

Dr Satya N Gupta

in a series of exclusive interviews with business leaders inviting their comments on blockchain technology and its impact on business



**Exclusive Interview
with
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BLOCKCHAIN

A WONDER TECHNOLOGY

AS INTERNET OF VALUE

From your global experience and being a pioneer in many emerging technologies, please enrich us on how these can be adopted to make tangible impact on society, governments, industry, and mankind at large.

Blockchain starts with bringing transparency to accounting and data sharing. It allows everyday users to prove ownership, to control access, and to monetize their data and content. The technology provides a single source of truth that can facilitate global commerce that is fair, trusted, and universal.

The salient features and benefits of blockchain technology include, but are not limited to:

- **Decentralization.** Blockchain eliminates the need for proxies and intermediaries, making transactions online, with far lower fees and more secure.
- **Transparency.** All parties in the blockchain network have access to the same information, making it transparent, verifiable, and accountable.
- **Security.** Blockchains use cryptography to secure transactions and protect against hacking and fraud.
- **Immutable.** Once data is added to a blockchain, it cannot be altered, providing an auditable and tamper-proof record of transactions.
- **Efficient.** Blockchain eliminates the need for duplicate record-keeping and streamlines processes, leading to increased efficiency.

These features and benefits make blockchain a promising technology for a variety of industries, including finance, tracking and tracing for supply chain management, logistics, railways, and telecommunication industry verticals to name a few.

How will the convergence of IPv6 and blockchain accelerate and enhance the utility of blockchain?

Blockchain is an end-to-end internet application, which requires routable IP address space to identify the source

and destination internet protocol (IP) addresses for better traceability and peer-to-peer transparency, where needed. Since the current internet protocol version 4 (IPv4) has run out of routable central address space at IANA (<https://www.iana.org/numbers>) back in February 2011, the new internet protocol version 6 (IPv6) comes with a virtually unlimited address spaces with 2 to the power of 128 (340 trillion trillion trillion) address space, restoring thereby the end-to-end model offering unlimited routable address space for large-scale applications, such as blockchain, which is currently using only the old IP protocol version 4 (IPv4), to scale up. The use of new IPv6-based technologies, such as IPv6-based Multicast (BIERv6) and Segment Routing over IPv6 (SRv6) enhances further the deployment of blockchain, unlocking new applications of the blockchain technology that have extended to various social and economic solutions in trade and supply chain management, financial services, manufacturing, art and media, smart cities, property and title transfers, management of the integrity of elections, and improving the quality of healthcare while reducing the risk of errors, as well as many other, shortcomings and threats.

IPv6 can benefit blockchain by providing a secure, private, and localized communication channel between two parties. This can be used for direct transactions, payments, and data exchange. Complementarily, blockchain can also provide benefits to IPv6 to innovate. Blockchain wallets are used to organize many payment addresses in an efficient and user-friendly way. The same technology can be used to manage IPv6 addresses. The blockchain can also provide enhanced security in the generation of IPv6 through on-chain certificate management. Cryptographically generated addresses (CGA) provide a concrete link between IPv6 and blockchain protocols.

What is your advice to the regulator, industry, start-ups and young talent in India, so that the country can use its massive talent pool as well as the conducive environment

to innovate, generate employment, and reap the benefits of this technology as well as harvest the demographical dividend?

One common misconception about blockchain is that it is intended to operate outside the existing legal frameworks and regulations. In fact, blockchain can be used as a tool for governments, companies, and industry to show that they are legally compliant. Blockchain provides an immutable audit trail, based on independent mathematical *proof of work*. It is also wrong to assume that data put on a public blockchain is visible to everyone. By using existing methods, such as salted-hashing, private data can be safely recorded on a public blockchain whilst remaining private to everyone except the authorized parties. This allows users and business to reap the full benefits of interoperability on a global public ledger.

Blockchain technology has the potential to make significant impacts in various sectors, including:

- **Finance.** By enabling peer-to-peer transactions and reducing the need for intermediaries, blockchain can increase efficiency and reduce costs in the financial industry.
- **Healthcare.** Blockchain can provide secure and immutable records for medical data, enabling better management and sharing of information.
- **Supply chain.** Blockchain can track the journey of goods from source to consumer, improving transparency and reducing fraud.
- **Government.** Blockchain can increase transparency and efficiency in government processes, such as voting and record-keeping.
- **Social impact.** Blockchain can provide a secure platform for distributing aid, reducing corruption, and ensuring that resources reach their intended recipients.

Some key pieces of advice for the various stakeholders in India looking to maximize the benefits of blockchain technology for:

Regulators and government

- Encourage innovation and experimentation with blockchain technology, while also implementing appropriate safeguards to protect consumers and prevent illegal activities.
- Promote standards and interoperability to ensure the long-term viability and success of blockchain initiatives.
- Collaborate with other governments and international organizations to develop a unified approach to regulation and oversight of blockchain.

Industry

- Foster collaboration and partnerships among different businesses and organizations to drive the adoption and integration of blockchain technology.

- Invest in research and development to continue advancing the capabilities of blockchain and identify new use cases and applications.
- Engage with regulators and policymakers to shape the regulatory environment and ensure a favorable climate for blockchain-based businesses.

Academia

- Encourage security professors to include blockchain in their curriculum.
- Include in your project funding for innovation and experimentation with blockchain technology.
- Encourage students to learn about blockchain and its features and create competition programs and hackathons.

Start-ups

- Focus on solving real-world problems with blockchain technology, rather than just creating blockchain-based solutions for their own sake.
- Collaborate with established industry players and seek out investment opportunities to help scale and bring their solutions to market.
- Stay up-to-date on the latest developments in blockchain technology, and actively seek out new opportunities for growth and innovation.

Youth talent

- Acquire a strong understanding of blockchain technology, including its underlying principles and applications.
- Seek out opportunities to gain practical experience with blockchain, such as working on projects or internships.
- Stay informed of the latest developments in the blockchain industry and look for ways to get involved and make a positive impact.

IPv6 Forum India and Blockchain Forum for

Productivity

- Define a blockchain roadmap for India with above stakeholders to make India the number-1 blockchain nation.
- Get blockchain mature utility industry to interoperate such as blockchain BSV and others by creating a quality blockchain logo program.
- Organize with NIXI to build a blockchain strategy using IPv6 – investigating the allocation of a single IPv6 address to each citizen in India for peer-2-peer transactions.

These recommendations are meant for your great country, India, to harness its massive talent pool and leverage conducive business environment to become a leader in blockchain innovation and reap the benefits of this transformative technology and may become *Blockchain Capital of the World*. ■