



BLOCKCHAIN 101 WITH
BRIAN KALIS, ERIK PUPO
AND MICHAEL KLEIN

BLOCKCHAIN 101: THE KEY TO HEALTHCARE TRUST AND SECURITY?

WEBINAR TRANSCRIPT

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Moderator: Hello, and welcome to today's webinar *Blockchain: The Key to Healthcare Trust and Security*. Before we get started, I'd like to announce a few brief housekeeping details. Today's session is being recorded, and an online archive of today's event will be available a few days after the call. You will receive an email from AHIP that will ask if you would like to receive the archive. Please respond to the email if you would.

I'd like to remind you of AHIP's anti-trust statement, and ask that you reference it in the handouts tab. The anti-trust statement prohibits us from discussing competitively sensitive information. You can also gain access to a PDF of today's content in the handouts tab as well, compliments of Accenture Health. Please keep in mind, you may ask a question at any time during the presentation by typing your question into the chat box located in the lower left-hand corner of your screen, and then click send. You can adjust the size of the slides to fit your screen by clicking on the scale button located in the upper right-hand side of your screen.

We're very fortunate to have with us today: Brian Kalis, Managing Director, Accenture Health; Erik Pupo, Managing Director of Vendor Health; and Michael Kline, Senior Manager, Accenture Health. At this time, I'd like to turn the floor over to our speakers.

Brian: Thank you. Good afternoon, and thank you all for joining us today for the discussion. My name is Brian Kalis, and I lead Accenture's digital health and innovation practice. My team focuses on ideating, shaping, prototyping and scaling emerging technologies and business models in the healthcare industry. One area of focus for my team is the ways in which blockchain can be applied in the healthcare industry to unlock new sources of value.

As mentioned earlier, I'm honored to be joined by my colleagues Mike Kline and Erik Pupo, for the discussion today. In terms of the agenda for today, we'll provide an overview of blockchain technology, explain blockchain fundamentals and describe the state of blockchain in the healthcare industry as a general introduction. So let's begin with a high-level overview of blockchains, and why there's so much buzz about the technology within the industry.

Blockchain overall is a catch-all phrase for distributed ledger technology, which is a new type of database system which enables multiple parties to share access to the same data, at virtually the same time, with a high level of trust and confidence in the data. Currently, data reconciliation sits at the heart of most business models; however, because everyone maintains their own data, the process is full of inefficiencies such as different parties constantly messaging data back and forth to get things done. Blockchain has the potential to enable a progression to a more efficient process in which reconciliation is part of the transaction process through trust and shared ledgers.

So with that, what's the potential opportunity? The financial services industry has been leading the charge in experimentation with blockchain technologies, and thus serves as a model for the potential cost and efficiency gains in the healthcare industry. We project savings of up to and exceeding 30-50 percent across investment bank transaction processing as you see from the example played to you on the screen. We believe that similar efficiencies may be possible in the healthcare industry in transactions that exist.

So what's happening in healthcare today? In general, when you look at healthcare and blockchain, we're seeing an increase in experimentation and interest in terms of how blockchain can be applied-- in particular, looking at what are potentially good use cases to apply the technology. And we're seeing that across both health plans, health providers as well as life sciences. If we go where we're seeing the highest level of interest and activity to date, life sciences is leading the charge. Health payers are following, and health providers are trailing after that.

If you look back to roughly a year ago at this time, we went from basic interest and experimentation that had been happening to now a higher volume of experiments that have been taking place by those actors. When you look at the landscape, similarly if you go to a year ago, there were a handful of vendors that were originally exploring -- of blockchain vendors that were targeting -- the healthcare vertical. You could count many of them on one or two hands at most.

We've been looking very closely at the external landscape, and this just gives a snapshot of a few of the vendors and different areas that they're focusing on as it relates to the healthcare industry. We've gone from that handful now, to an explosion of hundreds of different companies that have entered, targeting different use cases within healthcare.

Although we've seen that increase on the supply side, we still are at early stages into blockchain's evolution and dispersion into the healthcare industry. Overall, we do believe that blockchain will be an important component of the healthcare ecosystem. But likely, this will evolve over a longer term horizon, with three to five years where we move from initial experimentation to minimum viable ecosystems to ultimately becoming part of core transaction processing today.

What are some of the obstacles we see to rapid adoption? There are issues related to: the speed of verification, the capital expenditures that are required in terms of cost of legacy systems versus going to something new, regulatory constraints as you have new frameworks, security and privacy concerns in terms of how will blockchain work relative to other security and privacy paradigms, as well as new technical complexity as people look to understand the technology in an environment with scarce technical skills.

With that, we want to pause and get feedback from you and get a poll, and understand when your organization—your health plan— is planning to experiment with blockchain platforms. So what I'll do is just open up the survey to the audience here, and get some of your feedback to see if this is something you're experimenting with now, or if it's something that's on the near term horizon.

We've got some good feedback coming in, and we'll let a few more seconds for this to come through and then we'll wrap up the survey. [pause for survey] So just to give kind of highlights of what's coming through here, what I'm going to do is go ahead and stop the poll; it looks like we've stabilized here. If you look at the results here, we have roughly 14 percent who are experimenting with blockchain now, 13 percent - counterbalancing that - are not planning to. And then a high majority which aren't sure, which is understandable given the nascent nature of the technology, and how this fits in terms of overall paradigms. So with that, the results should be shared here. I'm going to go back to the presentation now, and transition to Mike who will go through the fundamentals of blockchain, and go at a deeper level of what blockchain is.

Michael:

Hi everyone. I'm glad to be able to be able to speak to everyone today. My name is Michael Kline, and I am part of Accenture's emerging technology practice, which incubates and nurtures emerging technologies for all of Accenture. My role specifically within emerging technology is to lead the development of those assets within our health and public services industries. And one of those key areas of focus that I really saw the potential and have been nurturing over the past year, is that of blockchain and its impact to payers and providers within the healthcare industry.

So with that, I'm going to speak a little bit about what is blockchain, and try to focus on what are some general use cases for blockchain across industries. Blockchain is difficult to talk about often, given the mass ubiquity of use cases. So first off, I just want to level-set on what blockchain is. If we have to simplify it to one sentence, it is the trusted exchange of data over a de-centralized network without the need of an intermediary. And what enables this trusted exchange is through five key concepts. And those are, it can act as a distributive database allowing multiple peers to access the entire copy of the database. It shares data with peers instead of an intermediary, so you don't need a centralized hub where all the data needs to flow. It can provide transparency of transactions without directly identifying the true identities of the transaction participants. It makes it evident if transactions are tampered with, and allows the network to reject invalid transactions. And lastly, it allows computational logic to perform actions on behalf of humans. Essentially, automate transactions across the distributed database.

Instead of speaking in detail about the architecture and engineering and mathematical problems that blockchain solves, I wanted to share a common pattern of use cases we have both observed with blockchain, and how is it applied - really in actual use cases - for

participants across industries. I would like to focus our attention on three primary technical attributes of blockchain and how that differentiates blockchain from other technologies.

First off, there's asset tokenization. This is all about representing a unique identity for now. Things like people, places, digital assets and physical assets. And this takes many forms, but the best known is probably the digital representation of currency known as Bitcoin. Most people have probably heard of Bitcoin, and while this is a crypto currency, it's interesting. It is not the end state. It's not what we want to focus on for massive option within enterprise. And we can do things like – with asset tokenization, we can represent property titles, votes and even our biometrics as unique assets that are tokenized for secure exchange.

The second enabler I wanted to discuss was shared ledger. As a shared ledger, this allows distributing data to many locations in order to make it highly available, without a central entity acting as a traffic cop. This isn't a new concept, but combining this concept with mathematical proofs from blockchains makes it tamper-evident, and new protocols have been developed on how those mathematical proofs can be used in order the entire network to agree on valid versus invalid transactions. These are known as consensus algorithms for those who are a little bit more familiar with blockchain.

And lastly, we have smart contracts. Smart contracts, simply put, are code. They are code that executes in a distributed manner on a shared ledger, and can be triggered by a transaction and in turn, act on the state of the ledger. Analogous to a database, if you think of the distributed ledger as a database, a smart contract is very similar to stored procedure. Building up on those three fundamental concepts, I wanted to talk a little bit more about the common patterns of blockchain use cases we've observed across industries.

If you focus your attention just briefly at the bottom of the slide that's on your screen, you see those three concepts listed again: asset tokenization, shared ledger and smart contracts. Building upon those on the top, you can see the different patterns that we've identified. And hopefully this gets you thinking about how blockchain can be applied within the healthcare industry as well.

The four boxes on the left side really highlight use cases that focus on the transfer or tracking of asset ownership. So this is things like issuing scarce digital assets, digitally owning the assets, transferring assets in seconds and tracking assets throughout a lifecycle. As we move towards the middle of the slide, above the shared ledger category, we see use cases that focus on auditability of transactions and data. These are things like make things and systems tamper-evident. Prove that something occurred. Leave an immutable data trail, or share selective information.

And lastly, we have the last two boxes on the right that focus on automating data and/or the assignment of assets based on the state of the chain. These are use case patterns such as embedding access rights to digital or physical assets, automating actions under predefined conditions. And these, just to clarify, all these building blocks share the various components of asset tokenization and shared ledger, smart contracts. And some take more advantage of one of these concepts than others. So that's why they're not directly aligned above the concepts

To help our clients understand when is this a good use case, when should they be applying blockchain to their industry, we created a decision tree diagram here to help understand the fundamental concepts of blockchain and give a very rough guide of is this a good idea for blockchain to apply. Instead of walking through every single box in here, I'm going to focus on a few key concepts that take us back to the first slide I walked through of, what are we trying to achieve with blockchain that we couldn't achieve with other technology.

First off we start with trust. We talked about the ability to trust transactions. And blockchain really solves a case where there is a lack of trust or it makes us difficult to trust that transactions occurred in the order that they were supposed to occur. Blockchain fundamentally solves that problem. And if you're not dealing with some level of trust either with an external entity, a regulator or a cross-organization boundary, then blockchain is possibly not the tool you would want to use.

Next is all about intermediaries. Are you an intermediary, or is someone else? Are you trying to avoid going through an intermediary? Blockchain does not always remove an intermediary, but it can make the transactions that flow through an intermediary move faster. Either way, you can choose to go around the intermediary with blockchain, or you can enable that intermediary to process things in a more trusted and efficient manner.

And lastly are some just organizational considerations that you want to consider with blockchain, around the number of participants in the network. What types of consensus will be applied to that network, and how will permissions be applied to the network? These are sort of the last things that are often not thought about as we just focus on sharing data. But there are some other things that you need to think about as you organize your network and your consortium around a use case.

So with that, I'm going to take us to another poll. Let me pull this up here. Hopefully everyone can see the poll on their screen. And the question is, what is the top reason your healthcare organization is pursuing or planning to pursue experiments in platforms. I can see a few responses are starting to come. Get your responses here, and I'll wait a couple of seconds as people respond. [pause for poll]

Brian: And then Mike, this is Brian. If you want, we are receiving some questions through Q&A. So what we'll do is pause here as well and take a look at the question and respond. And we'll do that in between sections.

Michael: Thank you, Brian. [pause] Okay, it looks like our responses are coming to a close here, so I'll go ahead and stop the results and share. So just a quick highlight of what we saw here. Most organizations that are pursuing blockchain right now are looking at it for – let me – operational efficiency. Next in line, it looks like there's those who are not currently pursuing or planning to pursue. Then we have the group of growth in new markets, so how can blockchain be applied to grow or enter new markets. And privacy and security is the next one. And lastly is regulatory – or sorry! Regulatory compliance is next, and lastly organizational learning. So that's it, I'll take a look at the question here in the box.

We've got a question regarding electronic data capture. The question is, we use a centralized electronic data capture system to gather data in clinical trials. The system we use is completely auditable, and we can track who reads and writes data across many different parties. How should we think about using blockchain to make clinical trials better? This is a really great question. I think there's a lot of opportunities, and we've seen a lot of organizations pursuing – we've even seen startups, specifically focusing on – blockchain's use in clinical trials. I may ask our resident expert in clinical trials blockchain, Erik – who will be our next presenter – to possibly comment on that question. Or if Erik, you're having trouble, I'll take it as well.

Erik, are you there? Do you want to give a shot at that question?

Erik: I'm here. I don't see the question. I apologize.

Michael: Okay, it's all right. The question was, how should we be considering blockchain and its ability to disrupt the current clinical trials landscape. So how clinical trials are managed, where have we seen blockchain being applied in clinical trial?

Erik: Ah, sure. In initial discussions that we've seen on it, a lot of the disruption that would occur when it comes to clinical trials would tend to focus on really two areas. One is essentially looking at the preclinical study area, so before you even get into any type of clinical trial itself. If you need access to drug discovery information, if you need in terms of redundancy in clinical protocol usage, there's opportunities there to create open data sharing using a blockchain network. And that's been explored and piloted already.

And in the second case, you're looking more at an area where you would make an improvement overall in terms of transparency and speed of clinical trials where you would try to establish a blockchain network that would allow regulators, the pharma companies and the CROs to actually work together to share information. To share the regulatory contract in terms of contract approvals, anything related to data that's associated with those approvals and with those contracts, and then the actual information that comes from the trials from patients.

Now that is a little different challenge cause it gets into a broader issue with blockchain, which is there has to be – just as you would see with other technologies and with a challenge like interoperability – there has to be behavior, there has to be will, there has to be process in place to do that. So when you talk about change in clinical trials, there's some ability to do so. There's some discussion to do so, but not yet at the point where there's a overwhelming will or desire to switch in the direction of let's do a blockchain network as a way to disrupt current clinical trials process.

Michael: Thank you, Erik. I'm going to turn it over to you next to take us through like you were just talking about, how blockchain is being applied within health industries. So if you want to go ahead and introduce yourself.

Erik: I'm a managing director in the Accenture Health Client Service Group, where I'm part of the leadership within the Clinical and Health Management Services team. I also develop and lead strategic and technological transformational initiatives as the Provider Technology Consulting lead for North America, for Accenture as well as our healthcare blockchain lead, working with payer, providers, life sciences. And I'm really going to cover the context. I think it's a great lead-in question actually, of different use cases, different ideas that are out there now in terms of potentially using blockchain to really move forward with these different types of use cases that are out there. What works, what doesn't work, what we've seen that has passed the test so far and where people have kind of said, "Yeah. This is a nice idea, but not necessarily a good fit for healthcare."

Certainly in the provider arena, you're seeing a lot of discussion about using blockchain as a network to handle tasks like a provider credentialing to handle the storage of provider data. Something akin to a provider directory infrastructure, and also creating provider contracts around that as smart contracts that can run on a provider blockchain network to support some of the functions and credentialing and updating provider side blockchain for reimbursement.

We've been involved in and seen very closely how you can use blockchain as a network in the accumulator process that many payers, many third-party payers – dental, vision, others – are involved in as part of the different shared accumulator processes to go on, making an accessible, transparent network. We've seen a lot of progress there. Progress in real-time claims adjudication with several start-ups now doing more work in terms of eligibility, doing more work in terms of being able to adjudicate claims in real time and provide claim status in real time using a blockchain network approach.

Smart pricing, which can be a little more dynamic and provide pricing transparency, but also do that in a real-time fashion. And then do things in terms of being able to manage the membership associated with a plan like computable benefits. So basically making benefits information available as part of a blockchain network, but then also making that computable by adding smart contract logic to make changes depending on what you may see for a beneficiary: where they are located, who they're seeing, different aspects of their care delivery overall.

And I wanted to touch on EHRs blockchain network, and use that to collect connected device data, to be able to manage consumer identity to a degree, even consumer consent – to capture that and to publish and make that available. And then with medical records sharing, readmission compliance, referral data sharing – I've certainly seen in my work used for care coordination.

Now one area that you see also with blockchain though is – and success, non-success is – the concept of storing healthcare data on a blockchain network in a distributed ledger that's then verified and validated by everybody in the blockchain network. And they have a copy of that. That has tended to have a little slower option, and there's kinds of issues in doing that type of approach. The major one being, well size and amount of data, so that's certainly a challenge if you're dealing with a EHR and trying to replicate across the blockchain network. But also just the challenges related to implementation of HIPAA, implementation of state privacy laws, the relationship with consent and making information available.

All of those have to be factored in, and a lot of times what you'll see is not so much the data stored there, but, or a hashing approach used to point to data. To use a blockchain as a way to point to information that might be available for specific patients. And that's of interest to companies in the life sciences space who look at that and say it would be great to know information about a patient that's using our product. But I don't need to see the entire electronic health record, just specific information that might be available about medication adherence, for example.

So on the next slide, I'm going to talk a little bit about a high-priority poll question – pull that out for everybody. What I wanted to start with is just a poll question, was to give everybody kind of a starter question related to use cases surrounding their healthcare organization. So what would you think that the highest priority use case that you have is? Either you're planning to pursue it, you've talked about it, you might apply it as a pilot or proof of concept, and different options in case patient identity, health records, healthcare payments, data management. Do you have a regulatory compliance aspect, clinical trials, supply chain, or just anything else that you might have.

All right, looks like we have quite a large swath that have come in surrounding healthcare payments, starting with provider data management and surrounding health records. So certainly in those three areas, I actually have seen quite a bit, and especially with audiences that I've talked to that work in the payer space and the health system provider space. Those have been areas of focus. Regulatory compliance, clinical trials, supply chain tend to be a little more focused in terms of life sciences as an area of interest for them so good answers there to start.

What I'm going to do now is talk a little bit about some of the use cases that I've worked on, some of the areas that we've seen as certainly very successful to the overall model for blockchain. Walk through it a little bit with you, and if you have questions, I'm certainly happy to answer those as well. One real big area right now for blockchain in health, and where it's really starting to get a foothold grasp within the marketplace, is supply chain management. And why is that?

When you deal with a situation like you have in a supply chain where you need transparency, some level of anonymity, some level of data sharing but still have in terms of the processes that are in place. A lot of major supply chain challenges between organizations who may not trust each other, who may not want to share pricing information or supply information, that's a pretty good use case for blockchain. And then added onto that, the market issue of – especially in the United States and certainly in other countries as well – counterfeit drugs being developed and pushed down into the marketplace – being able to track and trace the actual development of a drug and actually where it is, where it's going, where it's been. All of that is very critical for pharma, but also for pharmacies, for PBMs, for providers, for payers. All of the players in that type of model have an interest in actually helping to manage that supply chain.

From that, you've seen a lot of interest by pharma companies, by partners with pharma companies, to develop a blockchain network that would be for supply chain management overall. Tagging products, using barcodes, unique identifiers, being able to use IOT – the Internet of things – to help track and connect. There's that physical data, censoring information directly into a blockchain, and actually verify legitimacy of events that are occurring as part of the blockchain. So constant smart contract application within a blockchain network to make sure that everything is actually being posted out there regarding supply chain information. It's validated and verified to every member of the supply chain network.

And it's immutable, so if there's any issue – products don't arrive, products get introduced into the supply chain that may not be valid – there's an immutable record of transactions that have occurred to do that, and an ability to trace and provide authentication on product history surrounding that. This is more of a proof of ownership model in terms of transactions and the terms associated with that being met. What we've seen with life science companies is we're automating this. So build smart contracts into the network, make it much more automated and have the immutable record to try to improve on validation and verification. One approach there, certainly, that's been of strong interest.

Now another one we see is when organizations on the provider side say, "Well we have challenges related to credentialing, and we have to work through intermediaries. We have problems, and we have issues in terms of getting the right provider credentials. We don't trust them." The data itself, we'll not be able to validate it with people that may actually have the correct verification information that we need. We have issues related to kind of a subset of that provider directory, so being able to store all the information about a provider. We're getting regulatory push-back on that, because we're not maintaining correct provider directory information.

This is another example where you've seen payers, you've seen providers explore different piloting approaches to essentially store, and cryptographically sign credentials, on a blockchain. Everybody has access in terms of members of that blockchain and can trust validity of provider credentials, but there's also verification built into that. Everybody has the exact same copy of the provider credentialing information available to them.

And what you see with this, as in the previous example and a big point for me on blockchain with a lot of the use cases in healthcare, is it's always done with something else. It's not just we're doing blockchain because we're doing blockchain. It's let's use blockchain with other types of technologies like IOT, cloud, in this case certainly being able to use credentialing, technologies that are already in place. Even use a smart credentialing technology, maybe putting that information on a card and then storing that on a blockchain. The blockchain is the store of information – the database – but you can use other technologies with it to really enhance how you might be going about trying to solve a specific business problem.

And then with payers, that's been an area of interest in different types of innovation programs that payers have. The innovation studios, they've developed the types of pilots. They've tried to deal with different provider organizations, with different start-up vendors that may be developing blockchain solutions or what I call a blockchain enabled solution. And one we've seen that what worked out really well was a concept called shared accumulators.

So essentially with the shared accumulator process, being able to create a consolidated view through a blockchain shared ledger of all the information that goes into the accumulator's process from a vision plan, from a health plan, from a dental plan, Rx, CMS, ACOs, etcetera so that you can get an accurate determination in terms of family out-of-pocket cost, individual out-of-pocket cost. Who pays what? And as a smart contract, have those smart contracts in terms of having those built in directly to allow for some level of tracking members.

They might be changing plans or different accounts. Inherent changes that might be occurring related to benefit configuration or any type of accumulator event – maybe a federal regulation has changed or a mandate. And it's all applied to the same view. It all is built off business logic that's on that view in that shared ledger. And every actor has the same view. And why does this work in a shared accumulator environment, is you essentially have a situation where you consolidate these decentralized accumulator adjustments that might occur.

You have a single source of truth. Everybody might not trust each other – they might not like what's happening, they might not like what they have to pay – but everybody has the same view of a shared accumulator balance. So there's not a lot of trust, but it's able to enforce some level of trust because everybody has transparency. It's immutable. You can't change things. I can't put something on there and say, "Well, I didn't mean that." It's on there and that information's always going to be available. It provides some legalistic basis for activity moving forward. And you get kind of a broad network of trust established from that, at least as a pilot, works quite well because of that transparency that is then built in.

Brian: Hey, Erik...

Erik: So...

Brian: If we could go to the next poll.

Erik: Yeah.

Brian: There's a couple questions in the Q&A that relate to use cases that could be good to comment on before we go further.

Erik: Great. I apologize too. I... For some reason I can't see the Q&A. If you don't mind reading them to me.

Brian: Yeah. So the first one – and this just ties back to the initial page on the set of use cases. And as it's a common kind of use case that we hear in the market, it was, can you elaborate on medical records sharing and interoperability as that does get a lot of attention and...

Erik: Great, sure.

Brian: ... related to this...

Erik: Sure. I just did a talk on this yesterday. It's a great idea. And the idea is how could we potentially duplicate a medical record using a blockchain? And duplicate in this context means if I establish a blockchain network with several nodes that want to share patient medical records, what I would do is if someone makes that record available there's no third party – it's out on the blockchain network – and we're able to verify and validate that that information is there. It's correct. It's written into the blockchain. And then I decide to make a change, or let's say I decide to send it to a new member that I'm adding into that blockchain network.

It sounds like a great concept, cause it seems really easy to just be able to almost like cut and paste – replicate – information across to new members to share data using a blockchain. I think the challenge has been – in a lot of cases – that for one, you're dealing with a situation where what do you store on a blockchain when it comes to medical record data. And this is a lot of what goes on in piloting and proof of concepts, is trying to determine what approaches work. What approaches work whether it's hardware, computing power, and the different types of approaches I can use related to how to share information. What formats are uses as part of that?

Because blockchain is an enabler, it's an enabling technology. You still need to apply existing standards. You still can use existing standards. You should use existing standards. And you should use existing approaches that are out there. So if you are using Sequel, Care Quality, whatever networks out – Argonaut – whatever approach you're using, you should use those and see how you can apply blockchain to do that.

To answer the question underlying that in terms of interoperability, there's promise there to be able to use blockchain as a – perhaps a – different type of approach. But it's still kind of being tested out because certainly that issue of storing health records data on the chain itself – what does that mean? What is the impact of that? The computing power issues of if I have 25 million patient records on a blockchain network, that's not a performance – perhaps it's more of a performance block than anything else. It's not really what you would want to do necessarily as an approach. And that's kind of an extreme number, but just thinking in terms of the amount of data that could potentially be out there.

And then also with the different approaches that you're seeing with medical records, you're also seeing a lot of this pointing approach where you're saying, "I don't need to store it on a blockchain perhaps." So integration approaches that say, "I can integrate between Epic, Cerner, Athena, other vendors by using this pointer approach where I can just create a blockchain network that allows for me to point to where a record might be. It's almost replacing a record locator service with the blockchain network to be able to find where different data might be.

So in the interest of providers to payers who have that challenge of where can I find this data, so I have... So what was the other question?

Brian: Before we go to the next one, Erik, I'll just add to what you stated.

Erik: Sure.

Brian: I think underlying a lot of these use case – all the use cases – is there is also a, there's one dimension of well is it technically feasible. And can we do it relative to other alternatives? But then the second part across all these is culture, incentives, ecosystems and standards. And even those things maybe need to form, and ultimately changes in culture are required which are more significant in many cases than the technology, which is also a challenge to the overall evolution of how this gets applied.

In particular tied to the interoperability use case. So going to one of the other questions here ...

Erik: Cross-payer benefit. When I look in cross-payer benefit, it looks a little to me like the use of blockchain for what's called cross border payments and that type of approach. And basically what that means is in terms of – you've seen a little bit with the share accumulator example of how I can create some level of transparency. I can create some level of trust where there may not be any. This is really what we've seen in terms of the advantages of blockchain over other approaches is the need for more speed as part of cross-payer benefits. The need to cut costs related to accumulation of fees that might be part of that use case, and then also in terms of being able to track those actual benefits and the benefits information as part of that.

The way the use case would look to me at least, would be somewhat similar to what people have done with these types of cross border payment networks. You're establishing some level of the ability to have applications that can connect to a blockchain network and share benefit information across payers, keep anonymity built into that. Be able to do it in a way that it's immutable, so it's part of that blockchain network; the benefit information is shared. I can't just put it out there and then delete it and say now it never happened. It's out there. There's some terms perhaps established as part of that, to get to the level of agreement where everybody agrees on specific information related to who pays what.

So that, I've seen, as an approach that can work. What I haven't seen necessarily is just everybody jumping into that right now because it does represent a challenge like I had mentioned previously. Technology doesn't automatically make all that happen. If you don't want to share something or if you feel uncomfortable sharing something, or if you want to keep pricing information especially sensitive and not share that and not make it public to anybody to see.

Blockchain is just going to automatically make you decide now I want to do it. It's enabling to be able to potentially set up a network that could do that. So that I see as the major challenge with any type of cross-payer initiative using blockchain, is you still have to get around some of those sharing challenges related to the process and related to the behavior of the individuals involved.

Michael: Yeah, and Erik I would just jump in with one more future-looking, as many organizations are already part of a blockchain network. Starting to think about how smart contracts can create new products that combine benefits across many payers, and how those smart contracts could essentially have self-executing adjudication rules of how those benefits could be applied in new ways. So right now we have medical, dental, vision, Rx, right? They're very siloed, but you could actually pick up specific benefits. Move beyond what Erik's talked about into a very forward-looking way to apply that same use case.

Erik: Yeah. I did see one other question just in terms of databases cause I know that that comes up quite a bit too. Just what does this mean for what I do already? So I have all this data out there in terms of databases. It's not set up to work with blockchain. Do I need all new systems? The answer is no. It – again, it's not we're going to take over the world. And blockchain is just going to become ubiquitous across all healthcare organization infrastructures. That's not the intent in any way of how blockchain will work. It's a technology. A lot of what you see with projects now tend to be more integration projects.

You're taking data from an existing source, system or existing large enterprise system and moving it into blockchain. Not all of it, just some of it, and making that data available as part of a network so data as a network almost versus having it stored in a specific system. You can use open API approaches to make that data available as part of the blockchain network just as easily as you can with other types of approaches.

At this point, I was going to pull up our next poll question. And this gets a little more into kind of rules of the road. I could talk all about great use cases and all this great stuff people do, but in the end it comes down to barriers in your organization. So what do you see as a top barrier for adoption of blockchain, just based on what we've described based on the use cases I've kind of thrown out there as ideas that would really represent a challenge to you in your organization to move forward?

Brian: And just as commentary, we are seeing uncertain case coming in so far as the top, which is understandable.

Erik: Yeah.

Brian: I think this is part of what's being related to the call for experimentation and internal organizational learning, as well as finding those proof points for different business case. So understanding that, looks like that's come out on top here. Right, is that...

Erik: Yeah, I would add – I would certainly add, based on what I'm seeing as well, with the lack of interoperability or standards, blockchain has standards underneath it. So that is definitely something that's a barrier that you can kind of work within. But I certainly have seen that challenge as well with applying standards, then to botch it. It shouldn't be looked at as a constraint. It should be looked at as, we need standardization in healthcare. They need to be applied and that should be in place.

But it is supportive in terms of if you're establishing a blockchain network using blockchain to use existing healthcare standards as part of that. If you have initiatives being a fire standard or CDA, that operates as part of the blockchain network. But great answers cause I think kind of those capture certainly what we hear very much from many people in this space. All right...

At this point I'm going to close just in terms of any questions people might have. My contact information is here – happy to chat with anybody that has questions or certainly just wants to learn a little more about how blockchain works. I speak quite a bit on this topic and certainly do quite a bit of work in this space. Any questions from the audience beyond what we've already seen?

Michael: I do see a couple more questions in the chat box. So, yeah, I saw a question around – all of our data is sitting across databases which are not set up to work within blockchain. Do we all need new systems? And you may have addressed this one Erik, but I just wanted to re-emphasize the need for blockchain to not always replace as a database. But it can be that record locator that Erik talked about.

So think about how having a trusted source that is distributed can help you identify where the data lives, and prove that the data has not changed since the last time it was interacted with. That can be just as valuable as actually storing the data directly, as we say, on the chain. Sometimes it's best to leave the data where it is and use blockchain to supplement it and make it evident if anything has changed in the data. And also decentralized storage of where you can find that data.

Did I miss... Where there any other questions, Brian or Erik, that you saw in the QA?

Erik: No, not...

Brian: Maybe, yeah, maybe just one last call? Okay, a couple additional ones came in here. One of those is when do you think blockchain will mainstream in healthcare? There's some nuance unrelated to mainstream, is what I would state. I do think we will see higher levels of adoption and actual things going from experiment to proof of concept to live implementation, maturing over the next three to five years. I still don't believe that that will necessarily be considered mainstream versus just increasing up the adoption curve. But Erik and Mike, what are your thoughts on that?

Michael: Yeah, my thought is I think it's unclear. I think we will see mainstream adoption at some point. But it's unclear at what point that will actually the network effect will take hold. And you'll sort

of see that massive uptick in value, because everyone else is participating in the network. That's very difficult to predict. But we definitely see the steps towards that. And as Brian said, it's – the pace at what we see innovation occurring, it would not be ten years from now. It would probably be much less.

Brian: Yeah, the question is it will likely be in focused use cases. And some may start with internal versus externalization. But as Mike mentioned, it's hard to predict. One of the other questions that we've got here is, could blockchain be used to connect internationally? And do we see that happening? Mike or Erik, do you want to take that?

Erik: I guess the question is if it occurs internationally. All I would say there is, it would be no different than what you see with international payment networks already in place using blockchains. So the answer is yes, it's really just defining what that use case ends up looking like. Supply chains certainly are very international at this point, and you definitely see with those extensive use of blockchain.

Brian: I'll add to that. Obviously, there's a use case in dependency towards that question. But I think the answer is yes, but it will also be fairly unique to specific organizations. Certain large health plans, as an example, that have a large international presence that has been built up through acquisition and continue to build up through acquisition. Within the finance function, this has the potential to be applied related to sharing ledgers across international boundaries for an internal use case, which is what we're seeing being demonstrated in the finance industry.

But that is one aspect. You could see that as well in the provider system side, where you're seeing certain provider systems move into other international regions where they're looking to actually just connect up their own ledgers – financial ledgers – across those different systems. I see that as almost a first place, potential first place. Another question here was just how will government regulations effect blockchain.

Michael: I'll go ahead and give my thoughts on that. So I think government regulators are watching blockchain closely, and are generally receptive of the idea and the trust that it enables. I would expect regulatory bodies to be evaluating and updating their guidelines based on the adoption of the technology. So maybe they'll be more permissive in the future of the technology as it's better understood.

The second part of that is, I think there is some definite concerns as it relates to HIPAA and the HI Tech Act and how that will actually effect the distributed data sharing and which data can be shared, specifically PHI. So that is very much a point of consideration as you're designing your blockchain solution, and how data is actually shared and stored. I think it's a definite consideration that you must consider, especially as we're dealing with sensitive data, and making sure that that data is not put in a place that it should not be. Erik or Brian, do you have any other thoughts on that?

Erik: I completely agree.

Brian: In general, we are seeing actually many regulators – both at the state and federal level – trying to allow kind of the innovation to continue, but watching it closely and not necessarily put additional barriers in place. And also looking at their own internal regulatory frameworks to see how it may be impeding, to one of the other questions. I think a lot of it's watch and experiment.

The other dimension is, we're actually seeing a high amount of adoption of experimentation, both at the state and the federal level, to solve problems both with – and challenges – that the state's and federal regulators are facing. And I think that internal use is kind of also informing regulatory paradigms. So one example is the State of Illinois collaboration with Hashed Health related to provider data, which was presented a few weeks back at the Distributed Health Conference. And that's just one of many different example implementations we've seen coming both at the state and federal levels. And not just in health, both in health and outside of health.

I think with that, I want to just wrap up and as Erik mentioned, you can see that all of our contact information is provided here. And we want to thank everyone who's attended, and look forward to connecting further should you have any questions. So thank you all, and have a great day.

Moderator:

Thank you for that great presentation, and for sharing your thoughts today. Thank you to the audience for participating in today's conference. That concludes this webinar. Thank you again, and enjoy the rest of your day.

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