



Podcast Transcript

**BakerHostetler Blockchain University: Beyond Cryptocurrency
Non-financial Use Cases for Blockchain**

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Kattman Blockchain Technology is widely anticipated to disrupt major industries and business operations over the next several years but with all of the hype in the Blockchain market, at times it can be difficult, to separate fact from fiction and identify the real value in this new technology. To help bring things into focus we’ve crafted a five part series to introduce, Blockchain, from a technological market and legal perspective. The fourth episode in this series provided an overview of how Blockchain is being used today in non-financial applications. I’m Amy Kattman and you’re listening to BakerHosts. Are guests today are Rob Musiala and Veronica Reynolds. Rob is consul in the digital assets and data management group and the co-leader of the Blockchain technologies and digital currencies team. Veronica is an associate of BakerHostetler whose practice focuses on data privacy, digital media, Blockchain technology and Crypto currencies. Welcome to the show Rob and Veronica.

Musiala: Thank Amy. Nice to be here.

Reynolds: Thanks Amy. It’s really nice to be here.

Kattman: So, in our previous podcast, we've talked about what Blockchain is and how it works. We've also introduced some of the more widely used Blockchain networks like Bitcoin, Ethereum and Hyperledger but today we're going to talk about what Blockchain is actually being used for. With a specific focus on non-financial use cases. Rob I'd like to begin with you. Why are non-financial companies interested in Blockchain?

Musiala: So, from a non-financial standpoint companies see advantages in Blockchain, really to, drive efficiencies are data management and it really comes down to enhanced transparencies, speed and security over data management and I'll talk a little bit about those. With transparency there are advantages into using Blockchain especially when you have multiple independent entities because with Blockchain there's only a single view into data and no one single person or entity has some sort of special or advanced view into a data set. Also, this characteristic of immutability that we talked about means that, you know, the history of a data set has a lot more reliability and so that makes data sets more transparent with Blockchain. With regard to speed it's really about speed in the process of data reconciliation amongst various independent parties. So, as an example Veronica's going to talk about supply chain, you know, if there's an investigation into a supply chain and you have to look back in time to figure out what happened. If you have, let's say, five different parties that have five different data sets, you have to spend a lot of time and cost in reconciling those different data sets. Well with Blockchain, if everyone's using the same data set, you save on that time and effort and with security it really comes down to this idea of disintermediation or removing the data intermediary, and particularly the idea that with Blockchain it's a co-hosted network. So, if one node fails the other nodes still have a copy of the entire database and so that provides security. Similarly, the concept of immutability where no single person can alter or delete data provides enhanced security, and this can help against things like some of the large data breaches and hacks that we have experienced in recent years.

Kattman: Thanks, Rob. Veronica, what's the point of using Blockchain if you can just as easily use a traditional centralized database?

Reynolds: Yeah Amy, that's a great question. So the question of does Blockchain make sense or is a traditional database a better option is really a key threshold question to answer before implementing a Blockchain solution. So companies have to consider all of the points Rob was just talking about when deciding whether to implement Blockchain as a solution. Implementing Blockchain is resource intensive, so companies really do want to think there is an initial question whether the technology is the right fit for the business objectives, and this requires thinking through each aspect of the problem that needs to be solved through the potential implementation of Blockchain or distributed by their technology. And companies will also need to communicate with other stakeholders involved in the business in order to properly assess this question. Often, a traditional database might serve the needs of the company better and so you really have to dig into your research before launching. In order to help companies, assess whether Blockchain is the right solution for their business needs, BakerHostetler has identified five considerations companies it should

contemplate before making their decision, so first do multiple stakeholders need to rely on update the same data set?

Or would the ability to do so really enhance the business? This really requires understanding the problem one is trying to solve, right? So, companies need to understand their current business state. For example, in the supply chain context, if you have goods traversing across the world, this means you have multiple parties that very likely need access to the same data set, and this is something Rob was talking about if you're sending goods along the chain from point A to point E. However, if there's very few parties that need access to the data then that may not be a problem that needs to be solved. Second, we like to consider will the stakeholders mutually benefit from an increase in speed of updates? Essentially, this consideration analyzes whether to assess information in a timely manner. We're reducing efficiencies and promote faster processing of goods or information along the chain. For instance, if parties within the chain are required to wait for information before they act, delays in information or misinformation can result in pretty big mistakes, actions being overlooked, and an overall increase in the time it takes for goods to arrive at their final destination. So this factor may be more important in certain industries such as the transport of food, where shelf life is a really big issue. Suppliers in this industry will really benefit from reducing the travel time of goods.

This can also be an issue when you're trying to satisfy customer demand, so if you can deliver pharmaceuticals, for example, to patients in need at a faster pace, you're actually improving the way that the healthcare industry functions as a whole. The third consideration that we like to look at is, is there a desire for independent verification of data updates? So this consideration comes into play in a couple of different contexts. Do you need to increase trust between the parties? If so, Blockchain can really help you doing that by giving you the ability to record information to an immutable ledger. When you connect physical goods to the internet of things, which I will refer to as IOT technology for example, this can become really powerful because you can automate the data flow and secure it on the Blockchain. This is also helpful when you're trying to prove trustworthiness to consumers, so being able to provide a trusted set of information to people allows them to feel secure that the goods they're purchasing are authentic because they can verify the ingredients and materials used and whatnot without needing to trust a specific party entering the data who could be personally incentivized to enter in information that's incorrect or in a worst case scenario, just fraudulent.

The fourth consideration, is there an interest in saving money by cutting out the data intermediary? By decentralizing data flows you reduce friction, time, resources spent verifying information, and ultimately you cut out parties that serve only to verify the source of the data. So not only is this more trustworthy, but you remove a layer of friction. That's not only ultimately not as reliable, but slows down the process, and all of these things can reduce cost, right? So finally the last consideration we like to look at is, is there a shared interest in automating certain transactions? There are many reasons businesses within the supply chain would be interested in automating certain transaction, many of which I just

mentioned, right? When you automate the entry of data for example, you don't have to put your trust in other stakeholders to your business to enter the information correctly or in good faith. You can trust that the data entered is trustworthy. Automation also allows for more accurate data in which all the stakeholders can rely upon and analyze to make more informed business decisions.

Automation can also reduce friction and improve inefficiencies. But our tests at BakerHostetler isn't the only one. Businesses can also turn to numerous other decision models at various organizations promulgated in order to help businesses assess whether Blockchain is right for a business. For example, another factor listed as a consideration from one of the big four accounting firms that I think is particularly useful is whether there is a need for transactions to interact. If this is a business need and you couple this with automation, you can get really powerful and swift results from Blockchain integration. So, I'll just wrap up by saying I really encourage anyone considering Blockchain as a solution to really dig in and look these decision models before jumping into a Dot Blockchain, and if anyone has questions, we're always happy to talk people through this process.

Musiala: And Amy, just to underscore what Veronica was saying, you know we strongly encourage people who are thinking about Blockchain to first really seriously evaluate whether it actually makes sense. Sometimes it doesn't make sense. Sometimes it's better to go with a centralized database, and so we have our tests that we use, and there are other models out there as Veronica mentioned, and that's just a really key threshold question to answer. Two other things I like to mention on the topic of whether a Blockchain makes sense is the question of whether the data that you're looking at can be standardized and normalized in a way that it is easily compatible with moving over to a Blockchain database because if a data standardization process is too cumbersome, it may be that either Blockchain just is not cost effective for that reason, or it may be that this is not the right time and a later time might be better. Another thing I like to mention is it's important to look at all this stuff from the lens of what I call a current state, future state analysis. So before you can envision a future state, you first have to understand the current state of whatever process you're talking about, and a lot of times when you do that current state analysis you'll find that what you thought was happening is not what's actually happening, and that can help you as you're designing the future state.

Kattman: Sounds like there really are a lot of things you need to consider before moving forward. Rob, what is the primary non-financial use case for Blockchain?

Musiala: Sure, so Veronica has kind of alluded to this, but at this point in time companies have been experimenting Blockchain for a few years and it really, the primary use case that we in a non-financial sector that is most ripe for implementation is in supply chains, so tracking the location of physical goods and the chain of custody of those physical goods along a physical supply chain. And this is especially true in the context of supply chains involving multiple independent parties, and I think Veronica is going to tell us a little more about those.

Reynolds: Yeah, so a lot of industries are currently testing supply chain management through use of Blockchain technology, including maritime shipping, food and pharmaceutical supply chains. Across all of these industries, certain problems exist with logistics, coordination, and communication that Blockchain is really well suited to solve. For example, in the maritime shipping industry, and we're talking about one of the oldest industries on the planet, and you can really tell because many participants within the supply chain still rely on legacy data systems and manual document handling. But what we're really talking about here is the backbone of global trade, right? And a digital shipping platform powered by Blockchain can resolve many inefficiencies that currently exist in this ecosystem. Shipping documentation is incredibly complex. It's not something that a lot of people think about in their day-to-day, but it involves many parties, many types of documents, and since the majority as I just mentioned is done by pen and paper still, shippers and freight forwarders have to submit multiple documents to multiple parties with low transparency.

So, by integrating a Blockchain encrypted audit model of all the critical actions required for this industry to operate, you can increase safety and trust among all participants or help parties handle unplanned situations. For example, a shift in inventory demand or a cargo diversion request, and then you can give the customers broker new information or else immediately, which improves timely submissions to U.S. Custom. So there's a couple of large-scale efforts to improve this industry through Blockchain. One is going on in the APAC region, and so there's definitely some things to keep an eye on here. Another major industry utilizing Blockchain is the food supply industry. This one's really interesting. There's huge issues in this industry. For example, one third of all food produced is wasted. Blockchain allows the optimization of supply chain inefficiencies that really contribute to this waste by stitching together transaction records. When you can add data from IOT devices and put it into the record, you have an increased visibility and can confirm that the data is trustworthy, which is everything we've just been talking about.

Blockchain can also improve safety and affordability because it allows you to trace the origin of food products incredibly quickly. This improves again, transparency, trust, speed, benefits that go beyond food safety. Robust controls about how data is shared and the trusted exchange of data throughout the supply chain allow companies to use the data, much of which would otherwise be siloed and inaccessible to them to make business decisions, reduce cost, and ultimately just bring increased benefits to the consumer as well. In another industry where Blockchain is making incredible headways, the pharmaceutical industries. So in early 2019 the U.S. Food and Drug Administration, which I'll refer to as the FDA, announced a pilot project program under the Drug Supply Chain Security Act. So it's background, the DSCA was signed into law in 2013 in order to allow pharmaceutical trading partners to collaborate in improving patient safety.

So, what it does is it outlines critical steps in building electronic interoperable system by 2023. When members of the pharmaceutical supply chain are required to verify, track, and trace prescription drugs as they're distributed in the U.S. Now the DSCA was really created to help solve issues that proliferate in the Pharma

industry, including the issue of counterfeit medication to isolate and reduce the use of substandard ingredients and to prevent product diversion and entry from gray markets, so one project launched as a response to the FDA pilot program to verify and track pharmaceuticals and included four major global firms. The project began in 2019. It was built on Hyperledger fabric, and it found that permission watching networks can bring the highly fragmented supply chain into DSCA compliance because it can track drug movements but also limit the flow of private information and most critically it found that it can bring together parties that otherwise don't interact and in doing so the project found that it's actually possible to increase product safety. For example, the project estimated that their Blockchain could alert downstream partners of recalls in ten seconds which is a huge improvement over the current pace of up to three days. So, ultimately that project showed Blockchain serves as an incredible information bridge.

The last thing I want to talk about is the Cobalt Supply Chain. So, this one is really interesting the market for Cobalt has exploded recently which is driven by the surge in electric cars and that's because this is a material required for these cars batteries. The world Cobalt supply comes from all around the world including Africa, Australia, Cuba and many others. So, you really have a case where all aspects of the BakerHostetler framework are present. You have parties that want to access the same data set, increase the speed of updates, have independent verification of updates, save money and automate certain transactions. So, improving these aspects of this industry can help solve a lot of issues. Including the need for ethical sourcing and the reduction of fraud and you can also help solve for issues of child labor and help improve local economy's and political structures. Not to mention, reducing environmental risks associated with production trade and transformation of Cobalt. So, these are just a few examples of Blockchain being implemented and various supply chain industries that I thought were really interesting and were seeing a lot of movement in.

Musiala: And one way to think about this Amy, when we were talking about supply chain is that this is all about the consumer and consumer awareness and currently and I think in the years ahead consumers are going to be more and more concerned about where the products they're buying and using come from and how they got there and at the end of the day, in many respects, this is the problem that Blockchain can solve in the physical supply chain.

Kattman: Those are some really great examples and good things to think about. As we close out today's program, could you share what are some other non-financial examples of how Blockchain is being used today?

Musiala: Sure. So, Veronica talked about the physical supply chain and there are really kind of two other areas where Blockchain is being used and experimented with. One is what I call the digital supply chain and the other is in records management for credentials. So, I'll talk about the digital supply chain. In the Blockchain industry there's this concept, an emerging concept called Self Sovereign Identity or SSI and it's all about putting people back in control of their own personal data. So, if you think about it, in most of our internet based transactions we actually give away a lot of more personal data than we need to in order to effectuate the

transaction. An example I like to use is, when you go to a bar to buy a beer and you show your ID to the bartender all the bartender needs to know is whether or not you're 21 but instead on that ID that you're showing you're actually giving away a lot more personal information than that. You're giving your full name, you're giving your address, you're giving your height, your weight, your hair color, your eye color, whether or not you're a donor and all this information is really not necessary to that transaction with that bartender and this is a good example of by and large of what takes place in a lot of our online activity. Where we're giving away a lot more personal information than is needed for a particular transaction and so Self-Sovereign Identity, SSI, is all about using Blockchain and using concepts like Public Private Key Cryptography and emerging concepts called Decentralized Identifiers to create systems where we can validate that we are who we say we are in our online activity without giving away all this personal information that we often do these days. So, as one of our colleges, Jordan, mentioned on a prior podcast Hyperledger Indy is a Blockchain that is part of the Hyperledger suite of tools that is specifically designed for Self-Sovereign Identity type solutions. There's also a really cool organization called ID2020 that is looking at this concept to solve problems around, to solve problems for populations across the world that don't have access to good identity. So, this concept of SSI is really an exciting area where Blockchain could really solve some really important problems.

Reynolds: Yeah, I just want to chime in as well because in terms of information flow and the amount of information companies have about consumers. I mean there's a really relevant issues in the data privacy space. So, what Rob was really talking about in the aspect is Blockchain is a solution to many of the complicated data privacy issues that are really top of mind for businesses now that GDPR has been actively enforced for a few years and we're also just now seeing the CCPA beginning to be enforced. So, if you can reduce the amount of consumer information collected by businesses. If you secure this information, you give the consumer increased control, for granular level over what they share, you have an answer to a lot of the privacy laws many companies are currently experiencing.

Musiala: Amy, another area on the digital supply chain that I find quiet interesting is in the advertising field. So, in digital advertising campaigns there are all sorts of disputes between marketing platforms, publishers and advertisers about whether ad impressions were delivered to the right number of people at the right period of time in different advertising campaigns and there a lot of time and energy and cost that goes into reconciling those disputes. So, In the digital ad industry Blockchain is being experimented with to solve some of those problems by putting all those parties. Marketers, publishers and advertisers all on the same data site so that they can streamline that process of data reconciliation with regard to digital advertising impressions.

Kattman: Veronica, Rob mentioned record keeping? Can you talk a little bit more about that?

Reynolds: Yeah, so what we're really talking about there is recording information with efficiency, increased speed and a level of trust that allows you to trust records

that are recorded in this way. So for example, in August 2017 there were amendments to the Delaware general cooperation law which would allow, stock ledgers, UCC filings and other cooperate records to be recorded and maintained on the Blockchain to verify stock owner ship, better tracking and improve transaction times and proxy voting but for example this is one of those were you can see the benefit if you think about, okay. You want to track ownership, but it takes a couple days to track it. Well, in that amount of time and, this has happened in previous cases, where people have not, the central entity either didn't get the information in time, didn't record it properly and you end up selling more than what you actually have and that would not be a problem if you have these records recorded to Blockchain, right. Another example, in fall of 2017 MIT completed a piolet with a start up to issue digital diplomas on a Blockchain. So, this is another use case were it's very easy to see that would be really beneficial if we had one decentralized location of records where you could verify someone's academic history and you could give people the control, right. If they wanted to opt into this but if they did you could easily send that information to cooperate partners or potential employers and say here this is verified and everyone can trust the system.

Musiala: And Amy a couple other areas where Blockchain is being used for records management. One is in the property registries area. So, there are countries all across the world and here in the United States counties in Vermont, Illinois, and Ohio, at least that I'm aware of, and maybe there are more. That have used Blockchain is piolets to see if they can more efficiently and affectively record property titles and then finally in the invoice management space so, going back to the physical supply chain that Veronica talked about there's a whole aspect of that related to invoice management as goods are shipped from one place to another across supply chains and Blockchain is being experimented with in that area and we've done a lot of really cool work here at BakerHostetler, our college Katherine Lowry, has done some great work using smart contracts to make certain auto updates invoices and that type of process. Finally, just two other areas I'll mention that folks should be aware of, Blockchain is also being used to track and mange clinical research data. So, a patient data that is used for clinical research has all sorts of restrictions around access controls and things of that nature and so Blockchain is being used to help comply with those standards and then finally electricity grid management is one that is emerging that I find particularly interesting. That has to deal with off grid energy sources. Things like solar power, wind power where you're collecting energy that is off grid and there are some experiments going on where Blockchain is being used to help those off grid sources better communicate with the grid energy and in some cases these even facilitate transfers of energy to the grid and back to the off grad sources. So, a lot of cool things happening in data management and other non-financial solutions in the Blockchain space.

Kattman: As always, this has been really informative. Thank you, Rob and Veronica.

Musiala: Thanks Amy. Always nice to be here.

Reynolds: Thanks Amy, it's a pleasure.

Kattman: If you have any questions for Rob or Veronica, there contact information is in the show notes. In our next episode, introduction to Blockchain legal issues we will build on the content discussed in the first four podcasts to provide an introduction to the complex legal environment facing the Blockchain market. As always, thanks for listening to BakerHosts.

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