Procurement Block S1E7 Mohan Venkataraman

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SPEAKERS

April Harrison, Mohan Venkataraman

April Harrison 00:03
Welcome to Procurement Block, a podcast all about digital transformation in procurement and supply chain and how blockchain risk management and change management all factor in. I'm your host April Harrison, Marketing Director for Trust Your Supplier. I'm a procurement novice eager to learn more from the people who are at the forefront of procurement innovation. On today's episode, I am being schooled by Mohan Venkataraman. For more than three decades, Mohan has served in information technology roles, including work with eight employers, over 120 clients, 60 plus applications and hardware that includes mainframes, mid range, desktops, and process control systems. Mohan started the consulting and advisory practice with Chainyard's CEO back in 2013, and supported the expansion into blockchain in 2016. He has been directly involved with over 25, blockchain solutions, and enterprise and public blockchain platforms. Mohan has a strong interest in biotech and has been active with many local area biotech thought leaders in North Carolina. Mohan his interest includes mentoring young professionals and leaders while working with community to leverage technology and improve lives. Join us as Mohan and I discussed the basics of blockchain. Learn about the underlying principles behind blockchain, its relationship to Bitcoin, why blockchain is a team sport, and how it relates to shoe boxes. Hi, Mohan, welcome to the podcast.

Mohan Venkataraman 01:36
Thank you, April. I'm pretty glad to be here today talking to you all.

April Harrison 01:41
I've read a lot of your bio, you're a really fascinating person. And can you just tell me a little bit more about yourself?

Mohan Venkataraman 01:47
I've been in this industry for close to 35 years. And I've done technology across mainframes to midranges across many different languages, platforms, applications, domains and industries. So that

that really enriched me in terms of how to approach clients. And initial days, I was actually a field engineer, I did everything, you know, I was sent to the field. So I did hardware installation, I did software installation, writing device drivers writing applications, everything was on the shoulders of the field engineer. I've been very fortunate to work with big companies that have really influenced and shaped my career like DCM data products in India, Nortel networks, momentum software, Texas Instruments and the Lloyd. So that's kind of what I am, you know, in the sense I do enjoy talking to people, more people person, I do like to travel. And I do like to learn all the time.

April Harrison 02:46
I've known you for a while now. And you're really, really brilliant. And I would think that that would already be your superpower. Just the fact that you can be the chief technology officer. To me seems like a superpower. But if you had another superpower, what would that be?

Mohan Venkataraman 03:04
There's a philosophy in in Sanskrit. It's, it's called "Vasudhaiva Kutumbakam", you know, which is a Sanskrit phrase that you will find in all texts. All it means is that the world is one. So if I really had a superpower, I've often thought about this is that why don't you just change the physics of this universe? Like, we have gravity and all these things, change the complete physics and let everything start from scratch again, and where humans and animals and nature, we can all live together. So that's kind of, I mean, I've often thought about this. So that's, that's what I would do with my superpower.

April Harrison 03:44
So Mohan, I am a novice in all things related to digital transformation, honestly. So, I need you to school me a bit on blockchain. For me, my first association with blockchain was Bitcoin. First of all, what is blockchain? And then what is that relationship between Bitcoin and blockchain?

Mohan Venkataraman 04:07
So let me start with Bitcoin because everybody's familiar with Bitcoin, right? And so you're all familiar with payment systems like Venmo and PayPal? We often use why you know, what do you call we wire money or we use credit cards to pay and so it's a you know, we use standard feared currency, you know, fiat currency is traditionally like the US dollar or the Indian rupee or whatever. Okay, so use that. Now, one of the goals of now Bitcoin is actually a digital form of currency, it's actually digital money, and it can be used for transactions on the internet, using a peer to peer protocol. Peer to Peer protocol is like groups of computers that can gossip with each other and then facilitate transactions. So really Bitcoin was started as a crypto currency or a digital currency, it's got all the characteristics of a fiat currency, you know, it's got numbers, it's got a transaction ID, and it is a medium of exchange. That means you can use it for buying goods and services. So it's got all those characteristics. But there are some fundamental differences. So when Satoshi Nakamoto, back in 2008, I mean, now Satoshi Nakamoto, nobody knows who he is, it could be a group of people or it is some person who wants to remain anonymous. He felt that the traditional ways by which we transact, you know, money is traditionally issued by a centralized authority, like the federal government, the Department of Treasury, they issue money, and they control its supply. And its, and its monetary purchasing power. So they can increase in supply and devalue the currency or they can take away money and improve its value. And that and they also control the purchasing power, as well as they control how it can be used, meaning

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like, you have all these rules and regulations on where money can flow, whether it's cross border, or whether it is buying certain goods and services, anti money laundering laws. And, you know, these are all part of the characteristics of a centralized currency. Now, Satoshi felt that, you know, money should be free, and we should be able to transact universally without any central authority controlling us. So the whole idea of Bitcoin as it's a decentralized payment system, that was invented primarily so that money is the money is generated by the network based on certain transactions and the volume of transactions and other characteristics, that money can freely be used for exchange of goods and services for any kind of transaction. And again, it is the network that really controls the supply and demand and its buying power, rather than any central authority. So your question about like, what is Bitcoin and what is blockchain? So the Bitcoin is digital currency and the underlying peer to peer technology that helps you to transact over the net? Is the blockchain in this process? I mean, Bitcoin is the first FirstNet network is called a public network because anybody like you, me, Karthik, we could go and join the network. And we could be a member of the network and work with it. So Bitcoin is a good example of a public network. There was another group I saw, you know, who founded the Ethereum foundation. Vitalik Buterin, clearly Vitalik is one of the founders, he felt that Bitcoin is a little bit constrained because you're only doing payments. And he felt that that would be a better system that allowed you to want to build different kinds of applications. So when they built aetherium, they came up with a couple of different innovations. One is on the network, you can put some business rules package them, and they can execute on the network, and they call it smart contracts. So smart contracts are nothing but programs that run on the Bitcoin on the blockchain network, and execute business rules before the transaction is processed. It's not just sending money from one point A to point B if there are rules that need to be executed before that transaction can go through. And they also came up with too many different innovations notable among them as tokens, you know that tokenization of assets, so they came up with the token economy, and they also came up with another good innovation nowadays is defy, you know, decentralized finance, you know, that all used to centralize finance. But decentralized finance is the is what is catching on nowadays, where everything in the financial system is trying to move towards this concept. That's another good example of a public blockchain. And so both of them you and I could be members, except that on a theorem network, we would buy ether on the Bitcoin network, we would buy bitcoins. So let's take a very simple example. Right? So I've worked in many industries, where certain, you know, there are that I which come under regulations, right? So for example, let's take Acme as a company and they manufacture aircraft. And they have let's say, suppliers, who supply a very critical component that is regulated by the federal government or the European regulation regulator, because these parts can be used misused by if it went to low countries, so they want to track each and every part that has been manufactured, delivered shipped where they are. So Acme does not trust its own accounting firm. And so what it does is it hires for other outside firms. So that way, the Acme wants to be sure that whatever it does, it does not get penalized by the government for any of their transactions that is not appropriate, Acme is internal accounting goes and explains to all those four public publicly hired accounting firms, this is how we how to process a transaction, when you receive a purchase order, you got to verify that the purchase order is from legitimate organized, so they teach, he teaches all the business rules to these four, outside accountants. And so, those would be the business rules that they have to know. And they all have a common ledger, you know, the item master right or the inventory ledger. So, so, they are supposed to record every transaction on that, for every transaction that comes in into Acme, let us say they, they have a purchase order for an aircraft, or they send a purchase order to their supplier for this critical

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part. What Acme does is it makes five copies of it, one for itself, and four go to these outside accountants and they all look at it, you know, and validate the transaction and, and keep it aside there. Now it keeps on happening transaction one transaction to transaction three copies are made, and it goes to all these four different outside parties. And they all were you know, validate the transaction and keep it aside. Now periodically, what can happen is like, you know, traditionally have seen, right, we put things in shoe boxes. So similarly, like a bunch of transactions have accumulated at each location. And so one of the guys around in this out the four parties or five parties says, Hey, we need to box these things, because it's becoming a big pile. So one of them says, you know, shall we pile them up? And so all of them get together and say, Hey, what's the balance currently? what it what balance? do you have? What do you have, you know, accountant 1234. So they all compare their answers. And they say the balances x, if a majority of them say the balance is x, that means they have all processed the transactions correctly. At that point in time, the one who raised his hand and said, shall we box them and say, let's box them. And then let's start with the next set of transactions. So at that point in time, you take all the transactions in chronological sequence, put it inside a shoe box, and put some additional information inside, seal it and say so many transactions are there on this in this box, it was, you know, from this date to this date, and then you put it aside. So you have boxes, and then you repeat this process. So you got box one, box two, box three, all in sequence. So that's kind of like a typical process so that there is trust. So you know that exactly, all of the all of them have boxes, right? So if there is any problem, you can verify that five different parties are verified, and everything is accurate. That's what happens in a blockchain network typically. So I would say in this case, the whole action of five different parties validating it, or validators, and then taking the time executing the rules that the accountant taught, and each location is kind of like a smart contract, and then putting it into the box those transactions after all of them have agreed on the answer. So if all of them have talked with each other, that is the consensus process, meaning agreement, and then they put it inside a box. And that box is a block. So that's kind of like a way by which blockchains operate, right? except in the case of a blockchain, there's a computer on which there is this blockchain software that knows how to do all these things gossip, send a transaction to five other computers, and then it knows how to periodically trigger a consensus process. And then how do you take all the transactions and cryptographically, seal them into a file, and then set it aside in a database? So this is kind of how an automated blockchain process works, similar to the analogy that I just gave you. Does that make any sense?

April Harrison 14:02
Yes. So I've got it. So that shoe box is the blocks and then when you have when you string those together, that's the chain. Right? So that's the blockchain. Okay. So it's like a good system of checks and balances, and then a secure filing system as well.

Mohan Venkataraman 14:19
Absolutely. So now, so things that I didn't mention to not complicate the conversation is you know, blockchain is all it came about because of trust, because no one party trust the other party, right. If you really see in a business, I mean, like, I get a purchase, I suppose there is a purchase order from the sub, you know, we should do a supplier then, you know, the purchase order is interpreted by Acme in one way, and then it updates its systems like the SAP system or whatever purchase order system they use. The same copy goes to the supplier and the supplier interprets it and puts it in a different way. And so when the actual shipments happen, then the two Parties how to verify and check everything well,

they don't trust each other. And things could have gone wrong in between. and therefore the whole system of there is a trust issue, which is what blockchain tries to solve. And then there is also potential for fraud, or even manipulation of data or tampering of data, which is what blockchain tries to solve, which means that once you write inside that database, you cannot change it. Now, that's a good topic for conversation actually.

April Harrison 15:29
Is that the main way that a blockchain database is different from the traditional one - is not being able to tamper information?

Mohan Venkataraman 15:36
Tampering is possible anywhere. Okay, so anybody who is a good hacker can hack it. Now, why does it not happen in a blockchain? So first of all, let's understand tampering. And then I'll tell you about blockchain databases. So when I have five accountants, right, and if I want to tamper, I have to go to all those five accountants that Acme has, and go and change the transaction in each one of their shoe boxes, which, which is very difficult. In the real world, if there was only one shoe box, okay, it's easy open his box make the change in the transaction, instead of shipping to iesession. One, and then I steal one, right? So it's very easy. But when that same transaction has to be fixed in five boxes, it makes it very difficult in different locations. So if you imagine the Etherium day Etherium public network, there are more than 14,000 computers that keep track, you know, that have the Ethereum software running, and they have a copy of the ledger, for a hacker to go and change a transaction in any of the ledgers, they have to change, at least more than 50% of all the legends that are operating on that in the network, which is which is theoretically very, very difficult to do, because by the time another one is tampered, the network discovers that this has been tampered and it brings it back in sync, or there are new transactions that have happened. So it that's what brings immutability to it. So immutability is not because the database is so essentially strong. If somebody wanted to tamper with it, they can start from the last box all the way to the box in which they want to do the tampering and rewrite all the transactions. But in a large network, it is virtually impossible to go and manipulate every transaction and bring them in order. The second reason is that all of them are cryptographically linked, that means box number one, box number two is cryptographically linked to box one, that means a secret that is generated out of box one is my is buried inside box two. And similarly a secret out of box two is buried under three. So they're all cryptographically linked. So that is also computationally very difficult to do. That's what makes it immutable coming to the database itself, right? So blockchain databases are no different. You know, they all use no SQL databases, because it is schema less. The way blockchain writes into these databases is a different schema. And that's what makes it different It's not the database, its the way blockchain records the data inside these databases. How mature is blockchain? Is it widely accepted now? So we've been working with blockchain since 2016, but the technology itself is as old as 2008. Right? So 2008 is when Bitcoin came into existence and 2014 is when a theorem came. And right around that time came the hyper ledger project, number of thought leaders I would say or even enterprise companies like IBM saw the value of blockchain, they saw that the technology can be applied to solve a variety of problems. So back in 2016, the hyper ledger consortium was formed. The hyper ledger project focuses on enterprise applications that are based on consortium or private blockchain networks. Now, private blockchain networks, typically on membership based, it is not like open for everyone to come and open an account. So it'll be for example, trust your supplier from t y s is

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a membership based, private blockchain network. You know, members join this network, they are given cryptographic credentials and then they do business and blockchain being a team sport. All the members have some common interest, and therefore, they are able to interoperate, cooperate and collaborate on top of the blockchain. So enterprise blockchain actually helped to bring about a lot of applications, dealing with Supply Chain Finance, you can say even healthcare, that technology is also maturing and people's understanding of how to use blockchain is also maturing and so they are able to make more informed decisions.

April Harrison 19:44
Are there any current use cases that you can kind of speak to where blockchain has been applied?

Mohan Venkataraman 19:52
That is a good question. So we ourselves have been in Chainyard have been involved with a number of projects right and each product has been pretty unique. Some of them have been recognized. Trust Your Supplier is an excellent implementation of a blockchain solution from concept, in fact, from ideation on concept, all the way to production. So we had an idea. And we used all our learnings in order to see how to build it. In fact, Trust Your Supplier went through many iterations. So the first one was a concept, then it became a POC then from POC, MVP was both. And then finally, you know, after a lot of learnings it is now in production. So building a blockchain solution definitely takes a lot more than just how to code it and develop it right. It involves How do you govern the blockchain network? How do you build it in production? How do you keep the costs low? What kind of network infrastructure you require? So that's a very good example of something that was taken all the way to production. There are many others like trade lens from IBM, food trust, Walmart food trust, again, in partnership with IBM is good. Even in the public space. There are there are some good blockchain technologies like Chronicle, which deals with cold chain, that is Medi ledger. So there are blockchain projects that have really done very well. In fact, Ethereum is nurturing a number of good projects. And we have built some good projects on Ethereum. I think some of them are in PRC, and some of them across BOC levels. One good example would be how do you tokenize grants, right, the federal government gives a lot of grants for certain projects. And these grants in the past were just money issued and could not be tracked. So now, with using Ethereum, the project was able to tokenize these gripes and then use tokens as payments to the different service providers, as well as verify that the actual service was was performed according to satisfaction. So that's a pretty interesting way by which the government is using blockchain technology.

April Harrison 22:00
Okay. Yeah. I didn't even think about it being traceable. That's something important and used in that way when you just mentioned the college grants.

Mohan Venkataraman 22:09
See the there are specific use cases in which blockchain works anytime it is a team sport. So you do have to have at least more than one party that is interested in that common business problems. Blockchain fails if it is just one enterprise that is trying to build it for its own purpose. So it is a team sport, so you need to have at least more than one organization as part of the consortium or common business interest. Now, there's very specific use cases that blockchain solves, like traceability and track

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and trace is a very common problem that blockchain solves, I want to know the provenance of my product, you know, all the all the ingredients that went into the manufacturer of this product or the parts that went into the manufacture of this product. The other one is smart contracts, like corridors law is a common statement in the blockchain world, especially in the Ethereum world. So purchase orders and orders, purchase orders, invoices, these are all business contracts. blockchain is very good in in codifying this and having a common view of how these contracts execute for all the parties involved in that particular transaction. There are other specific use cases like regulatory use cases, you know, the government wants to track sustainability, like how are different enterprises complying with certain regulations? So can they put all the regulatory reports on a blockchain and securely share it with the government? That is a pretty good use case, then healthcare records, you know, healthcare records are all over the place? How can the blockchain help to secure healthcare records and allow secure sharing of those records with all the parties like clinics, hospitals, doctors, pharmacies, how can it enable so there are many different use cases and so identifying the right use case for the blockchain is very important if, if a project has to be successful.

April Harrison 24:08
You've mentioned that blockchain started all the way back in 2008, probably? And to me, that doesn't seem that long ago. It seems like the technology has moved really, really quickly. What is your vision of blockchain in 2030?

Mohan Venkataraman 24:25
So I've been attending a number of conferences and in 2030 people won't talk about blockchain. It's just like, you know, today's Ethereum. Today's database for right so we never talk about SAP having an Oracle Database behind the scene, right? So today, blockchain is a novelty and everyone is talking about it. But in the future, blockchain is just part of a solution. I mean, like I'm using a blockchain database underneath my solution, so people will not even talk about it. That is one possibility. But by 2030, that would be a lot of other things. That happened there are so many different networks. So we do see within train yard and I do see that as well is that some networks may disappear, some may merge with other networks, then there might be interoperability between different networks like a trade finance network may interoperate with another supply chain network, like trust your supplier. So those are all possibilities. The other thing that we see is that blockchain alone, I mean, a blockchain started because of trust, transparency, privacy, smart contracts and consensus and, and that were some of the core characteristics of blockchains that triggered a number of applications. But if you see the outside world, IoT, which is the Internet of Things, and AI, ml are also taking rules and they are solving different kinds of problems. So there will be a convergence by 2030 of these technologies coming together to solve problems differently. For example, if you take IoT sensors, they are transmitting data at an immense rate that data somebody has to trust. So the blockchain can provide that trust element, that the IoT data that came in is accurate and that it has not been tampered with. Now you take AI, ml, AI ml algorithms to understand some of them are very complex. And those algorithms are processing this data that is coming and giving us insights. Now, do we trust those insights? Did the algorithm actually executed or somebody bungled? Didn't, right? So the blockchain once again, provides that level of trust by saying that this data was used for this calculation. And this was the instance of the algorithm. So by 2030, there could be convergence of these technologies coming closer together. And so solutions will

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become, sensor solutions are getting more complex, people want more transparency and trust. So blockchain, AI ml, and IoT could all come together for newer solutions.

April Harrison 27:05
So it'll be more standard, we won't even really think about it kind of like we don't think about smartphones anymore. We just have them. Not a novelty.

Mohan Venkataraman 27:16
Absolutely. I want to clarify one point for you. Now, the problem with Bitcoin is that it is not, it is not what he called environmentally friendly, you burn a lot of energy, and you burn a lot of electricity and computational power, which actually many of the many of the folks who are very concerned about sustainability and environmental friendliness, they really think that Bitcoin is not ecologically friendly, environmentally friendly, or even socially friendly ESG. On the other hand, the technology that we use in TYS is more based on litter based protocols where the finality is immediate, and you don't have to do mathematical computations in order to create a block. So that makes us much more environmentally friendly and sustainable.

April Harrison 28:05
In your example, with Trust Your Supplier, it can also actually work the opposite way where it's more environmentally friendly, because you're reducing the amount of either paperwork or other types of transactions.

Mohan Venkataraman 28:22
We usually don't use that in the calculation. But yes, from pure blockchain perspective, its energy consumption is very low. All the computers that we run inside the IBM Cloud, those are very efficient, and they do not burn a lot of energy. Because the processes, the transactions are really simple. And the consensus process is also very simple. And of course, you know, we are a lot more environmentally sustainable, because we reduce paperwork, and so many other things into wires.

April Harrison 28:54
For those of us like myself new to blockchain and digital transformation, do you have any advice or tips you'd be willing to share? Something practical that we can try at work or at home,

Mohan Venkataraman 29:06
Obviously, how can you become familiar? There are many, many resources. But you know, I would say YouTube has got a lot of good videos, you know, if you Google, I mean, just to get your basic information. But if I were to get my, you know, get a little more information. I would always start with a public blockchain because private blockchains you got a program and all those things, right. But as public blockchains offer a lot more, what do you call diversity of tools and technologies and features that you can easily get your hands dirty, go to bitcoin.org or you can go to aetherium.org. And they have a lot of tutorials, if you really see learn, they have very simple tutorials and some of them carry videos, that is a very good resource, but also say, you know, just out of curiosity, just open an aetherium account, you know, open open an app Count with Coinbase, which is an exchange, and then play with very limited amount of USD if you want to buy and buy a few cryptocurrencies that are not too

expensive like and see how it works, you know, you open up a wallet like a meta mask for yourself, you open an account, install meta mask and open an account, you have a wallet, you connect that wallet to the Ethereum network, you buy a little bit of crypto and you see how this whole thing works. There are good videos on how to do this very easily. That would be another approach. And then the most exciting thing I found is there is a on Ethereum. There's an application called cryptokitties. Crypto kitties is nothing but digital cats. And it's considered an NFT. And people actually trade these cats. There's a learning section in Cryptokitties. And you can actually go and, you know, use the Learn option to see how NFT's really work. And they give you a fantastic explanation.

April Harrison 31:03
How cute and that is really at my level too. That's the level I need to learn more about this stuff.

Mohan Venkataraman 31:09
So if a case will really keep you fascinated because the world of NFTs, which we never talked about non fungible tokens is getting a lot of traction on blockchain, you saw, you know, Jack Dorsey. His first tweet became an NFT. Right, and it traded for a million dollars or more. Similarly, there are all these there are many other NFT's that is catching on, and they are being traded on public blockchain networks.

April Harrison 31:39
And I will post some of these links in the show notes as well so that our listeners can find them.

Mohan Venkataraman 31:44
Absolutely.

April Harrison 31:46
Yes. So Mohan, what projects do you have on the horizon? And where can our audience find you to follow and connect?

Mohan Venkataraman 31:53
Oh, well, we're doing some interesting projects now. And so right now what we are doing is the tokenization of real estate. Right now we're working with a company that wants to tokenize real estate assets, and then offer those tokens to public investors. This is a way by which you can, the company can raise funds to purchase properties. And for those tokens that these investors purchase, they get dividends. In dividends, which is actually coming through rents and other means of income generation. So we are tokenizing it, meaning like you're building it on a public blockchain like finance, and we are tokenizing the assets. We are also built, you know, we are also working with wallets and how to move money between wallets how to generate tokens. So that's very interesting. The second one that we have worked on in the past, but there seems to be a lot of interest is the wallet. It's a digital wallet that runs on a mobile phone, phone. And the health records are under the control of the individual who owns that phone and who owns that wallet. So we build that. But now we see that there's a lot more requests on in general how to share healthcare records between the patient and healthcare organizations. And so we are looking at the wallet. There are companies that have asked us to help them with consent, giving consent for sharing the records. So we have since we have done a lot of

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work in this space, we are looking at how to use our mobile wallet for that purpose, or even do some other algorithms to satisfy those kind of business requirements. We're also working with the university trying to build an NFT. How does NFTs operate right? for non fungible tokens? There are people who want to just trade I mean, there was a kid who actually drew dinosaurs and was doing NFT trading on the blockchain. Now, so there is a lot of interest in NFT's and we are building a sample example of an NFT trading application that students can use. So those are a couple of interesting things that we are doing. People can always email me or connect with me on LinkedIn. I'm on LinkedIn under movee97. I can put that somewhere m o v e e nine, seven. Easy to find me.

April Harrison 34:15
Mohan. Thank you so much for schooling me on blockchain basics.

Mohan Venkataraman 34:20
Yes. You know, it was it was completely ABCD for me back in 2015. I think it take took me a while, you know, but I think things have simplified been simplified since then, because people started understanding the technology. And there's a lot of material and content available. And many of them I tried to simplify it for various audiences. So things are much better today than what was back in 2014-15.

April Harrison 34:49
I really appreciate it.

Mohan Venkataraman 34:50
Thank you so much.

April Harrison 34:51
All right. Take care. That's it for this episode of Procurement Block. I'd like to thank my guest, Mohan Venkataraman, for joining me on the show. If you want to play around with blockchain, links to the resources Mohan recommended will be in the show notes at www.procurementblock.com. Let us know if you give any of them a try. Procurement Block is produced by Trust Your Supplier. You can reach us at procurementblock.com. Show notes are available on our website and you can leave your questions and comments via the listener comment form. Thank you for learning with me today. I'll leave you with wise words from Benjamin Franklin, "An investment knowledge pays the best interest."