key. Because of that, there's no way for someone to know that this random string of digits that's embedded in this blockchain relates back to you. That is true. I think Amy used a really good word on "pseudo anonymous" because as long as no one can link you to those random string of digits, then it's true, it is anonymous.

Will Bible: However, if someone ever were to be able to link you to those random string of digits, they would then have a complete transaction record for as long as you were doing transactions on that particular blockchain. Because the blockchain itself is immutable. If you went through and you did lots of legitimate transactions and had one illegitimate transaction, and years down the line

someone was able to connect you as a company or as a person to that particular account, they would be able to see all the transactions.

Will Bible: Because once it's decrypted for whatever reason, it may not be a factor breaking decryption using quantum computing or some other method, it may be simple trickery to find out what your Bitcoin wallet addresses are well. Once it's decrypted everything is laid bare for all to see.

Will Bible: When we think about the digital world and having distributed ledger's companies need to be very thoughtful about what is the information that we're going to store in these distributed ledgers. Because while we can go a long way to try to protect the privacy or ensure the privacy, once it's out there, it's never coming back.

Will Bible: For that reason, some of the use cases that I foresee in the future have more to do with certifying authenticity of things than actually storing data. In fact, you might want to store the data someplace where you have more confidence that it will never see the light of day outside of your entity because that data is such a valuable asset.

Will Bible: But you might want to use the blockchain to timestamp it and put a record of authenticity on that data so that if someone in the future change that data you would know it. This becomes particularly important when we look at what people are able to do these days with tampering with evidence. Like photography, video, et cetera, how can you trust that something is original? One of the ways you can do that is by creating a timestamp on blockchain that can't be changed.

Will Bible: I think that there's a lot of potential use for an immutable ledger, but there's also risks that people should be aware of. I think people are becoming aware of them, as they start to realize that maybe their cryptocurrency gains or, in the case of sure there'll be losses, Dan, you have to pay taxes. As that starts to happen, I think we're recognizing that these pseudo anonymous solutions can very quickly become non anonymous.

Dan Sunderland: Thanks, Will. That's very helpful. As I reflect back on what we've talked about today, we reflected back on all these articles that we see out there, and being an audit dinosaur to some degree, does a 97% number seem to ring true to me? When we're thinking about a set of financial statements there are certainly things that a blockchain can deal with and that's basically the normal cycles. It can deal with receivables and straightforward sales of widgets. It can deal with payable transactions or payroll transaction alike.

Dan Sunderland: But what blockchain can't do, I mean, what it can't supplant, and what we all do on day-to-day basis is deal with those estimates that reside in financial statements and that are so dependent on judgment by management and judgment by auditors along the way. As I reflect upon this, it really seems to me

that blockchain is a great thing to have. It's something that's around to stay, but it does not supplant us as auditors along the way.

Dan Sunderland: What I'd like to do is, again, thank Will and Amy for the time they spent with us today. We hope that this has been informative and it allowed you to contextualize and differentiate blockchain from crypto from digital assets.

Dan Sunderland: When I think about crypto, I dragged a quote out that said "If people value something, it has value; if people do not value something, it does not have value; and there is no intrinsic about it." So, you think many, many years ago people used to look at fiat paper currencies and laughed contending that the only store of value or something that intrinsic value is gold. Now people look at digital assets and also laugh contending that they perhaps have no intrinsic value.

Dan Sunderland: Yet, I think only time will tell whether crypto currencies supplant fiat currencies or become some other significant method of exchange. Technology adapts and finds its highest and best use. It's usually not where somebody predicted. Blockchain itself does and will likely find many best uses.

Dan Sunderland: We started this discussion again today with a fairly bold assertion: audit is dead. For that matter, if we read the press fiat currency isn't far behind. This is really part of that blockchain hyperbole out there. Yet blockchain does exist and has relevance in many areas.

Dan Sunderland: The technology has many unique applications. The technology may revolutionize certain things, but it's certainly not a panacea for all the ills in the world. We as management, auditors, investors, and regulators, we all have a role in looking beyond the hype and understanding this new technology, exploiting it appropriately and managing the risks associated with it.

Dan Sunderland: We thank you again for joining us this afternoon and please have a good rest of the day.

Moderator: This does include our presentation for today. Thanks to Dan, Will, and Amy for an excellent presentation. You can find their contact information in the Speaker Bio tool to the left of your screen.

Moderator: When we close in a moment the screen will redirect to our user survey. We really appreciate your valuable feedback. This webinar will be available in archive in about an hour at the same length as the live webinar. Feel free to come back and review any of the content or invite colleagues that you feel might find it valuable or interesting. Thank you for joining us. Have a great day!