Blockchains Architecture, Design and Use Cases
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Lecture – 35
Blockchain in Financial Services: Payments and Securities Trading

Hello everyone welcome back to the next lecture are Block chains course. We discussing use cases in the supply chain industry today be two use cases, sorry two lectures are talking about multiple use cases in the supply chain space. So, first I will start out with a within a real world incident which is which effected Walmart actually cause the millions of dollars.

So, in China what happened means you probably a few years back, where Walmart was having pork in it is retail stores and they found out that one batch of pork was actually infected it was not fit for consumption. So, what they try to figure out where that batch of pork came from and also where all that batch of pork could have gone.

But there no information about this, because that is supply chain is fairly complex this pork could have come from some firm and maybe got stored in a warehouse got refrigerated somewhere else and then finally, could have reached the Walmarts retail store. They would actually you have maybe three or four owners it would have change hands and finally, you could have reached Walmarts retail stores.

Now, because of the fact they had no idea where this pork came from or even where all this pork went to this batch of pork that the infected one, where which other Walmart stores this batch of pork went to because, they had no information about this. They ended up recalling all of the pork in all of China which cross the millions of dollars and of course, this was this was serious issue.

Because, if they cannot let the pork just stay there because if it was consumed then even people were died. So, just avoid that sort of safety issue they have to recall all of these pork thinks back.

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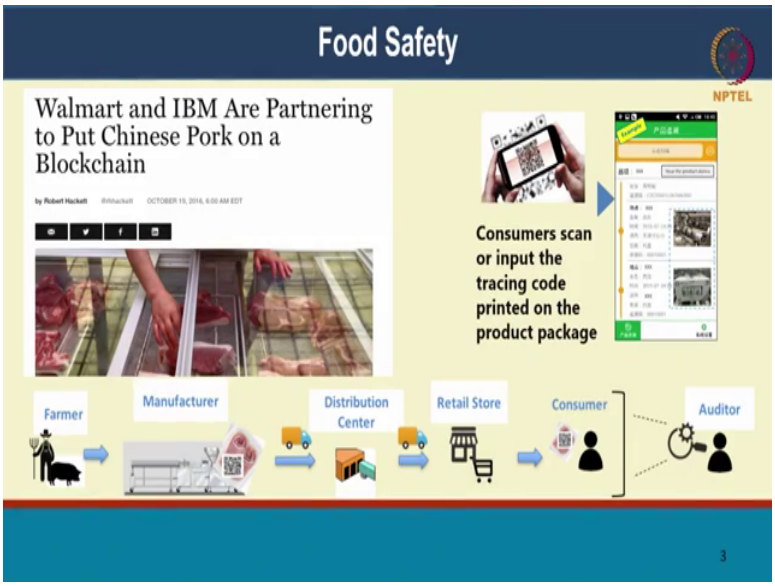

And you can see this kind of a recall issue is not just limited to the food industry is actually beginning in the let us say the electronics industry, where maybe you find out that some devices are malfunctioning because you will say a part is not proper. And they you end up recalling a large number of these devices or it could be in the automobile sector. So, these things happen all the time. Now, in the foods specifically beyond just a monetary caused this is also safety issue where people might actually died right, you do not want that to happen. So, Walmart has had these issues with in other places as well in with mangoes in Mexico with spinach in California.

So, many of these instance that have cost Walmart a large amount of money and they were interested in finding out can I know that a particular as a customer or even right or E Walmart or Walmarts customer.

Can I look our at a batch of produce let us say pork or mangoes or whatever it is can I have understanding of where it actually came from, how it is being processed it is let us say from a farmer. Maybe the some amount of manufacturing is involved may be the mangoes made into mango juice right and then you got distributed you got stored in a retail store and then finally, gets to a consumer.

So, can I just maybe from a mobile phone scan this particular produce scan let us say a some q r code there. Can I get the information about exactly where this came from and this is also important if you if you think about it is also important in the organic space, which is actually

a very a growing business in almost every geography right. Organic foods are becoming more and more important and all of us of course, we treat our health is as the most important concern.

So, we do it would be great if we can get provenance or prove that this particular produce has actually gone through proper. A production standards for organic goods they have been stored properly, they have been all through distribution and transportation, they have been store properly and the not been infected.

And finally, when I actually get those mangoes I can actually trust the these are actually organic mangoes there have good quality and I am willing to pay little bit extra for that because, it does protect my health.

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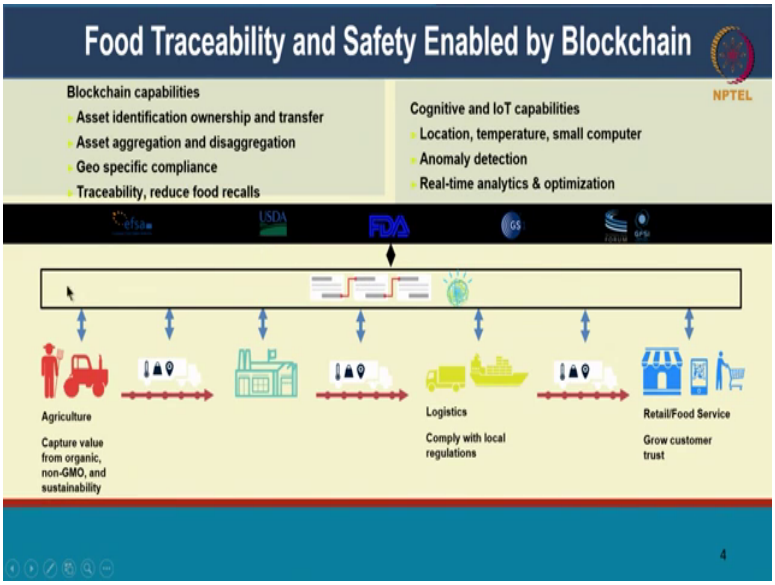

So, this hole food traceability and safety enable by block chain is seen as a very big use case right, it is a probably in the several millions of dollars worldwide. So, we would not be able to capture exactly where all things of where how goods of progressed from farm to pork.

So, that is the standard terminology and along the way they will be sensors which are tracking these goods and there may it also be inspectored. So, are coming in and like the FDA, where coming in and checking whether these goods are actually good.

So, there are multiple organizations that are involved along the process and we can have IoT and other capabilities even analytics that are built in that detect whether things are going ok. So, it could be a normally detection to see that.

Now, the temperature seems to be a bit of and that may risk that might be a risk for the goods to for the agricultural produce to gets spoiled. So, there is a lot of interesting things you can do with the intersection of AI I o T block chain in this space.

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So, there is also governments are also waking up to this about the importance of food safety. The Indian government is also doing certain things not to a necessarily on block chain, but in bringing forward safety acts right.

So, these are regulatory requirements and how food produce has to be how produce has been cultivated, how they have to be processed and distributed right?

So, there is a foreign supplier verification program that the US got the FDA actually brought into force last may. It was came into effect May in 2017 and what is about is US actually imports a large amount of their food requirements from outside. So, this is a big importer of food and agricultural produce.

So, there is a requirement on the importers. So, whoever is importing let us say Walmart is importing these actually cultural produce from brazil or the Caribbean islands, they need Walmart, then needs to ensure that the whoever the exporters are verified and they are

actually adhering to best practices for production cultivation processing distribution and so on.

So, it is the FDA mandates that the importers in the US are required to verify whether the exporters are exporters in the distributors are adhering to best practices. So, this is a burden on the importers but, it is a matter of safety right. So, these sorts of these sorts of federal requirements or whether government requirements are coming into play into in many jurisdictions actually.

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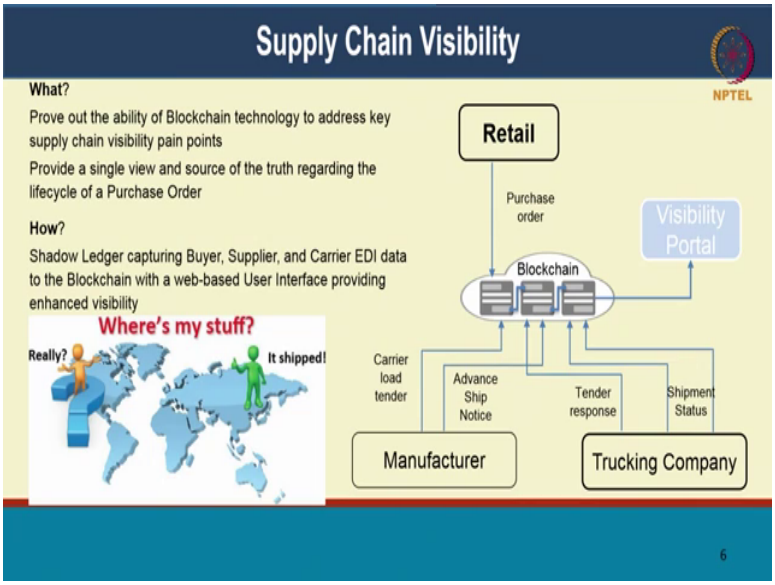

So, the very related aspect of this whole food safety aspect is really visibility into what is happening in supply chain.

For instance, as an exporter I would like to know I am I goods are at any point of time, as an importer Walmart for instance I am running out of meet produce. I want to refill my stock right, I want to know where the next batch of a goods are coming from how am I going to refill this right. So, there is a visibility aspect across the supply chain not just for the end users.

But for every intermediary also there is a visibility issue today. So, they all have just local visibility, but they would like to have end to end visibility. In the similar to the logistic space just that this might be a;may be a smaller problem with the within a local environment.

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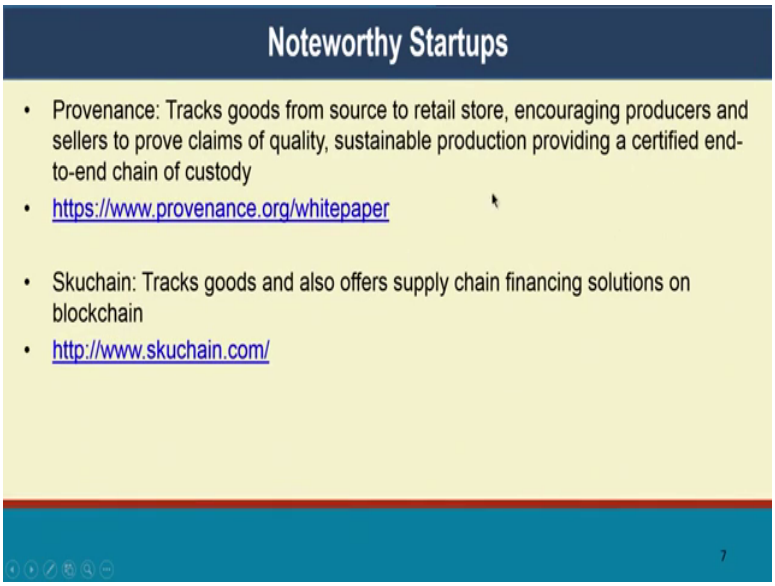

There are many noteworthy startups that are just solving this visibility problem right, there is problems, which has a nice whitepaper is a they track goods from source to retail store. And what they also do in addition the is that the encourage producers and sellers to prove their claims of quality.

Let us say a there is a producer that claims that I am going to sell organic mangoes. Then what they what provenance as a startup with they asks what they ask the producer to do? Is also document exactly what steps they have taken to ensure that this produces are actually organic. And then the produce with the producer can actually put this put out all this information and the consumer can then be can then actually trust this information; that you are actually doing all these things for the mangoes that I have just purchased.

This can also be in terms of sustainable production right so, how are you making sure that you are not over using the soil for instance or you are not depleting resources water for instance in your area. If you can provide proof or some of those things then, consumers are actually willing to pay extra for that.

There is another startup called Skuchain; which also does this kind of tracking of goods in a supply chain and apart from that they also have some supply chain financing solutions which we talked about right. So, they do a mix of some of these use cases for supply chain in industry. So, that encourage you to check out these startups and what they are doing right. So, it was very interesting to follow this space.

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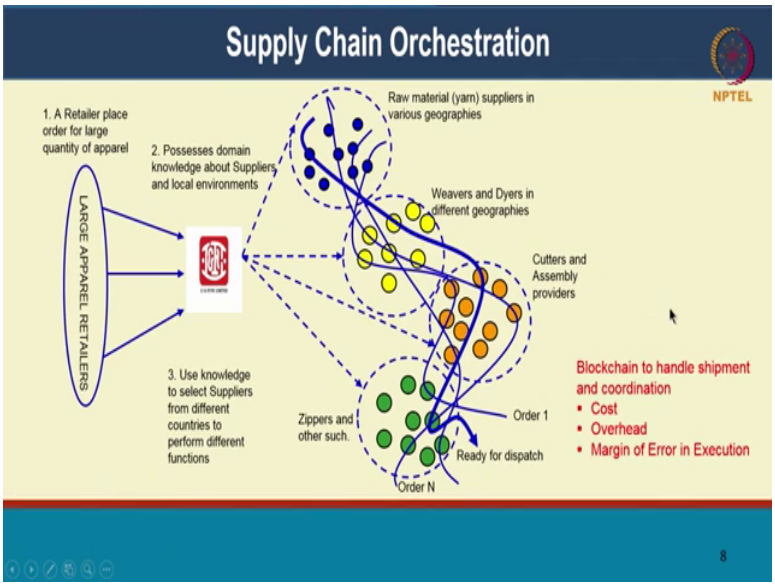

So, this is another very interesting use case in the supply chain spaces. So, if you think about some of the leading brands of let us say t shirt manufacturers or people who produce a dresses right or a parallel of any kind.

Many of these brands, the large brands the way they produce their shirts in and dresses the way that do that is actually they have a very complex orchestration process.

Where, let us say maybe the yarn the raw material for this shirt might actually come from one place actually let us let us take an example right Egyptian cotton is extremely popular. They have very good quality cotton there and I might actually advertise say I am have actually using very high quality cotton from my dress right they might source this the yarn itself from Egypt.

The weavers and dyers might be let us say places like India and Bangladesh where we have very good facilities for we have expert class one and we have also have very good quality dies. So, the actual die is might come from India and maybe Bangladesh. And then some cutting and assembly might let us say one of them might be India the other might be Bangladesh or it could be Indonesia right and finally, there they are the some zippers and other small things right, buttons and all have to be attached.

So, all of these might actually be happening in a different place. So, is actually of global orchestration that needs to happen and think about this all of this has to happen in a short time

frame and they all have to be orchestrated well. Now, there will be problems; if let us say the yarn is there, but the weavers and dyers and there right.

So, the yarn will be waiting at the next location right the, from Egypt is come to India, but then the weavers and dyers are probably doing something else and they not available to work on this particular, this particular order. So, anywhere on the supply chain if there are delays it could cause serious financial implications right and this also has a very big play in the fashion industry.

So, fashion is you know is change is very dramatically it is a very high and industry lot of money in it and every couple of months is a new fashion trend right. So, if you are going to cause delays in this if you are not there in time you are going to miss that trends. So, the you are whatever you produced is going to be absolute weather right.

So, no such of problems also arise right you might you and I might not experiences, but in the high in fashion industry it becomes a very very important challenge. So, today if you think of how these kinds of orchestration works like I need to have the Egyptian cotton ready have the yarn prepared and after 3 days you will get shipped to India.

And there when the shipment comes in I need to have the weavers and the dies ready, I will then as a one that is done another 3 days I need to have the next cut cutters in the assembly has to be ready. So, this is a very complex orchestration that has to happen with pinpoint profession right.

Now, today it happens very manually right, it involves the lot of phone calls, emails, coordination amongst all of these entities to make sure this happens smoothly. Now what have we can do this on a block chain platform? Now all of these they all share information about how things are progressing and you can also do advance prediction.

So, I know that this cotton is going to get delayed by couple of days and I can accordingly adjust what my weavers and dyers are going to a workout right, or I can have my raw materials ordered in time for when the goods have a going to come through.

So, there are lot of these again small optimizations that can be done, which have a profound impact on the end to end time line as well as the cost of production. So, this kind of supply

chain orchestration, oh you can think of I took the example of clothing, but these kind of orchestration happen also happens in other industries like the automobile industry and so on.

So, again this is a very important problem this kinds of supply chain orchestration. And you can bring that on into a block chain platform and have all of this automated has a smart contract on block chain right, each of these entities participating in the block chain and providing information for it.

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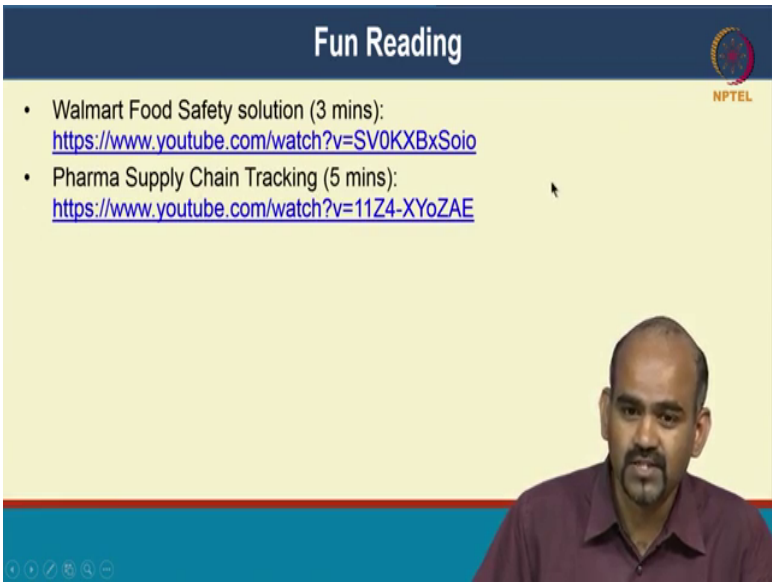

So, that kind of comes to the first section of concludes the first section of the supply chain use cases. So, again a couple of quick videos on this to just give you a feel for some of these use cases, the Walmart food safety solutions this is a small 3 minute video, motivating the use case and talking about what we are actually doing in the space using block chain. And there is also a Pharma supply chain tracking again a video on some of the challenges in the farmers Pharma industry and how their supply chains work.

With that thank you, we will see you soon in the next lecture.