

# Emerging Technology: A Blockchain & Digital Currency in Finance

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## ABSTRACT

In the modern era the technologies are growing rapidly. The study intends to depict the role and conceptual epistemology of Blockchain and Digital Currency with reference to the new regime in financial education. The study portrays that the role of Blockchain and Digital Currency used in finance is to serve and spread knowledge among the financial educators or financial learners, students, youngsters and those who want a career in the finance domain. The following objectives of this study: First, to identify the role of Blockchain and Digital Currency in finance. Second is to get a full acquaintance with Blockchain and their impact in financial education. Third is elaborating the process of Blockchain with diagrammatic representation. These all objectives are presenting only the conceptual framework of Blockchain and Digital Currency in the context of introduction, history, examples, impacts and future implications etc. The Blockchain and Digital Currency is a new regime in financial education. Simultaneously, this study presents and highlights the diagrammatic glimpses of it. This study is collecting data from various sources such as journal articles or research papers, reports, internet / websites, and personal reading and observation.

**Keywords:** *Blockchain, Digital Currency, New Technology, Cryptocurrency Finance.*

## INTRODUCTION

All across the world, new technologies are developing and evolving. The use of electronic currency is nothing new. The expanding use of new technologies due to online trade has increased the need for new electronic payment solutions. The use of the Internet as a new financial market and electronic payments in retail are what are truly novel. Today, money is simply ready-to-use data stored in a database or on a microprocessor. Unquestionably, the goal of such a device is to increase the effectiveness of the standard payment method. Participants can readily communicate without the need for a regulator because there are now no established standards in the blockchain system and we are therefore unsure of the limitations. The universal Internet money that underpins Blockchain technology raises many considerations about how to best utilise its benefits and how to minimise any risks or collateral harm that may result from its use.

Innovation in payments and worldwide competition are made possible by high tech. But even so, there is room for examination of the digital currency's unqualified acceptance, confidence, and expectation, which serve as the primary forces behind the network's growth. More specifically, interdependence of demand is necessary for the network to spread, therefore before it achieves equilibrium, the network must reach the minimal volume needed. "Critical mass" refers to the network's bare minimum volume. Due to the existence of "critical mass," the objective attitude is that the future of digital money is still an open question.

This study underlines the technology adoption in the presence of network externalities. This study discusses the blockchain distributed ledger technologies that have many features to offer emerging financial services. Blockchain is starting to insurance internet Communications. Blockchain Technology will change the finance sector to a great extent as information technology has enabled peer-to-peer communications as well as mass media communications. Blockchain enables fast, safe, low-cost money transfers for quick transactions without the involvement of a third party, reducing or eliminating the possibility of hacking.

### **Overview of The it Revolution and Financial Advances**

New electronic payment methods were more in demand as a result of the rising usage of new technology in online commerce. specifically this week, the revolution in the middle of the 1990s, the fall in computer prices, and the networking of the same. The "geography of money" is introduced by Cohen (BJ #). This phrase is a result of the usage of the internet as a new financial market

and electronic payments in retail. A new electronic payment mechanism called electronic cash, e-bag, e-currency, digital currency, digital money, or digital cash has been introduced as a result of the information revolution. Unquestionably, the goal of such a device is to increase the effectiveness of the standard payment method.

Bitcoin is a digital currency, and its value changes based on how widely it is accepted by users. This is partly because there is no regulation for Bitcoin, unlike the conventional currencies we use like the dollar or the rupee. Therefore, due to the open system, lack of a regulatory agency, and/or integrity in the execution of transactions, transactions made using Bitcoin are thought to be more private and anonymous.

Transactions are carried out using cryptographic protection and their execution is done through a network of public electronic books "ledgers". For verification of transactions, It is necessary to have a specific hardware and software that users can set up and after a certain number of transactions they receive a proportion of Bitcoin. In this way, it is also performing an additional commissioning of digital currency.

### **Brief History of Digital Currency**

It has been centuries since the introduction of the barter economy, metals and coins, gold, and silver, as well as the current monetary systems and checks. Most recently, cryptocurrencies like Bitcoin have been introduced. At some point, every sort of money is important in transactional activity. More complex tools for the exchange of products became necessary as human society and markets in particular developed. In this regard, the introduction of cryptocurrencies revolutionised the global payment system to a degree that was unthinkable just a few years ago. Cryptography is used to secure cryptocurrencies, which are digital or virtual currencies. The difficulty of counterfeiting cryptocurrency is due to this security feature.

The development of electronic money and digital currencies can be attributed to two factors. The first is that, in accordance with the Austrian School of Economics and Analysis, money is a "social institution" that is subject to institutional change that has already been initiated. It is seen as the result of spontaneous evolution intended to address the drawbacks of exchange and the double coincidence of desires (C #). The most recent phase of this evolution is e-money, which signifies a greater degree of institutional transformation.

The emergence of money is a new method of processing information for the transmission of purchasing power, unlike the information revolution. Many financial innovations involve various ways of carrying out financial transactions rather than creating new forms of money.

### **OBJECTIVE**

- To identify the role of Blockchain and Digital Currency in finance.
- To get a full acquaintance of Blockchain and their impact in financial education.
- To elaborate the process of Blockchain with diagrammatic representation.

### **Blockchain**

Blockchain is a term used to describe a collaborative distributed database or tally over computer networks. The most prevalent application of blockchain technology is in cryptocurrencies like Bitcoin, where it is crucial for upholding a secure and decentralised selling history. By ensuring the confidentiality and accuracy of a data record, the development of the blockchain promotes confidence without the need for a trustworthy third party.

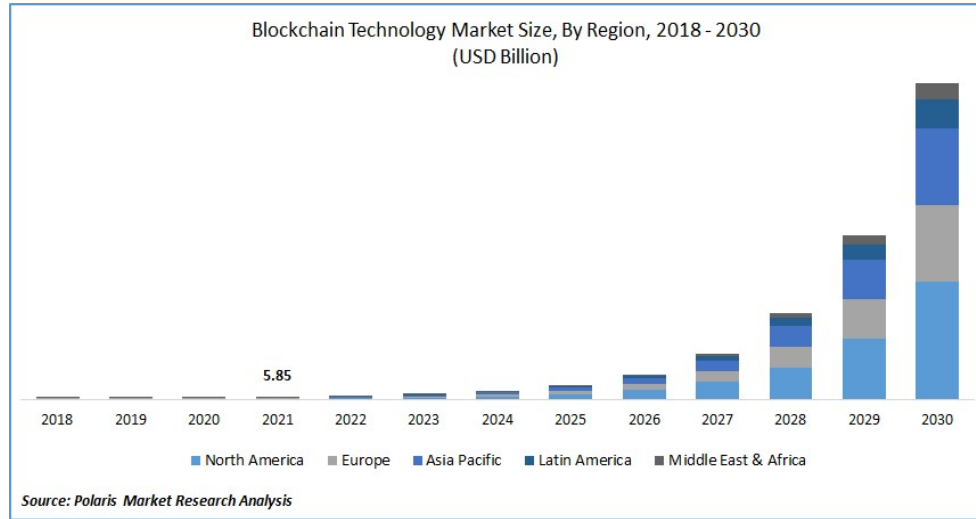
The data structure is one key distinction between a blockchain and a conventional database. A blockchain stores data in units called blocks, each of which contains sets of a specific type. The so-called blockchain is created by sealing and connecting each entire block to the one before it. Storage capacity for blocks are predetermined. Once the chain is complete, each piece of information that follows the most recent block addition is used to induce a new block, which is likewise added to the chain.

Blockchain aims to make it possible for unfettered digital information sharing and archiving. Inflexible checks, which are immutable, irremovable, and unbreakable records of transactions, are built on a blockchain. This is why distributed ledger technology (blockchain) exists (DLT).

The blockchain may be accepted as one type of payment mechanism. A person (or group of persons) going by the moniker Satoshi Nakamoto built the blockchain to serve as the public distributed ledger for bitcoin cryptocurrency transactions, building on prior work. Bitcoin was the first digital currency to enable double spending without the aid of a central authority or other trustworthy body due to its use of blockchain technology. The bitcoin idea explained other activities and easily accessible blockchains that are heavily employed by cryptocurrencies. The blockchain may be accepted as one type of payment mechanism. Private blockchains have been proposed for use in business. Others

have asserted that properly constructed permissioned blockchains may be more decentralised and safe than permissionless ones in actual use.

**Exhibit-1 Diagrammatic representation of Blockchain Worldwide. (“BTM by region”)**



**Exhibit-1 : Blockchain technology Market size, by region**

**Digital Currency**

Digital currencies may modify the way society perceives money. Any cash, money that's handled, saved, or changed largely on a digital computer system, particularly over the internet, is considered to be digital currency. Digital money, cybercash, e-money, and other terms are also used to relate to it. Central bank digital currency (CBDC), cryptocurrency, and virtual currency are the three most popular types of digital currencies. A distributed database on the internet, a centralised electronic computer database controlled by a business or bank, or within digital lines may include records of digital-currency. Digital currencies are analogous to those issued by central banks in terms of their characteristics, but they generally warrant the traditional physical forms of edict money, similar as published bills or formed coins. Still, they don't have a physical form in the conventional sense because they're grounded on computer to computer communication, mortal relations, and the information and processing power of waiters that store and keep track of money. Like conventional currency, digital currencies have uses. They're applicable to paying for both goods and services. They can be utilised for more effective deals each around the world. For case, if they're both linked to the same network, a person positioned in the United States can shoot payments in digital currency to a counterparty located in India. The

rapid-fire nature of digital currency deals significantly reduces the cost of issuing bills and coins. You can have centralised or decentralised digital currency. A centralised system of product is seen in the allocation of currency by a central bank and government organisations. Popular cryptocurrencies serve as an illustration of decentralised digital systems.

### **Examples of Digital Currencies**

**1. Cryptocurrency:** Cryptocurrency is a type of digital capitalist that works as a means of exchange over a computer network and is not managed by any central authority, like a bank or the government. It's defended by cryptography, making it nearly impossible to fake or double spend.

**2. Central Bank Digital Currency:** CBDC is a central bank- issued digital currency or set of digital tokens that functions also to cryptocurrencies. The maturity of central banks throughout the world is probing the issue of CBDC, with each country's criteria serving as the primary motorist. CBDCs grease fiscal addition and make it easier to conduct financial and financial policy. Due to the fact that they're a centralised form of plutocrat, they might not offer sale obscurity as certain cryptocurrencies do.

**3. Virtual Currencies:** Virtual currencies are unregulated digital currencies that are managed by developers or a founding organisation made up of different process participants. An example of a virtual currency is a gaming network token, whose Economics is determined and managed by developers. Virtual currencies can also be algorithmically regulated by a defined network protocol.

### **How Does Blockchain Work**

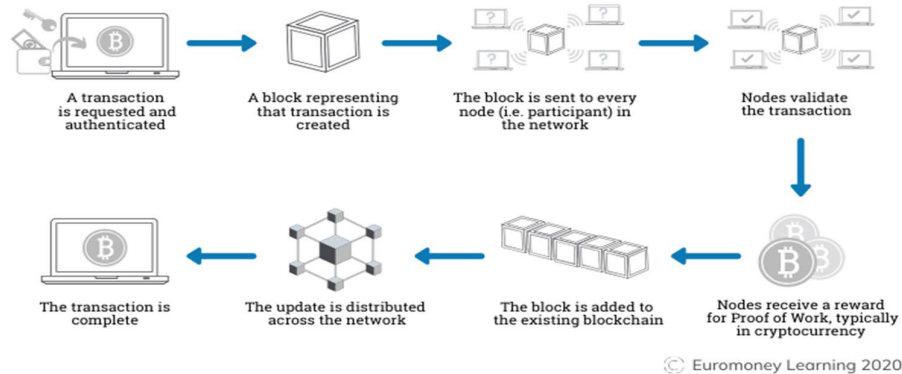
The blockchain is a participating tally that stores sale data among a network of untrustworthy peers. Through bumps, which are computers that serve as actors in the blockchain, people execute deals on a blockchain. In a blockchain, each block is distinct from the former bone and contains data as well as its own hash and the previous block's hash. A hash value is a singular value created from a string of textbook using a fine algorithm. Although a hash algorithm maintains a block's and blockchain's security, evidence-of- work is also employed to reduce corruption and ameliorate security. The Proof-of-Work (PoW) system creates data that is challenging to produce but simple for others to validate. A PoW or fine problem must be completed by the minors for the network members to accept a block. It generally takes 10min to complete PoW calculations and add a new chain to the block.

By addressing the recipient with the public key, anybody may shoot the sale. Only the owner of the wallet, who is in possession of the private key, is able to penetrate the sale. A distributed network with a participant ledger, private key cryptography, and a third technology—an incentive for maintaining the network's records and handling transactions—combined to create a blockchain. Public and cryptography keys work together to generate identity in blockchain technology. A strong digital hand and strong ownership are created by the combination of these keys. The miners engage in transactions that result in blocks that grumble to every knot. The blockchain is updated and the block is added after being validated using PoW by the bumps. The rewards for these conditions are given to the bump or miners in the form of bitcoins that are added to their digital wallet (Feign). Additionally linked into the purchasing process are payment channels. To verify the sale, they ignore the Blockchain.

**Exhibit 2** Diagrammatic representation of transaction getting into the blockchain. (“transaction in blockchain”)

**Exhibit - 2 How does a transaction get into the blockchain**

### How does a transaction get into the blockchain?



**Exhibit 2 How does a transaction get into the blockchain**

### Benefits of Blockchain Technology in Finance

The blockchain allows new banking and fiscal products and services, participating operating models, further effective procedures, lower costs, and more open, inclusive, and secure commercial networks. It makes it possible to issue digital securities more snappily, at a cheaper cost per unit, and with further customization. Therefore, digital fiscal products might be customised to meet the requirements of investors, opening up new requests for them, lowering costs for issuers, and lowering counterparty threat.

**Security:** By eliminating single points of failure, its distributed consensus-based design also removes the need for data intermediaries like transfer agents and messaging system operators.

**Transparency:** It makes use of standards, protocols, and shadow processes, serving as a single, shared source of truth for network users.

For diverse parties in a corporate network to interact, handle data, and come to agreements, it is simple because of its transparent and immutable ledger.

**Programmability:** It enables the construction and execution of smart contracts—tamper proof, deterministic software that automates business logic, increasing trust and efficiency.

**Privacy:** It provides the industry's top GRE, Alliance selective data sharing, and business network. This ensures that privacy and secrecy are preserved while greatly enhancing openness, trust, or efficiency.

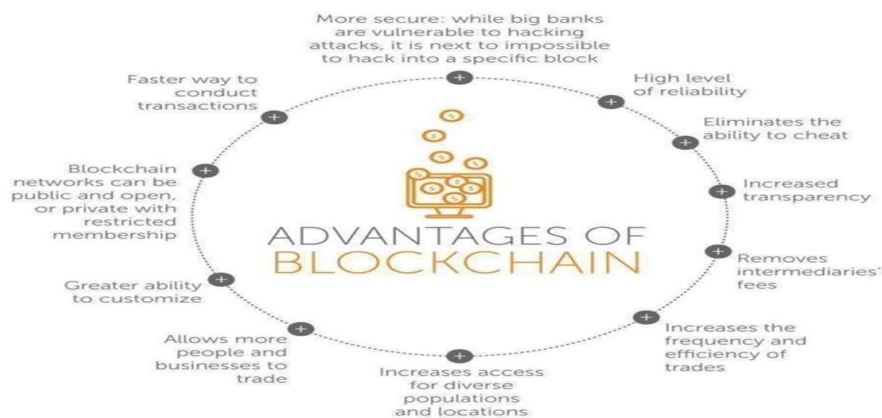
**High performance:** Its private and hybrid network are designed to withstand sporadic spikes in network traffic of hundreds of transactions a second.

**Scalability :**The mainnet's global reach, recall resilience, and high degree are all offered to any corporate solution, supporting interoperability across private and public chains.

By the end of 2030, banks will be able to save up to \$27 billion on cross-border settlement transactions, or more than 11%, thanks to the adoption of blockchain technology, according to a report by Juniper Research.

### Exhibit 3

#### Shows the Advantages of Blockchain (“Advantages of blockchain”)



### Exhibit 3 Advantages of Blockchain



## Impact of Blockchain Technology

Presently, the influence of blockchain technology on banking and fiscal services is being estimated in relation to other sectors and businesses. Decentralised, transparent, anonymous( or pseudonymous), and incommutable describe blockchain technology. Digital currencies, a salutary new means of sale that's safer and superior than factual currency, are created using blockchain technology. Digital sale checks are maintained using blockchain as the foundation. In recent times, blockchain technology has been used in a wide range of diligence, including manufacturing, force chain operation, and fiscal services. Banking product and service invention Innovation in banking goods and services has, for the utmost part, fallen short of prospects at the moment. still, there's now a new option to give their guests with lesser value through digital asset Exchanges with fantastic service delivery to blockchains. centralised tally Technology has the capability to address patient issues with business services by enabling several institutions to significantly ameliorate the banking experience for their guests. The capability to precipitously change a variety of other fiscal means on or via a blockchain network may also be handed by banks to those consumers. **Exhibit 4** Shows the impact of Blockchain Technology in the financial sector.

**Exhibit 4**  
**Impact of blockchain tech in Financial Sector (“Home”)**

### Impact of Blockchain Technology in Financial Sector

This graph/chart is interactive, and changes automatically based on the 'Just left click on it and select 'Edit Data'



## Blockchain Challenges

Blockchain offers both potential and challenges. There are now applications for the blockchain that may be used to execute financial transactions and facilitate the exchange of various financial assets. For instance, HSBC recently revealed that it has carried out a trade financing transaction using blockchain technology. The deal was immediately completed. Compare this to the time it may take to conduct the same transaction using a paper-based technique, which might take up to a week. This is where the future of global trade finance resides.

The potential for disruptive transformation in the financial industry due to blockchain technologies includes:

- Changing the paper best system is the finest way to disrupt business operations.
- Creation of new, intermediary-free peer to peer financial marketplaces.
- Enhanced risk management through the widespread usage of global digital identification that has been confirmed.

Despite all the possibilities, the financial industry faces substantial blockchain hurdles that might impede future development and broad use of the technology.

The following are significant blockchain challenges:

1. **Performance Problems:** Transaction rates utilising Bitcoins are exceedingly sluggish, only reusing three to seven deals per second. Although the bitcoin blockchain was designed to improve selling speed, it can only process up to 15 transactions per second. When compared to legacy payment processing systems, which handle thousands of transactions per second, this is slow.
2. **Standards :** There are issues with interoperability amongst blockchain systems. Interoperability was added to legacy systems' products during development. In order to get further acceptability, Blockchain Technology must likewise adhere to this universal pattern of interoperability.
3. **Cost of transactions:** A key issue with several blockchain technologies is the price of the power and computing resources required to conduct trades. Creating bitcoins involves being "booby-trapped." The complicated computational task of mining bitcoins currently consumes more power than a bitcoin is worth in many places.
4. **Criminals stealing cryptocurrency:** Each bitcoin has a corresponding criminal conditioning. Additionally, owing to cyber crimes, bitcoin exchanges lost around \$1 billion in value. However, there are still

important businesses over security concerns and distancing from the crime affiliation. Public blockchains, which are decentralised and operate on a peer-to-peer network, are immune to hacking, while private blockchains, which operate centrally like a bitcoin exchange, are unquestionably more susceptible.

5. **Volatility of cryptocurrency prices:** Cryptocurrencies are less suitable as a long-term store of value due to the dramatic fluctuations in their value, which saw them unexpectedly lose up to 80% of their value in 2018. This extreme value volatility weakens any system that depends on cryptocurrency payments.

### **Challenges of Digital Currencies**

- Challenges to monetary policy, the structure of the financial markets, and financial stability.
- Disintermediation of the banking system
- Risks related to cost and financing availability.
- Risk to computer security potential There are already a number of cybersecurity issues associated with recent interviews. With the advent of digital currency, hacks might increase in frequency and severity, much as the Mt. Gox bankruptcy case.
- Risk to financial stability: If the RBI published interest rates on the digital rupee, banks would face instant competition. The stability of the financial sector might be in jeopardy if the regulator ends up in a direct competitive position with the regulated businesses.
- Consumers are not motivated to switch to digital rupee: Due to the fact that an increasing number of retail transactions have already been performed, users have no reason to convert to a CBDC. Inform me of the UPI-based speedy payment methods.
- Operational issues: The implementation of CBDC will raise many operational issues, including data security and KYC (know your data) requirements.
- End of privacy: A person's digital currency needs to collect some fundamental information about him in order for him to prove that he is its owner. These basic facts may be sensitive, including a person's name and fingerprints, among other things. Furthermore, even when the phone is switched off, CBDCs will keep leaving a digital trail. for instance, the expense of lodging, eating, and travelling.

Digital money must be created in a way that satisfies people's privacy expectations if we want it to be attractive. However, the complete anonymity provided by cash does not seem like a practical choice. Other goals of public policy, such as guaranteeing adherence to anti-money laundering regulations and preventing the funding of terrorists, would be violated.(SHUKLA).

### **The way forward: Technology revolution and monetary evolution**

Today's cryptocurrency industry is fragmented and very competitive. More elements that will diminish and increase the appeal and trust of utilising cryptocurrencies have been found by experts.(Rahn #).

The digital currencies ought to

- Instantly liquid: The liquidator should be produced immediately or on demand.
- Safe and unchangeable: Not spendable
- Dependable: supported by a lender of last resort (e.g. a central bank)
- Free from cryptographic fractional reserve banking Cost-effective to issue
- Available right now
- Ruled and controlled
- Transparent with a closed transaction ( directly and remotely)
- Give economic activity (commerce) a purpose and create lasting value.
- A standard that will allow interoperability
- Be legitimate: Have a capable authority that can enact these norms.

Cryptocurrencies will undoubtedly benefit market participants.

The benefits include-

- Instant asset availability: There will be no waiting period before consumers and companies may use the coin.
- Instant access to liquidity: The coin will be extremely liquid or will instantly provide liquidity when needed.
- Working capital-free: Banks won't need to retain as much cash in reserves since it will be accessible for other uses and fill the gap left by the lack of intraday liquidity in the programme.
- Efficiency of transactions: Since cryptocurrency transactions are instantaneous and quick, they increase efficiency by eliminating the intermediary and avoiding drawn-out back office reconciliation procedures.
- Security for transactions

- Economic development may be permanently boosted by cryptocurrencies issued by central banks.
- Working as a crypto reserve currency, commercial banks may supplement the fractional reserve banking system by keeping a portion of their reserves in cryptocurrencies rather than in fiat money.
- Lower cost: The banking system will be able to reduce the cost of issuing, circulating, and handling bank notes thanks to cryptocurrencies. Additionally, transaction costs will drop considerably, particularly for international transactions.

## **CONCLUSIONS AND FUTURE OF BLOCKCHAIN**

Blockchain as a fundamental technology will have an effect on the financial technology landscape as it continues to disrupt the banking and financial industries. Blockchain solutions may provide a potent new type of data sharing by using preferred processes like consensus building and distributed ledger data, which also eliminates third party innovation and Ding up breaking. Through a skilled financial system, blockchain in banking may assist offer speedier payments to clients.

The acceptance of blockchain technology will necessitate developing business models that incorporate networks that connect producers and consumers as well as coding arrangements that exchange incentives to secure our governance (Doshi).

While blockchain technology is used in many other businesses, the financial sector has been among the leaders in adoption. Blockchain technology is presently being used by around 30% of banking institutions to create a new digital financial services platform. Banks began making significant financial investments in the study and development of blockchain-based dispute resolution methods. As a result, the adoption of blockchain in the banking industry is considered as having the potential to address a number of difficulties and challenges in the financial services industry and increase the transparency and dependability of the banking system. Blockchain in particular is a disruptive innovation platform, thus its effects may extend beyond reviving the financial services industry.

## **FUTURE OF BLOCKCHAIN IN INDIA**

From becoming a platform for Bitcoin, as Satoshi Nakamoto initially intended in 2009, it has been a lengthy road to Amazon's inclusion of ground-breaking black-bone technologies to enhance commerce across industries.

It is encouraging to see that technology is also advancing in India, where the government is taking steps to create a national blockchain architecture in order to create a centralised up to 44 distinct industries, including e-governance, which might be supported by this ecosystem.

In addition, India will catch up to nations like China, the UAE, the US, Brazil, Chile, Canada, Singapore, and Switzerland in the blockchain arena if it decides to utilise the potential of this new Technology through a legislative Framework. In the future, this technology will completely alter the playing field. According to the analysis, it will be used by a lot of new, creative businesses, and at least one would be worth \$10 billion by 2022 if it were founded utilising this cutting-edge technology. For 30% of the poorer customer base by 2030, it might be utilised as a safe from the national Technology. Blockchain would increase corporate value by about \$176 billion by 2025. By 2030, this will have further increased to \$3.1 trillion. It only displays the potential as it develops.

The Ministry of Electronics and Information Technology (MeitY) has identified 44 major sectors for the proposed Framework, which is one of its best features. These domains span nearly all industries, from agriculture and pharma to education and energy. Among all of them, e-governance will be given the most consideration since the government has compiled a lengthy list of prospective applications for 100% reliable service delivery to the public. A few of them include cross-border transportation, public service delivery, charitable giving, smart grid management, the transfer of land records, the pharmaceutical supply chain, notary services, duty payments, automated customs enforcement and compliance, agriculture supply chains, e-voting, cryptocurrency wallets, health records, and vehicle registration. The confidence and accountability of e-governance will be preserved since it is so difficult to tamper with data stored in blockchain technology. In addition to the present infrastructure and services, it can also combine existing apps like e-sign, e-pramaan, and digilocker. It implies that the isolated atoms used by various departments to embrace this technology will now be merged, and with the help of the business sector and improved research, we will witness the much-needed impetus for its changes. The suggested policy initiative clearly lays out the objectives and effectively captures the potential. The technology will let data be stored in a distributed environment in a way that is decentralised, vigilant, time-stamped, and unchangeable. (“Blockchain tech is the future - The Hindu BusinessLine”).

## **FUTURE OF DIGITAL CURRENCIES IN INDIA**

The Reserve Bank of India plans to introduce a digital currency before March 2023, when the current fiscal year ends. Digital transitions nowadays leave a trace and an audit trail. Every time a debit or credit card is swiped, details about the cardholder's identity, transactions, and whereabouts are known. Through its real-time gross settlement system, which provides insurers with cash transfers in a matter of seconds for high amounts, and its National Electronic Funds Transfer system, which handles retail payments, the reserve bank has contributed to the industry's expansion. Then there is UPI, or the Unified Payment Interface, which is a peer-to-peer interbank and person-to-merchant transaction facilitation immediate real-time payment system.

Summing up- Accepting that blockchain technology will be advantageous to and attract a variety of possible businesses and organisations, all of which will undoubtedly invest in it, should not cause any difficulty. Although it will help combat a number of market-wide problems, technology still has a long way to go. If you are a computer enthusiast or not, blockchain technology offers fresh and interesting work and investment prospects to offer, all of which are worth examining. Over time, there will be noticeable development in this industry.

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