Blockchain is steadily revolutionising businesses across industry verticals by redefining their transaction frameworks. Enterprises across the banking, financial services and insurance, telecom, retail, travel and public sectors have started developing blockchain use cases for creating a more secure, immutable and transparent environment. However, ambiguity around regulatory standards continues to pose a challenge. Industry experts talk about the blockchain potential for India, the key risks and the future outlook…(*From left: Rajesh Dhuddu, Global Practice Leader, Blockchain, Tech Mahindra; Satya N.Gupta, Secretary General, ITU-APT Foundation of India; Jaideep Reddy, Leader, Blockchain Practice, Nishith Desai Associates; Dr Vikram Venkateswaran, Director, Deloitte India*
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What potential does blockchain hold for the Indian market, and what are the key emerging trends and use cases?

Rajesh Dhuddu

Blockchain is fast evolving as an important lever for digital transformation. It has the potential to change the way businesses run by meeting underserviced and unaddressed needs, driving efficiencies and curbing frauds. Almost all crucial sectors such as financial services, agriculture, healthcare, real estate and utilities stand to benefit from the application of this technology.

In India, public blockchain can effectively tackle multiple problems such as offering services digitally while helping check frauds and misuse. It can play a significant role in furthering the Digital India mandate – ensuring safe and secure digital transactions.

Blockchain is witnessing significant footing in the country, especially in the banking and financial services sector. Indian banks, stock market exchanges, and business conglomerates are the pioneers for leveraging blockchain in India. The security, data preservation, and networking capabilities of blockchain can address traditional cybersecurity barriers and enable the information-sharing requirements of contemporary business.

Satya N. Gupta

Blockchain, a distributed ledger technology (DLT), is a revolutionary value adding tool for artificial intelligence (AI). It holds the promise of solving any problem, including those that may be unknown at the moment. It brings in security, transparency, permanancy, legality and trust through the use of cryptography, immutability and smart contracts. The various use cases for blockchain in India pertain to land records, health records, the agriculture sector, financial contracts, fintech and telecommunications. Further, it has the potential to solve unsolicited calls, or do-not-call, issues. It can also help in the creation of a national digital grid using indefeasible right of use, smart contracts and crowd sourcing principles through the tokenisation of the existing fibre optic infrastructure in the country.

Jaideep Reddy

The main benefits of blockchain are decentralisation, disintermediation, and, in many cases, cost savings. The following benefits of crypto-assets have been recognised by government authorities:

• Control and security

• Transparency

• Very low transaction costs

• Instantaneous settlement of transactions

• Reduction in costs of cash

• Ability to provide a more comprehensive and unified source of credit history

• Reduction in instances of tax avoidance

These features can be hugely beneficial for India, which is aiming to be a digitally-enabled society and trying to minimise the costs of intermediaries. For instance, the country was estimated to be the largest receiver of inward remittances globally by the World Bank in December 2018. The remittances stood at $79.5 billion for 2018. The same World Bank report also noted that the average cost of receiving remittances in South Asia was 5.4 per cent, which is approximately $4.29 billion (Rs 306 billion) annually for India. Based on this year's budget, this amount will fund India's Mid-Day Meal scheme for about three years, which shows the urgent need for reducing the cost of remittances.

Dr Vikram Venkateswaran

Blockchain is more of a foundational technology. Just like cloud, blockchain is expected to follow a similar adoption path. Blockchain can be used for immutable records, which means one cannot erase or modify encrypted records, and this is important from an integrity as well as security point of view. It can be used as a distributed ledger, which means that at any given point of time all those in the chain will have a real-time view of what is happening in the network. Further, smart contracts running on blockchain provide a good alternative for corporates to get the business done. Traditionally, contracts in India, if disputed, have to be validated by a court of law. But, with regard to blockchain, smart contracts can be implemented, which can then be executed upon completion. It provides a very hassle free way of doing business. While the

original intention was to implement a public blockchain network, Indian organisations are favouring private blockchain. If we look at the alliances in this space, it is more on the private side.

There is a big opportunity for skill development in the blockchain domain. While a lot of Indians have the right scientific talent, there exists an opportunity to skill them in emerging technologies. Moreover, new companies/start-ups can look at blockchain as their foundational infrastructure.

While, so far, all the use cases have favoured the financial services industry, the supply chain, logistics as well as consumer goods industries are also looking at blockchain technology. The key is to take the use cases beyond the proof of concept level, to the proper implementation level.

What should be the building blocks for developing a successful blockchain ecosystem in India?

Rajesh Dhuddu

With the right amount of industry and government participation and collaboration, India could be one of the world's blockchain leaders. Niti Aayog has been driving several initiatives to foster a successful blockchain ecosystem.

Andhra Pradesh is the first state to adopt blockchain for governance to prevent tampering, protect digital assets and transactions, besides piloting two projects that streamline vehicle registration and manage land records. Further, Telangana is the first state to build a blockchain district for nurturing a vibrant ecosystem comprising blockchain companies, blockchain training institutes, accelerators and academia. The Telangana State Information Technology, Electronics and Communication department has signed a memorandum of understanding with Tech Mahindra to set up an incubator for technology and process development for fostering the growth of Indian blockchain start-ups and companies.

Blockchain is increasingly being used by the government to eliminate corruption. The Telecom

Regulatory Authority of India (TRAI) has commissioned a blockchain-based solution for curbing the menace of unsolicited calls and spamming. Such initiatives can help build blockchain capabilities across sectors, including telecom, media, travel and hospitality, healthcare and even public sector undertakings.

Satya N. Gupta

The key building blocks for developing a blockchain ecosystem in India are awareness building, capacity building, a favourable regulatory regime and the creation of multiple centres of excellence in various government and private institutions through the public-private partnership mode. In addition, proof of concept (PoC) will need to be conducted across various domains to test the impact of this revolutionary technology.

Jaideep Reddy

Crypto-assets are essential for the successful implementation of blockchain, as recognised by several academics and industry leaders. Distributed ledgers or “private blockchains” can exist without crypto-assets. Although such technologies have existed since the 1990s, they have only come into vogue recently after the attention generated by blockchain. An outright ban on the crypto-asset activity should not be considered for several reasons. Crypto-assets and blockchain are new and disruptive technologies that present both benefits and risks. History has taught us that such technologies should be regulated and not banned, since banning is likely to be counter-productive and may also suffer from legal infirmities. Rather, in line with international consensus, a balanced regulatory approach should be followed for promoting various benefits of the technology and mitigating the risks. In our paper, “Building a Successful Blockchain Ecosystem for India”, (December 2018), which we submitted to the Indian government, we have suggested the legal routes through which the government can introduce a balanced regulatory regime. This involves introducing a know-your-customer/anti-money-laundering (KYC/AML) regime and a licensing regime for crypto-asset business.

Besides this, educational programmes on blockchain by leading institutions for students and the public, which are already under way, can help generate an informed view on the pros and cons of the technology, as well as build skills in the software community.

Dr Vikram Venkateswaran

For any organisation looking to deploy a new technology, it is important to look at its use cases as well as the organisation's own strategic priorities and key performance indicators.

For instance, when the cloud was introduced, it was not a question of flexibility but whether an organisation had a business need for flexibility. Similarly, it will be important to see how organisations can benefit from blockchain attributes such as smart contracts, encryptions, distributed ledger and immutability.

First, it is important to do a fit analysis in terms of how blockchain can be used to solve business problems or meet strategic objectives. This fit analysis needs to happen across technical and functional aspects and the ecosystem will develop accordingly.

Second, it is important to consider how the risks – technological, operational, security, etc. – will be managed. The most vulnerable part of blockchain is the smart contract. A lot of attention is required towards coding standards for ensuring that there are no vulnerabilities in the contract.

What should be the regulatory approach towards the technology in India?

Rajesh Dhuddu

The regulatory approach needs to be two pronged:

• The government should state its position on cryptocurrencies clearly. This is important from the innovation perspective. Many start-ups leverage cryptocurrencies as the most preferred form of raising capital. An unfavourable regulatory framework for blockchain will stifle these start-ups, forcing them to migrate to safer havens globally.

• The government should mandate the use of enterprise blockchain, only if it is relevant to addressing the constantly plaguing problems such as spam calls.

Satya N. Gupta

The role of the regulator has to be that of a facilitator and not a controller. Regulators have to help in creating awareness, strengthening capacity building and bringing in initial funding for PoCs. This calls for implementing a light-handed regulation and preparing a code of conduct for self-regulation to start with. We need to follow the example of what was done for the next-generation network and IPV6 by TRAI and the Department of Telecommunications.

Jaideep Reddy

For the purpose of legal analysis, all crypto-assets are not alike, and the implications of each should be assessed on a case-by-case basis. Broadly, crypto-assets can be of three types: payment tokens, security tokens and utility tokens. Those security tokens which amount to securities will be regulated by the Securities and Exchange Board of India (SEBI) and under the Companies Act. Trading activity with regard to all other crypto-assets falls into a regulatory vacuum, although existing laws such as the Consumer Protection Act continue to apply to a significant extent.

This vacuum should be addressed by introducing a KYC/AML regime, and a licensing regime for crypto-asset business.

As regards KYC/AML, businesses dealing with crypto-assets, that is, providing custody or trading services, can be included within the framework of the Prevention of Money Laundering Act by a central government notification. As regards licensing, a new regime for crypto-asset business can be evolved by:

• New legislative provisions, such as under the newly proposed regimes on commodity spot trading and payment systems

• Administrative regulation under various laws such as the Consumer Protection Act, Payment and Settlement Systems Act, Non-Banking Financial Company (NBFC) regime, and/or Securities Contracts (Regulation) Act, and/or,

• Statute-backed self-regulation

Administrative regulations under the existing laws will be limited by the current scope of the parent statutes, while new legislative provisions may be able to better address the unique nature of crypto assets. In either case, the responsibility for such licensing or oversight should be clearly assigned to a given regulatory body to avoid jurisdictional ambiguity. Since SEBI has competence in investor protection, it is one option that can be considered in this regard.

Meanwhile, the existing laws such as the Consumer Protection Act, Foreign Exchange Management Act, Indian Penal Code, Information Technology Act, Payment and Settlement Systems Act, Prevention of Money Laundering Act, Prize Chits Act, deposits-related laws, securities laws and tax laws should be actively enforced with regard to crypto-asset business, since most of this activity is already covered by these laws. The applicability of some of these laws may be further clarified or fine-tuned with respect to crypto assets.

What are the risks and issues in using blockchain? How can these be managed?

Rajesh Dhuddu

The key risks vary based on the nature of blockchain, i.e., private or public. In the case of public blockchains, there is always the question of how much information can be made public. There is also an element of unidentified nodes, their malicious intent while contributing to the consensus mechanisms and the risk of takeover of the network by controlling the computing power.

In the case of private blockchains, there is the issue of how much control the central authority handling the blockchain systems has and the degree of decentralised consensus. Further,

parties joining private blockchain may not be willing to share their data freely till complete trust has been established. A significant risk associated with blockchain is the ability of quantum computing to compromise the secure SHA 256 algorithms that form the basis of immutability in blockchain.

Satya N. Gupta

Since the technology is totally transparent, open and digital, there will always be risks, as with any IP-based technology. But all these risks can be mitigated by using appropriate technologies, as is done in the case of the public internet.

Jaideep Reddy

The risks include money laundering, volatility and fraudulent deposit schemes. We have suggested ways in which these risks can be mitigated without going for a complete prohibition. No country except for China has chosen to prohibit blockchain. The US, the UK, the EU, Japan, South Korea, Singapore and others have adopted a balanced regulatory approach. The G20 and the Financial Action Task Force, of which India is a member, has also suggested taking a balanced approach.

Dr Vikram Venkateswaran

Organisations face fundamental questions of whether they need blockchain and if they are ready for it. They need to consider change management across people, processes and technologies.

According to a Deloitte survey, the implementation risk and the challenges in replacing or adapting to the legislative system, is one of the bigger challenges. Further, business continuity and meeting customer experience are seen as strategic risks. It is important that enterprises manage and govern blockchain implementation, and consider all the risks and controls required for migration to the technology.

The other key risk in the blockchain domain is that a lot of organisations working in the ecosystem today are start-ups, and are mostly based on open source.

What is the future outlook for blockchain in the Indian market? What lessons can be learnt from global markets?

Rajesh Dhuddu

With capabilities such as enhanced security, data validity and immutability, blockchain holds tremendous potential for the Indian market. Several things can be learnt from global markets in the field of regulations, building blockchain start-up ecosystems and fostering innovations. Estonia, Russia, Japan, the UAE and Denmark are some countries that are adopting blockchain for their grassroots operations. Meanwhile, Singapore is adopting blockchain in aviation.

Looking at blockchain case studies in various industries, it is clear that building a digital blockchain-based economy is possible. Leveraging the learnings from across the globe can help us in moving towards creating a digital nation seamlessly.

Satya N. Gupta

In India, we are on par with global trends and the market is unlimited here. We need to seize the opportunity and gain the leadership position through collaborations amongst all stakeholders. The International Telecommunication Union (ITU), a United Nations body, has a specialised working group on blockchain. We should participate in that very actively to exchange knowledge and experiences. I wish success to our fellow stakeholders in leveraging this technology, and can help through the ITU, if needed.

Jaideep Reddy

A recent report by Incrypt, a non-profit organisation, which surveyed blockchain software developers in the country, found that open, public blockchains (powered by crypto assets) can be a new growth driver of the Indian economy, similar to the IT services industry. The lessons to be learnt from global markets are that innovation should be allowed to blossom along with regulatory oversight (including regulatory sandboxes), and that blanket prohibitions are unwarranted except in extreme cases.

Dr Vikram Venkateswaran

Here, India might have a lot to teach the global markets. India's banking industry is cutting edge, leveraging emerging technologies, including digital. We have a lot of expertise to share in the blockchain domain. That said, India can look at introducing blockchain and emerging technologies early on in schools and colleges. As for those in jobs, continuous re-skilling and re-learning will be required, some of which is already under way.

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