

# Use of Bitcoin as a Cryptocurrency

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## Abstract

The perfect currency should have limited supply, easily recognizable, durable, as well as portable. Bitcoins as one of the cryptocurrencies have tremendous benefits for most marginalized people, merchants, tax departments and regulatory authorities. It has better price discovery, is anti-inflationary. Because of less awareness among people there are less research work. Many people are unaware of the usefulness and technology related to cryptocurrency. This paper aims at to review working of Bitcoin technology and to explore technological aspects of this cryptocurrency. It also discusses the possibilities of Bitcoin's implementation as currency in India.

**Keywords:** Bitcoin, Cryptocurrency, Blockchain,

## 1. Introduction

Money is the legal tender as a mode of carrying or exchanging goods and services to maintain an economy as a whole. Money was introduced with an aim to stop the barter economy which was later in exchange of metals like gold, silver and copper were used as minted coins. One can derive this as revolution of money and then the paper money was invented by Tang Dynasty China and later on accepted by every other Nations. This money was meant to maintain stability in trading by the value of Goods and Services. Paper money is controlled by the Centralized Governments of every nation and it is a legal tender. To control money the monetary policy was set up which limited the money to keep its value stable rather than being liquidated. But as time passes by, the massive growing global economy and increase in use of technology, revolution of money continues. The famous new type of money is "CRYPTOCURRENCY" which is known to be a form of electronic money. It is widely famous are the Bitcoins. This money is not issued or controlled by any banks and don't fall under any government regulations. Out of all cryptocurrencies, Bitcoins are the most famous, because they have managed to create a pattern of how people think about them. It has built its own ecosystem.

## 2. Bitcoin and Other crypto-currencies

Among the other cryptocurrencies are Bitcoin Cash, Mixin, Marker, Ethereum, Dash Zcash, DigixDAO, Monero and Litecoin. The figure 1 shows comparison of prices of various cryptocurrencies in US dollars. This statistic shows the most expensive virtual currencies globally as of July 20, 2018 is the Bitcoin. Bitcoin was the most valuable cryptocurrency at 7,451.29 U.S. dollars per unit.

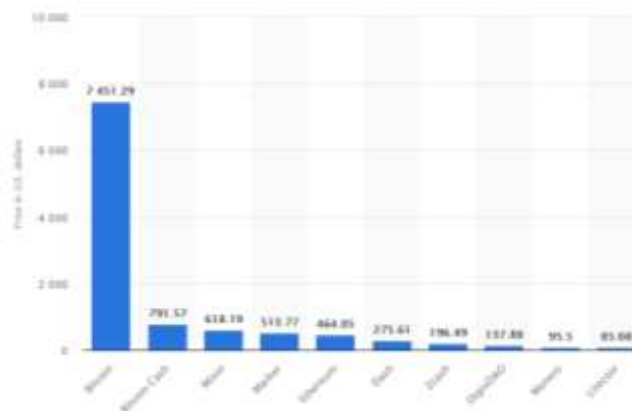


Figure 1: Most expensive virtual currencies globally as of July 2018 [7]

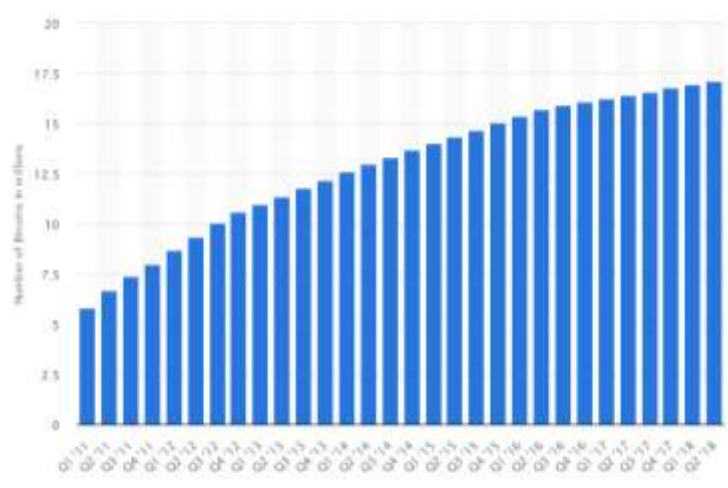


Figure 2: Number of Bitcoins in circulation worldwide from 1st quarter 2011 to 2nd quarter 2018 (in millions) [8]

The statistic presents the total number of Bitcoins in circulation from first quarter of 2011 to second quarter of 2018. The number of Bitcoins has been growing since the creation of this virtual currency in 2009 and reached approximately 17.12 million in June 2018.

### 3. Literature Review

This paper [1] discusses the questions, answers and legal; issues associated with Bitcoin transactions. This paper [10] discusses about insightful analysis of Bitcoin's properties and future stability and also identified three general disintermediation strategies and provides a detailed comparison. This paper [9] discusses about anonymity and decentralization of bitcoin. This paper [12] discusses about Bitcoin activity to date, economic, technology and governance. This paper [2] discusses about the analyses of the Indian tax and legal consideration regarding bitcoin. This paper [11] discusses about anonymity, bitcoin, laundry, mix, pseudonymity, shared wallet and transaction.

### 4. Problem Statement

Many people in India are still unaware of digital currencies. To make it a part of people daily lives or to apply in their day to day life networking is a must to spread. As compare to fiat money usage of bitcoin in the market is still low because of lack of knowledge. People working in companies like Tigerdirect & Overstock are making customers understand the process of bitcoin transaction and pros and cons of bitcoin. Because of less

awareness among people there are less research work. Many people are unaware of the usefulness and technology related to cryptocurrency. This paper aims at to review working of Bitcoin technology and to explore technological aspects of this cryptocurrency.

## 5. Working of Bitcoin

The figure 3 illustrates the Bitcoin transaction. Bob an online merchant decides to begin accepting bitcoins as payment. Whereas Alice, a buyer has bitcoins and wants to purchase merchandise from Bob. Both Bob and Alice have bitcoin wallets on their computers. Now these wallets are like files which contains information that provide access to multiple bitcoin addresses. An address is (something like this: 1GTYU567KDSMDKI) is a string of letters and numbers. Now each of these addresses has its own balance of bitcoins.

So, to make transaction with Alice, Bob creates a new bitcoin address to send her payment to. While creating his own address what bob actually does is he generates a “cryptographic key pair” which includes private and public keys. If one signs a message with a private key (which is only known to its creator), it can be verified by using the matching public key (which is known to anyone). Bobs new bitcoin address represents a unique public key and the corresponding private key is stored in his wallet. To verify that message is been signed with valid private key, public key is used. It allows anyone to verify the message.

Alice and Bob are anonymous to each other. When it comes to submitting a payment, Alice tells her bitcoin client that they would like to transfer the purchase amount to Bobs address. As Alice’s wallet holds the private and public key for each her addresses, the Bitcoin client signs her transaction request with private key of the address she’s transferring address from. So other people from the network can now use the public key to verify whether the transaction request is actually coming from the original amount holder.

With the help of previous hash value, the new transaction block and a nonce the new hash value is generated with the mining computers. It is impossible to predict which nonce will produce a hash value. So, they are forced to generate many hashes with different nonces until they happen upon one that works. Each block includes a coin-base transaction that pay out 50 bitcoins to the miner who first mine or solve the cryptographic puzzle. In this case Gary a new address is created in Gary’s wallet with a balance of newly minted bitcoins. As the time passes on, Alice transfer to Bob, with all these hard works the bitcoin transaction is done.

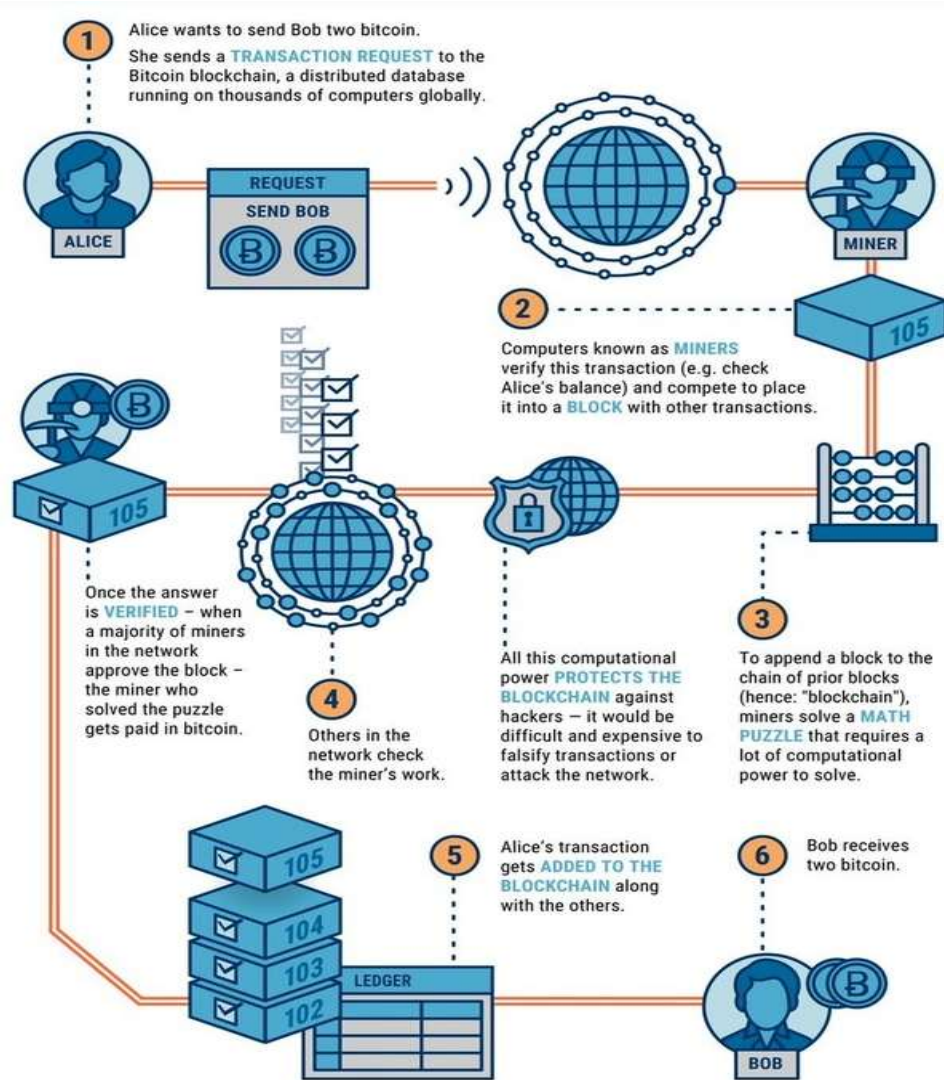


Figure 3: Working of Bitcoin transaction (Source: CBINSIGHTS@mikequindazzi)

## 6. Risk associated with Bitcoin

a. **Money Laundering:** In money laundering the intermediaries (third party) would collect money from one source and transfer it to another source through Bitcoins. To get the transaction secured without revealing their personal information or identity the money launderers and other people operating in black markets used bitcoins.

b. **Drug Trafficking:** To shelter themselves from the strict scrutiny of the law Bitcoins are becoming the first choice of Drug Dealers. The software that lets one surf the dark web anonymously was used by these people to access Silk road (launched in June 2011). Countless people used Silk road to get access to illegal merchandise including from drugs to hire for assassins.

c. **Tax Avoidance and Evasion:** Most of the countries have not resolved the issue of taxation and transaction in related to bitcoins. It is hypothesizing that the answers might be in assenting. For the purpose of transaction there are very few democracies that have released rules or guidelines regarding to bitcoins.

## 7. Bitcoin Advantages and Disadvantages

Some of the advantages of Bitcoin are as follows.

**Freedom in Payment:** Exchange of money is possible with Bitcoin, literally anywhere in the world. The problem of crossing borders, rescheduling for bank holidays, or any other limitations is wiped off completely while transferring money.

**Control and Security:** Giving control of Bitcoin transactions to the users, it helps to keep Bitcoin safe for the network. Merchants cannot charge extra fees on anything without being informed. They must talk with the consumer before adding any charges. There is an absolutely no need of any personal information while making and finalizing transactions in Bitcoin. Since personal information is not at all required, Bitcoin protects against identity theft. Bitcoin can be backed up and encrypted to ensure the safety of the money.

**Very Low Fees:** Currently there are either no fees, or very low fees within Bitcoin payments. With transactions, users might include fees in order to process the transactions faster. The higher the fee, the more priority it gets within the network and the quicker it gets processed. Digital Currency exchanges help merchant process transactions by converting Bitcoins into fiat currency. These services generally have lower fees than credit cards and PayPal.

**Non-Inflationary:** Perhaps, this is the reason why Bitcoin is called the *Future of Money*. Generally, the central government can get fiat currencies printed as much as they want. When the economy is slowing down it is not able to pay off its national debt, the government orders to print more currency and inject it into the economy. This causes the value of currency to decrease as more people have more currency. Also printing more notes creates inflation and increases the prices of commodity. It is because now more people are willing to pay for a particular commodity and the seller has to increase the price in order to make the sale. Thus, the person who had gained when government injected more currency can now buy more but those people who were not benefitted from have limited currency and now the prices of commodity has also increased.

**Quick and easy payments:** Making payments using cryptocurrency is very easy. The transactions get done within a matter of few seconds. It is very quick because it does not require to feed many details. All that is needed is the address of the wallet of the person or enterprise to whom one wishes to make the payment to. The amount shall credit to the receiver within few seconds to a few minutes depending on the crypto. The ease of transfer and the low transaction fees makes it very desirable.

**No chargeback:** Once the payment has been made, one cannot take it back. This depletes the chances of a fraudulent and deception. Once the transfer has completed, it cannot be reversed. Nobody can file chargeback like it can be done with credit cards.

Some of the disadvantages of Bitcoin are as follows.

**Still developing:** Bitcoin is still on its invention and will take time to completely develop and implement it properly in market. As it's a digital currency, hackers may get access to it. There is a lack of tools and services to keep it highly secure. There is also lack of awareness in people about bitcoins which is making the development difficult to be achieved. Since people don't know about bitcoins and its use, they are not ready to use it.

**Possible government interference:** Since it's a digital currency; government will always be in fear or distress of getting hacked. Due to this government may ban bitcoins in their country. Since bitcoin wallets are frozen, accessing them becomes tough.

**Deflationary:** Bitcoins are available in limitation. So, if any business companies or investors have hold on it for long then other companies won't be able to trade with it.

The graph of bitcoin demand and availability goes up and down anytime. If bitcoins are limited in market; demand increase and vice versa which will profit or loss the current investors of bitcoin.

**Not accepted on large scale:** There are many companies and websites that do not accept bitcoins due to its drawbacks. Before investing in bitcoin, make sure its accepted where one wants to use it. Bitcoins will take time to get in the large-scale market and additional uses which will require awareness on wide spread and security on high levels. Also, many sites don't use it because there is no option to reverse the transfer once made it. Attendant focus is needed while making any transactions. If any transaction goes to the wrong group; one might get into trouble.

## 8. Use of Bitcoin throughout the world

The legal status of Bitcoin varies substantially from country to country and is still undefined or changing in many of them. Whereas the majority of countries do not make the usage of Bitcoin itself illegal, its status as money (or a commodity) varies, with differing regulatory implications. While some countries have explicitly allowed its use and trade, others have banned or restricted it. Likewise, various government agencies, departments, and courts have classified Bitcoins differently. Table 1 shows various countries in which Bitcoin currency is considered legal and illegal.

## 9. Bitcoin as a currency in India

In India, Bitcoin trading peaked to over 3.5 million US dollars, in January 2018, with a steady rise following in domestic usage. It may seem insignificant as the monthly trading volume of Bitcoin is US\$3.5 million but the U.S. bitcoin trading volume for the same month exceeded US\$36 million. The financial institutions in India got digitizing at such a time when nearly 40 percent of the country's population owns a smartphone. People are becoming skeptical of depositing their savings in banks, a sentiment intensified by the recent demonstration of the paper currency. These trends all make India ripe for a spur in cryptocurrency usage, and trading. [6]

Table 1: Countries supporting Bitcoin

ZONE	LEGAL	ILLEGAL
ASIA - South Asia	India, Pakistan	Bangladesh, Nepal
East Asia	China, Hong kong, Japan, South Korea, Taiwan	Macedonia
South East Asia	Cambodia, Indonesia, Phillippines, Singapore, Thailand, Vietnam	NIL
Central Asia	Kyrgyzstan	NIL
Eurasia	Cyprus	NIL
West Asia	UAE, Israel, Saudi Arabia, Jordan, Lebanon, Turkey, Iran	NIL
Australia	Australia, New Zealand	NIL
Africa- Northern	Morocco	Algeria
Western Africa	Nigeria	NIL

Southern Africa	Namibia, Zimbabwe, South Africa	NIL
America- Northern America	Canada, United States, Mexico, Central America, Nicaragua, Costa Rica	NIL
Caribbean	Jamaica, Trinidad & Tobago	NIL
South America	Argentina, Brazil, Bolivia, Chile, Colombia, Ecuador	NIL

India was regularly buying and selling bitcoin, but the cryptocurrency made its real debut as fiat money when demonetization took place in November 2016 by the Modi-led government. The reason for this has two parts. They are: the demonetization forced many Indians who hold large amounts of untaxed, black money to quickly find new ways of white-washing money to avoid both, taxation and government scrutiny. Bitcoin became an ingenious way to hide money. People could simply buy large quantities of bitcoin with old rupee notes and then sell them back later for newly minted, legal currency. For tech-savvy Indians, bitcoin- which is a digital currency non- independent on banks and government, became an alternative for government-controlled currency. Despite the demonetization-driven spur in bitcoin purchases in India, cryptocurrency usage remains peripheral. Though its price is volatile in nature, bitcoin is consistently more expensive in India than rates on the international market by five to 10 percent. This is largely because India lacks bitcoin ‘mining’ capacity, the excruciatingly slow and energy intensive means of generating new bitcoins through the verification of sophisticated algorithms. Furthermore, Indian nationals struggle to buy bitcoin from foreign exchanges due to government restrictions on cross-border currency flows.

However, a growing domestic cryptocurrency ecosystem and favorable government regulations could make bitcoin more accessible to middle class Indians, setting the stage for a digital gold rush. In April 2017, Finance Minister of India- Arun Jaitley, formed a committee to assist in drafting a regulatory framework for cryptocurrency in India. The committee submitted their report in August 2017, and the government has stated their intention to publish proposed rules on cryptocurrency in the near future, though have yet to agree on a date. In early 2013, the Reserve Bank of India (RBI) began awakening Indians of the risks and misuses of cryptocurrency. A lack of understanding about how cryptocurrency works in India has given rise to fraudulent. Moreover, the recent global ransomware attacks, which affected India as well has added urgency to the need for a government policy on cryptocurrency, where the cyber-hijackers demanded payment in Bitcoin. A central concern for the Bitcoin community in India, is how the government will define cryptocurrency. Though referred to in terms of currency, given its slow transaction times and volatile value, bitcoin operates more like an asset. A decision to classify it as a currency instead of an asset would necessitate a large regulatory apparatus, constituting a serious discouragement for bitcoin usage in India.

The Indian government watches the domestic growth of cryptocurrency with a mix of apprehension and intrigue, local startups are leading the way in incorporating bitcoin and other cryptocurrencies into India’s lofty digital ambitions. A dedicated group of bitcoin exchanges now provide app-based buying and selling; similarly, a small yet growing number of stores and online vendors are accepting cryptocurrencies for products and services. A series of funding rounds have already taken place for cryptocurrency startups such as Coinsecure, Unocoin, and Zebpay, an indication that investors are taking notice. As India moves to digitize much of its financial services and parts of its consumer market, cryptocurrencies offer a new, dynamic addition to the Digital India project. [3]

## 10 Discussion

Blockchain is a digital ledger in which transactions made in bitcoin or another cryptocurrency are recorded chronologically and publicly.

1. Future of Blockchain in India: Blockchain technology is not limited only to the sphere of the financial sector. There are many instances where Blockchain technology has been effectively used by different nations for different purposes. And India is a head to head with other nations and such a great use of technology cannot be neglected. Bitcoins are the best form of Cryptocurrencies to be used now on internet in a way.

2. Future of Bitcoins as payment option: Bitcoin is supposed to be used as a payment system. That is, if you have Bitcoins, one can use them to pay for anything and everything instead of using money. Thus, Bitcoin enables worldwide transactions to be very fast and convenient with low charges. Bitcoins are useful for trading currencies internationally, something current banks lack, but at the same time they are risky because they are not regulated and can be used for Market Manipulation.

3. Future of Investing and Trading in Bitcoins: Trading /Investing means buying and holding Bitcoins/Altcoins and selling when the price gets higher. India has been looked as one of the nations that would shape Bitcoin's future in the coming years.

4. Banking the Unbanked: It may be hard to believe, but two billion people in the world still do not have a bank account. Most of them live in low and middle-income emerging markets, but even in high-income countries, large numbers of people are unable to use banks to meet their day to day financial needs. This means they don't have access to the convenience, to security and to interest that banks provide. Moreover, many people have access to a bank account but do not have adequate access to the financial services that banks can provide. These people are known as the underbanked. Even in the United States, for example, 33.5 million households were recognized in 2015 as unbanked or underbanked. Clearly, the unbanked and underbanked together constitute a large market that is not well served by existing institutions. In the third world countries, large banks do not want to extend credit to the underbanked. Even when they do, they charge very high interest rates to offset the risk. For a time, microfinance institutions provided a way for the underbanked to access much-needed credit, but in recent years, large banks have begun to participate in microfinance. In the process, the interest charged on microfinance loans has increased significantly and become a major pain point for the unbanked.

If unbanked population could have a bitcoin address, they could be banked fairly quickly through bitcoin. Bitcoin can even be merged with the recent payment disruption like Aadhar pay as one of the payment currencies. The merchant can accept payments using bitcoin which would reduce the transaction fees drastically. According to Zebpay (a leading Indian bitcoin exchange), it charges a minor transaction fee between 500 (0.80825 USD) – 8,000 (13.028 USD) bits depending on the number of bitcoins one sends.

India's unprecedented effort to "bank the unbanked" through the Pradhan Mantri Jan Dhan Yojana (PMJDY), is by far the largest such undertaking in the world. Launched in 2014, the mission to provide no-frills, no-minimum-balance bank accounts to every adult, including the one-fifth of the population living below the poverty line as well as those living far from a bank branch has been remarkably successful. As recently as 2011, only 35% of Indian adults had a bank account. 306 million JDY accounts have been opened, roughly 60% in rural and semi-rural areas as shown in figure 4. The average deposit now appears substantial relative to poverty-level income. By lowering bank transactions costs, hundreds of millions of people who lacked access to financial services are revealing a latent demand. Many previous efforts to reduce the ranks of the



unbanked have been far less effective. Consequently, a great deal of work is needed to determine which characteristics of the Indian programme have been key to its success. [4][5]

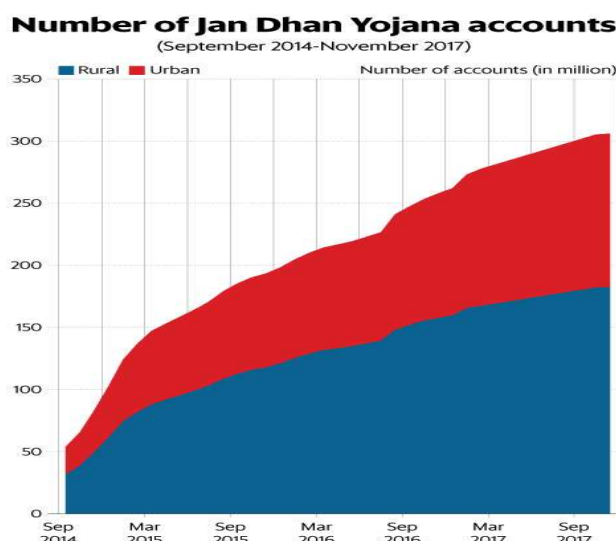


Figure 4: Analysis of Data of Pradhan Mantri Jan Dhan Yojana (Source: PMJDY website)

- Is it the country's unique Aadhaar ID that facilitates account opening and limits fraud?
- Is it the government's effort to digitize payments, including benefits transfers that can be distributed through these accounts?
- Is it the willingness of a largely public-sector banking system to advance a possibly unprofitable national mission? Is it the thousands of new bank agents engaged to encourage account opening and use in rural villages?
- Is it added benefits (such as debit cards, insurance and overdraft privileges) associated with the accounts? Is it the national scale that creates a range of favorable network effects (such as facilitating remittances across long distances)?

## 11. Conclusion

Bitcoin will do to the banking industry what email did to the postal service. The email did not make postal service irrelevant however forced the post office to concentrate on their strengths like their reach to remote rural areas, providing banking to low income population and less on their weaknesses. That's the technology part of it, as per economics, perfect currency should have limited supply, easily recognizable, durable, as well as portable and that's exactly what bitcoin is. It's a known fact now that Bitcoins and other cryptocurrencies have tremendous benefits for most marginalized people, merchants, tax departments and regulatory authorities. It has better price discovery, is anti-inflationary and the transactions are irreversible. RBI has also noted that blockchain technology is best known for its groundbreaking application in the modern cryptocurrency, and more-so because of the disruptive innovations it promises.

The problem that one can foresee is the pace of change in regulations; change in regulation usually takes a route of develop, propose and adopt which generally takes a period. Regulations or regulatory changes typically evolve at a slower pace than innovation thereby killing it by declaring it illegitimate. Also, as its not been governed by a central authority bitcoin tends to fluctuate widely and to be used globally its volatility needs to settle down.

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