TRANSCRIPTION

> **Ms. Angana Guha Roy Chowdhury, Deputy Director, The Bengal Chamber of Commerce and Industry :**

Good morning, everybody, I welcome you to the 9th Edition of the Business IT Conclave. This year's theme is 'Fintech Riding on Blockchain'.

We have with us Shri Debashis Sen, Additional Chief Secretary, Department of IT & E, Government of West Bengal & Chairman, HIDCO; Mr. Bhaskar Pramanik, Former Chairman, Microsoft India and Member of the Board, SBI; we would also request Mr. Arnab Basu, Chairperson, IT Committee, BCC&I; Mr. C S Ghosh, President, BCC&I; Mr. Ambarish Dasgupta, Former President, BCC&I; Mr. Debasis Basu, Co-Chairperson, IT Committee, BCC&I; and Mr. Tamal Bandyopadhyay, Consulting Editor, Mint and Adviser –Strategy, Bandhan Bank, who will be moderating the session – request you to all please come and take your seats on the dais.

> **Mr. Tamal Bandyopadhyay**, **Consulting Editor, Mint and Adviser –Strategy, Bandhan Bank:**

Good morning and welcome to this session… this is not a panel discussion – each of these gentlemen will have their inaugural speeches – this is the inaugural session – I will just introduce the subject, and then we'll go one by one.

Essentially, for many of us, Blockchain, which is about 10 years old now – it brings our mind to Bitcoin and other crypto currencies etc. So it's a very radical decentralization of technology – it's a record-keeper and adjucator, which does not depend on any 3rd party or outside institution. So in that sense, this is a sort of new governance, which is why it's also radical. And we are almost seeing, this Blockchain is creating a parallel economy and parallel legal system. I'll just give you 2-3 facts, what's happening globally for Blockchain, and then we'll hear through the session what's happening in India.

Now, the most responsible study, if I'm not mistaken, is a McKinsey study which talks about Blockchain has been growing or will grow by 2021, 4 years down the line, at a CAGR of 61.5%. And big techies across the world – Microsoft, IBM, Accenture – they are all running to embrace Blockchain. And what's happening? I'm just giving you this fortnight's development – Microsoft has joined an alliance which is called ID 2020 – it's a global partnership, creating an open-source Blockchain-based digital identity system in the US. It will allow access to sensitive online information via an encrypted Data hub. It has also entered into a deal with Israel's largest bank, called Bank Hapoalim – it's creating digital bank guarantee based on Blockchain. You know what happened today in the PNB scam, the LOI scam, and there in US, Microsoft is now tied up with Israel's biggest bank to create digital bank guarantee based on Blockchain.

Now, what is IBM doing? IBM has partnered with Stellar and Clipits group to help financial institutions south-Pacific, to improve the process of universal cross-border payments by reducing the settlement time and cost. It has also launched its first commercial Blockchain deployment for private equity market, in collaboration with Northern Trust.

And finally, just hold your breath – IBM just announced world's smallest computer based on Blockchain technology; and the size of the computer – guess… it will be smaller than a grain of salt.

Finally Accenture, the global consulting and tech firm – it has collaborated with Walt Disney Studios, to purchase virtual reality machine learning and Blockchain.

So this is what, across the world, is happening in the Blockchain area; and it's very interesting… I think it's very progressive on the part of BCC&I… thank you, Mr. President to have this subject and looking forward.

So, the welcome address by Mr. Arnab Basu, Chairperson, IT Committee, BCC&I.

> **Mr. Arnab Basu, Chairperson, IT Committee, The Bengal Chamber of Commerce and Industry:**

Good morning. As I stand here on the 9th Edition of the Business IT Conclave, it gives me great pleasure to welcome you all.

As many of you would know, I'm not a Blockchain expert, nor a Fintech expert; so my welcome address is not to give you a lot of technical details around either of those; but I think… the way we conceived this, when we thought of this from the IT committee – this is our signature event for the year; the Chamber has always focussed on being a bridge between technology users and developers, and how that is being consumed by the business; and when we thought of this year's topic, one of the thoughts was, should we focus on Blockchain – but then it becomes very technical and dry in some ways.

Should we focus on fintech as an ecosystem? Again there's been a lot of programs on fintech, not so much in this part of the country… but we felt that… why don't we bring it together? Because if you look at many of the fintechs today, and what they're trying to do, most of them, in some way or the other, is riding on what Blockchain allows them to do. And to a large extent, if you look at many of the fintechs who are currently collaborating with large financial institutions in the country, or even developing products for many of the foreign banks and foreign institutions, many of them have been working on this concept, working and building their products, their platforms, on this concept; and hence we thought – let's work on fintech riding on Blockchain as a key theme for our discourse today. We are very honoured that many learned speakers have agreed to come here today, most of them from outside Kolkata – we have to change that next time – but we do have a very learned speaker list today for all of you.

When I look at what Blockchain has been doing over the years – it's of course still in its infancy – I wouldn't say that it has become as mature as we would all be thinking it is – but even then, we already find a lot of organizations trying out different kinds of use cases on Blockchain, whether it is around insurance sector, insurance claims; whether it is around digital payments, whether it is around land records, health records, whether it is around reducing fraud – all of these are being enabled by this decentralized ledger system; and I think, if you look at today's India, it requires technology to make that leap; it requires technology to make us have that kind of … I wouldn't say exponential growth, but definitely I would say breakout growth; and technology can do that.

We were today discussing how in many businesses, high-touch is now being enabled by hi-tech – and we'll hear about that from some of the esteemed speakers – how customer loyalty is being enabled by technology; how fraud is being… I wouldn't say wiped out, but being reduced by using technology. And whenever you have use cases where you need instant reconciliation, you have a high number of transactions, you have trust as something which is very integral; and you also have something where transactions are interacting with each other – one transaction is affecting how the next transaction is happening – you'd find a lot of use cases coming in in Blockchain. And I think it's very heartening that even from this part of the country we have a lot of tech start-ups working on financial services sector; they're working on financial services solutions which are being taken up by many of the large banks, which are being taken up by many of the new banks, because it gives them the ability to have a level playing field with entrenched players in the industry, and I think it's something which we as an industry-academicia develop a forum – we feel that it's something which would make inroads in our lives. In today's life, I think, we don't have technology as something which we can live without; and I think in some ways, technology has become so integral to our lives – we don't even realize that we are using technology.

So with that, I would pause… and again welcome all the esteemed speakers and all of you… when we look at different people who have different quotes, but one quote from William Mougayar, author of 'The Business Blockchain' which stuck with me was: "How do you create value?" What he says is, you create value by running services on the Blockchain. And that's the world which we are going towards. Thank you.

➢ **Mr. Tamal Bandyopadhyay**, **Consulting Editor, Mint and Adviser –Strategy, Bandhan Bank:**

Thank you. The next speaker is a very interesting person, Mr. CS Ghosh, who is the Founder, Chairman, and MD of Bandhan Bank. You have 13 million customers now? 1.3 crores. So it will be very interesting to hear Mr. Ghosh, how he uses technology… because the kind of business you do is essentially business of connectivity, right? Your people meet your customers at least once a week, which is the key to the quality of assets. So we'll hear him, how actually he mixes the two – the human touch connectivity, as well as how does he embrace technology.

Before that, I'll give you one interesting fact – where does India stand when it comes to artificial intelligence or use of robotics, industrial robot. Now what are industrial robots? Industrial robots are automatically controlled, reprogrammable, multipurpose machines. In this century, that is, between 2001 and 2018, there was 200 times rise in the use of industrial robots in India, particularly in the automobile industry. Still, the density of robots in the Indian industry is the lowest among all developed markets. This is a study which just came out last week, study by Center for Development Studies (CDS) in Thiruvananthapuram. What it says – number of robots deployed by Indian firms has risen 200-fold since 2002. Now, in India, there is 16,026 industrial robots, which is 0.1% of the workforce. In other words, in 2000, per 10,000 workers, there was less than 1 robot; and now in 2017, per 10,000 workers, there is almost 10 industrial robots working, mostly in the auto sector. Over to you, Mr. Ghosh.

> **Mr. C S Ghosh, President, The Bengal Chamber of Commerce and Industry:**

Good morning to all. Tamal Da asked this one question, but if I go to answer that, I may not be able to touch on the Blockchain matter… but I would like to touch both on that.

My experience in bank – it is fully IT-based banking services as of now. When I first decided to convert from my MBFC to bank, then all the requirement has come from the bankers who are experienced in the bank, who are recruited from the different bank, Bandhan Bank, and then discussed about this, and say that there is a need of one core banking solution called CBS; and another 32 different types of software will link with them to run the bank. I have done it before starting the bank.

But surprisingly, I saw that every month, I am purchasing 2 new softwares; and every one has a purpose; and how it is changing the world, and need; and automatically what they are giving the logic I cannot say no; because this is a very big area – I have not that knowledge to rationalize, justify, and talk with these IT people, and say that no, this one I will not take. Because all of us in the banking industry, we are trying to first reserve the customers' comfort, customers' satisfaction, customers' data should be preserved in such a way where there will be no question come on that. So something we are looking on that, the many things is very frequently changing on that … so much frequent… and then we select, purchase and link with the CBS – it is also taking good time on that. But I feel that the running in future of any bank… and it's a very tough call, that how much they are spend for IT, how much expertise is required to put up that on IT, I don't know that… the Blockchain again coming on that – block heart or Blockchain. So block heart we are always at the fear – heart block, so that we will go to the doctors. But this Blockchain not like that, we like to feel that we do not need to go to the doctor, but we automatically like to solve our problem.

So whatever the small points I know about the Blockchain – very few of the experience, but not in the practical… like to talk about it, and I learn from the different people, I like to mention in here. But I would like to listen from all of you who are expert in this platform; and how we can be like to use, and give the benefit to the bank and my customers on that. Of course, our customer number is big, so I hope this Blockchain can help us to give the more comfort service to the customer.

Blockchain is defined as a digitized and decentralized ledger. I feel the simple way I like to talk on that … I feel it is good… but India, fintech ecosystem was evolved by startups; and offering digital mobile charges and introducing digital wallet, which are now being used for various other commercial activities. If we see that now, it is very related to today's news, the Flipkart and Walmart have come together; how the ecommerce and wallet, mobile banking, all are used in that way to do the future business on that. The fact that this new offering have strongly impacted consumer behaviour, has not only attracted attention from the more technology-savvy individuals, but also a lot of investments. Quite interestingly, India currently has over 600 fintech startups in the space of lending, payments, insutech, Blockchain, and rate tech. So the market is big. So we are also… India as a country, we are also taking that opportunities, how it can be… this 600 fintech and startup organization can be contribute on that.

This number is expected to grow further with initiatives such as Focused Accelerator Progress programs by local and regional govt, banks and funding support by the leading corporates and business. The BCC&I has always recognized the fact that, in the new environment of the society, industry, and business, the need for corporates to internalize, and to demonstrate their responsibilities to the society in which they operate is no longer a matter of debate. Since most citizens are interested in the understanding of the underlying, that is, Blockchain technology, and how it can be impact the average consumer. The BCC&I would like to take this opportunity to discuss about how the fintech industry can offer several prospects with the help of Blockchain technology.

Blockchain… it is not only the financial players in the industry… that is also a belief on that… exploring Blockchain by the non-financial industry also; that is in telecom industry, healthcare, travel, retail, and public sector industry also can be used the Blockchain. The key focus of these industries is to incorporate the primary features of Blockchains such as decentralize the data storage and data into their system; for eg, Blockchain-based patient-record management will assist several healthcare companies to secure medical records, monitor the pharma supply chain. All things considered, as a decentralized platform for innovation, Blockchain technology over time, will revolutionize virtually every industry.

For now, the financial services industry may be one of the first to be impacted by the widening adaptation of this technology in India. However, I assure you, this development is not only limited to the respective industry, but also has the ability to support several prospects for our non-financial services industry. I wish the success for today for the new technology discussion with the help of all of the experts in here… thank you all.

> **Mr. Tamal Bandyopadhyay**, **Consulting Editor, Mint and Adviser –Strategy, Bandhan Bank:**

Thank you. Now the special address by Mr. Debashis Sen, Additional Chief Secretary, Department of IT & E, Government of West Bengal & Chairman, HIDCO.

This gentleman is not a typical bureaucrat – actually all the things associated with bureaucrats, I think he is far away from all that… I have seen him once in Mumbai and once in Kolkata… he is extremely committed to move ahead, create industrial… create an environment to create industry, jobs etc… so I think nobody can be a better person than Mr. Sen to address how you will embrace technology and help it.

And before that, one fear I want to allay, because there is always a fascination and fear about technology and Blockchain, how it kills employment opportunities and all… I actually did a lot of homework, because I don't understand technology… it's a Barclay's report, came out last week; it's called 'Robots at the Gate' – which says that all of us feel that employment opportunities will go down if the Blockchain and all that come; but it says, as of Jan 2018, US unemployment is 4.1%, Japan 1.4%, Germany 3.6%, and UK 4.3% - they are all lowest ever unemployment rates… so that most people are employed, and all these advanced economies at this point of time. So technology and Blockchain which is 10 years old, has not taken anyone else's job.

Other interesting facts, again from this Barclay's studies – if you think that technology alone can improve your productivity, think again. It says: "Machine Learning, robotics, Blockchain etc believed to be boosting productivity and growth, but not… between 2005-2015, US productivity has grown at 1.3%. But between 1995 and 2004, it had grown at 2.8%. So the growth actually has come down. Similarly OACD countries right now is growing productivity at 1%, but earlier it was 2.5%. Sir, over to you.

> **Shri Debashis Sen, IAS, Additional Chief Secretary, Department of Information Technology & Electronics, Government of West Bengal &Chairman and Managing Director, Housing Infrastructure Development Corporation Limited and Chairman, Nabadiganta Industrial Township Authority:**

Good morning, everybody. As Tamal da has been known in the media circles for a long time, and we met him at Taj Gateway Hotel in Mumbai – he was Editor, Mint… and he … Dr. Mitra was supposed to come today… we were trying to project the financial hub in Mumbai, and it was there that he told us a very good tip on how to communicate with the rest of India. Thank you for the opening remarks.

From the department of IT&E, just last month, we had conducted a day-long workshop on Blockchain. So therefore it was very deeply deliberated what is the future, and what we need to do. We are very convinced from the govt, that we have to lay emphasis on emerging technologies like Blockchain. Since in this room I assume that a very informed audience is there, I will therefore not beat about the bush and say, certainly, Blockchain has gained its eminence from cryptocurrencies – Bitcoins and the like. But cryptocurrencies are not valid in India. If there any legal persons here, please show me a legislation that bans cryptocurrency. But for all practical purposes, we know that the Reserve Bank has said that within 3 months, all banks virtually have to stop trading or exchanging with cryptocurrencies, and therefore that is the death knell for cryptocurrencies in India.

But is it so? I say it is not so, because number one of course, the whole world is integrated… there is no point is saying that the boundary of India ends here for Blockchain and Bitcoin, this is the end… and then somebody else takes up. The ambassador of Estonia was here a few days ago, and he met me and he said, how, using Blockchain, they are providing e-residency, citizenship, over the digital… the world is digital, it's a cliché now, we all know, there's no point therefore saying that it's banned in India, therefore you don't need to learn Blockchain or cryptocurrency.

Number two, last week we were having a very different kind of a seminar, called by the Society of the Child Protection Rights. The Hon. Chairperson, Ms. Ananya Chatterjee was there, and the topic was, how can technology be used to stop child pornography and child abuse. And one of the ways in which the International Justice company said, was that, you track a criminal who is doing such sexual abuses on young children, is to track where money is flowing – among other things; you have to communicate, get a feedback, and you have to track money flows if you really want to be serious in stopping these ills from the society in the world. Do you think every searched criminal is using legitimate dollar currency to do that? A large portion of this is happening in cryptocurrencies.

So if you want to fight crimes against humanity by these criminals, who will not stop at your diktat of using only very freshly printed orange 200-rupee notes… we have to learn and stop it. And therefore I say, let there be no fallout, no lack of faith in Blockchain and the need to study for it. Mr. Diptiman Dasgupta is here… 'Blockchain believers'… he has created a Facebook network, and officially, Dept of IT&E, perhaps for the first time in the history of India, had collaborated officially in the workshop on Blockchain… so he is a believer in Blockchain, and there are thousands like him who have already come together.

Day before yesterday, and yesterday's paper carried one great thing about Blockchain – that Facebook has created a new division on Blockchain – they have not said why. And people are wondering why the Head of Facebook Messenger has been shifted to the Blockchain unit. And it goes on to say that the technology world is very sharply divided into those who believe – Diptiman being in that group – and those who do not. But can you afford to neglect it? You have to believe it, nurture it, because if the next revolution is coming, as Blockchain believers believe, that internet, the way it transformed society, Blockchain is going to transform society. So if you are not ready, somebody sitting in China, somebody in Hong Kong, somebody in some other company is going to overtake you. You can't afford to lose sight of Blockchain, cryptocurrency, and everything that comes with it, and therefore fintech.

And with these things, let us say, what is happening already. After the workshop that we had last month, I have to narrate this very personal experience. A group of chartered accountants came and met me. They said – Sir, we didn't know that this technology was there. We have been doing some studies after this. Your workshop has also brought this to the light, and we have all – there were 5 of them, including one technology person – we have left our jobs, and we have founded this Blockchain-based fintech company. And what are you doing – I asked. They said that cross-border… Bangladesh and India, a lot of trade happens, all of us know… ilish comes from Bangladesh, and rice goes to Bangladesh. So every time there is a cross-border settlement of accounts, which is very cumbrous… letter of credits, etc… and they said, if we could have a Blockchain-based smart contract system so that the accounts could be settled in the Indian side among the traders, export and import, and Bangladesh side, export and import – and that is what they are working on. I think it's a great example of how smart contracts can ease using Blockchain in cross-border trades like this.

So this is the way to go ahead. Global trade, fintech, Blockchain is most appropriate in these areas. And therefore, I would say that there is a great need to build up skill on this. The recent draft of National Telecom policy, which was just announced last week, says that 'Propel India' is one of the keystones of the telecom policy; and it says that emerging next generation technology should be encouraged, and Blockchain and fintech and AI and robotics which Tamal Da has been telling about, these are all part of it. We have to know this. And the way to know this, one great example to move forward, and what we are doing also, is to encourage startups in this respect.

Startups are a great way – not because they do great business, but because they can get talents and skills in a short form, by the millennials, by the young group. And we must see, not what they are really earning, or earning capability, but because they have been able to cull out the talent pool in the society, in the environment. So what US big silicon companies are doing? They are constantly on the lookout for relevant… if

it's AI, if it's machine learning, if it's fintech, if it's Blockchain… and who are doing good in startups… and eats them up, like today what the Chairman, Mr. Ghosh told, that Flipkart and Walmart are getting together, getting eaten up; so all startups, because they have the talent… this is the main point… how many people know how to assimilate cryptology, that is essential for Blockchain propagation? Very few, let me say. So therefore, if there is a startup who are confident in doing Blockchain, they will be taken up by people globally, because they is such a dearth of skilling. And therefore, it is very important to look at and encourage startups. This is a policy that the Govt of West Bengal is taking, and one of the ways in which we can encourage is to create hackathons.

Last year's hackathon, we had certain topics, and one of the topics was fintech. It's another matter that nobody really reached the top mark… they couldn't be awarded, the jury did not consider them to be good enough, but that's not the point. We want people to think of how to use Blockchains in fintech and other emerging technologies. This year's hackathon, we are tying up with the National Payment Corporation of India, which is having an all-India hackathon contest on fintech, and we are tying up our own Bengalathon with them. The only objective is to encourage people to come in. You'll get a prize money, recognition, a prize and a certificate from a minister – ok, very good. But the main point is, one person or one group is getting, thousands are thinking and trying for it – that is how we create a pool of talent, a pool of believers, a pool of people who can do something that can change the society.

So encouraging startups and talent for Propel India, for fintech, for smart contracts, for across-the-border trade, and for stopping crime – for all these we need to encourage fintech and Blockchains. In Bengal, in Kolkata too we are having a center. In 2012, Hon. Chief Minister Mamata Banerjee… she had just assumed office a year back – and she inaugurated the financial hub in Rajarhat New Town. And today, there are 23 financial institutions, public sector and private sector, Bandhan Bank included. So they have taken up plots… it's coming up slowly; recently we have taken a decision that a part of that would be dedicated to fintech.

So if we want to build up a fintech society, we are having a cluster approach in Rajarhat New Town, in financial hub, where already 23 banks and insurance companies are working, where there are lots of talent – you'll see Amazon today, Google today is placing their future openings in places where there are good universities; because you need talent, you need those professors who won't came up. So in the fintech hub, we have the second campus of Presidency University, Alia University, Amity University, St. Xavier's University, and not very far, in Katakol, is the ISI, Indian Statistical Institute, who already have center of excellence on Cryptology and encryption, which is the base of Blockchain.

So we are very hopeful that the fintech hub in New Town Kolkata, surrounded as it is by financial institutions, by educational institutions, will become a real future growth point for the whole state and the whole country. I will end by saying that, very lately, Hon. Chief Minister has announced on the floor of the Assembly that there will be a Bengal Silicon Hub in New Town Kolkata. Already 100-acre plot of land has been earmarked, and the focus will be on emerging technologies, innovation, and research and development in areas we are very strong at. So I am very hopeful, the govt is very hopeful that today or tomorrow, for fintech and Blockchain, Bengal will emerge as a nodal point for further development. Thank you.

➢ **Mr. Tamal Bandyopadhyay**, **Consulting Editor, Mint and Adviser –Strategy, Bandhan Bank:**

Thank you for outlining the state govt's plan to encourage Blockchain, use of Blockchain and technology. It is also very refreshingly different because many years ago, we used to talk about big industries coming to Bengal and all, but now you spoke about encouraging startups – very different. And if I remove your name and people don't know who is talking and which geography, people might think it's one govt official in Telengana and Hyderabad is speaking, not a Bengal IAS. So, very different.

So once again I'll just give you a contrary view – many of us believe that machine can do everything, we don't need human beings to do the job. Who's responsible for this? The first Terminator movie in the 1980s – that was the first time we spoke about something called sentient machine which could do everything. Even before that, in 1957, US Navy developed an artificial intelligence called 'Perceptron'. And when they had a press conference, the New York Times wrote that US Navy expected this machine will walk, talk, see and write. This is 1957, and now we are talking about 2018 – nothing has happened. So always it's a bit overhyped.

So a machine cannot do everything, and even if machine takes away some jobs, actually because of this, there are new jobs also being created. I'll give you 3 examples how in the new environment, when Blockchain technology and robotics come, new jobs are created. This is done … all of you have heard of Mr. Tim Cook who is Apple CEO. In 2016, he tweeted, saying that about 86 billion dollars will be earned by 2017 by a new set of professionals called App Developers. That job was not there a few years back – so that's the job newly created. Similarly, job of data scientists, the job of bio statisticians – we never heard of these, but as we progress, these are the new set of jobs being continuously created.

Now all of us are waiting to hear Mr. Bhaskar Pramanik; again he is sort of synonymous with technology in India – Former Microsoft Chairman, and now Member of the Board, SBI, India's largest lender, and one of the world's top 50 banks. Welcome for your keynote address.

➢ **Mr. Bhaskar Pramanik, Former Chairman, Microsoft India and Member of the Board, SBI :**

Thank you. I was trying to figure out what should be the best approach, and I thought that talking about technology would not perhaps be the best use of your time and also my time. And what I thought I'd do today is to divide my speech into 3 sections. The first is really to talk about banking. I've been on the Board of SBI now for about 9 months, and I can tell you it's been a fascinating experience. I moved from what I think is the most unregulated industry to the most regulated industry and into what I would consider the perfect storm. All of you just have to pick up any financial newspaper and you can understand the kind of crisis that banks are going through at the present moment. All for the good, as it means that we're going to have a bright future ahead, but it's very tumultuous times. So I wanted to share my experiences and what I've learnt during these last 9 months; and the reason I'm going to do that is because a lot of what has happened could perhaps have been avoided if there were better use of technology.

Now again, technology is becoming something which should not really be what engineers and technologists and science students should be familiar with. Frankly, technology is something which every CEO, every

Chairman should be aware of – not in terms of the intricacies with which it works, but for them to be able to imagine how the business should be run. And I was just sharing with Mr. Ghosh that I've had the opportunity to spend some time with Aditya Puri, Uday Kotak, Chanda Kochhar, Shikha Sharma, and also with Arundhuti from the State Bank of India; and each of them has an appreciation of technology, not from the perspective of what that technology is, and how fashionable it is to adopt that technology, but from the perspective of what they want to do for their customers. And what I'd like to do is to share with you 3 tips in terms of how you should look at technology, not necessarily for financial services for the banking industry, but across any industry, and I'll share that with you. And finally I'll dive into Blockchain. There's a lot of myths about Blockchain, there's a lot of great things which you can do with it, there's a lot which is happening here in India, and I'll share some of that with you. But I also want to talk about when you should not use Blockchain – I think it's important to understand that.

So let's start with the banking industry and what I've learnt. If you think about banks today, they haven't evolved very much beyond the moneylender in a village. The difference however, is that you have regulators, you have global markets, you have lots of intermediaries, and you have governments which are also involved especially if you happen to be a public sector bank. In fact SBI is run by the SBI Act which is an Act of Parliament, so SBI has actually has multiple bosses who tell them what they can or can't do. So banking has become a lot more complex, but the basic principle is the same in terms of how the business is managed and run.

So I believe that fundamentally that has to change, and technology can help change that. What I appreciate about what Mr. Ghosh has done is that he's taken his clientele which used to be the rural people and he's given them hope. He has financially empowered them, and to me that is the role of a bank. So to me, SBI is not about creating financial products, nor is it about making profits on a quarterly basis or return of assets. Their basic vision as a company should be to financially empower every individual and every organization in India. That's their mission, and that's their vision. And then they need to figure out how to go about doing it.

Now SBI has actually done a reasonably good job, and let me give you some statistics. They have over 400 million customers or accounts. Now just think about it – that is more than Airtel plus Reliance put together in terms of subscribers. Don't think of them as accounts, think of them as subscribers. Just imagine what would happen if you could delight those accounts or subscribers so that they use SBI not just twice in a month or thrice in a month but they constantly interact with SBI for all its financial products and services to empower them for everything they do, whether you're a housewife, a small or medium enterprise – how can you interact – that's the dream, that's the goal, that's where technology can help.

The second thing about SBI is its reach. It's got 25 thousand branches, 50 thousand ATMs, and 650 thousand point of sale terminals. It operates not just in India, but in 20-30 countries across the globe. So therefore it's massive; it's got multiple channels; and if you look at its balance sheet, it's one-fourth of India's GDP – it's huge. When I joined this company, I had a big problem, because the unit of measurement is 'lakh crores' – nothing smaller than that; every number there on the balance sheet says 'lakh crores' on the top. It's in rupees, so it's much smaller than my previous company… Microsoft was a hundred billion dollar company

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and its market cap is 733 billion dollars – it's the third most valuable company in the world today. But the point is if you look at the size, the reach, the transaction intensity of SBI, it's huge. So this is where technology has to play an important role.

But technology for technology's sake is not of much use, and therefore it's important for SBI as well as other banks to focus on what are their priorities. And if I look at the banking industry today, I would believe that the top 4 priorities for any bank would be: Number 1 – risk management. Credit and risk management is number 1; and you can understand why it's important, because if you look at all the challenges which the banking industry is facing today, it's really basically because of the wrong decisions which were taken close to 10 years ago in terms of the loans which were provided. It's a lot more than that; it's also basically got to do with do with govt policy, a whole bunch of things which have happened in terms of auctions, prices which were paid, and that's resulted in this kind of a mess. But credit and risk management going forward is going to become important. You know, I really thank Raghuram Rajan. When we think of Raghuram Rajan, the Governor of the RBI, we always think of him as the guy who solved inflation in India, who refused to reduce the interest rates, because he was worried about inflation. Well, we should give him credit for this new policy of the RBI which is focusing, not on the profitability, auditing banks for profitability, but for risk management. And they're doing a phenomenal job; and this is going to bring about a huge change not just in the banking system, but also the industry. Industry in the past always used to believe that if I fail, I would go back, do another deal with the bank, get them to take a haircut, and go back and re-invest; and now thanks to the govt, the RBI, the DFS, and the banking system, which has now said, no more is that going to happen. But going forward, what do we do that we don't have those problems, and technology can play a big role.

The second is in terms of growth. How are we going to grow the business? Because you've seen the growth figures – consumer lending is growing at a massive pace; but if you look at the enterprise or the commercial, it's not growing at that pace. And therefore that's a big concern for bankers, especially like SBI, who are lending to enterprise customers.

And then finally if you also look at the net interest margins, they are also declining, so there have to be other ways in which you can charge customers for services which are of great value to them.

And then the third area would really be in what I would call looking at the PNL of the companies, because if you look at banks, there's lots of scope for further efficiency, for cost reduction, and I think they are looking at how they can make that happen.

And finally … there are many others… there's human capital, asset management … but I don't want to cover those… but the fourth one, which I think is really concerning a lot of banks, is the structure of the banking industry, which is because now there's so many different players. So you got the traditional banks, which are highly regulated; then you got the NBFCs which are regulated to some extent; then we've heard about fintechs; fintechs are interesting, because what they do is that they go and look at the value chain, and find out where, in that value chain there is the maximum profit, and where there is maximum customer dissatisfaction, and that's where they apply technology.

Now you can ask yourself this question: why don't the large banks do that? They're starting to apply that. They're looking for customer dissatisfaction, and then they're going and finding out how they can solve that before somebody else takes that business. So fintechs are there. Then you start looking at venture capitalists. The banking industry has never given much money to startups. Why? Because they still work on the principle that they need a physical collateral. And startups are not about physical collateral – they're about IP – Intellectual Property. Now this is not just unique to India – this happened in the US, and that's why VCs came to the fore, and now that same thing is repeating here. So is there a way that banks can start lending to software companies, to technology companies, to IP; and it's not necessarily software – it could be pharmaceutical, it could be many new areas. If you look at the US economy, it is growing because of the knowledge-based industries. And if banks can't fund those, then who will? Then you create another set of people who will do that, like the VCs.

And then finally there's another set of companies which are into what was traditionally being done by banks, and that is private equity; because now with all the stressed companies, these private equity companies are actually buying into that, and they are actually investing in all that.

So I think this is the structure of industry, private equity banks are not allowed to do that; in fact private equity companies borrow from the banks and then go and give it to … reconstruct the company, and then once the company's constructed, they sell it and make more money than the banks actually do. So that's the other priority, and again, how can technology be used to do that.

So one of the things I wanted to share with you as a tip is that basically, technology can only do 3 things, and you need to understand what those 3 things are and define them with much greater clarity. Number 1 is about improving customer outcomes; number 2 is about risk mitigation, and number 3 is about cost reduction. This is typically what anything you want to do in terms of outcomes can be classified under. In most banks, IT projects are focused on 4 areas; it's about empowering your employees, engaging with your customers, optimizing your business or transforming business. Empowering employees is about productivity, analytics for better decision-making, mobility, virtual reality, augmented reality for training, engaging with customers, chat bots, internet and digital banking, CRM. Optimizing business is about CBS integration, data warehousing, cyber security, loan management. And transforming business is digital banking… SBI has an application called YONO – 'You Only Need One' application… trade finance using Blockchain; this is all about creating new customers, and also about creating and marketing new products.

Now you also have to understand that technology, the challenge here is that you appropriate use of technology to solve the problems you want to solve for. If you have a pressing problem for today, please do not use future technology, please use today's technology. It takes a long time to use future technology to solve today's problem. If you've got a problem for tomorrow, like growth, you should still use today's technology. It's only when you want to look at transformation that you should look at future technology, because future technology can help you, but you have to change your business model, otherwise you won't get the benefit.

So let's talk about Blockchain… Blockchain is a technology which can be used for reducing risk and improving customer outcomes in many areas of business, including financial services. At its core, Blockchain is a secure, shared, distributed ledger. It has a new shared data structure where banks can record transactions and work together to validate updates. Smart contracts act as a shared tool to govern changes to the underlying ledger in accordance to pre-agreed rules or terms. This concept of a distributed ledger and Blockchain was invented by the people who invented the Bitcoin. It is what is called a permission-less Blockchain. What we use in industry, because of the underlying regulatory requirements and contracts, is called the permission-led Blockchain. Even today, if you look at Bitcoins and mining, the speed at which you can operate Blockchains is only 7 transactions per minute, which cannot work in normal trade, finance, or any other business applications; you need transaction speeds to be much larger. This is one of the limiting factors.

So if you look at what Blockchain is not, number one is, it's not a single thing. So don't look at Blockchain and say – this is a piece of technology, I can buy it, I can licence this, I can put it in. Blockchain is actually an interesting mix of technologies; it includes hashchain mix blocks, distributed computing, algorithms, encryption and more. So be careful when you decide you want to go into Blockchain – it's not very simple.

Another common misconception in the Blockchain is it's not another form of distributed or encrypted database – it is not that. So therefore a lot of people believe that, being a distributed ledger which everyone has a copy of, and it's a shared database and everything is ok – that's exactly what it's not. In fact, you can solve a distributed database problem much more simply with current technology.

Now the financial services industry is fundamentally about facilitating the trusted exchange of value between multiple untrusting parties. Brokering that trust is an enormous responsibility and carries significant risk, which is why the industry has become increasingly reliant on costly intermediaries, manual processes, and error-prone reconciliations. So if you think about what happened in the Nirav Modi case, this is exactly what has happened. The Nirav Modi case is also interesting because if it had been a completely manual system with no SWIFT involvement, tech most probably would have caught it. But having this hybrid where something is computerized and something is not, my belief is, is worse than if you didn't have anything at all. So Blockchain can actually solve this, and I'm surprised that SWIFT hasn't introduced it already, because Blockchain would actually have caught it; it's a completely automated system where all the contracts, and checks and balances and security would have been in place.

So one other thing about Blockchain is that Blockchain adds accountability, reliability, and universal transparency; and on the internet, it is the only technology which has a payment layer - and that is critical, because most of the time you're going to use Blockchain is when there are some form of payments required.

I wanted to talk about some of the challenges – and one of the challenges of Blockchain technology is, it requires an understanding at a fundamental level of all aspects of security, law, value exchange, decentralized governments, process and commercial architecture. It therefore implies that traditional lines of business and organizational silos can no longer operate under the historical structures. This is one of the reasons that Gartner recently published a document that basically said that very few companies, that only 1% of CIOs

indicated any kind of Blockchain adoption within their organization, and only 8% of CIOs were in short-term planning or active experimentation with Blockchain. Now, SBI has been in the forefront in experimenting with Blockchain technologies, and they have at least 5 or 6 different projects which are ongoing; one of them is in coalition with a number of other different banks.

So I just want to close with one line: I strongly believe that banks charter should change; they should be focused on empowering the individuals and the organization – the key word is empowerment, and all technology, when you look at Blockchain, look at it from the perspective of who you are empowering and how you are going to do it differently from what is done today. Thank you.

> **Mr. Tamal Bandyopadhyay**, **Consulting Editor, Mint and Adviser –Strategy, Bandhan Bank:**

Thank you for going beyond Blockchain and giving us the larger landscape of Indian banking scenario, what's happening. Now requesting Mr. Ambarish Dasgupta for his special address.

> **Mr. Ambarish Dasgupta, Former President, The Bengal Chamber of Commerce and Industry and Senior Partner and Founder, Intueri Consulting LLB and Advisor to IT&E Department, Government of West Bengal :**

Good morning. The topic I have been given today is not directly linked to Blockchain, but extremely contextual. Bengal's potentialities for the ASEAN countries, and the digital scene in the ASEAN countries has an extremely contextual relevance to today's world, and why so? As all of you must have been watching the news yesterday on TV… the US sanctioning on Iran… and there are, like that, multiple happenings. It seems like today, in this world, the confluence of multiple unpredictable happenings being driven by multiple unpredictable personalities who are now controlling the world; it's making the whole world, at this time, a very high-pitched dramatic movie, with twists and turns every day. So from an imposition of tariff to an imposition of a sanction to the showering of bullets on a nation… it looks like a very high-pitched dramatic movie which can take a twist or turn at any time. In fact I think that the readership or viewership of the whole world happenings today is possibly much more than even the local happenings of a panchayat election or a Karnataka state election, because it's so interesting to see today that what these unpredictable characters in the world will be up to next.

While the world moves through these kinds of journeys, the business, the economy, the trading, the prosperity of the people cannot of course wait, because we still have to prosper. We still have to do our work, produce our goods, do our business – it has to continue. So there is a role which the economists will have to play, a role which the businesses will still have to play, and we have to chart out a path amidst these turbulences which the world today goes through. In this context, I must appreciate that the BCC&I, for the last one and a half year, has been extremely focused, aligning to the global happenings, to the studying diligently of the ASEAN and the SAARC nations' economy. And while this has been going on for the last 1 year, the entire thing actually took a turn, the attention got diverted towards the ASEAN and the SAARC nations or far east countries in the 2017 beginning, when we first heard about these TPP and the withdrawal of the US from the

TPP, and then there is the Trans-Pacific Pact, and then thereafter redefinition of the TPP… China wanting to say that we will be redefining the TPP… or then we started to hear about multiple other trade agreements coming into the picture to make the ASEAN economy prosper as a block.

Also at this point in time, there were reports published from World Bank, a subject called global value chain… they published one in 2016 and one in 2017 – it was also pretty contextual, and to some extent, coincidental, while the movement was happening to the ASEAN economy, that they published a report like that, where they mentioned that there are cluster of countries, a huge block of countries, which are not actually at the point of innovation of a product. I don't mean IT product – I mean product like a car or any other consumable thing… or they are not even at the point of consuming of that product. But these countries, they did not innovate, and they do not consume also. There is a huge number of countries. But they play a very important role within the path that traverses from the point of innovation to the point of consumption. And therefore they said that the GDP of the world, which we consider as the aggregation of the GDPs of the countries, is actually to some extent, if not misleading, but an incompletely leading information about the countries' contribution to the world's economy; and why did they say so? Because they felt that these countries who are playing a role in this entire global value chain, may not be having a significant proportion of GDP compared to the world's GDP or a percentage of the world's GDP; but the value addition that these countries are doing in one product, if they suddenly, due to poverty or any other political happening, crumble, then the entire value chain of that product will crumble, like a major car or any other major consumable, or a medicine; and if that happens suddenly, then this will be a huge impact on the GDP as well. So therefore the GDPs of the country is not always giving the right information, it is the value addition that these countries are doing.

And in that report, they also mention, it is observed that the emerging economies, both from the African side or the LATAM, and particularly on the ASEAN economy, that the major league, which we all know, are playing a very heavy role as a cluster in these, not so much contributing to the GDP, but contributing to the gross value addition of the world. And in that there was an interesting observation also – though we are seeing many countries playing a role here, but there is a propensity or tendency of some countries in that cluster to gradually fall behind, and not to play a very significant role any more in that value chain, and increasingly, they may get marginalized. The reason that was given was that these countries, while they are playing on the cost of their skills or on the cost of their production, lessening it and therefore playing an important role in that, they are also suffering from a major non-tariff barrier, and this non-tariff barrier was coming from the inefficiency of the production, inefficiency of the logistical handling, and inefficiency due to the bureaucratic procedures of clearances, custom formalities, and the various red-tapism in those countries, and therefore they felt that it is important that these countries play a significant role in enhancing their production efficiency, reducing their non-tariff barrier, and bringing more predictability into the non-tariff barrier costs.

At this point, when BCC&I and my organization being aligned to that kind of thing, since we work in the strategy space and more on the international expansion policy, we met many representatives of these countries – Vietnam, Malaysia, Cambodia sent delegations, teams to those countries also, and figured out that while the report says something, but sometimes we have a dismissive attitude about a report also saying that

those are all theoretical reports produced by these regulatory bodies, but interestingly when we started meeting these countries' representatives by being there or by talking to the consulates or those companies originating from there, we figured out that they are completely echoing that sentiment. They are saying that since there is an opportunity that has come to us right now to grasp the economic leading position, we just do not want to lose it. And therefore we just want to release the combinatorial effect of the entire technology – the cloud, the mobility, the industry 4.0, the AI, the Blockchain, everything that is available to really leapfrog into a state where our efficiency cannot be questioned, where our cost of production cannot be questioned, and where we are extremely sustainable in maintaining this; and they also mentioned, we do not have skills – because if we really want to now produce these products, if we really want to produce architects or designers or developers to take us into this industry 4.0 or Blockchain, how to streamline our crossborder agreements, how to make our preferential trade agreements being impacted… we do not have those skills. And therefore we are also not wanting to depend so much on the western front, because of the situations and unpredictability factors, also not so much on the Middle Eastern organizations, who may be also well advanced in technology. And therefore we would like to have something coming up in this part of the world, and preferably India, having these skills, having this potential, having served the world with this kind of technology, maybe to the western world but not to us, and can therefore India play a very big role in moving these ASEAN absorption of the technology up?

At this point in time, there was a Forrester report which was also published… that corroborated the fact that what kind of growth these 13-14 countries will be having in an IT consumption… like 5-8% of growth, mind-boggling number like some 268 billion dollars of consumption justifying the amount of market which exists there, and that market is crying because of the lack of skills, and that market wants some, nearby, in the close vicinity, some kind of a delivery center, development center, some skillsets and something coming up very quickly. Recently Mr. Ghosh led a team to Bangladesh also – the same situation out there, though Bangladesh did not feature in that study that they did about these ASEAN countries, but it's no different, maybe much lesser in volume, but the need was like all the banks really asking for the entire automation that the bank can have, but the Bangladesh banks or the Bangladesh skills do not really give them that conviction, they want something to happen close by.

And when we analyzed the situation, and the BCC&I also analyzed the situation because they did it as a project of 'Act East', and they focused on the IT part of that 'Act East' with the linkages, and analyzed the various trade agreements and analyzed the positional advantage and multiple things, they figured out that though the entire east coast of ours is conducive to produce that, but more so in Bengal, because of multiple reasons – our cultural proximity, our geographical proximity, our habits, our practices, is very similar than taking it from the west coast or from other states into the east coast. And therefore there was a strong need for Bengal to establish itself, maybe jointly with Bangladesh, to cater to this entire ASEAN side. And therefore when we discussed this, and the govt also that the formation of the joint ventures with these ASEAN countries companies, the formation of training institutes here, the CIO's workshop move and penetrate and deepen our position into these ASEAN countries is what we found out would be extremely beneficial for Bengal to flourish as a Bengal Silicon Valley with a focus on these ASEAN.

I may also say for the Bengalis out here, who know that yesterday was "Ponchishey Baishakh", Rabindranath's birthday, so it may not be wrong to remember him in this context also, though it may sound surprising that how a digital and Blockchain can bring Rabindranath here… in 1916, when he first made his visit to Japan – then after that of course, he made 4-5 visits – he wrote this book, letters and anecdotes of his Japan trip… he was the first gentleman who actually proposed to Japan to have this pan Asian movement – he of course did not have digital in mind at that time, but he felt that because of our quietness, our sublimity, our patience, our cultural heritage, our passion for the arts, he felt that we should not be solely moving to the western imperialism, and we should be having a pan Asian movement coming up. And maybe 102 years later, BCC&I is paying their homage to Kabiguru by having a digital pan Asian movement coming up. Thank you.

> **Mr. Tamal Bandyopadhyay**, **Consulting Editor, Mint and Adviser –Strategy, Bandhan Bank:**

Thank you. Now the vote of thanks by Mr. Debasis Basu… before that, I am just tempted to spend 30 seconds… all of us have been talking about big data, even though these 2 words have not been discussed… but do you have any idea how big is the big data? I'm just talking about one report of IDC, it's a leading market intelligence firm – in 2014, it estimated big data is, at that year, 4.4 zeta bytes… and it's doubling every year, and by 2020, that's 2 years down the line, we have 44 zeta bytes. Now what is a zeta byte, any idea? 1 zeta byte is actually 1 trillion gigabytes… and what is 1 GB – roughly 250 songs, 5 min each. So 250 songs multiplied by 5, that's 1 GB; 1 trillion GB makes one zeta byte; and by 2020, we will have 44 zeta bytes. That's the big data analysis.

> **Mr. Debasis Basu, Co-Chairperson, IT Committee, The Bengal Chamber of Commerce and Industry:**

As we come to the end of this inaugural session, it's my privilege to give the formal vote of thanks. It is with the support and cooperation of the stakeholders that we every year embark on the Business IT Conclave, which is the signature event of the IT Committee of BCC&I. This is the 9th edition, and given the topic, I think it is going to be exciting for the next couple of hours, and post-lunch session.

Our heartfelt thanks go to the Information Technology & Electronics Dept, Govt of WB for partnering with us in this endeavor. The Chamber's vision is to be a key partner to commerce, industry, academia, professionals, and the govt, and by organizing such events, we provide the platform to explore the next gen of technology innovations that's happening across the globe. And I think this event will generate enough excitement amongst the folks who are going to participate through the day. I would like to thank Mr. Debashis Sen, Additional Chief Secretary, Department of IT & E, Government of West Bengal for taking time from his busy schedule; I would like to thank Mr. Bhaskar Pramanik for his very enriching lecture and bringing some very diverse perspectives; I would also like to thank Mr. Tamal Bandyopadhyay for anchoring this session. Thanks to all the speakers and panelists for the subsequent sessions whose contribution is going to add to the thought leadership and going to be the key essence for the event. Special thanks to our sponsors, Sector V, our media friends, the audience.

[PRESENTATION OF MEMENTOES]

➢ **Ms. Angana Guha Roy Chowdhury , Deputy Director, The Bengal Chamber of Commerce and Industry:**

From the IT Committee, The Bengal Chamber, we plan to work on the verticals on which IT has major impact – fintech is one such. In March, we organized Healthtech, and as a precursor to Healthtech, we organized Health Hack, which was an innovation competition in healthcare. We had around 30 entries, 8 finalists were chosen by our jury panel, there was an official tabulator, and today we will be felicitating the 4 best innovators, and 1 student category.

The best student category was 'Fall safe device for elderly people'; I'll request the team to please come up to the dais for the trophy and certificates.

The 2nd runner-up was a presentation on 3D for development, it was on prosthetics.

The 1st runner-up was an innovation on connected lightweight devices for examination of blood and urine.

And the winning team was portable olfactory diabetic detection device.

We move on to the next session, the Lead Session – Landscape & Legal Modalities. The session will be chaired by Mr. S Radhakrishnan, Former President, BCC&I. We have with us Mr. Vivek Belgavi, Partner, India FS Tech and FinTech Leader, PWC, he will be speaking on 'Mapping the expansion of Fintech with realistic demand of Indian Financial Infrastructure'; we have Mr. Souvik Das, Senior Solution Advisor: Evangelist for Digital Transformation, SAP – he will speak on The Da Vinci Code of Innovation with intelligent ERP - Business with Purpose; Mr. Diptiman Dasgupta and Mr Debojyoti Das, who are the co-founders of Bengal Blockchain Believers; Mr. Xavier Kuriyan, Director - Solutions and Alliances, Global Compute and Network, India, Dell – he'll be speaking on 'Blockchain, Fintech and beyond'; and we have Mr. Prashant Mali, Cyber Law Expert, Bombay High Court, who'll bring the legal perspective on Techno-Legal aspects of Smart Contracts, Cryptocurrencies & Global Trends.

➢ **Mr. S Radhakrishnan, Former President, The Bengal Chamber of Commerce and Industry:**

Welcome to this Lead Session – Landscape & Legal Modalities. As we had a lot of discussion on the Blockchain and fintech, and as I'm not an expert, I'm not in favor of giving a big lecture on that subject now… so I will straightaway invite the speakers to present their subject.

I would now request Mr. Vivek Belgavi, Partner, India FS Tech and FinTech Leader, PWC, to speak on 'Mapping the expansion of Fintech with realistic demand of Indian Financial Infrastructure'.

➢ **Mr. Vivek Belgavi, Partner, India FS Tech and FinTech Leader, PricewaterhouseCoopers Private Limited:**

Thank you. So I'll tell the story in 3 chapters: Chapter 1 – why are fintechs expanding; Chapter 2 – where are they expanding; Chapter 3 – what are the challenges and opportunities linked to the phenomena.

So first with regards to why they are expanding, I'll start with a small… for me when I got into this space around 3 years back, and when I start looking at literature around it, I stumbled upon this strategy professor named Clayton Christensen, which during my B-school days we were taught Porter, no one spoke about Clayton, and in retrospect, I feel he is the most relevant strategy professor to cover disruption as an area; and I'll start with a small anecdote about how he went about it.

So he wanted to study disruption, and he wanted to study disruption in industries and markets… and it's a very tough project, because if you take an industry like an auto industry, it takes almost 50-60 years before disruption happens, right? And if you're studying something, you need something, almost like a lab experiment, which you can study in a small period of time. If you remember genetics, it was formed by studying fruitflies, because they have a 1-day life cycle. So what he figured out was, what was the fruitfly equivalent of an industry; and he was studying in 1980s… so he found out that the semiconductor industry, at that point in time, was in that space, especially linked to hard drives, because that was the era when we were moving from mainframes to PCs… so within 10-year period that he studied, more than 100 companies in a 10-year period attained the No. 1 position in that industry. So it was in such a flux, it was a perfect industry for him to study. For me, that's the context… and he was studying as to why disruption happens.

So the primary reason he arrived at was that the disruption happens because the incumbents in that industry assume certain segments to be unprofitable – they don't play in that segment. IBM during those early 80s didn't feel that creating small hard drives was profitable… not IBM… IBM was more of a consumer of hard drives… but the organizations, the leaders who were making large hard drives … they didn't get into smaller ones because there was no demand for it. But there were people who took bet there, made it affordable to get into that space, and that kind of contributed to the PC evolution to happen, so that's the corollary there.

If I draw the corollary to financial services, and take the case of something like wallets, before the whole wallet licenses and PayTMs of the world evolved, for last 20 years nothing was stopping incumbent banks from launching their wallets. They had all the licenses, all the technology – it was just not deemed profitable. Why would you go and give a wallet to someone, why would you go acquire a merchant, where is the money to be made… no one could solve for it. So that was one reason where… now fintechs, based on differentiated technology models, can make it profitable, they can monetize data better - that is one reason why it's expanding.

Second reason it's expanding is latent market demand. While we talk about a lot of statistics, very realistically speaking, when you talk about financial inclusion in India… and I ask this question in this audience – how many of us feel that they have got reasonable relevant wealth management advisory? No one? This is the

market demand. All of us need relevant wealth advice – this is just a case in point. All of us need credit when we need it as a case in point. The penetration of loans, mutual funds, insurance in India – everything is in single digits, so that 90% of the opportunity left is the opportunity which can be tapped, and that's the second reason why we think fintechs are growing.

The 3rd interesting reason… and we had done a survey along with Yes Bank recently, called I-form, and we started looking at… the 3rd drive was talent… and intuitively people said, in India we don't have too much talent for fintech. But then we started really casting a kind of net wide, and we said… and if I take the case of Kolkata, how many technology companies are based out of Kolkata who are running global financial services, support or business out of Kolkata? There would be a fair amount of them. They are people who understand financial services, they understand technology. How many financial institutions are based out of India, between ops and tech teams, or even business and product teams, who understand technology? There's a large pool sitting there. Now we are 3-5 years into this cycle, there's also a large pool sitting within fintech, the big ones who have made it, the likes of PayTM or Mobikwik or Freecharge… they have made it fairly big. And they will start spawning off their own mini startups after that. So the talent access in India is also something which is very high. So these are the 3 reasons I believe it's expanding.

The next question, where are they expanding? What are the opportunity areas for them? So at PWC globally we do an annual fintech survey, which has a 1000-plus participants including incumbents, including startups, including the technology companies, the GAFA – the Google, Apple, Facebook, Amazons of the world … and when we looked at the India cut, we found 3 areas where the opportunities are growing. One, which is very obvious to all of us, which is digital payments; and in my view we have just cracked the Level 1 automation of digital payments in terms of a wallet or in terms of a BHIM or a UPI infrastructure. There is still a hugely underpenetrated offline payment section. If I just walk out of this hotel, all the shops there should be accepting digital payments, should be making it easy to accept digital payments – there is a whole offline merchant adoption which is still pending.

The second area where we're seeing a lot of traction is alternative lending, and this is an interesting story… I live in Mumbai, in Bandra… there is a main market there called the Bandra Bazar, and every suburb would have similar such bazaars… and I was talking to this guy who sells utensils, and he has the same shop which has been there for the last 20 years. But in last 5 years, 60% of his sales, now he is doing to either an Amazon or Flipkart. He has a shop, he does his retail sales… but 60% of his sales he is supplying to one of these e-commerce vendors. Now what does it really mean? If you went to the same shop 5 years back, the probability that you will get an accurate financial inventory of that shop would be very very low, and no institution would lend to them. But now because he is moving 60% business online, now we have a view of his GMV online, and the likes of Capital Float, Lendingkart, have come riding on top of it to say – can we look at his transaction data, assess his business potential, and start lending it against that? So invoice-backed financing is a theme which has picked up, as an example of alternative lending. The same thing is happening on the retail space – there is a startup called MoneyTap which basically has an app, it will use a lot of variables on your mobile and

say that, for an unsecured line of credit being both the tenure as well as a value as well as a credit worthiness for the end customer.

The 3rd area... which especially since I am in Kolkata speaking at a BCC&I event, and we have a lot of technology as well as engineering talent in West Bengal, and this 3rd theme is very relevant, which gets missed out... all these are business areas... there are also new age technology products and platforms which are emerging in this fintech world. These platforms are cloud native platforms, these platforms have AI and ML baked into it, and they're in different areas.

I'll take one example of this startup which has gone to series C round of funding... it's called Credit Vidya – so they have built a platform and model which specializes in alternative credit scoring. They have APIs which can, for example, run on mobile phones of all of us, and just based on what they see on the mobile phone, on the kind of apps you have... whether you use English language apps vs native language apps, whether you use games vs this... they start creating a digital score and profile, and link it back to credit-worthiness. As a case in point, amiability – how amiable or socially connected a person is, has a high correlation with credit-worthiness. So if you find the person is more socially connected, the probability that he is more credit-worthy would be high. And I think it's a very important move for a country like India, where less than 5% people truly have a credit credit score. So how do we give lending to other persons? How do we give lending to a shopkeeper whom we engage with on a daily basis, who we know is trustworthy, but doesn't have enough financial records? So we will have to resort to some of these alternative scoring models; and there are these product platforms now emerging who will do this; these guys are not B2C companies... these are B2B companies, their platforms are being bought by banks, insurers, and fintechs themselves. So the new-age product space is again a very very viable space which can't be ignored.

Coming to the last section, what are the challenges? I think there are 3 challenges – I'm going to pick a little bit of offbeat challenges here – one challenge I feel is sustaining behavioural change, something like a demonetization plus a digital payment push; during that moment it really created a lot of adoption, but what happened after that – as soon as the cash came back in the ecosystem, people started going back to cash. So sustaining a behavioural change... like Google Tez is another favorite example of mine... just in last 5 months, it has already overtaken PayTM in terms of UPI transactions, which is phenomenal, for a technology company to enter into this space in India, and overtake an incumbent, that too an aggressive incumbent like that, is impressive. But can they sustain it? Are people using it because they really want to have adopted it? Or is it because they're getting discounts and rebates and they'll just move back to cash as soon as the rebates are over – it's still a question mark.

The 2nd challenge is market access. Unfortunately every segment in India, including a segment like banking and financial services is heavily fragmented. We have 20 thousand-plus banking-like institutions in India, if I count all big and small accounting and financial institutions... it's a very fragmented market. Very few parts of the world have such a fragmented ecosystem, and I'm saying this at a banking level. Now if your market is SMEs, we have 50 million SMEs in India. Now if you are a startup, how would you access them? And many of them are not online – you need to have channels to access them. So fragmented market access becomes a

challenge. I have been working very closely with many of these fintechs for the last 3 years, and I feel that they scale to a certain stage and then they stagnate. And only a few people like PayTM who get a lot of funding can move on to the next stage and the next stage after that, but for many people, scaling after a point becomes a challenge.

The 3rd is sustained funding access. Now when we look at the fintech ecosystem, we say you get talent, you get market access, you get funds, you can do a lot. Now, with funding access as well, the challenge we see is, there's always a pressure to monetize very quickly. We were running a program for Nomura very recently, and I looked at a few startups from Israel, and they were spending 18 months on their product before monetizing it. In India, within 6 months as soon as you deliver a product, this whole urge to go hit the market and start making money is very high. So no one is sticking with the product or platform to make it better and better. And as soon as you get into the services space, the product focus goes away. So those are the top 3 challenges that I see.

On the infra side, I'll just mention that probably we have the best infra available anywhere in the world- between Aadhar-based e-KYC authentications, marrying it to the India's tag which is UPI-plus model, it is the most democratized and easy-access infrastructure possible. So on the core infra, I think we are doing quite well. And it is going to get improved, with UPI 2.0, with BBPS being launched further, with the new Aadhar e-KYC norms being in place, etc, it's just going to get better. So infra is going to be… the classic infra in terms of internet access plus rails, I think that's going to be easier; but the 3 things I mentioned are what we have to surmount for. Thank you.

> **Mr. S Radhakrishnan, Former President, The Bengal Chamber of Commerce and Industry:**

I now request Mr. Souvik Das, Senior Solution Advisor: Evangelist for Digital Transformation, SAP to speak on The Da Vinci Code of Innovation with intelligent ERP - Business with Purpose.

> **Mr. Souvik Das, Senior Solution Advisor: Evangelist for Digital Transformation, SAP :**

Thank you. Why the title of the topic… I am just focusing on the purpose. Purpose drives business growth. It improves business performances, it builds customer relations, and engages employees. And it also engages the business value – it helps you to create a business brand value. It is also critical for the investors. Now if you just see some of the numbers that we are throwing up on the purpose, if you are focussing on the purpose, then it can increase your sales by almost 20%. It can boost the employee morale, and it can lower the turnover. We as SAP are working on different solutions which will help and protect the environment by delivering solutions that address the need for sustainable energy, and on the responsible development side of it. That's SAP, and we had started the journey decades ago.

So when the whole session is being focusing on what is Blockchain and how it's been helping the industry, the overall session which I will be focussing on is primarily what are the things that have been happening in the world in terms of Blockchain, and how SAP can help you on that particular journey.

Now let's see some of the numbers in terms of Blockchain… if you see, by 2025, Blockchain is supposed to create $176 billion value addition on the overall economy. And it will grow to a $3.1 trillion by 2030. So this is a huge dollar value that we're talking about. If you see some of the numbers in Blockchain right now, whatever is going on, so life science is one of the primary sectors where the Blockchain will be a key impact driver. So 83% of the life sciences companies in the next 5 years are working to do something in the Blockchain space. Similarly if you see, there are over 1.4 billion investments that has made over past 3 years, and at SAP we are also committed on the hyper ledger area to work on the standard solutions which will be coming up.

Though I know that this overall session is focussing on the fintech area, but just to give you a perspective that this Blockchain, it's a very evolving technology, and it is not only impacting Blockchain as a financial services – there are other areas which will be impacted by Blockchain as well; especially, for example, in the supply chain in the foreign aid, in the institutional aid in different countries. So I will speak on 2 different industries where Blockchain is going to have a significant difference. One is definitely on the foreign aid section – so where there will be a transfer of the money from the donors, and whenever you are receiving at the backend of the actual recipient, the whole system can be tracked as a Blockchain sequence. There are multiple companies who are working on this – just to name a few of these… for eg, Alice – this is a UK-based organization who are working on bringing a transparency to the social funding. Similarly there is another company called Bankqueue – they are doing pilots in Kenya where digital identity process has been developed on Blockchain. These are the live POCs which are happening in today's world right now with this kind of innovative technology. Now these are the industry practices where the industries are going ahead and doing this kind of transactions. Let's see what we have done in this kind of area.

So if you see, we have already experimented on the Blockchain for a pretty long ago. Recently in the last year we have done a Blockchain study between the SAP and ATB which is a Canada-based bank. So we have done the multi-country transactions which used to take multiple days to transfer money from one country to another country; we have done a POC involving Ripple which is an open-source platform, and we have done that in 20 seconds using this innovative technology. This is still a nascent stage – these are already evolving areas that we are working on, and this will definitely be one of the focus areas for SAP in the near future.

If we talk about the recent days when every organization is focusing on digitization, on transformation as a journey, as per Gartner's IT roadmap, there are 2 phases of it – so one phase where you are focusing on running the business as it is so that you do not face any huge losses, and the second part of it is doing the innovation. So Blockchain or internet of things and everything in the related areas, these are the innovation part, where you have to grow, you have to do certain kind of innovations with a already existing platform, so that if you want to fail, you can fail fast, and it should not have any impact on your overall processes, whatever you are running on your existing business. As in the previous sessions the speakers have already pointed that if you are going to do something apart from innovation, you have to focus on your existing technology; and if you are to do something on the innovation part of it, then you have to focus on the next generation technology. So that's how we are bringing the 2 different aspects of it into a single solution.

So if you just consider about the inside infinite loop model that we have come up with, in that loop we have both the solutions will be in place. So first solution which will take care of your existing landscapes, existing processes, where you do your finances, where you do your purchases, and inventory, all those things will be taken care of… and on top of that we are bringing you the Da Vinci Code of Innovation, which is called SAP Leonardo. So in SAP Leonardo we are giving you the platforms through which you can do the innovations. We are already giving you a certain base platforms ready for the developers and customers to work on those solutions and bring innovation much faster. I will share some light how we are going to do that in the near future, what's the roadmap from our side and how we are going to help on the Blockchain area.

So if you think about what could be the value diverse for a Blockchain, or if you are thinking about doing an innovation project within your own organization to have a Blockchain variness, then typically the Blockchains will have a multi-party ledger. So if you are thinking about, say where you have the only organizations who are involved, then probably that is not a case for a Blockchain. If you are thinking about distribution of ledger across different companies or groups, then probably that is a test case or test POC element for a Blockchain. Also Blockchain brings another part of it which is the time and cost reduction – and how it does… it basically removes the intermediaries. So if you have any use case based on this kind of factors, it will be helpful to consider them as Blockchain innovation projects within your organizations.

Transparency and auditability are the built-in trust factor in Blockchain is paramount. So you cannot basically change a block. Every block has a hash already built on top of that. So it already contains the previous history of the whole blocks. So if you are talking about 10-15 different organizations creating blocks of 1000 or 10,000 blocks on a regular basis, and if you change 1 single block, that means everybody in the node will be notified about that, that there will be a change happening. So it is almost impossible at the present technology to hack a Blockchain. And the risk and fraud minimization if you are looking for these kind of solutions based on your industry practices, that will be another area which will be a good value driver to explore on the Blockchain space.

Now coming on to that, what are the use cases SAP has already worked on? These are a couple of use cases where we have already started working on and done POC, in multiple different industries – it's not relevant only for fintech, but these are industries… for eg, we have done it on the public sector. If time permits, I'll show you a video in south Taiwan where we have done a Blockchain POC with the govt in the public sector, and how the digitization, the overall process is happening there. Then we have also worked on the transportation in the landing for the shipping companies. We have done the digital twin in asset management areas. So these are all part of our Leonardo assets, and on top of that we are building the POCs which is very specific for different industries.

Now being the use cases we have already done for different industries or different LOBs – let's talk about what we are doing in a Blockchain per se. So we are one of the premium members for the hyper ledger, and we are also part of the founding member for the Blockchain Research Institute. We are also working on different open-source groups who are actively involved in the Blockchain space, so that we can get the firsthand information about the Blockchain and how it's shaping up the whole chain. Below if you see, we are

member of Alastria which is a European-based group. They are focusing on bringing together different telecom providers, energy companies, public sectors for smart city projects together. We are collaborating with Alastria so that we can also have a Blockchain space in Europe – this is primarily focusing on Europe; and the BITA – Blockchain in Trucking Alliances – so this will also help us to understand the transportation industry in a better way on the Blockchain space.

Now if we go to the Vision part of it, and right now how the technology stack you are working on, every organization is working on, and how it will be transformed into the next technology stack... innovation doesn't happen in isolation, it's always linked with customer situations or established processes which you are working on. So if you see, in Blockchain, this is not a single technological stack – you have to understand that there are multiple different technologies which will be available in the overall landscape. And we cannot consider SAP as only a technology vendor working in a Blockchain space. So that's why our innovation is happening right now on the cloud platform. In the cloud it's very easy for us to collaborate with different technology stack and different technology platforms, and integrate them all together, so that we can bring the value of Blockchains. We have already created Blockchain as a service which I will introduce in the next slide... just to give you information what we are doing in the Blockchain space in 2018 and beyond.

So if you see here, one of the enabling layers here is the technical integration aspect, which ... there are different connectivity between the participants where the Blockchain will play a major role. So how we have defined this in the Blockchain as a service and the Blockchain nodes, that will be integrated not only with the cloud solutions, but we are also trying to bring them together as optimized solutions as well. So this will be the innovation across companies in the cross-organizations with the help of the open-face APIs that we are being developed right now and we will be exposing it to the world to consume them.

Now taking cue from the previous slide, what we are positioning as platforms on the Blockchain, we are giving you 2 things to work on to our customers. One is the hyper ledger and the multichain. If you see on the below side, there are 6 blocks which is part of the Leonardo stack, Blockchain is one of that – and apart from the Blockchain there will be other factors as well. So if you want to explore in conjunction with Blockchain something else, then that is the technology platform you should be considering. In SAP... the customer still thinks SAP is an ERP organizations which are doing value addition in terms of the base skill solutions or the business process innovations on the core side of it.

But just to give you an information that we have an organization inside SAP, which is called 'SAP Startup Focus'. It started around 2012, and we have around 300 validated solutions where different startups – not SAP... we are actually helping startups in funding, giving our technology, our space, mentoring them to work on the solutions in the new age space; because the new age space right now is changing so fast, for a company like SAP, it's too difficult to go and do everything. So we are depending on the partners in terms of the startup focus... we are bringing them on to our table to give them whatever solutions are relevant for them. So there are almost 6500+ startups from 58-60 different countries working on these solutions in actual different areas; it's not only Blockchain, you talk about any innovations, and they are working on that. For eg, if you are talking about IOT, machine learning, fraud detections, from each and every space we are doing that together,

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and we are bringing the POCs in place. So I will request all of you to explore this – the Startup Focus page is already available as a public domain site… if you need any further information, you can go there and look for it.

So these are all new-age things which are happening on the cloud platform, and there are different technology vendors working here as well. Just to give you an example which is not relevant for Blockchain, but for eg, Technolium is one of our vendors in the Startup Focus, and they are working on the smart utility on the utilities space. So they have developed something on the solar energy cases, and how the businesses can optimize the solar energy based on the grid values on the forecasting of the weather data; on those there are the solutions which are already available. So there are multiple solutions which are already validated by SAP available on the platform, so I request you to have a look on that.

Just to bring a closure… this is very close to my heart, I am a diehard Ferrari fan… if you consider F1 race, you cannot win F1 race just by a driver, even if you are the best driver in the world, still you cannot win if your pitstop strategy is not happen properly. For a pitstop strategy to be executed properly, you need somebody who can help you to do the tyre change… or if you have already dented your front wing then change it… so SAP as a technology provider, we will be helping the driver, which is the customer, to bring that innovations with you. I'll just show you a video and close my presentation.

[VIDEO PLAYS]

This is basically a Blockchain project happening in South Tyrol as a POC, where the citizens of south Tyrol are working on multiple forms… if they go to any govt, for eg, even if we talk about Kolkata, and if we go to any different organizations, any different govt projects, you have to fill up different forms. The same thing is happening in South Tyrol as well. So to eliminate that kind of a process and bring back the transparency and the faster processes in terms of a govt regulations, they are working on a Blockchain, all the information, whichever needs to be captured, is available right now; this is a case study which has been working on with SAP and South Tyrol right now as a POC, and we will be having this kind of different cases in different industries as well. Thank you.

> **Mr. S Radhakrishnan, Former President, The Bengal Chamber of Commerce and Industry:**

I now request Mr. Diptiman Dasgupta and Mr Debojyoti Das, who are the co-founders of Bengal Blockchain Believers… on how close to the ground it is in business landscape.

> **Mr. Diptiman Dasgupta, Bengal Blockchain Believers**:

Thank you… I am an IT executive in IBM, and with me is my colleague Mr Debojyoti Das, a senior IT architect in IBM. So today we are here not as IBM… because you know that in Blockchain world, IBM has done a significant contribution – I think one of the pioneers in contribution. And there are many industry solutions, many innovative solutions that are coming out of IBM in regards to Blockchain. But we will not speak about IBM Solutions today, but rather a more interesting thing.

I'm not going through any technical slides… but just to think through the very basics, if we are to take away from the Blockchain, 4 things to remember: the shared ledger, being the shared repository distributed ledger; smart contract being the rules of business; privacy is one of the pioneering things in the Blockchain; and the consensus, which is the most beautiful thing in the Blockchain… the consensus mechanism. So 4 principles are key - any Blockchain solution based on which all the use cases today are standing on top of that.

Now, how it is helping? It is helping to reduce the time, reducing the fraud, it is coming up with the business model, and one more interesting thing I would like to say – we have seen that business drives the technology, in many of the cases, business is fundamental, and as an architect, we come up with the technical solutions. But Blockchain is a case where technology drives the business, because many of the existing business models of today, that is already getting changed tomorrow, because of Blockchain – because Blockchain is giving us a new way of thinking, transparency, traceability, and the fraud-freeness. All these are the fundamental principles on top of which all the Blockchain solutions are standing. Because you know the problem – today if I go for 1 second beyond the financial industry, the meat problem and all those things which are happening, that is one of the fundamental things that we can solve using the Blockchain – a food trust chain or the food trust solution that IBM has already come up with – that is one of the pioneering solutions in this area. So there are many avenues coming up where this can be applied.

Now I would request Debojyoti to speak… basically 2 things we'll cover today: one is a very simple example on the trade finance or microfinance, where Blockchain has a widespread penetration and can be done… and second is our community, what Mr. Sen already told about, the Bengal Blockchain solutions. So this is an experimental thing beyond our day job in IBM, that how technologies, communities can change a lot, impact a lot, because Blockchain being the new thing, a lot of people must be aware and knowing about this technology, and public communities can play a big role in this whole ecosystem. So Deb will speak about trade finance.

➢ **Mr. Souvik Das, Senior Solution Advisor: Evangelist for Digital Transformation, SAP :**

Thank you. I think we have spoken a lot about Blockchain… so what I would tell you is a story… many of you would know the history of Blockchain. Back in 2008 there was a guy called Satoshi Nakamoto who wrote a paper, and that's where the revolution started. And the whole fundamental revolution that he wanted to do is disrupt the financial institutes primarily, and there is a huge background to that. You know the story that happened with the fintechs in 2008.

Now that we are doing a session titled 'Fintech riding on Blockchain' itself tells you that from 2008 to 2018, there is a revolution already; because when Bitcoin was invented, it was primarily to disrupt the financial institutes. And now the fintechs are the ones embracing Blockchain with both hands. So that's where you can relate where this revolution has gone in these 10 years, and it's going to go much far. That's what we believe, and with that belief we started a journey called 'Bengal Blockchain Believer', which we will talk about later… but as Diptiman requested me to talk about what is going round in the world and in India about trade finance or fintech… so trade finance is one of the examples that has somehow become really popular, and a lot of
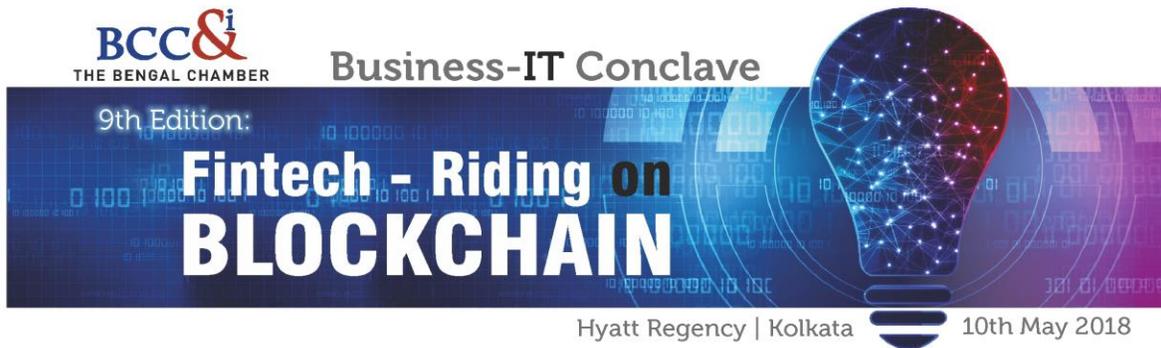
banks across the globe are trying to build platforms for trade finance on Blockchain. For eg, here I have posted 2 examples where you can see the names of global major financial institutes, and primarily banks are joining hands in a consortium, which is probably a new thing for them; so they are all coming together in a consortium and trying to help their customer on a trusted platform.

Now trust is the primary important thing when it comes to Blockchain. We have discussed earlier that how we are producing more and more data… trillions of data. Now the question is, we started our IT journey with systems of records, and then we moved on to system of engagement – that's where we started generating loads of data. Now today if you go to any social networking platform, you get to see a lot of data – but who certifies that the data is correct? So you will probably see that 90% data is not completely trustworthy. Now we are moving towards a system of trust, and that's where Blockchain plays a major role. Now more and more we adopt technology, more and more we generate data – there has to be something that will actually help you trust the data, or that certify data for you. So at a very high level, Blockchain kind of creates a backbone which gives a particular platform of exchanging data with a mass, to come up with a trusted model. So that's what Blockchain actually brings behind the scene.

As you can see, the major global banks are already adapting Blockchain; and then if you look at one of our Indian banks, and I know this morning we spoke about SBI, and I brought this up because this recently came into the news, that ICICI bank is doing a trade finance thing, and they already have 250 players with them… so they are building an ecosystem for trade finance in India. So India is not far.

So the topic we have been asked for, about how close to reality is Blockchain… so all these things I'm displaying in this slide are real. This 'we.trade', you can Google it and find out all these banks have already made it real; the project Batavia which is led by the UBS, another bank… it's already on the verge of being real; so the technology has actually matured. I heard someone calling Blockchain as being in infancy… I wouldn't really agree, the technology has matured enough. Yes, it has a long journey to cover, but it has significant amount of maturity at this point in time so that it can be made real for business.

So at this point I'll again hand over to Diptiman to give you the Bengal Blockchain Believers story, how it all started, and where it is currently.

> **Mr. Diptiman Dasgupta, Bengal Blockchain Believers**:

This is a story of November. So we being IBM-ers, and actively engaged in Blockchain… day and night we work on Blockchain on many of the solutions and customer journeys. So one day we thought why don't we create… Blockchain being such a unique technical topic… why don't we create a public community in the Facebook community … and basically this subject is so less known… so if Bengal tomorrow thinks about Blockchain, there must be a widespread impact, it should not be a closed door technology… it should not be within a certain set of people so the technology will not flourish.

So we thought about creating a public community, and we started adding some of our friends, and nearbys…and in this way the whole thing started. Everyone then came forward and started promoting this

technology. Today if you join this community, you will find hundreds of use cases posted there...everyday I think there are 23 active countries are participating now, with 1200 members so far. So we thought, if this community is creating so much impact, buzz, knowledge creation... because community can place a huge knowledge creation in the whole ecosystem; if tomorrow you want to go in the Blockchain journey for Bengal, there must be a widespread knowledge... may not be everything or everyone is matured, but there is a student section, there are govt officials, there are a lot of other professionals – like Mr. Sen said... a set of chartered accountants – they came forward, they wanted to think about the startup post our event.

So in this way, this technology which has so widespread impact across all professions, all kinds of business, then all people should also know the basics of it, should know where this can be applied. That's why day by day it got increased, people started joining, and we started doing a lot of programs joined with NASSCOM – so NASSCOM gave us the platform to spread the Blockchain message, to tell the Blockchain story, not only in Bengal, but also in Orissa. In Bhubaneswar we did the session in Feb...and we planned that if Blockchain is giving so much buzz and we need to move ahead in this journey, why don't we create such a big event in Bengal itself? So Mr. Sen came forward, he gave us all the funds, and we had a massive program last month in New Town Convention Center with a full day Blockchain workshop... approximately 500 people joined there.

So this is the journey – we started our foundation in Nov-Dec timeframe, and then genesis we did... we have a longer roadmap, we are not going to stop – because the more we want to create impact, the more people should be inclusive in the whole ecosystem. Then only it can be a perfect community where both consumer and the producer there, where we want the investors to join in, where we want startup mentors should join in... so that is already there. So whole ecosystem can only grow if it has a platform to collaborate. That's our mission which we will take forward; and probably we are heading towards a global Blockchain congress hopefully, we are planning that... and probably in Dec, after InfoComm or something, we are planning that mega event joined with the Govt of WB, maybe joined with NASSCOM, that is not yet decided. But we will continue our journey... through our this public community, which is not yet established foundation... that is probably we cannot do being a part of IBM... but we'll continue the journey where we want more people to join, learn, and spread the message of Blockchain, then only whole ecosystem can uplift. Thanks.

➢ **Mr. S Radhakrishnan, Former President, The Bengal Chamber of Commerce and Industry:**

I now request Mr. Xavier Kuriyan, Director - Solutions and Alliances, Global Compute and Network, India, Dell to give his speech.

➢ **Mr. Xavier Kuriyan, Director - Solutions and Alliances, Global Compute and Network, India, Dell:**

Thank you. I'll give you a perspective as to where we think Blockchain is going. Now it's not just Blockchain... there are 2 technologies that we believe can change the world – one is AI and its entire tree; the other is Blockchain, and I'll give you an idea why first.

Business-IT Conclave
9th Edition:
Fintech – Riding on BLOCKCHAIN
Hyatt Regency | Kolkata   10th May 2018
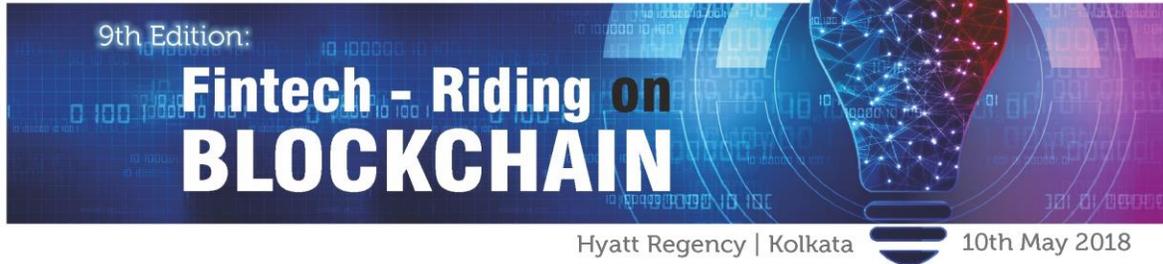
Remember the video that's been doing the rounds on social media about what Google did with an AI, I'd say passing the Turing test? Now a statement that was made over there, that caught my eye, was the reason why it was done. Because it made life easier. One of the things that took a lot of time was this... which is why we went and did it – is what Sundar Pichai said. That's what these 2 technologies largely have in common. Now AI is going to take a lot of the mundane out of our lives... it's going to get an appointment, it turns on my lights at home, it makes sure that my heater comes on and off in the morning – all of those mundane tasks that we were used to doing... and AI today already does... a lot of it is already done by devices sitting at home that run timers; if you wake up and motion is detected, it automatically switches on your coffee machine, your heater – and a lot of those things already exist today. What Blockchain is going to do is revolutionize the way we do a lot of the businesses today. And I'm going to take this in 2 perspectives – nothing is going to make a radical change until it is widely adopted. Now, I cannot think of an industry today which doesn't have some project on Blockchain, and I'll give you a few examples.

There's a company we're working with in China that's doing shipping logistics. You wouldn't think that shipping logistics is complicated, right? Container goes on board, ship carries it to point B, offloads it, container terminal takes over, it goes to a trucking company, trucking company transfers it to carrier number 2, goes to port number 2... a typical container from point A to point B changes hands 16 times – that's the global average. Now if it changes hands 16 times, who has the inventory of the container... who has all the details of the container? Does anyone have an idea of how it's done today? A sheaf of papers changes hands. Or in the more advanced world, there's a nice sticker that's stuck on to the container, or an RF tag is put on a container; it's not the most conducive way of doing things ... shipper A doesn't want to tell shipper B what's in the container ideally. A shipping agent doesn't want to tell the trucking company that carries from the ship to the container terminus what's in the container; he only wants to give information about weight, category... there are different shipping categories, that category is mandatory... and there are about 10 fields that need to be given to the trucker. Imagine this happening on a Blockchain, and that's what a company in China has done. A single chain that every member of this container's journey has access to... and has access to only the fields that he needs to know... where the customer – the person who's shipped it and the person who's going to receive the container has access to the exact point where that container is throughout the journey.

Dell EMC as a company is a massive logistics company. If you look at India alone, we sell a few lakh notebooks a month. Logistics has a huge part to play in how Blockchain is going to develop. That's just logistics. Look at the medical field. How many of you have gone to a doctor and carried a file to a specialist? All of us have. Imagine a Blockchain that had your data, that the doctor that you're going to go to has access to the data that's relevant to him. When you go to a lab, the lab updates that data into your chain. You have access to it, a doctor you give rights to access it has access to it. That's coming. That's a startup in India that's working on it... and all those compliances to make sure that data is private. In the logistics field, in the medical field, there are massive uses of Blockchain.

The same technology is being used in the financial world. Souvik talked about cross-border transfers; we've talked about credit scoring and ratings; there's a ton of use cases that I can think of where a Blockchain is the
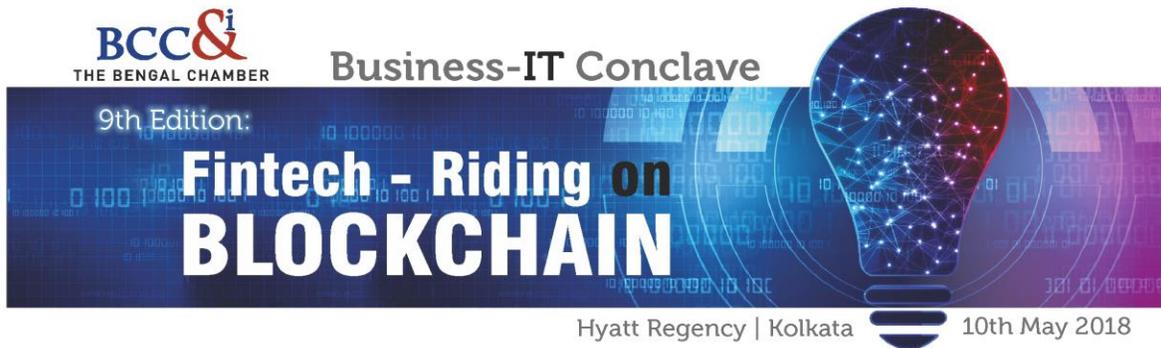
ideal way to store and transfer this data. And that's what's going to promote the development of Blockchain. The fact that every industry be it logistics, the medical field, manufacturing, banking, every one of these verticals is going to contribute in some amount to the development of the Blockchain technology.

Now where is this all going – which is what I wanted to talk about. Are we going to see a world where everything resides in one chain? Unlikely – the world's too big for that. Where this is going… and already work has started with many of our partners, is in personalized chains – chains that are personal to people. So you and everything that you need, is associated with a single chain – which means that multiple chains are going to talk to each other. It's not going to be a world where it's going to be one transaction or institute or person talking to another in the case of Blockchain. It's going to be me, as Xavier Kurien, having access to my medical records, to my shipping manifest that Amazon is sending me, having access to something I ordered from Alibaba, from Flipkart… having access to my wallet… and all of it aggregating on me, which I have access to. Personalizing chains is the next evolution of where we see this going.

Now, a lot of people ask me what you are doing in this, and I'm not going to stand here and say that Dell EMC is going to be the one to lead this charge. The people leading this charge are the small startups that are in the back alleys of the world today, that are doing cutting-edge stuff in how this technology is going to develop. Any one heard of the Bank Chain? Small company in Pune. Anyone's heard of Locomoto? Small companies… Locomoto is 8 people right now, and they're doing cutting-edge stuff as far as how logistics and supply chain works on a Blockchain. That's the world that's going to lead the development of the technology, and that's the ecosystem that we are supporting.

Dell Technologies as a conglomeration of businesses is pretty big, and there is a lot of work that we are doing in it as well. But the biggest value add that we're doing is, I believe, bringing these people together, and that's what's going to change the world as far as development of this technology goes. VMware is doing some amount of work on the byzantine algorithm. There's some amount of work being done by Pivotal… multi chain aggregation. We're obviously in it for the platform, and the cloud platform on which a lot of this runs – but it's not just about Dell EMC. What we're more interested in is bringing together the ecosystem, so that we can work with the people that are leading that charge. I run those alliances for Dell in India – I'd be very interested to talk to anybody that is doing cutting-edge work, and I'd be happy to introduce them to others that are doing that kind of cutting-edge work, so that they can compare notes. Thank you.

> **Mr. S Radhakrishnan, Former President, The Bengal Chamber of Commerce and Industry:**

I now invite Mr. Prashant Mali, Cyber Law Expert, Bombay High Court, to speak.

> **Mr. Prashant Mali, Cyber Law Expert, Bombay High Court :**

So when you have the only solution as hammer – you always see all the problems as nails. So many of the Blockchainers always try to see that everything in the world can be fixed by a Blockchain. So I'm going to try and tell you what are the nuances and legal positions there in the Blockchain world or the cryptocurrencies world, so that your Blockchain doesn't end up in becoming BC.

Business-IT Conclave

9th Edition:
Fintech – Riding on BLOCKCHAIN

Hyatt Regency | Kolkata   10th May 2018

BCC&i
THE BENGAL CHAMBER

To begin with, as earlier speakers have told you about – smart contracts. Now to understand smart contracts, let's first understand what is a normal contract. Normal contract, according to Indian Contract Act, requires 5 things. One is a valid offer, valid acceptance, lawful object, valid consent, and there needs to be what is called consideration of the money, which is to be paid. When it comes to smart contracts, we don't have what is called as valid consent, because consent gets approved, according to IT Act, by digital signature. And when it is Blockchain, the signature is of its own – the hash code which is being generated. So if we need this Blockchain journey to go further, we need certain regulations to change. In US, I know of 3 states, including Nevada, they have a law in place, which recognizes smart contracts made out of Blockchains or used for businesses. In India we don't have that regulation as of date. Most important is, the spinoff of Blockchain today that is important is cryptocurrencies. So let's try and understand what the law has to say about cryptocurrencies, and then you can tell me, is it the right legal framework we are standing on?

So if you look at 2H of FEMA… FEMA is the Foreign Exchange Management Act of 1999… it says: currency includes currency notes, postal notes, postal orders, money orders, letters of credit, credit cards, blah blah… but there is no mention of any cryptocurrency; and it says: as may be notified by Reserve Bank. So Reserve Bank has not notified any cryptocurrency as of date. Dec 24th 2013 – RBI comes and says: the creation trading or usage of virtual currencies including Bitcoins as a medium for payment are not authorized. It was nailed down on Feb 2017 when there was a press release, and furthered by our Finance Minister; Nov 30th he said that govt position is clear – we don't recognize this as legal currency as of now. And on 1st Feb, they said they'll take all measures to eliminate use of crypto assets in finance and making it a financing illegitimate activity as a part of payment systems. Thereafter there were a lot of income tax surveys, and so that actually made the cryptocurrencies scenario grim in India.

Now, what you should take away is, what are the risks here? Digital currencies currently being an … or always being an electronic format, will always be prone to risk of hacking. Then there are umpteen amounts of frauds which are going on. So we need a legal framework to arrest this fraud. I had a case where there was a Ponzi schemer who actually was marketing an MLM scheme, and he was saying to commoners… he was having Bitcoins made out of golden paper, and people were fooled thinking it was Bitcoin… and you invest in this and we'll give you 10% return per month. Luckily we had our economic offence officers sitting through the whole presentation of MLM where we could arrest them, and these Ponzi schemes are growing in rural areas of India as I speak. So there has to be awareness about these currencies being built in.

So lack of any authorized central agencies to regulate the payment or redress grievances – now the problem is, people who are invested in Bitcoins have no place to go, because we don't have legal frameworks. If we have legal frameworks, just imagine the case. You have a typical case that you have 10 Bitcoins which have been stolen. You go to the police. Police does a good investigation and find the Bitcoin thief. Now they want to confiscate these 10 Bitcoins. Where are they going to keep? Does Home Dept of West Bengal have an official Bitcoin wallet to keep? They don't have. Tomorrow if police goes further and makes an SOP and has a Bitcoin or cryptocurrency wallet, do the courts have it? Because if you want that 10 Bitcoin back, then you have to file a Return of Property case, and take those back. Courts don't have it … how are you going to store the Bitcoins?

Would you store it in the wallet of a police inspector... would you trust it? There has been a case in Gujarat where the police inspector kept it in his own wallet and he sold it off and became rich. So this is the current legal scenario. Exchanges are now located in various parts of this world – how does law enforcement go and bring them under our purview? It's also a law enforcement issue.

Taking my subject to illicit trade, illegal trading... so terrorists being financed... so that becomes an issue. So what is the law's stand? Are Bitcoins goods? So if you read the Sale of Goods Act, in Sec 4 it says clearly that the transfer of the property in goods is for price, it's not for barter; so you give something and you get goods, because right now Bitcoins can be used as barter, so Sale of Goods Act doesn't act. So what came next? SEBI... some people created a ruckus in the media... they say – make it as a commodity... so SEBI said, you make it as commodity, we'll take it under control; because in US, it is commodity, it is under the Exchange Board or equivalent there in US... but govt has not declared it as commodity. So ultimately it leads on to what is Bitcoin's lines of code? And what does lines of code means... you'll find the definition in Copyright Act... lines of code means computer program. So that is the current legal stand right now in our country of Bitcoins or cryptocurrency.

So these are the issues which ... if they get tackled... I'm not a pessimist, I consult a lot of Blockchainers or cryptocurrency guys... legal framework has to be established in consent with govt. Many of the advantages of Blockchain were shown; one was privacy. You as Indian citizens please think to your conscience – does govt want to give you privacy? Every govt... will they think that you keep everything hiding and don't show me? They will never do. No sovereign power wants to give you privacy... they will bring some law or act... snooping will be there. So if there is too much of privacy, govt is never going to be approving of it. So you need to give some carrot to the govt.

Two – cryptocurrencies has, as of date, no power in the hands of govt. That's its beauty... but govt is not going to approve unless govt has some tie in it. In Singapore you can pay taxes also. In certain parts of US states, you can pay taxes, do govt transactions using cryptocurrencies... there has to be valid legal framework. So some organized bodies have to pressurize from lobby groups, advise Govt of India to bring some legislation which governs this whole framework around Blockchain, smart contracts... first of all, the definition of smart contracts... it is not a contract at all... it may be called as an agreement between 2 persons... you really can't call it a contract... Doesn't have the limits of a contract, so how do you recognize it, as per your Indian Contract Act... then everything gets valid. No company is going to invest in future until and unless it is legally safe – there is no legal risk getting involved. There are so many startups working around this with novel ideas, but with legal base if they do it, I think it would be used to the greater cause of humanity and mankind. Thank you.

➢ **Mr. S Radhakrishnan, Former President, The Bengal Chamber of Commerce and Industry:**

Thank you.

➢ **Ms. Angana Guha Roy Chowdhury, Deputy Director, The Bengal Chamber of Commerce and Industry:**

We are moving on to the next session – the CIOs' Forum: Blockchain and AI transforming BFSI. The session moderator is Mr. Leslie D'Monte, Technology Editor, Mint. We have with us Mr. Jimeet Modi, CEO & Founder, SAMCO Securities & StockNote; Mr. Suresh A Shan, Global CIO, Mahindra & Mahindra Financial Services Limited; and Mr. Hemant Adarkar, CTO Digital Venture, The Nainital Bank Ltd.

➢ **Mr. Leslie D'Monte, Technology Editor, Mint:**

Good afternoon. We'll have a quick discussion… you've heard a lot of speakers speak on Blockchain… we thought of expanding the scope a little to AI and Blockchain. Now you'll probably be wondering why. The reason is very simple – because most of you on the dais feel that implementations of Blockchain in India, especially in the fintech sector, are not the large scale ones. These are like in their pilot stages, their experimental stages. So we'll try to give you some kind of insights into what the panelists feel about this. But the fact remains that if you remember that way back in 1994, Bill Gates said that banking would be needed, but the banks themselves would not. I think that was quite a telling statement at that point in time… he made a prediction. Amitabh Kant also kept reiterating this, and at a recent conference, he said that you will see the death of physical banks, because the costs are enormous. Using smartphones, each of us will be a walking ATM by 2020.

Now, you may agree with these statements, you may disagree… that's a matter of perspective… not necessarily all of it based on data… but the fact remains… I think it won't be an exaggeration to say that the fintech sector is clearly experiencing what is known as an Uber moment or an Air bnb moment; and the reasons are very simple… because the new entrants and the disruptors who are not traditional players – just look at them… names that we have probably never even thought of – Google, Apple, Facebook, Amazon, Microsoft, Netflix. Now, today, for eg, you have Google Tez, a payment mechanism, you have Apple Pay, Samsung Pay, Paypal… the govt's own BHIM coupled with the united payments interface, the UPI… you have instant messages… I think some of you have already started. How many of you do payments on Whatsapp? Then you have the JAM Trinity… and you have banks that are using a lot of AI, automation, robotics, chatbots. You also have them using augmented reality and virtual reality – mind you, these are very futuristic technologies given the fintech sector, but yes, some are experimenting with that.

But yes, we have a lot of focus on Blockchain today – the reason as I said – we have expanded the scope to AI and Blockchain, because we wanted to understand where exactly are banks and the other associated players, whether it be a Mahindra & Mahindra financial services or a stock market player like Jimeet, who is a startup in algorithmic trading, the high frequency trading kind of stuff… we want to just get an idea about this. So let me start with Hemant. You say that Nainital Bank is basically .. you're working towards making it a digital-

only bank. But if you look at the current scenario, where exactly are you when we talk about these newer terms like AI, Blockchain... the whole AI suite of technologies which include machine learning, deep learning, NLP, etc?

➢ **Mr Hemant Adarkar, CTO Digital Venture, The Nainital Bank Ltd:**

Basically a bank cannot look at technologies for the sake of technologies – you know the technologies must be used for solving a problem... I'm solving the problems of you know, trying to make this cashless and digital economy, which our govt keeps talking about. So first of all, we must have problems ... then there are use cases for all these technologies. And of course big data, AI... there are very clearcut use cases in banking financial services and insurance sectors, but we haven't yet really got serious use cases in the Blockchain. But definitely from an AI perspective, you people can see that how not only AI, but machine learning, where you make the computer systems become richer and richer and more precise by giving them proper data. And then deep learning – how do you give very personalized services to your customers? But we can clearly see in some of these areas that there's going to be a positive ROI. But we are still at a worldwide experimental level.

➢ **Mr. Leslie D'Monte, Technology Editor, Mint:**

Thanks Hemant – I'll come to some specifics on what you are exactly doing in your bank, because that would give the audience also an idea as to what you are doing. But clearly I think, when we are talking about this whole thing of big data, there are 3 drivers of AI, as all of us would agree. One is the presence of sophisticated algorithms... huge amounts of data on which these algorithms can be trained upon; and of course the quality of data has to be good, which we will come to in a bit as far as the challenges are concerned; and third is the whole thing of how... the computing power, whether it is GPUs, TPUs or FPLGs – the Field Programmable Logic Gates. These are different technologies that are furthering the whole AI ecosystem.

So from Mahindra & Mahindra financial services' point of view, clearly you're not only into AI, but something that will warm the cockles of the heart in the audience is the fact that you're also experimenting with Blockchain. From a current point of view, just give us some idea of what exactly are you doing with these newer technologies – without getting into the challenges, just the opportunities.

➢ **Mr Suresh A Shan, Global CIO,Mahindra & Mahindra Financial Services Limited:**

Good afternoon. Mahindra & Mahindra has tied up with the suppliers – earlier we used to fund them, using SME... generally that takes 2-3 months where we have to verify all the records and try to fix it up how fast we can do it. Today after getting into this Blockchain model which we have bought from IBM... and the usage is how fast we can ensure that the documents are verified. So the 3-4 months has come dramatically to 5-6 days, and still we are trying to work upon how to make it more authentic and secure, so that the data can be used effectively across other things. When we do business bonding, the same ledgers and data are available for ICICI Bank and other banks, with NDFCs also... so when they try to use it as much as an information, it is trying to enable us to get it faster, second reliable, and security side, we are having an information which is already authenticated by a bank or a reputed finance fraternity, so we have something else which is already

re-used. When we try to interact with the customer also, customer has no need to produce that information every time, which is already available, which we can try to do … one, time and effort is taken out… even this security concept as much the data, whatever is given and cleared by a bank, which is allowed to use for somebody else who can also use the same weightage, get the credit faster.

➢ **Mr. Leslie D'Monte, Technology Editor, Mint:**

Thanks Suresh. Before getting into specifics, Jimeet, I'd like you to give us an understanding… you come in a slightly different space, that of the capital markets, the stock markets basically; and you're using a lot of AI and machine learning and deep learning, because you have humongous amounts of data to deal with. So could you give us an idea of what exactly you're doing now?

➢ **Mr Jimeet Modi, CEO & Founder, SAMCO Securities & StockNote:**

In terms of AI… as the panel we've spoken about how important data is… essentially data is the fuel for any AI system to operate efficiently. What we are doing in the stock market is that… the beauty is that we have huge data sets available in the stock markets for years, NASDAQ data is available for a very long time, the S&P 500 data is available since 1950s, the Sensex data is available since 1990s… and essentially what we've done is that we've integrated deep AI technology for pattern recognition. So essentially identifying what are the buying patterns, what are the selling patterns, how are trends in the markets playing out etc; and therefore having an efficient entry or exit point of time in line with how the trends of the market are operating. I think the entire AI technology stack allows us to do this far more efficiently, number 1; number 2, do it in a completely unemotional manner.

And what we are doing is that we are using the AI technology to churn the vast ocean of data that exists in the stock market and then present them as simple trading investment ideas, that are presented to investors and customers across India by a simple mobile app distribution platform. So that's what we are doing with our stock market platform at SAMCO. Also, speaking a little bit about Blockchain, and to add to why we never really sort of did a deep dive into the technology.

➢ **Mr. Leslie D'Monte, Technology Editor, Mint:**

I'll come to that, because that's from a point of view of why you have not implemented. But let's restrict ourselves to the opportunities first. Hemant, perhaps you could give us some specifics. Now, you've clearly, the way we've understood how banking was operating till even 3 years back, the conversations used to move around how we are implementing core banking. Suddenly then we move to how banking is being done on mobiles; then we said ok fine, how it is being done on smartwatches, today nobody talks about it, because certain technologies live, others don't see the light of day, or just die along the way. You have obviously moved up the chain into AI technology. But what exactly are you doing? What are the newer technologies and how is it helping the customer journeys, how is it helping the consumers?

➢ **Mr Hemant Adarkar, CTO Digital Venture, The Nainital Bank Ltd:**

So you know digital banking is a misnomer, a loosely used word basically providing 3 things to the customer – internet banking, mobile banking, and maybe a tab banking or even giving tabs to the branches. That was the definition of digital banking. But the real definition is that internally, the bank as an organization also should get digitized, in terms of digitizing its own internal processes. Many places you see that a bank has offered all these digital channels, but using physical ledgers to allow entry to lockers.

In addition, the internal communication of banks… a simple example like a temporary overdraft, where many times, a senior manager says – there's a temporary overdraft, and he forgets about it. Can I have a unified communication platform where even an 'OK' said over a phone by a senior manager, is digitally signed, that he's held responsible for the decision. Otherwise the junior office suffers for all this.

So there are so many existing technologies that can be used, apart from AI, as I said, ML, deep learning depends on the purity, the quality of data, which unfortunately in many Indian banks, we cannot really opine about. But there are some interesting things when Leslie comes to the future… but at the moment, trying to digitize the internal processes of a bank. Then using the modern UI UX to actually give a customer a proper journey… not just he wants to … you see many banks advertising today, that open an account in a few seconds… but even after he becomes my customer, can I disburse him a loan in half a minute? And these technologies exist today. You have lots of accounts opened, and then there are no transactions in it. But digital journey is not only at account opening, but it's through the entire life cycle of a customer interacting with the bank.

➢ **Mr. Leslie D'Monte, Technology Editor, Mint:**

Before I move to Suresh, I have a question for the audience. How many of you actually believe that these newer technologies like AI… Blockchain of course is still in its infancy… but let's talk about the AI suite of technologies… do you feel it has helped you as a consumer, has made banking speedier – or is there a perceptible difference in banking? So I think this is something all of us should take cognizance of, because when you ask a user bank, probably they will not even know that AI is there in their everyday world, whether it's being used, whether it's not reached etc.

So Suresh, I'd like you to throw some light on how, you know, the financial products, how have you enhanced the efficacy of financial products. What exactly is happening? Is it like – the speed of transactions have increased, it's reaching them in a speedier fashion, loans are being disbursed faster – what exactly is happening?

➢ **Mr. Suresh A Shan, Global CIO, Mahindra & Mahindra Financial Services Limited:**

To start with, business should have that demand, business should have that purpose of how AI, big data… suppose you take big data… when we started financing for customers who don't have even the residence address properly… means you don't have residence address captured what all the data available to support it

– so there we started plotting data using geo special, which will have an online-offline of the customer address, which is kept in our system. So keeping rural as a target where the customer doesn't have a home, where the address was not given properly or authenticated by a regulated system, we were able to create using geo special, and we were able to connect the customer using the geo special information. So while capturing the all information, earlier we thought we are supporting 4 million customers through 1500 locations… big data analytics gave to say, we are participating… means Mahindra Finance is available in more than 5.5 lakh villages where my 4 million customers are distributed. So the information comes to us to say, we are available in all the districts, and we are in those locations which is almost 5.5 million.

So take it from AI. AI is not like something which we are going to generally arrange out of our system. First we should have a demand statement – what to do, what information… even sometimes untapped information will guide you to get more information. So in our case, we had electronic pass machine given to all the executives – they have to go on-field and collect information to bring it back. We want to check whether those particular executives are on-field – we put something to connect a sensor. The sensor will check whether this guy is out… that time it's raining, just drizzling, or it's hot summer … that information got captured, and it was stored in the system. So when we started using that data beyond a point of time, we had enough data which gives the information about that location. So that location information we try to take it up, and project it on an India map… wherever it's raining, it'll have a green picture on that, wherever it's hot, it'll have a red picture on that. That same information is shared to group M&M… wherever it's raining, it has been instructed, why can't you use a live information so that you can sell tractors, and wherever it's hot sun, why can't you sell the pickups and jeeps of the other product.

So this information, initially somebody has to cook and give to them… meaning somebody projects and creates an information with some information. Today you have a live information, every 2 hours it is coming from the live field, which is available for the corporate group where they can use it for other purpose. So AI, big data … everything is a big jargon if you're using as a technology, but create a demand statement… like what business requires, what information you want. If rural, what are the failures today? To get a KYC, what are the information required from supporting– can we create through Blockchain… can we create that information so that customer gets the enjoyment?

Today if you see in the finance world, one side customers, the other side regulators, intermediary system is dealers, brokers, agents – they decide the technology. So this kind of startups, new innovation technology will remove that unwanted big system, so the customer can directly connect to financial using the regulators rule defined, and they are able to get the wow factor. So use as much as AI, again big data… relevance in terms of what we can do better so the customer service is empowered, and we are able to make a customer real wow factor… then this data supports a lot; and especially rural, where we don't have a lot of data in terms of his house, KYC… if you see biometrics, we think biometrics is just an authentic system… but when you go to a rural, before literacy, they use this money figure as much as information. So they know better than us what type of frauds can happen. So try to take that information from them, create a big system so that it has a knowledge management, so that we can go back to the people, share what all the states which we can create

using this technology, which is part of our culture, our value system, our people's information, which is going to matter a lot in terms of AI… it's not like we are going to buy a system from western and going to deploy and use it… we should bring as much as known epics, which is nothing but our culture, our value system, which is converted to digital, so that it enables us to empower customer to do business on time.

> **Mr. Leslie D'Monte, Technology Editor, Mint:**

Thanks Suresh. So the point you're making is that when the customer walks into a bank or a financial institution, he doesn't really know whether you're using AI or chat bot or Blockchain… and he may not even care. Corporate clients won't care, they will just be requirer. Hemant, could you also give us a couple of specific examples of how this is benefitting consumers, whether they are retail customers or corporate customers?

> **Mr. Hemant Adarkar**, **CTO Digital Venture, The Nainital Bank Ltd:**

As somebody in the audience said, we don't think that these things are reaching us… of course, in terms of the elite salaried upper-middle class, of course can use the chatbots made available to you by many private sector banks. So chatbot is one area… but they will not really take off in this country… he talked about Indianization so I meet lots of fintechs who come with xyz.ai… and they come to me saying we can develop a proper bot who can do your customer's journey through internet or mobile banking. But I said, do you have any Indian languages there in your bot? So I see a positive trend that Hinglish chatbots are bigger… and more than banking, there are some young people working on the capital markets, helping people to trade with all sorts of Hindi vocabulary. So unless there is some kind of localization of these technologies, also it'll not really reach the consumer. So there are efforts which are happening… and we are trying to create a digital bank mainly towards SMEs and rural India, and where we are looking at fintechs which are trying to help the customer journey through regional language bots.

> **Mr. Leslie D'Monte, Technology Editor, Mint:**

So probably the conversations are happening at 2 levels – this India and that India. Jimeet – stock markets… what is happening in that… a couple of examples, the specifics on how it is helping the aam junta kind of stuff, or corporate customers.

> **Mr Jimeet Modi, CEO & Founder, SAMCO Securities & StockNote:**

So to add to what Hemant and Dr. Shan said, what is important is, the core thought is, simplification of the life of the customer. As you rightly said, the customer doesn't care whether you are using big data etc in order to simplify his life, and this is the core philosophy that organizations like ours is working with. So in the stock markets, so to speak, what are we doing? There is tons of data available, tons of trends and patterns available, and there are say, 100 thousand contracts that are being traded in the markets on a daily basis. Now as a customer, what is it that you want? You want one simple idea that you can work with and put your money in. It could be either an investment idea or a trading idea. But you typically don't have the capability of scanning

through these 100 thousand contracts at the same time. But the AI technology stack can allow you to look at the entire market and give you a simple idea, that today xyz go out and buy xyz stock, and hold on to it for the next year or so, and this is the rationale behind it. And this is being done in a fairly simple fashion, not overcomplicating it with jargon, with 20-30 pages research reports – it's all being done fairly simple fashion.

So I think at the core of it you have the stock market, and I think going forward, the entire asset management industry is going to change significantly because of the integration of these technologies in the decision-making process. Even the wealth management industries as far as how a variety of options that are available for investors to invest and save their money so that they can get a better return. Those options will be found better by machines rather than humans, because they will have the capability to look and spot trends that humans will never be able to. So I think from a stock market point of view, from capital market point of view, I think the wealth management landscape, the asset management landscape and the core landscape of trading and stock-picking and investing is likely to change because of the integration of these technologies.

> **Mr. Leslie D'Monte, Technology Editor, Mint:**

Thanks Jimeet. So I think when you heard the earlier speakers, some of them touched on how AI is being colored by perceptions of the Terminators, the Perceptrons etc… everybody knows the history of AI… it went through AI event or period basically because of these promises. But to say today that we do not have AI would be an understatement, because if you look at your smartphones, they are all AI-enabled … you have Siri, Cortana, etc… AI is in your banks, financial institutions, in the algo trading, you have talks about your long haul trucking, about driverless cars – so to say… the problem they say is that when AI starts getting everywhere, then you don't see it… and this is not me saying it, this is the founder Marvin Minsky who said this sometime in 1969, and he is considered the Father of AI.

I think the problem is when we start having those perceptions of the Terminators etc and feel when is it going to reach there, and then we get disappointed. But I guess AI is very much here. According to Gartner, the prediction is already that AI will be in every software by 2020. I do not know whether that is going to happen or not, but perhaps give a few years here and there.

But let's get to the challenges now. I think, when we speak about the AI landscape, 3 words that come straight to mind are security, privacy, and inter-operability. When you talk about Blockchains, and some of the earlier speakers have already pointed out that the transaction time of a Blockchain is 7-8 seconds per transaction, which is very slow, so you can't use it for very high frequencied works as such. But in all fairness, I think we need to mention that there are hash crafts which are BAG-based Blockchains, or the directed acyclic Blockchains. Now these are Blockchains that take minors out of the equations, and they can actually create thousands of transactions per second. I think Hash Craft claims to have more than 10 thousand. Obviously it does mean that Blockchains clearly show a lot of potential.

But there's a slightly different question which I will just be posing to my panelists in a bit – it is the whole question of whenever people ask, they always make this statement – I don't like Bitcoins, they are a bit risky,
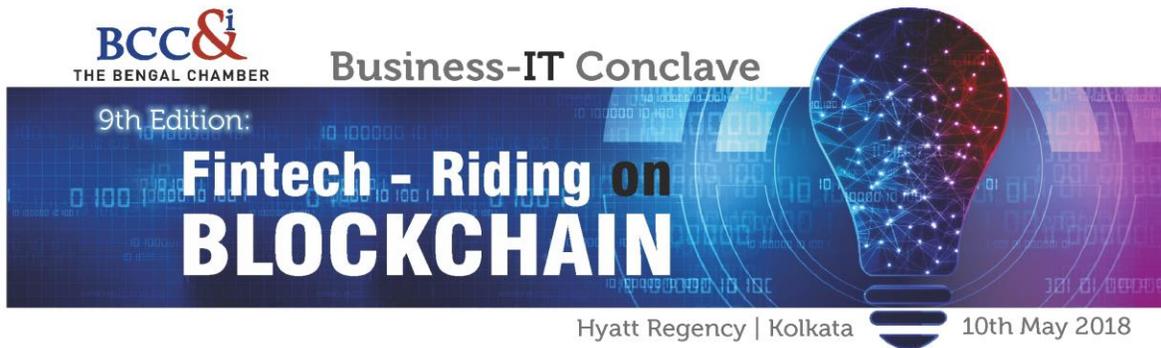
but I love Blockchains. Now my question to you is, how do you distinguish between the two? Can you have a Blockchain without a token, without a cryptocurrency? How can you dissociate these 2 terms? And if you do so, then won't your Blockchain just be a glorified database and database innovation?

Hemant, you have been toying with these ideas on Blockchains a lot; you have been doing a lot of challenges. How do you evaluate these newer technologies? How do you seek ROI in the sense… this isn't going to work for me, because some of the technologies may die along the way, some may mature, some may not give you immediate ROI, and there are CEOs asking you for the terms out there. How do you evaluate these technologies and say – this is going to work for your bank, this is not going to work?

➢ **Mr. Hemant Adarkar**, **CTO Digital Venture, The Nainital Bank Ltd:**

Firstly, emerging technologies are also like stocks – you don't know if you are going to climb up the wrong tree or not… because 18 years and above when I was working in Infosys, we started a web services center of excellence there with a promise… web services that time had a promise that we will be able to find, discover businesses programmatically over the web, and attach to them, and then do business. What finally we got about it is a good technique for 2 disparate object-oriented programs to talk to each other. That itself, from an inter-operability perspective, was a great thing.

So technology again never stays in the same form that people envisage it, but some of the basic principles of Blockchain will remain. And therefore I feel there are some existing technologies that actually do most of the jobs apart from the fact that the proof of work, and the security aspects… I mean really speaking, Blockchain seems to be, thanks to the cryptography, it is one of the safest database ever. Otherwise if there is no concept of a token, no concept of getting some kind of a reward for adding a block with a … you know the competition that you all do is going to be just a more glorified database… and as one of my friends says – why bother about Blockchain… let an RDBMS vendor worry about it… Oracle or B2 or somebody will come up with a more secure database which cannot be tampered. We are worried about the use cases… where are the use cases, and I have been jokingly saying that Blockchain seems to be a solution in such a problem. But actually there are many financial writers who believe that Bitcoin is the real use case for Blockchain. This is something that people have been saying, and the organization I used to work for, JP Morgan, his Chairman also said, this whole thing is a fraud… but then he said that Blockchain is a very interesting technology. So this is a dilemma, but I feel there is something very interesting will come out of it.

➢ **Mr. Leslie D'Monte, Technology Editor, Mint:**

I think it's already come out… so Suresh, you can throw some light, because I think in your case, it's a top-down approach in the sense that clearly Anand Mahindra wants Blockchain and all… so I don't think you have much of an option.

➤ **Mr. Suresh A Shan, Global CIO,Mahindra & Mahindra Financial Services Limited:**

See, generally you should see the opportunity, but surely it should be supported by the business. Take the live case. In our case, when we said the same way, whether information is going to play a major role, or really cost is going to play a major role. Today if you see in all financial systems, information only plays a major role… because we do have core systems to get the information faster through the central system to control it. So all compliance, regulations today if you see for eg, when demonetization was introduced, we ran a query on our systems for last 5-6 years… full minor finance collection is 100% cash collection across the country. But still we had for 3-4 years, all the customers paid only Rs 100-note, Rs 50-note, Rs 20-note, Rs 10-note. Very few people… out of 4 million customers, less than 0.2% people paid Rs500-note or Rs 1000-note. So it shows very clearly, our customers are within the bar and they are able to do it. So we don't want to take much risk.

Then we wrote to RBI, we requested them to say… full customers are earn-to-pay model customers, supported with data. Again how is it supported? Whichever customer who is part of rural who is running an earn-to-pay model, his individual business was recorded and supplemented part of the record. Even all the people who are prompt payers, for them, guarantors were their wives or mothers. So wherever the persons were paying on time, the customers' data supported by guarantor either mother or wife. So we said – see the positives… non-performers have their own way of doing it, but performers have a way of doing it. So try to implement and try to make guarantors bring their wives or mothers next time, so that the other people also can get into the positive side. Same way since your customers are paying only the Rs100, 50, 20, 10-notes, they are not into Rs500, 1000s. So why have to go more vigorously with them. So we started empowering cash collection, but ensured that we have part of the true team, and as per our big headlines only.

So such analytics gives you more information where even though tougher times it enables you to sustain in your model, try to continue and go. Especially in rural model, we say, e-business, less of electronics, more of emotions. So try to capture as much as which happens part of them, try to take it up. Today you try to see a worksheet filling up. Majority of the rural cases, generally a worksheet is filled by a broker or agent, some 3rd party does on their behalf. They just put a thumb impression or a signature… they can only read their name, that's all. But today the chatbot is allowing us to have a local multilingual conversation, where he tells, I want money for this purpose, I can do this, and if I get these profits, I'll share with you. So this is nothing but earn-to-pay model. So Mahindra Finance came out with a system to say '2 Din mein badle din'… where within 2 days, you'll get the disbursement if they are able to narrate what they want using a chatbot, in the local language.

So see the opportunities, whichever is lying on that, use the technology as much as which enables and empowers to sustain the current, and try to create that opportunity… surely it matters a lot. But keep customer so that the system should be simple, and try to use as much as multilingual and try to connect it. Otherwise today's challenge in rural India – we do have connectivity issues, electricity issues, resource availability issues in rural India. These 3 major is… whatever the problem today we are facing digital is because of these 3. If you're having alternate solutions where technology can work on online and offline solutions… electricity alternate powers work on light memory, light power issues can be sustained… create

resource availability, create as much awareness about finance… let them know what clarity they can do, and how much it can yield them which is going to create as an investor… try to create as much transparency which will yield in finance, and that guy become your stakeholder, and he will become your person… we call them Gram Pradhans… majority of the customers work on our behalf as an agent for other customers. So try to build that system, use digital as much as that empowers you a lot.

➢ **Mr. Leslie D'Monte, Technology Editor, Mint:**

So clearly we are seeing a use case for both AI and Blockchain in a limited fashion, nevertheless, but clearly there are use cases; but as I said, it's technology that's in its infancy.

Let's speak a little on the way forward. Jimeet, what is the way forward when you're looking at the full HFTs etc, the algo trading, lot of AI, you're using a lot of machine learning and deep learning to search through your databases, make sense of that data… what does it mean … the way forward… for the consumers – retail, corporate, whatever they be?

➢ **Mr Jimeet Modi, CEO & Founder, SAMCO Securities & StockNote:**

From a way forward perspective, I think, if we use a bucketing approach, in the first bucket, how is this technology going to change the way we manage our wealth? So I think wealth management is the first bucket where this technology will have a deep impact. Very often in internal meetings I say that today, 50% of all transactions in capital markets are done by algorithms and systems; and therefore the only thing that you need to do is identify what is the pattern that they are trading, actually interpret it, and try and make a profit out of it. So the manner in which how we trade, how a retail investor puts his money directly into stocks is going to change significantly, how he identifies opportunities to put his money is going to change significantly. Also I think in the next year or so, we will see an emergence of AI-based mutual funds as well, where mutual fund managers will be significantly assisted by AI machines for decision-making processes of when to buy or sell… and our belief is that over a period of time, such asset managers or mutual funds will tend to do better than just a normal human asset manager. So that's one bucket.

Also, from a technology standpoint, we also believe that the lending bucket is also significantly going to change, in the sense, the technology allows you to have a better profiling of a customer, the credit appraisal system, you can have a predictable analysis on whether a customer could default, not default, etc. So even the lending bucket and the use case and the application of AI in lending across the board, whether for SME or retail, is significantly going to change. So I think every business in the next 5 years, if it does not adopt to the technology benefits that AI and ML give on the table, it's not that a business may not survive, but scaling up and actually giving the insight to a customer, either in terms of speed or quality of execution, may not be possible without the deep integration of these technologies in various walks of business.

> **Mr. Leslie D'Monte, Technology Editor, Mint:**

Fair enough. But have your subscribers become more wealthy because of AI?

> **Mr Jimeet Modi, CEO & Founder, SAMCO Securities & StockNote:**

So, we very often say that a standard mutual fund SIP in a 5 year rolling basis delivers like a 15-16% ROI. Our internal AI-based mutual fund SIP delivers a 15% out performance in a 99% confidence level. So in 99% 5 year rolling periods, we will beat a standard mutual fund SIP at all points of time. So that's how smarter, more disciplined machines and AI is able to create for a far more value for the end customer.

> **Mr. Leslie D'Monte, Technology Editor, Mint:**

Clearly the proof of the pudding lies in the eating. Hemant, what's the way forward?

> **Mr Hemant Adarkar, CTO Digital Venture, The Nainital Bank Ltd:**

I will just give an example, which technologically is almost possible thanks to AI, ML and big data… is what Brett King says in his Bank 4.0 as voice-enabled banking. The branches are going away slowly, internet screens have gone, we are now waiting with just a smartphone; next would be telling your bank that please, let me buy this, where there is nothing typed, so that there are no security issues involved. So voice recognition is being perfected, it's almost there, Google has already released some basic APIs; I don't know how many of you have seen the Alexa ads where Alec Baldwin says – Buy me these $200 socks after a drunken brawl. So this voice-enabled banking is, thanks to all these disruptive technologies, we'll have the next level of Bank 4.0… I should be able to talk to my bank, that's all.

> **Mr. Leslie D'Monte, Technology Editor, Mint:**

So good… Industry 4.0, now Bank 4.0. Suresh?

> **Mr Suresh A Shan, Global CIO,Mahindra & Mahindra Financial Services Limited:**

Just to conclude with some examples – in rural India, people don't know the difference between even a bank and NBFC. So there we try to narrate, bank is nothing but Rama avatar, fully disciplined, father-oriented, process, policy, procedure, follows one wife, and ensures whatever the troubled times, ensures the integrity and discipline. Krishna – NBFC… disruptive, cunning, 18 thousand wives; both are avatars from Lord Vishnu who ensure poor to rich. The differentiation – Rama will look bad when he plays like Krishna, Krishna will look bad when he plays like Rama. So banks will continue to be like Rama, Krishna will be like NBFC. When you ask that rural customer, now you tell me which you want – he says, I'm ok with Krishna.

So it should be so simple – use the known epics to define unknown ethics – let us talk banking in their language instead of trying to impress and confusing the full system. Secondly, if you see the prospect in terms of customers looking a lot more from the financial services, especially digital everything is going to matter a

lot when technology is going to talk their language, multilingual, let it be in the local language; let us talk really what they require, the earn-to-pay model; and try to connect as much how we can try to take it up so they reach the level they want.

People generally think South Indian has rice more, North Indians will have chapattis more… but it's nothing like that, it's purely your body condition… so remove r from rice, which is ice, so if body condition is hot, will have rice; whichever body condition is chill, remove w from wheat, it is heat. So simply try to understand who wants what and try to give it, by assuming things, it's going to put you in trouble. So technology should understand what should be consumed, what behaviour we have, what type of assumptions we take it, it will try to take it up on that. Last but not least, try to select a technology which is a good partner, which will give you complete… try to select a partner who is not good, then you will be finished; don't try to select a partner too good, you will completely get finished. So try to align it so you get a complete partner.

➢ **Audience Member:**

This is Abhijit Roy from AI Business Process Consultancy. I have a specific question… in a Blockchain we see that if the intermediate rows are altered, then we can audit it. But if a current row is altered, how to identify it?

Mr Hemant Adarkar, CTO Digital Venture, The Nainital Bank Ltd

There is no concept of current row altering. In fact, if you see the way a block is added, that time whoever is the mining node, he may not select the same transactions. So there is nothing unique at the time of creating a block. So one miner's block can be different than another's. So there is nothing altered.

➢ **Audience Member:**

We know that for any offence, the place of the offence or the place of incident is important. What about if it is done in cryptocurrency or there is no geographical map of this crime or incident? How to handle it?

➢ **Mr Hemant Adarkar, CTO Digital Venture, The Nainital Bank Ltd:**

Your IP address can be seen; the only way to identify you in a Blockchain is your public key. And anonymity is one of the fundamental properties of Blockchain.

➢ **Audience Member:**

This is Jibendu from Cognizant. Since this is a session on fintech riding Blockchain, in order for the fintechs to do something credible, it is important that the banks are actually opening up the APIs, something that is happening in Europe… if we go to Barclay's website for eg, we can see all the open APIs. So do you think the Indian banks will open up their APIs for the fintechs to be more relevant?

> ➤ **Mr Hemant Adarkar, CTO Digital Venture, The Nainital Bank Ltd:**

API's banks are opening up – that there's no doubt about it. But if you're talking about something in the Blockchain arena, there is a bank chain; about 30 banks have signed up to do various POCs on Blockchain. So this is something all major banks and cooperative banks, all are involved in that.

> ➤ **Audience Member:**

I'm Rinki Chatterjee from a startup… will it be possible and what's the probability that we'll get complex derivatives to date on stock exchange done through AI?

> ➤ **Mr Jimeet Modi, CEO & Founder, SAMCO Securities & StockNote:**

I think the answer is that it's already happening… in the sense that for the purpose of designing complex derivative strategies, a lot of AI and ML stats are already being used. A lot of HFT platforms, a lot of HFT algorithmic trading, which is eventually done through the coalition system of the exchanges, is using AI and ML for complex derivative strategies. So it's already in place, but if your question is, can this be done at a core retail level, can a retail customer be empowered to do so? I think that is still some time away. Because the first is to have a widespread awareness of the complex derivative itself. Then to come and tell a retail investor that how that strategy was derived at, is a very long process. So I think more than a possibility perspective, it is possible to do, but the complexity in making a customer understand this is far and beyond, which can delay the actual implementation.

> ➤ **Audience Member:**

I'm Alokananda Rao from Alwari Systems. The whole concept of Blockchain is based on cryptography, and so to say, secure. But is there any other overall global regulatory framework which is being thought of… something on the lines of internet governance that can keep it safe? Because while we are confident of cryptography and everything, hackers are always one step ahead of us.

> ➤ **Mr Hemant Adarkar, CTO Digital Venture, The Nainital Bank Ltd:**

The beauty of Blockchain is that there is no central authority… at the moment there is a debate whether separating our Bitcoin and Blockchain, where the Bitcoin is a currency or an asset, so there are lots of unanswered questions. There are many websites dealing with this, that people who are going to regulate this is nothing but the govt, the finance ministries of various countries, and the central banks. But everyone has diametrically opposite views – some of them are trying to regulate, some are saying this is fraud. So it will take some time. Internet was accepted by everybody, and it took some time. So this is just a 10-year old thing; in fact in the modern thing, 10 years is a long time, but if you see what are the views of various regulators in the world – there are various websites you can refer to.

One thing I would like to add, for the Blockchain regulatory aspect, is that Blockchain emanates from the concept of crypto anarchy, which means that there is no govt.

> **Mr Suresh A Shan, Global CIO,Mahindra & Mahindra Financial Services Limited:**

It is very simple. One painting, somebody is saying 300 bucks. Banks are defining it 300 bucks. It's a barter system – buyer and seller fix the price. Buyer likes it, says it's Mahatma Gandhi photograph, I give 2 crores. This is what today is happening in Blockchain… but if it comes to how much it is going to be standard across the country or across the globe, this is going to come out of that. But today, maximum Blockchain used as much as outside India is more on that, that's why we are finding it difficult, how to fix all those things, which is not so easy.

> **Audience Member:**

This is a note – I understand that it has value and I can exchange it, because it's tangible. Now in case of Bitcoin and Blockchain etc, this is somewhere in a hazy line. Don't you think it would be hard to gain wide acceptance?

> **Mr.** Leslie D'Monte**, Technology Editor, Mint:**

A very fundamental question… there are 21 million … that's the limit of Bitcoin… 16-17 million are in circulation …so everyone asks, where does Bitcoin get its value? Obviously from the fact that you and I trade in Bitcoins, which is actually what the govt and many banks are not comfortable with. So I don't think those questions… there are any easy answers… people who see value keep trading in it… people who don't, don't trade in it.

> **Audience Member:**

In one of our recent hackathons, we were trying to get the customer experience more real, in terms of getting video interaction with the relationship manager, with the customer, plus trying out, scoping API interactions. Do you think these kind of innovations would come to the end consumers down the line?

> **Mr Suresh A Shan, Global CIO,Mahindra & Mahindra Financial Services Limited:**

It's nothing to do with innovation – it's a demand. If that particular video is going to help us take some financial decisions or gives an emotional background about the customer, surely it matters a lot. I keep on saying… business is less of electronics, more of emotions. If you are able to capture it, produce it, we won. Otherwise you have n number of systems, but none of the legal case banks, financial services gone. All information should be more of a customer rather than today government. Today single line between compliance and service. So we focus more on regulating and compliance data only. We are having corporate digital, not customer digital. In India or globally, everyone talks about corporate digital; it should move to customer digital. Every customer should be treated as a corporate. Then digital is 100%.

[PRESENTATION OF MEMENTOES]

> **Ms. Angana Guha Roy Chowdhury, Deputy Director, The Bengal Chamber of Commerce and Industry :**

The post-lunch session is 'Blockchain in Fintech creating Innovations and Disruptions'. We'll also have a speaker from JETRO who'll be speaking on business collaborations with Japan on fintech. It will be chaired by Mr. Sanjoy Sen. Speakers: Ms. Indrani Saha, AVP, Cognizant; Mr. Kaustubh S Oak, Executive IT Architect, IBM; Mr. Pankaj Mittal, Board Adviser Global Block Chain Foundation; Mr. Sumit Misra, General Manager, RS Software (India) Ltd.; and Mr. Subash Shanmugam, Associate Director – IT Consulting, Protiviti.

> **Mr. Soichi Umeki, Director, JETRO (Japan External Trade Organization) (under Ministry of Economy, Trade & Industry, Government of Japan):**

Good afternoon. I am greatly honoured to be able to speak on the business collaboration between India and Japan. Let me give you a brief overview of the investment volumes from Japan to India. Japanese investment volume accounted for $5.7 billion in 2016, and the number of Japanese affiliated companies operating in India is 1369 with 4838 locations. In fact, Japan is placed 3rd, after Mauritius and Singapore, in terms of investment accumulation from 2000 onwards, towards India. In terms of foreign direct investment to India, Japan holds the top position.

Needless to say, Japan is giving its highest priority to India in terms of business. Factors like high economic growth rate and regulatory reforms make it easier for foreign companies to do business in India. Therefore Japanese companies consider India as the most promising investment destination for mid to long term perspective. However the distribution of Japanese investment in India is somehow concentrated to automobile, machinery, engineering, as these are Japan's competitive industries. Our endeavor at JETRO is to promote more bilateral as well as trilateral trade in investments. My initial task is to increase the investment volume in a mutual manner.

Today, I would like to briefly speak about our thoughts and challenges penetrating to do business in India with Japan, in 3 points. Firstly, as I said before, Japanese investment in India is unevenly distributed. In other words, it is concentrated in the automotive industry, mainly by large Japanese corporations. Therefore going forward, we must explore new investment avenues to diversify Japanese investments to a wide range of industries in India. We are focusing at sectors like IT, and also working towards increasing the presence of Japanese SMEs, including startups, in India. Effectively showcasing the market opportunities to the potential investors is a vital element. To achieve this, we have been conducting market researches, individual consultation, and organizing trade fairs and business matching events in India and Japan. I'm glad to inform you that this year, we are planning to exchange high-level business delegations in the areas of service and IT. I sincerely hope that such cross-border visits and events will encourage you to look at the business opportunities and exchange ideas with these Japanese players.

Secondly, let me touch upon the perspectives for the IT industry, including fintech. Although Japan is the world's second largest financial market, when it comes to investing in IT, the nation's major financial institutions have largely tended to confine their investments to back office operations. Thus although Japanese fintech companies and the front end innovation they offer has risen suddenly to the forefront, the rise is actually belated when compared to our Asian neighbours. Feeding the sense of urgency from arriving late to the scene, Japanese financial institutions have just started to put investments into fintech. Demand in the fintech market is increasing as online stocking grows, ecommerce expands, and the increase in card favoring foreign tourists spurs on the spread of credit cards. In Japan, the leading sub-market of fintech is payments. However other sub-categories have also been swiftly gaining traction in the past few years. There has been a sharp spike in the interest towards Blockchains as fintech technology. Additionally, the idea of going beyond virtual currencies and utilizing Blockchains in a wide variety of areas has just begun these recent years, and we are seeing a sudden rise of implementation and commercialization of those technologies in Japan.

Turning the perspective towards the IT market in India, there was a time when India was seen as a global outsourcing hub. In the due course of business expansion through collaborations with multinational companies, Indian IT companies have become more competitive, and are playing a pivotal role in the field of high-end innovations. This has brought a game change in the way the world sees India. More and more Japanese companies have also started recognizing the potential of Indian companies. Under the dramatic speed of the technological innovations and rapidly changing social needs, it has become imperative to make swift creations or solutions. On the other hand, Japanese companies have come to recognize that their conventional in-house innovation model has its limits in catering to the global requirements. In this regard, I am expecting more Japanese companies to set up their R&D centres in India for developing their product and services that are suitable for the global market, and leveraging the world-leading IT technologies possessed by the Indian companies.

At the same time I am also hopeful that the Indian IT players will consider expanding their businesses in Japan. There are 39 Japanese companies listed in the Thomson Reuters 2017 list of top 100 global innovators. This was the largest number in the world, surpassing even that of the US. Japan is also ranked 1st in automobile manufacturing, computer hardware production, and chemical manufacturing. For Indian IT/fintech companies to expand globally, I believe there are clear benefits by collaborating with Japanese companies in the field where Japan leads the world. FYI, at present, there are around 70 Indian companies operating in Japan. Combining the strengths of Japanese companies and Indian IT technologies would widen the horizon for success across a wide variety of fields.

Finally I would like to quickly touch upon a few challenges regarding the Indian business environment from the perspective of Japanese companies. India is a growing market. However at the same time it is a highly competitive and price-sensitive market; due to constant increase of price it takes a long time to reach the break-even point for the companies. Secondly, further simplification of administrative procedures is required. Thirdly, complicated tax systems and procedures. The Govt of India as well as the state authorities has been

addressing these concerns and taking appropriate actions, which is represented by the introduction of the GST. I am confident that the GST has given fresh impetus to the efforts of ease of doing business. I sincerely hope that this journey of administrative reforms should continue to reach a satisfactory level. As I stated, India is not an easy market for Japanese companies. But those who have pioneered in creating a high reputation and brand in the market are doing exceptionally well, and continue to expand their businesses. Tracking the successful foreigners and creating a mid to long strategy with patience is a line of advice we are delivering to the new challengers from Japan.

I would like to conclude with the hope that the Indo-Japan relations will become even stronger in the years to come, and we JETRO would like to be the connecting link between the 2 nations. Please contact us for any query regarding business with Japan. Thank you.

> **Mr. Sanjoy Sen, Co- Chairperson, IT Committee, The Bengal Chamber of commerce and Industry :**

Good afternoon. Blockchain – I'm sure in the morning, you've heard a lot about it. When we are working on Blockchain and discussing about things, to me personally, it's all about building trust. If we want to build trust in the internet, Blockchain is a way of building trust. It's a way of doing collaboration, a way of security that we today want in the internet – and last but not least it is also a way of disintermediation – I don't need anyone to mediate... maybe that will have a cost effect.

Having said that, in India, it's a country where Aadhar has digitized about 1.2 billion of the population. In this scale, what is the impact if you want to implement anything, be it GST payment through a Blockchain, or anything... it's a question, and for that we need strong participation from the govt. In fact, there's a very famous economist, Diego Comin, who says that the growth of economy depends upon how fast and how intense the govt can use and implement technologies. So Blockchain is a technology that needs to be integrated, implemented, with huge amount of rigor if we want to achieve what all Blockchain promises to us.

> **Ms Indrani Saha, AVP, Cognizant Technology Solutions India Limited:**

Today what I'm going to talk about is what is the enterprise's outlook towards this... since we have been serving customers across the globe, across the vertical segments, what we have been experiencing, what are the real challenges, what is moving, some of the experiences that, as a practitioner, I have been seeing on ground.

So for us it has been almost 3-plus years of journey where we have been talking to customers and exploring this space, and looking at many use cases. While today's session is on BSFI, but the reach of this technology is really far broader. It's across industries and segments. In Cognizant also, when we started our journey, it was from the financial services set of customers with a lot of inquisitiveness and queries pouring in. It was back in 2015, but soon the door opened – it was insurance, then retail, manufacturing, logistics, healthcare, life science, what not. Every segment where interest is there, and the interest is there for logical reasons.

If I go back to the IBM session, when they were explaining Blockchain, there were 4 basic concepts they spoke about. One was distributed ledger, then smart contracts, then cryptography security part of it, and then consensus. So these are the 4 basic tenets. And now this technology and the way it is evolving… it all started with Bitcoin, we know about it… so there is by and large 2 categories of networks we can think of. One is public permission-less networks, where Bitcoin is the pioneer… so here we said that it is anonymous transactions… who is transacting no one knows… and the transactions are moving everywhere, every participant knows about the transactions, though they don't know your identity because it is anonymous… so that is there in a Bitcoin. So that is more categorically in a public permission-less ledger.

But think about the enterprises. No one is willing to share data indiscriminately. So that's where the play of a private permission Blockchain is … the demand and frameworks that's coming up to support a private permission Blockchain. Don't confuse with the public and private, because … today's session we heard that Indian Govt is saying they are open to explore Blockchain, but not the cryptocurrency, Bitcoin etc… but there are very upbeat to make Blockchain real. So when people are talking about Blockchain real, most of the enterprises' focus is on the private permission network. Let me define that – when it comes to a public permission-less ledger or network, you have participants but they don't know each other. They are all reliant on the software or the protocol, which is ensuring the trust in a trustless environment. And that's why there is lot of complex algorithms going, because the moment, in a room of 10 people, if you don't know each other, we don't trust each other, coming to a consensus on a particular topic takes a lot of time… and the moment you do that, there is a downside to it. If you have to have that consensus, very complex algorithm, then it is very compute-intensive. So it takes a lot of time, there is a lot of compute power that is going, and then overall, your performance is not that great. So that's why the shift has been from a public permissionless model to a private permission model.

So private permission model, the participants in the network are known to each other… it's not really that all trust issues are being solved, but primarily creating a more connected business network. The primary challenge, if you look at it today's business environments, every enterprise is operating in a very silo-ed way. So what Blockchain or distributed ledger technologies are bringing today is enabling you to connect them all together in a very seamless way. Of course, the security and other stuff is the fundamental tenets to it. I am able to communicate or exchange with other parties who are not necessarily an untrusted one… because in an actual business, it is a trusted set of parties who we are working with – but it is more of that integrated ecosystems… lot of silos that is there today, and this technology helps them to connect together.

Keeping this as a backdrop, this is what is the private permission ledger, and as I share my experience with all our enterprise customers, where all the explorations, piloting, and production, whatever is moving, I'll share some of the use cases we see… it is moving to production this year… so these are all private permission model… so that is the premise we should have the clear understanding about.

So, even in the use cases parlance we heard about payments, so one of the widely talked about use case in Blockchain from Day 1 is the cross border payment, and Ripple is one of the leading solution provider in this space, who is fully focused on cross border payment. Now let's understand Ripple a bit… because Ripple

started with an open source, which was an Ripple consensus ledger, as they termed it. Today the solution they are giving is not an open source solution, it's an absolutely commercial solution called Ripple Gateway, and we know there are lot of experiments globally – you know some of the Indian banks are also doing the explorations to participate in the global payment for cross border payments. So this is a great example, that's where is movement... I wouldn't say movement I mean fully move, because while we are listening about all the news about exploration, but we haven't seen that where the news has come up... that yes, it is live and the transactions are happening.

Let me give one more example. So this is the ultimate points where it's a kind of borderless world, and I'm doing all global payments, cross border payments so seamlessly... and we all know this is one of the pain areas. Now I'm talking about one of the leading banks, there was a news last Oct, JPMC... JPMC is also trying to solve some part of the problem, but they are not trying to achieve that big feat... and why not, I'll come to that a little later... but let's understand what they are trying to do. They are trying to address a little smaller part of the problem... it is still related with your cross-border payments ... but what they are saying, if you refer to the news, in Oct last year, they said that they are setting up inter-bank information exchange network. So what is it all about?

Most of you know that JPMC is heavily into correspondent banking, and typically in a payment chain, cross border payment chain, so there are lot of processes happening in the payment sanction checks, and this is typically time-consuming process where in the chain of payment, the banks are there... if one bank gets a sanction hit, they have to go back to the previous banks, get that information, and it's a very long cycle. So instead of jumping to the full payment, what JPMC is trying to address is, during the sanction hit, if there is a query, can I have a connected network where I'll be able to get that requested information seamlessly and quickly.

So is it that JPMC doesn't believe in the cross border payments? Perhaps no – they do believe, but before taking a big leap, you require some foundation to be set up. You need to crawl before you walk – that is fundamental. So that's what we believe – industry is taking a measured approach. There had been lot of hype, initially a lot of testing. Now enterprises have also taken that fail-first strategy with small experiments, but the point is if you have to reach cross border payments, you don't know where you will reach in terms of regulation and other stuff, where we will actually land. So instead of taking that big feat, what JPMC is thinking, instead of doing that, let me do a small work... and that is very critical part of the process... and there is lot of area of improvement to bring more efficiency.

So why I bring up this particular example is, so typically they are always very upbeat – there is a technology, it is a hammer, let us start hitting all the nails that you get across. But more than technology, if you have to look at Blockchain kind of scenarios, one is technology... how ready the technology is, is point no. 1. Then what is the business problem you are trying to solve? When you are trying to solve a business problem, do you have your partners with you? Do you have that ecosystem, that collaboration that is required from the partner? Because often it seems that the technology is there, every problem will be solved. But our experience says, even in forming a consortium, forget about the technical consensus mechanism – proof of work, proof of state,

taking 10 business stakeholders from the various enterprises and getting a consensus on what I want to achieve. What is the process? Because the way the industry is designed today, even from the cross border payment side, they would be having very many different set of processes – there's no standardization of process. The moment you say, I'm going to collaborate, there has to be some amount of standardization in that regard as well.

So … I'm a strong believer of Blockchain, definitely the technology has a lot of merit… but my take is, let's not be always very bullish about everything… let's take a measured approach, let's take one block at a time and try to solve it, instead of saying, ok… thinking about very big. If you have already solved a small problem, you have made a lot of progress, because you have already created the ecosystem. So let's keep that in mind, and let's hear from my other panelists what have been their experiences. Thank you.

> **Mr. Kaustubh S Oak, Executive IT Architect, IBM:**

Good afternoon. What I want to cover, before getting into the proceedings on Blockchain, let me thank everyone…. I won't talk about concepts of Blockchain… what I'll do is give my colour to whatever other speakers have spoken about since morning.

If I have to have another definition of Blockchain, I would shy away from just bucketing that as a technology – I would call it a paradigm shift. It's so significant that it's going to impact the processes, the way the companies work together, the way the businesses are done moving forward, the way people are utilized in the businesses, and of course, the technology… and I'm going to talk about how Blockchain is related to the current system landscape. Key thing is, it is a paradigm shift… it is a lot bigger… it is not a project, it is a journey, possibly a multi-year journey… you would have multiple players along with you, not just one enterprise, multiple enterprises.

If I have to equate Blockchain with the kind of evolution we witness, most of us were maybe just entering into the professional careers back then… I'm talking about internet, the way internet started, 15-20 years ago… nobody imagined there'll be something like internet, no one imagined that computers would be connected to each other, and there is going to be a form of sharing. What is internet – you are sharing information. Now, that information is just information – part of that is actually making you help or helping you make money… part of it is digital junk… and the other part is of course somewhere in the middle.

Now if I have to equate the internet evolution with what we are seeing in the Blockchain era, I would say Blockchain is like internet of value; and my fellow speakers have talked about asset, and how the asset would flow from one enterprise to another in a business network, each one adding value and thereby making money. So it is a flow of assets across business network, each making money and adding their bit. So it is an internet of value, and if I have to expand that beyond a finite number of enterprises, think about many enterprises, many such Blockchain networks connecting to each other; and what you see… and perhaps this could be a reality a few years down the line, you would see an internet of Blockchain networks. So you would

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have lot of companies connected to each other through some network – not directly but through some network.

My other point – and that is something I constantly hear when I talk to several clients and I'm in several workshops is – what Blockchain is going to do to my existing system landscape. There is a great element of fear that Blockchain is going to replace my existing system. And I think we had a speaker from SAP before lunch... and an SAP is part of the DNA of many enterprises ... and there was a time a few months ago when SAP was feeling threatened by a Blockchain evolution. Now you need to take that with a pinch of salt, because setting up enterprise using SAP is not a big joke... and replacing an enterprise which has SAP-like landscape by Blockchain doesn't make sense... for 2 reasons – one is, why do you want to reinvent the wheel... and the second one is why do you want to invest if you have created it already.

So key thing... you are going to take advantage of all the systems which are out there. Now where Blockchain is going to help you is these processes ... I mentioned about paradigm shift... it is going to span across people process technology... and each of them would have some limitations. Either they are inherent because that's how the enterprises function... it could be because how they are part of the business network. The reason could be anything, but Blockchain is going to help you overcome limitations in each of those areas and act as a glue joining different enterprises, providing the trust part... a lot of people feel... why we need Blockchains... there are businesses happening today, and if there is not trust, why would anyone do business with each other?

Now we are still talking about established business networks. A few years ago, a term called "World is flat" was coined... around 2001; which also means that the business networks are going to continue to grow. You don't know who you would partner with few months down the line. Now when you do partnerships, you do not want to set those point to point connections again, right – be it your IT systems, be it manual processing... you need something which could be latched on to very easily. And distributed ledger is a concept which helps all these scenarios where new businesses are going to join other ones, a lot easier.

The other very important misconception people have is... one was whether Blockchain is going to replace my entire system landscape; the other misconception is, all the data I have in my enterprise would land in distributed ledger. Well, the answer is no. We are talking about a subset of data, a common data, for all the enterprises which are part of the business network – only that extent of data needs to go on the ledger. So if you have invested in master data management systems and all the other system forms of records... nothing goes away, they stay in there, but through distributed ledger, you are increasing the collaboration which otherwise was absent in today's setup.

We had a discussion around smart contract... smart contract in my opinion is an evolving term. The way I would look at smart contract in the Blockchain domain is a way to automate certain manual processing, which may otherwise be happening in an enterprise. There are places where the transactions would happen without checking the rules, that may be existing in your paper-based contracts. So smart contracts provides

you an opportunity to embed some of the rules which can be checked during the transaction itself, and not as a result of some kind of dispute.

The other important thing that Blockchain is doing is the disintermediation, or getting rid of the middleman, and if I have to talk about the cross border remittance scenario, when you want to transfer money from one region to another, we would think we are talking about 2 banks here; but in reality you are talking about several hops, right? 20 odd banks could be involved. And what each bank is doing is… of course they are helping you move that money to the other region, but at the same time they are charging some fees… and at times that fees could be unreasonable. Why it could be unreasonable is… we are talking about … whole genesis about Blockchain was lack of trust in the central system… so make it distributed, not have control with a single authority… let everybody have the control, or enable the control to a software such as Blockchain.

Now, going back to the cross border case, the intermediaries, the people who are there… the point I'm getting to is, helping you challenge the status quo… it's not just the disintermediation, but in other areas; there are processes, people, all these middlemen who are there just for the sake of it, they have been there for years together; something like Blockchain, distributed permission ledger concept is going to help you challenge whether I need these guys, or whether it makes sense to pay them fees, charges, on a continuous basis.

Now the other side effect of this status quo, and again going back to not picking on someone, but SAP, and there are payment systems… SWIFT is one example… what Blockchain movement is helping us do is it has gotten them thinking. They need to innovate, make their services better. You would hear SWIFT is also adopting Blockchain in their fabric, SAP is also doing that. So I think as a consumer, as a business, Blockchain is doing a good part from that angle.

If I have to talk about the adoption patterns, I think in 2017, in IBM, we did about 400-plus proof of concepts worldwide on Blockchain and in various domains. There you would typically have anchor company… so let me pick say, Abott, a pharma company… it could be another company… but the proof of concepts was limited to single enterprise, but when you look at the prerequisites or the critical ingredients for Blockchain you need multiple players… and you would not easily get to multiple players when you are talking about a POC.

In 2018, we see a change. In 2017, predominantly the pattern was some sort of an internal ledger… let me try to find a use case for Blockchain within my organization. Now we are talking about a level above that, which is a consortium… so a group of like-minded companies are coming together, be it be banks, hospitals, manufacturing companies etc… because they have a common problem to solve, common use case, and they are looking for a solution. And for some of the use case, Blockchain is one of the appropriate solutions. So they are forming consortiums, and then IBM is helping stand up a platform which could start with X number of partners and then you will have onboarding of other set of partners on a continuous basis. So this is the second level.

Third level is the information hub… Mr. Sen talked about the Aadhar card in India… that could be a good example of a setup which could be enabled in Blockchain, where you are carrying information about citizens… that's something which will be controlled… you will have consent-based mechanism, who can access what. So that's the third pattern. And fourth pattern is Nirvana pattern. We talk about multiple companies, several players coming into picture, which ultimately lends ourselves into a network of Blockchain networks.

What IBM is doing in Blockchain – IBM was the originator of what is named as hyper ledger fabric today. IBM started working on this Blockchain technology 3 years ago, and then decided for obvious reasons to donate it to open source community… Linux Foundation is now managing all that and IBM is one of the foundation members… so there are number of companies who are now involved in maintaining this Blockchain technology called hyper ledger fabric. IBM is also trying to build an abstraction layer above hyper ledger fabric. Hyper ledger fabric is open source which is available to anyone, any startup can download it and build a specific use case on that. IBM is trying to build a platform … so if you talk about bare bone technology, you need to invest in downloading that, configuring that properly and then using it properly. So to save all those troubles for enterprises, IBM is building an offering called IBM Blockchain Platform… it's a cloud-based offering which will have hyper ledger fabric at the core of it, and then you would have well-managed platform. Whole idea is to abstract away all the nuances of technology, because one of the things we often hear when there is a Blockchain topic is – it is complex, it is hard, you need special skills. And that is exactly where IBM is trying to have focus on … try to make it simple, build tooling, build offerings around that so more and more people can use it and build Blockchain applications rapidly.

We hear about IOT – Internet of Things… we hear about AI, about micro services or API… my perspective is that all these are complementary to Blockchain. When you talk about IOT, it is going to help realize a particular scenario lot better in combination with Blockchain; and ditto with AI and micro services. AI is going to come into picture when you have critical mass of data available in ledger; in my opinion, these are still early days – maybe a year down the line we would talk about big data in the context of Blockchain or distributed ledger… I think it is still early days.

I want to end on the note of what are the threads that we see. You may have realized that underlying backbone for Blockchain is cryptography, mathematical algorithms which are of interest for some geeks, but cryptography is as good as how quickly it can be broken into. The thread I'm talking about is quantum computing, and you may have heard about that area, but again, we are starting off with Blockchain, so no need to be sounding pessimistic here, but we need to keep an eye on what are the advancements happening in quantum computing. Quantum computing is going to help you crack into complex cryptography algorithms lot quicker – we are talking about several supercomputers needing several months to be able to do that today… with quantum computing, it could be a lot faster. Thank you.

> **Mr. Pankaj Mittal, Digital Enabler AI, IoT, Co Founder Pune Angels, Member CIO Angel Network, Board Adviser Global Block Chain Foundation:**

I work with global startups and Blockchain as a sector. How many of you are Blockchain startups – raise of hands? How many are familiar with Blockchain as a technology – hands on? So I will just go back to the basics – so I work on global startups in Blockchain as a particular sector – Blockchain, AI, ML etc. Now we know what Blockchain is capable of doing – distributed ledger, record keeping, value chain, value storage, authentication, transfer of value etc. Now, do we know that there is no proper Blockchain education available? Anyone heard about any certified Blockchain course? Bitcoin is a by-product of Blockchain as a technology. What I'm trying to put together here is a perspective on what Blockchain is completely capable of. Fintech is one supply chain we talked about, perishable goods, large ecommerce players, trucking systems… Blockchain with security… Blockchain is completely decentralized, yes we are aware. But do we know what is the value on what we put on a Blockchain? Happens on a protocol layer. Now if you can fork a protocol or you can … you all know TCPIP? Now if we can fork a protocol in Blockchain world, these are the people who are going to be the next millionaires, who will decide on the next course of action, what will happen in the Blockchain world altogether.

Now in Blockchain, IBM signed a deal with a company called Maersk… completely new business model, completely 2 different companies, IBM being an IT services company, AP Moller-Maersk is a shipping logistics company. What they are trying to create is a consortium, whereby they are talking about large shipping companies all across the globe form up a Blockchain alliance, and they can keep tracking about it. Now at Global Blockchain Foundation, we primarily work with industry, startups… we're trying to set up multiple centers of excellence all across India and outside India; on democratizing what Blockchain is all about. There is a lot of myth about Blockchain is equal to Bitcoin or cryptocurrency and that's why it's not being adopted. I've taken a lot of sessions for CIOs, all across pan-India… in fact I was speaking to a CIO from Kolkata here about what could be the possible use cases of Blockchain, how I suggest or identify a possible use case in my enterprises.

Certain steps… people, heard about immutability, consensus, provenance in Blockchain world? These are certain things which are important for a Blockchain to be successful. So you have to have consensus between multiple parties, there is immutability, which is the trust factor we talked about; there is a provenance that whatever you have written on the block is not going to be tampered – once it is done, it is written for ever. Now, what does it help to build up new business models and new business cases? That it is tamper-proof… it is not going to change anything – which means reconciliation, storage of records, health exchanges are coming on Blockchain, derivatives are coming on a Blockchain… lot of this of it… while it is being used and coming it on a Blockchain is, helping the technology at a cusp.

Now when you write a genesis Blockchain, first block in the system… Blockchain alone cannot work as a technology… it complements… what you write on a Blockchain is important… so if you are garbage in, garbage out… but if you use technologies like AI, ML, you know what could be the data quality, what are you writing on a Blockchain, that is important – how are you measuring the data quality, data consistencies. So if you are putting garbage in a Blockchain genesis block, you're not going to get the right output… it's a completely lost block.

So things like that is what is solving for use of Blockchain in the world. So shipping industries we are talking about, about accounting, auditing, reconciliations… while we talked about fintech deal. Diamonds are being traded on Blockchain… gold exchanges are coming on Blockchain… for the matter of authenticity, trust, accountability, transparency on Blockchain. So Blockchain as a technology is being accepted and adopted all across, but it is also seen as the next potential disruption in the industry today, after internet. I recommend you to read a paper called 'Internet of Agreements' by Vinay Gupta. Second, please visit a website called 'www.blockgeeks.com' – that gives you the start in fundamentals from where you should start learning about Blockchain.

3 large platforms I am aware about – Ethereum, IBM hyper ledger or hyperledger fabric, and R3 Corda. But today industry is mostly using hyper ledger … Ripples are still using for cost-product transaction, transformations; we also see banking insurance using lot of Blockchain projects… we were talking to a very large global bank, where we were saying that … they were running multiple Blockchain projects… so I as a consumer when I go to the bank and need to get a personal loan… so I need to give my Aadhar details, id proof etc, all has been given and the loan has been sanctioned. After some months I again go back to the bank and say, I need a home loan, and the same thing is being asked again. After some months, I again went to the same bank and ask for a car loan, and again the same thing is asked for. Now, that is increasing some costing for the banking world… what we are saying is that rather than doing multiple KYCs, why can't the bank have an internal core e-KYCs? Man chain we spoke about in the morning… 26 banks have taken participation about what is going to happen in e-KYCs… SBI has been spearheading that… they are using multiple products, protocols to see what this banking can do and ensure that there is a possibility of reducing the amount of time.

Aadhar we spoke about… I also work with Central and state govts where we have been contemplating about the use of Aadhar or creating digital identities on Blockchain. How many of you know that China has gone ahead in all of these and put lot of data on AI and Blockchain, and in fact they have gone one layer up whereby they are ranking and rating their employees, people, the entire population of China in a decentralized database which is on Blockchain. So people within China, using certain parameters in Ministry of AI, they are ranking the citizens of China based on those certain parameters.

So Blockchain is going to change the whole game and picture around what's going to happen. The entire concept is decentralization … about… while it is hackproof, yes quantum computing is about something which we should be worried about, but technology will take its own sweet course of time to accept and adapt what will happen, but I'm extremely optimistic about what is going to happen in Blockchain in the world, and
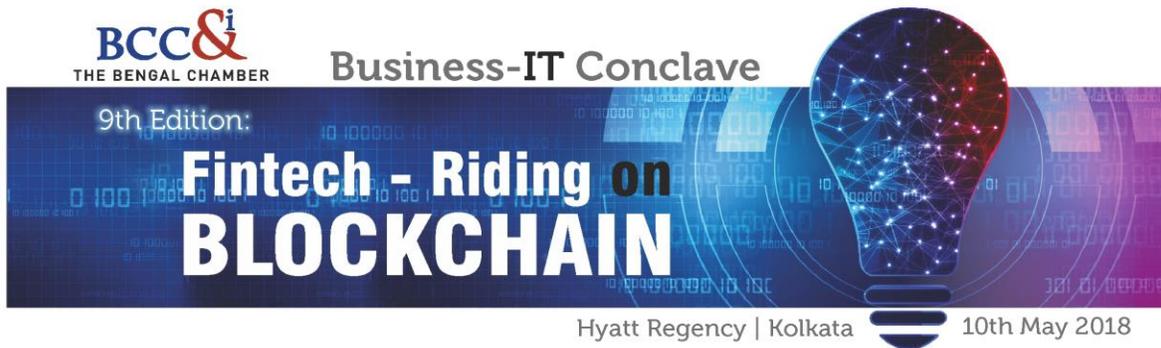
increasingly seeing globally that Blockchain acceptance on multiple use cases… there are sandbox environments created… we are working on a very large project with Govt of Singapore where we are putting up a sandbox environment for startups to come and do sandboxing for Blockchain projects, and see if this is a viable possibility of doing a POC or a proof of value or proof of work. So Blockchain is here to stay… while lot of use cases have not been around, those use cases have been discussed on previous review… but I think this is the year where we see lot of proof of value or proof of concept be put into production to a certain extent… may not be at a large scale, but in an isolated manner to a certain extent where we can see that the proof of value is emerging out of Blockchain as an identity. Thank you.

> **Mr. Sumit Misra, General Manager, RS Software (India) Ltd. :**

I will be talking about the area where our organization works in, which is to deal with electronic payments. This electronic payments is providing a revenue estimated to about $2.3 trillion worldwide, and about 43-plus percentage of that is coming to the banks in some form that is going to fuel the entire part of the Blockchain in the near future.

So as we see, there'll be a lot of transactions that'll be happening through the Blockchain… trillions of dollars will be flowing with microfinances and all of these coming together, and right now we have all the technologies to do data mining on standard transaction mining systems… but in Blockchain, that is not very easy, because of the permissions etc that is there, the data and information is restricted. As we are talking, we are trying to work with someone in order to build a mining system on the Blockchain-based payment transactions that are happening. The difficulty is, this being a permisioned type of environment, you need to have mechanisms to protect the data. At the same time, for the mining purpose you are trying to find a pattern, and that becomes very difficult unless you have the permission to look at all the data all the time, whether you want to figure out whether it is coming from the same source, going to the same source. So those are the problems we're having working with that.

The second thing I'll mention is that in India, we are seeing that there are lots of wallets that have evolved. So it is estimated that about $4.4 billion of money will be blocked in the Indian wallets very soon, and the digital transactions in India are increasing dramatically and will become almost tenfold in a few years.

Now that being said, we have a new regulation that has come in, which is called inter-operability of wallets. How to fuel that? Probably the best way is to create a permissioned Blockchain which is shared by various wallets, and using that you can transfer money, and do that inter-operability. Now that brings up a new perspective, that for similar type of services across the world, can there be a permissioned Blockchain created, and the trusted beings, those vendors who provide those particular software, and then it becomes a mechanism to interface with each of these, and value can be transferred using the Blockchain, across various applications.

Now there are challenges there because it's not very easy for application transactional systems to interface with Blockchain type of structures, because right now the speed of operations or the throughput which is
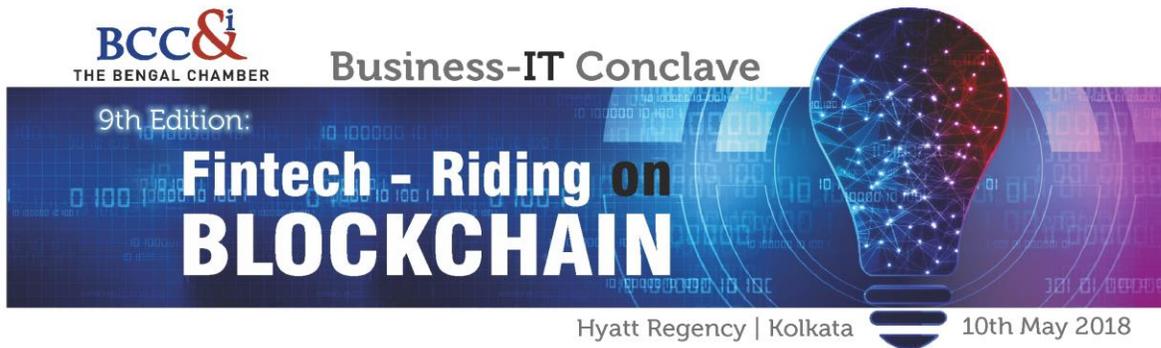
typically rated as transactions per second, that is not the speed at which Blockchains are operating at this point in time. So I would like to point here that, as we build and interface all these systems, as we bring in Blockchain as a rich tool in order to interface all this, we have a long way to go and solve lots of problems for interfacing, for inspecting the data that is there in the Blockchain, and create a value out of that. Thank you.

> **Mr. Subash Shanmugam, Associate Director – IT Consulting, Protiviti :**

I will be sharing our experience, our journey, as a company, as Protiviti, in terms of how we've approached Blockchain as an emerging technology. Of course, this is not the only technology we were looking at - as part of additional transformation, there were other competing technologies that we were looking at – but Blockchain per se had an interesting story.

About 20-24 months back, when we were exploring what this technology could potentially mean, for our own business, as well as for the business of our advisory clientele, I found it very difficult to explain the concept. If you notice, for all these years, we don't even have a standard ISO definition of what Blockchain or DLT is. Each one has their own terminologies, each uses their own clauses and terms. So trying to explain what provenance is, or what cryptography is to the board of directors, the CEOs, was a very difficult task. And that's when a couple of companies came to my help. One of them was McDonalds… the second was Lacnor, the company which produces milk and dairy products. Now McDonalds interestingly came up saying that their potato is farm-fresh, from Idaho farms in the US, with lovely visuals, and background music. It sort of meant that the other guys provided synthetic potatoes. And that's when you have a question in terms of how do I believe that?

Similarly if you look at Lacnor's ad – milk from cows fed on grass – that is the tagline. And you're charged a premium. The same story goes with organic foods – you're charged a premium of at least 15-20% over and above that. And you believe that yes, organic is good for health. Now this is where Blockchain really helped… where I could at least sell to the F&B sector and to my internal board, saying that – we can prove if this is fresh or not, or organic or not, with a concept called provenance. And that's how it all started off… that we could trace the origin of a product, and provenance does help. So that's one key factor that we harped on when we started looking at this technology.

Apart from that, in terms of the trends we saw with Blockchain, in terms of definition, characteristics, use cases applications – we've got a good idea of that throughout the day. But I'll delve on the other things in terms of the changing patterns. From our perspective, we see 3 changing patterns – first, the source of the drive. Maybe a couple of quarters back, we had the private entities really being gung-ho about DLP, Blockchain. The govt entities, be it the central banks, the ports, or the govt authorities – they remained silent, they didn't even want to participate in pilot projects.

But the last quarter, maybe starting Jan 2018, we witness a lot of initiative taken by govts, central banks, because they've started seeing the value in that. And this is coming in different forms. It could be in terms of funding – for eg, in Andhra Pradesh there was a Vizag conference held last year, and there's a 100-crore

funding that's given for Blockchain. So you can see that there's an impetus given by govts now, by ministries, central banks, regulatory authorities, in terms of what Blockchain can do... and they're all in an exploratory mode. The same is happening across sectors. There are various reasons for that of course, but there's a definitive trend where the govts are playing a greater role, and that's the reason we are also sitting here discussing all that.

The second is in terms of relooking at governance on the platform. Essentially the challenge has been not just about identifying the use cases, but how those use cases are going to work on the platform. Now, we're doing a couple of projects on electronic KYC, and we demonstrate that everywhere we go, in terms of how the customer will take the responsibility for his documents in terms of uploading and updating his documents going forward. But again, we are changing the process, the policies there... so it requires a buy-in from the various stakeholders, which is where the challenge is. You take any sector, the challenge about adoption of Blockchain is more in terms of how you redefine the process, how you redefine the govt's mechanism on the platform. So today, the biggies like Western Union, Money Gram, Ria, in the payment market, they're looking at Blockchain not because they love the concept – they're forced to do that. They control the whole market, but they're forced to have a look at what this technology can do. The same thing with SWIFT payment gateways... they are also forced to do that, it's not from choice. So we see this shift happening in terms of adoption where people have to rethink about the process before they look at adoption.

One more element to that is, it's also very heartening to see commercial and govt entities relooking at their role on the platform. So for eg, as a central bank, you don't need to own wallets... you don't need to have wallets for retail investors... but today, central banks are looking at that possibility. There are couple of banks that we're talking to who are actually looking at the possibility of holding wallets for the retail customers. Similarly there are commercial banks who are re-looking at their portfolio of services – how do we provide services to the customer on this platform, what is the role of a bank going forward. You go to any of the economic forums or summits – you'll definitely have one objective, which is to talk about the underbanked. So we have a huge underbanked population – our payments systems, payment strategies should ensure that the underbanked are also appropriately banked. So there is a KPI, a metrics around that. But with Blockchain, you probably don't need a bank. All you need is a wallet, which is governed with certain rules, and maybe the units within the wallets are also governed. There is a sense of security also available. So that is how the rethinking is happening – and this is coming from the CEO of a prominent bank in the Middle East. So that's the change that's happening in terms of how people are thinking about this platform.

The third trend we see is in terms of currency, cash. Now cash has been prevalent since its initiation. People have tried to replace cash, to reduce the amount of cash – there's a certain negative connotation about cash. How many of you have negative connotations about cash – that cash in the economy has to be reduced? Significant. I'm sure a few of the reasons that you have is one – in terms of the safekeeping of cash – the cost involved in safekeeping cash. Second – in terms of the float... it takes time for cash to get to your bank. Third – in terms of the insurance premium you pay on cash. However, cash has still remained – you have the m-wallets and e-wallets, but cash has still remained in the economy. So central banks of the region are looking at

a central bank-issued digital currency – you talk to any of the central banks in the Middle East, in the south-east Asian regions, you will have a conversation which is happening on cash which is issued on the digital platform, which is equal to the fiat currency. So that's the change which is happening where central banks are now taking a greater role in terms of looking at how cash will be maintained in the economy.

Apart from that, I think in terms of the challenges that we see… the governance, how it will be managed on the platform, and what is the cost per transaction or subscription – there's no clarity on that, because all the work we're doing today is with regards to the pilot projects. So going forward, as one speaker mentioned, how IOT and AI could be complementary on the platform. There's a big scope for that, we're doing some assignments on the IOT being integrated… it gives a lot of comfort for the client in terms of data not being entered.

So these are the 3 trends we're monitoring right now, and we see a lot more changes happening in the future. Thank you.

> **Mr. Sanjoy Sen, Co- Chairperson, IT Committee, The Bengal Chamber of Commerce and Industry:**

Just to sum up what we heard: everybody is saying we need a business process re-engineering. In fact, the banks' existence needs to be questioned; their processes, service offerings will be changed… and also there are lot of POCs and POVs happening – whether it is really delivering value or not, time will tell. Any questions?

> **Audience Member:**

I get a feel that the basis of Blockchain in a use case is not useful until it is at the basic premise of distributed ledger. So most cases I don't see the use case there, whether it's a … whatever I get to see… that concept of distributed ledger is the baseline per my understanding of Blockchain, and I only see the proper use case in cryptocurrency. I don't see proper use case anywhere else at all.

> **Mr. Kaustubh S Oak, Executive IT Architect, IBM:**

I think you're not the only one… there are a good percentage of people who think whether we need Blockchain at all… and that'll continue to happen for few more weeks, but to your point on whether there are use cases… now, I think Pankaj spoke about the Mersk use case where IBM is involved… we are talking about fairly large entities, who would want to have access to their own copy of data at any point in time. And those are the scenarios where distributed ledger makes sense. Now, is you are talking about traditional business networks where there is some element of trust involved, and the only deficit is compensated by evidence, that you provide additional documents, collaterals, and that's about it … the trust is in place and then the transaction can happen. Mersk was one example, the other example we heard about was getting the confidence in the quality of food. Now, there is an inherent lack of trust in the system… you can't trust unless the evidence of whatever transaction you are doing, the value you are adding on that particular asset, unless

it is stored in an immutable manner, then people are not going to believe you. Blockchain is not like something which has just appeared from nowhere – all these technologies, when you hear about cryptography, mathematical algorithms, they have been around… even the data bases – there was a discussion around whether you need decentralized data bases, whether they are sufficient. So when you look at all those things in a combined manner, what you get is something like Blockchain or distributed technology. Now, one would say – well, I would want to put it together on my own – then what you are doing is creating the Blockchain technology. So I would say there may not be n number of use cases, because I see that is the thinking right now… it is a cool technology… let me apply it to any use case where I have multiple parties… well, it may not make sense. The shipping company example I mentioned… there are several players – logistic players involved, freight cargo players involved, airlines involved… and inherently you can't take the trust aspect for granted, and that's where something like distributed ledger comes handy.

➢ **Mr. Pankaj Mittal, Digital Enabler AI, IoT, Co Founder Pune Angels, Member CIO Angel Network, Board Adviser Global Block Chain Foundation:**

Blockchain is all about decentralization, that's the core concept; second, it's all about removing intermediaries in between. So when we talk about use cases, the fundamental concept is that, why we are trying to do a Blockchain or bringing a use case on a Blockchain is, we are removing intermediaries, bringing efficiency into the system. For eg, we are working with Govt of India on providing digital certificates. Now, what is the relevance of bringing a digital certificate to an awardee? Now, India has a large population, we do have fake certificates coming into the system. What Govt of India is telling Ministry of Education is that, we are spending a lot of money for educating and upskilling people … but there is no traceability of what happened to that human person… where he got employed, what happened to that money? So can we ensure that we create this user as a digital identity on a block, and ensure the complete traceability of his whereabouts, employment, etc, and this is immutable, it cannot be reversed. So tomorrow if he goes to IBM for a job, there is an availability of one of the nodes where IBM can check, this guy was certified in xyz technology or abc technology, while he gets certified by somebody like NSDC or some other govt agencies, where he got the certificate but he can't fake it. So it's also about bringing efficiency into the system, in what use case can be done. when you talk about a million or billion plus people, digital is… Aadhar is going to come on Blockchain, the govt is contemplating that. So what is distributed ledger… it's about data being distributed on multiple nodes all across.

➢ **Ms Indrani Saha, AVP, Cognizant Technology Solutions India Limited:**

I think the point you made is valid… the important part is the concept part of it… Aadhar world, it is handling, it's a centralized system, but think who is anchoring that – it's the govt. but when it comes for a competitive enterprise within the same industry segment or across industry segments, then who is the anchor person? You asked why distributed ledger… the fundamental concept is, if I do some transaction… today also I am handing off information to you… it's nothing that it's all disconnected… there are mechanisms… it might not be happening all real time… data hand-off is the basic premise of running your business with your partners. But think about the technology – if it has the power, the moment you do the transaction, even before the

transaction is accepted, that's getting validated and going to the other partner, getting validated and included… and then you have a copy of the transaction, both parties. So the use cases you are talking about… between the transacting parties, there is a single view of the transaction. I'm going to the insurance segment… so Axa has launched one kind of system already, where if there is a flight delay insurance… in past, whenever there is a delay, you have to submit bunch of proofs, that yes… from the airlines to the insurer… now it's a connected system… if you have purchased the policy… whenever there is a delay, that information is seamlessly been transferred to the insurer… so you are getting out of your flight which is delayed, and your insurance… you don't have to claim for it. So there are cases where this interparty data sharing, through this distributed ledger concept is helping. You could always say, I could have a centralized system, it could have been, yes.

➢ **Audience Member:**

Leave Blockchain aside for a minute… there is cryptocurrency and Bitcoin as an offspring of Blockchain technology. Now, how do you think this could be adopted by and large by everyone, because there's nothing tangible that you have – it's all in a messy cyberspace environment. Here, for eg, cash is something tangible, your bank account is tangible, it shows… but here how does one…

➢ **Mr. Sanjoy Sen, Co- Chairperson, IT Committee, The Bengal Chamber of Commerce and Industry:**

Your currency is tangible because Govt of India certifies that it will give you that money. Unfortunately in Bitcoin and cryptocurrency, there is no governance. NYC is thinking of starting their Bitcoin… so when those governance comes into place, it will become a reality.

➢ **Mr. Pankaj Mittal, Digital Enabler AI, IoT, Co Founder Pune Angels, Member CIO Angel Network, Board Adviser Global Block Chain Foundation:**

Regulators are still working on making it as a tangible asset. It's completely decentralized as of today – nobody is regulating or managing it… that's the whole concept. So when we talk about being tangible, what value does it add to it… so today if I lose a Bitcoin, I go and complain to the police, and somehow they bring it… where do they store all that. So there is no tangibility now because it is decentralized. Regulators, policy makers, they all have to come together to see what is the possibility of making it as a trading asset, whether it is an asset class or it is a tangible asset, what will happen… that the people and lawmakers of the country have to come forward to make sure that this becomes an asset class to a certain extent.

➢ **Audience Member:**

Once it becomes an asset class it is just like a rupee note?

> ➢ **Mr. Pankaj Mittal, Digital Enabler AI, IoT, Co Founder Pune Angels, Member CIO Angel Network, Board Adviser Global Block Chain Foundation:**

Yes. But then whole concept of it goes away, because of decentralization. So if you start controlling it, what is the point?

[SESSION COMPLETE]