Cryptocurrency and Bitcoin as a Payment Gateway- A study

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Abstract: Cryptocurrency is a medium of exchange which uses cryptography to secure its transactions. DigiCash in the Netherlands was the first form of internet money and it was invented by David Chaum. But the company went bankrupt in the year 1998. The second wave was with reference to internet payment. Start-ups created payment solutions and virtual money systems. Players like PayPal became highly successful as they understood customer needs. 2008 economic crisis that had huge impact on the economy of the USA as well as countries across the globe. When one system fails, it is quite natural for people to experiment other options and cryptocurrency was one such alternate available. Though there were some instances of cryptocurrency concept in the past, it was Santoshi Nakamoto who published a paper in 2009 explaining the concept, technology and source code for implementation on blockchain. He also introduced world's first cryptocurrency Bitcoins. There after lot of other cryptocurrencies have also come into picture. Bitcoins has seen enormous increase in value, wide acceptance by people, heavily traded on bitcoin exchanges. It is disrupting the global financial industry and global economy. At the same time lot of issues like fraud and theft, sharp decline in the value, regulatory issues associated with bitcoins coming to light regularly. This paper is an attempt to understand the functioning of Bitcoins and blockchain technology, usage of blockchain technology in other domains and to understand perception of industry participants towards Bitcoins.

Keywords: Cryptocurrency, Bitcoins, Blockchain technology, Global financial markets, Regulatory framework, Bitcoin exchanges.

1. Introduction:

A cryptocurrency is a medium of exchange just like cash or credit card; it uses cryptography as a mean to secure its transactions. With the circulation and launch of Bitcoins in 2009, the world of cryptocurrency was evolved. Cryptography also control on the number of creation of any additional units of any cryptocurrency. Cryptocurrencies doesn't have any physical existence like traditional medium of exchange has. Generally, cryptocurrencies are used only for business doing or while transacting only some portion of business houses accepts this new disruptor currency system. The number of people accepting cryptocurrencies in the market is however widening. For transaction, cryptocurrencies are used via smartphones applications for payment via digital wallet. The technology that mainly governs the smooth functioning and also which is the root for this payment system is called "Blockchain". It involves continuous growing list of records or typical transaction, each records are called as blocks. Each of the blocks is interconnected to each other in a more streamlined manner; it is therefore debatable as in whether the Blockchain technology which led to rise in cryptocurrencies or which led to rise in the functioning of cryptocurrency is the nest available system in today's digital era or not? The system works as the following example: Let's say a person walks into the coffee shop and buys a copy, he pays the amount of coffee via credit card and walk away. Now let's say that the person has paid it through cryptocurrency, he opens his/ her wallet, scans the QR and makes the payment. Now in the first case, it will take as long as 3 to 10 days in many cases for the transaction to be approved by banking institution and also it will go through some security checks and then the amount will get credited or debited for the concerned party and also some charges will be levied. But if the payment is made through any of the cryptocurrency, it takes only 10 minutes of the time to approve and credit the payment. Also

the Blockchain system which is a sort of an "open ledger" system allows the user to see the transactions and no fees is occurred by the either party.

There are several numbers of cryptocurrency that are available in the market; the number is increasing each passing day. The value which is been derived for the cryptocurrency is derived via "mining". It includes programmer and software engineers which are mining the amount of cryptocurrency. So the price or the market value of cryptocurrency works on the function of demand and supply for the cryptocurrencies. But as some of the latest trends suggest and also it has been mentioned by many top analyst of the Wall Street that out of the odd 300 cryptocurrencies available in the market only couple of them are worth the noise, "Bitcoin" being one of them.

Satoshi Nakamoto the person or group of people created the bitcoins, widely even known by the term altcoins. As per the research produced by the University of Cambridge, there are close to 5.8 million unique users using cryptocurrency wallet, most of them using bitcoin. The unit of account in bitcoin is called bitcoin. The smallest amount of bitcoin that is represented is called Satoshi; it represents around one hundred millionth of bitcoin. A bit equals one millionth of a bitcoin or 100 Satoshis. Also number of bitcoins that will attain its full space will amount to just 21 million bitcoins. According to few experts in the field, in the year 2140 last bitcoin will be mined.

While some people believe that it is a type of "Ponzi scheme", some considers it as a wide investment opportunity. Bitcoins are untraceable, only the public key is used and can be seen by any individual in the world, the name, address and other relevant information are however kept hidden because of the Blockchain technology usage. If any individual loses the private key, the bitcoins that are owned by the person are lost forever. Bitcoins have gained the high end value in all its lifetime, except in the year 2014, when the prices or the market value of the bitcoins dropped. Bitcoins can't be banned as said by experts, still there is open and closed end activities which are carried by the investors in order to invest in the bitcoins and also trade it via different means. Cryptocurrencies are even banned from many countries in the world including India.

2. Methodology:

Objectives:

1. To study the bitcoin mining process and operational aspects of bitcoins as a payment gateway
2. To understand the blockchain technology
3. To understand the perception of industry professionals about bitcoins from a transaction perspective

Data collection tools: Secondary data is collected through published articles and reports, newspapers, magazines, journals and bitcoin exchanges. Primary data to understand the perception of industry professionals about bitcoin being a payment gateway was collected through administering a questionnaire. The sampling technique used is random sampling.

Data analysis and interpretation: Percentage analysis, descriptive statistics, charts and graphs are used to interpret primary data.

3. Analysis and Interpretation:

Bitcoin as a payment gateway

The cryptocurrency market is gaining momentum not only as an investment opportunity but also in terms of daily use in the business. Earlier the payment made where typically by the use of net banking as an option; soon e-wallets started taking a great share in the market. The main advantage for using cryptocurrencies as a payment gateway is because of their exchange rates. There are businesses that are currently using cryptocurrency as one of the payment method. The debate whether it is legal to use it as a payment gateway is a different thing altogether. Estonia has clinched the number 1 position as the best cryptocurrency friendly

country. Well known as the birthplace of Skype, it now hosts a number of Bitcoin ATMs and start-ups such as Paxful, a global peer-to-peer buying and selling service for bitcoins. With one of the highest internet penetration rates in the world, Estonia is well positioned to be a place where cryptocurrency users can certainly feel welcome. While some countries like Canada has defined usage of cryptocurrency as a barter system. There are even countries like Iceland and the latest addition of South Korea and India to the list that has banned its citizen from using cryptocurrency. There are even countries like Malaysia who are yet to put forward their steps in terms of usage of cryptocurrency.

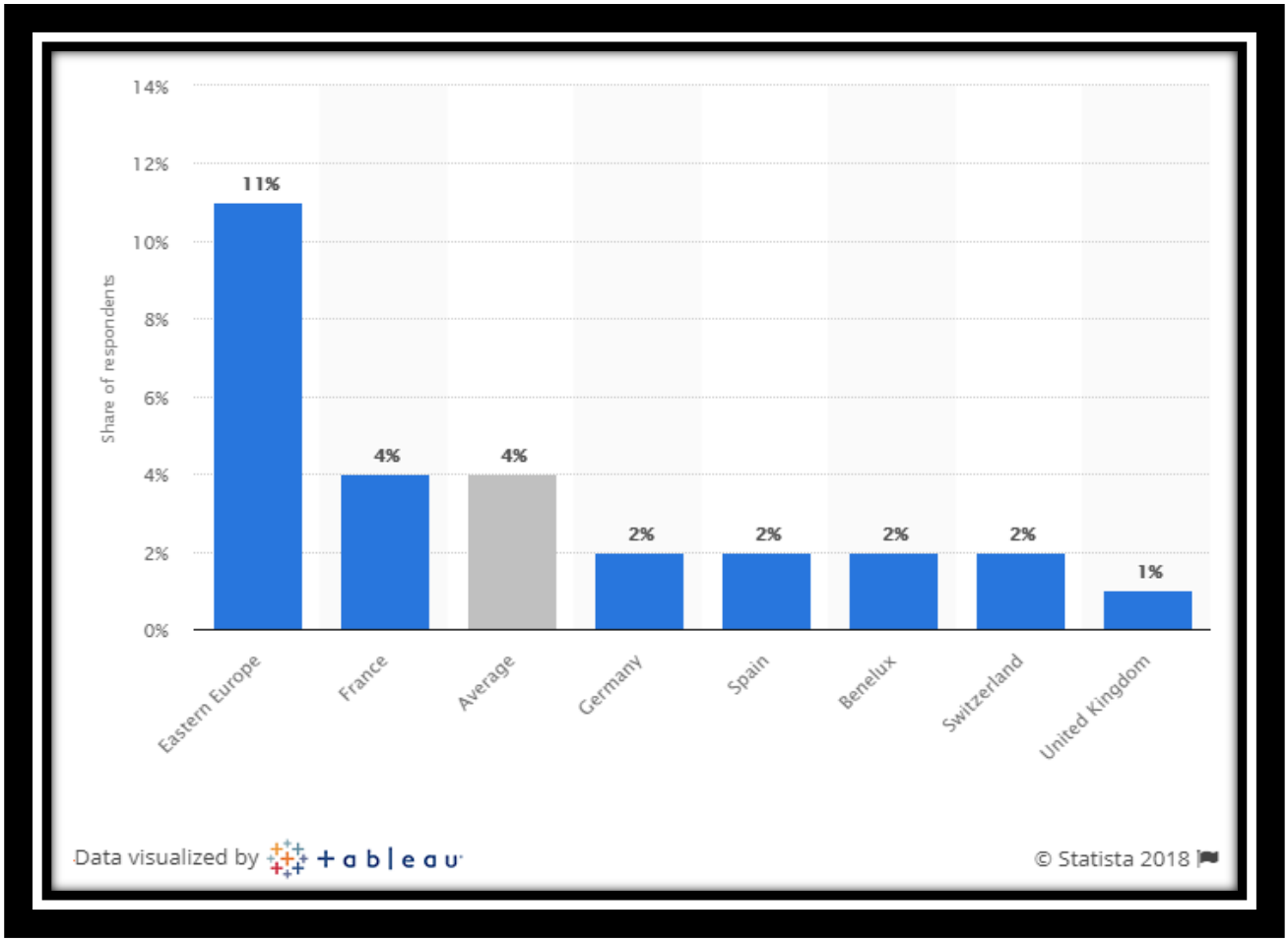
The reason why usage of cryptocurrency as a payment gateway is gaining momentum and has started gaining place in the minds of not only the business houses but also the common people is because of its decentralized system that it follows. Comparing the payment gateway with the traditional payment method, the traditional payments are often termed in 'high risk zone'. The reason is because of the intermediaries involved in the process and also because of the human interferences. The second factor that works in favour of cryptocurrency is the fact that the transactions which are once recorded in the Blockchain can neither be altered nor can it be deleted. No chances of any kind of frozen accounts, also there aren't any barriers like geographical or any of the hidden terms.

Companies and businesses like WordPress.com, Microsoft, Subway, Namecheap etc., are all using cryptocurrencies as a payment gateway. With companies like Bloomberg and also start-ups within the bitcoins such as Bitcoincoffee.com who have started accepting the payment for their various products via cryptocurrency, the digital payment disruptor is soon going to dominate the businesses all around the world. Users are also using VPN (Virtual Private Network) while making payment. Using VPN has made the cryptocurrency as a payment option more reliable and secured. Hence, it can be concluded that it gained positive trust in the minds of the corporate houses.

There are different types of payment methods which are followed when it comes to cryptocurrency as a payment gateway. One of its kinds is multi cryptocurrency payment gateway. Multi cryptocurrency are one of the forms of decentralized payment platform that enables users to send and receive payments in multiple cryptocurrencies. The main aim and objective is to create an atmosphere for payment which eliminates and minimizes the number of intermediaries which are normally involved for the payment process while making any transactions. The other advantage that a user has is security that is provided by the Blockchain Ecosystem. One of the reasons why users are making extensive use of cryptocurrency is because of its security feature. Multi cryptocurrencies facilitate global transactions and also helps in maintaining a safe network for payment. The concept "Smart Contracts" are used in order to facilitate the negotiation and close payment agreements between various people involved in the transaction process, right from suppliers, distributors, businesses and consumers. A smart contract also helps in audit process which increases the layer of security and also enhances payment process.

Following is the data which was published in "The Statistics Portal" which shows the share of consumers using cryptocurrency as a payment method every day in Europe. (Figure-1)

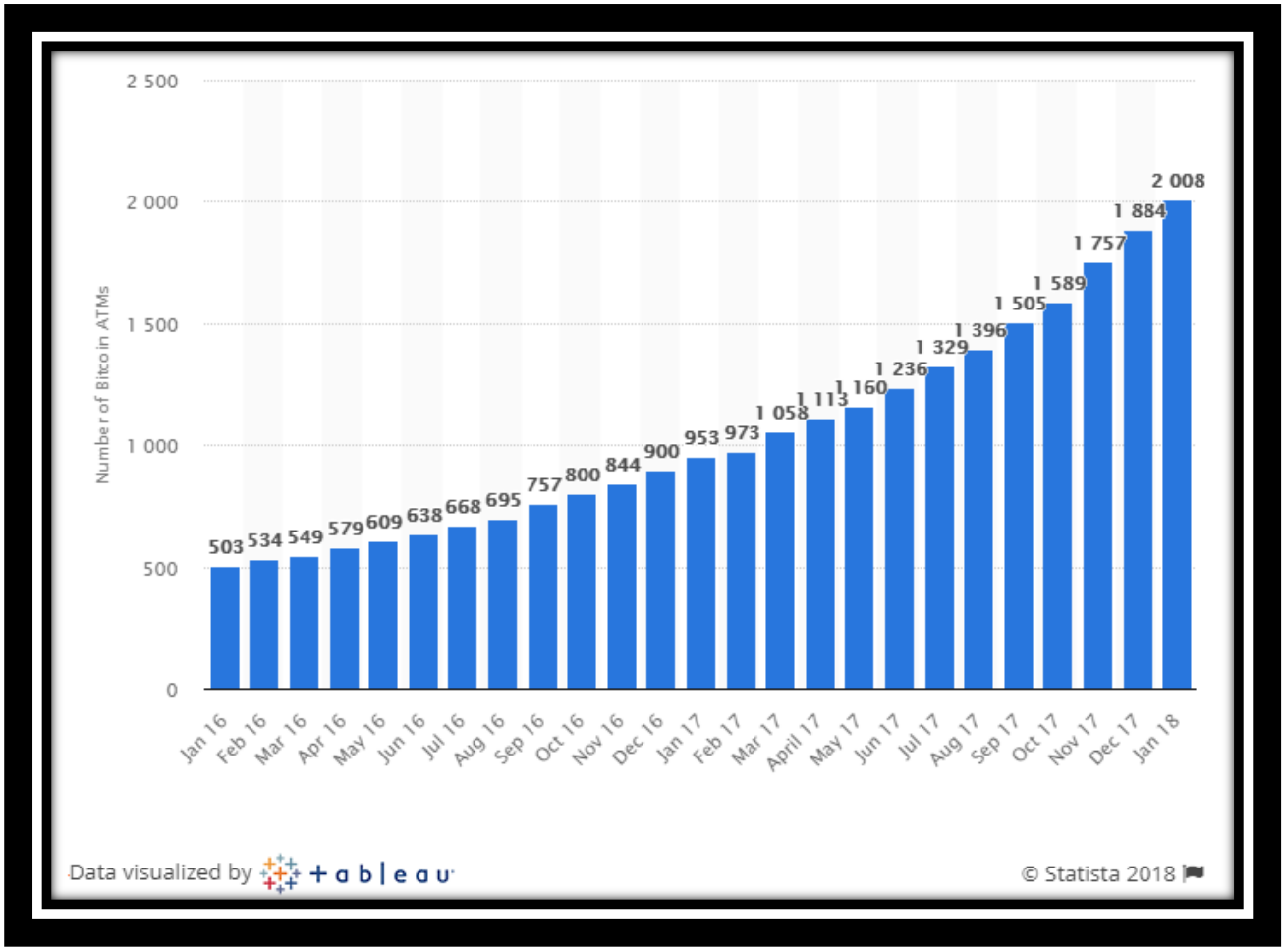
Figure-1



(Source: The Statistics Portal)

The following image shows the number of bitcoins ATMs worldwide as of January'2018 as published in "The Statistics Portal". The reason why there is more mention about the bitcoins specific whenever there is mention of cryptocurrency comes, is because of its momentum and also because of its image in the minds of business houses and also in the minds of consumers.

Figure-2



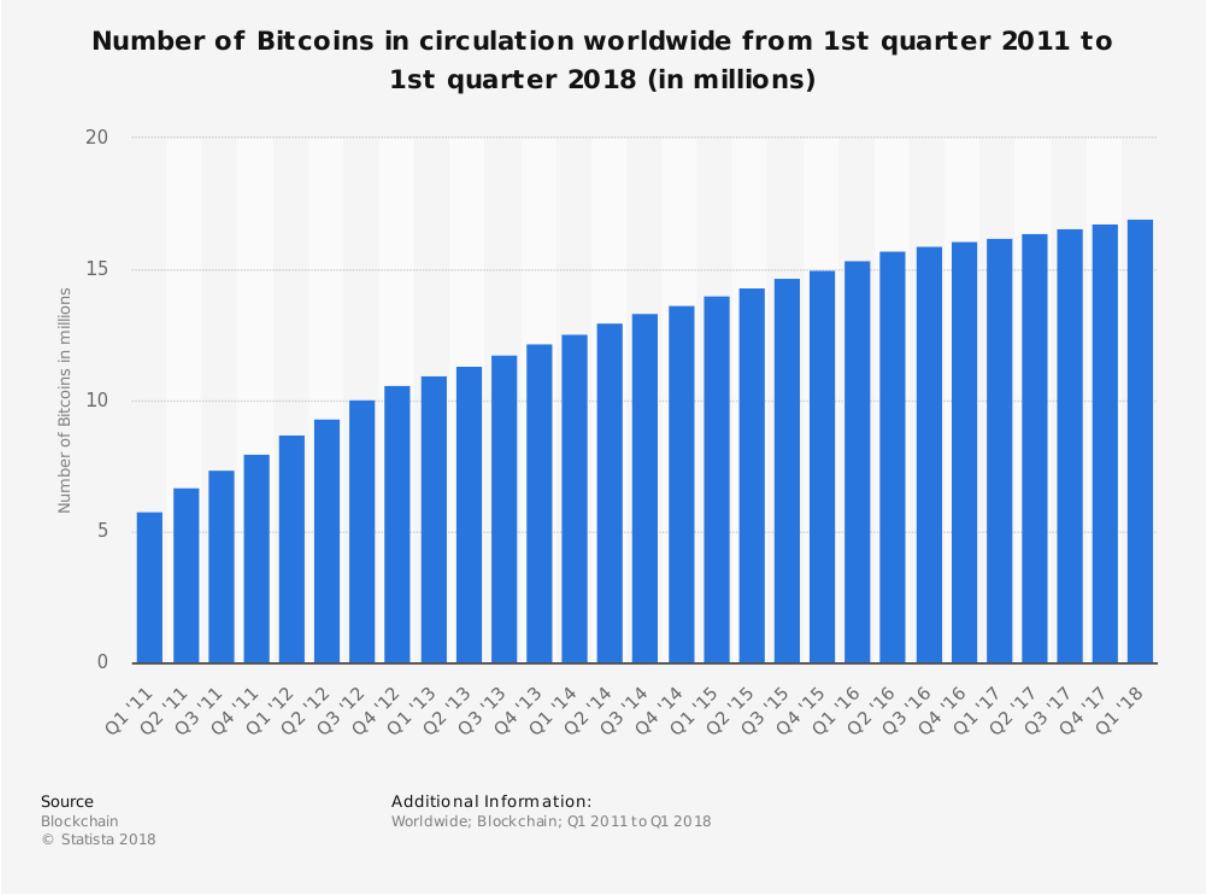
(Source: The Statistics Portal)

Thus it can be concluded that the usage of cryptocurrency as a payment gateway can be termed as 'slow and steady'. But it is always believed that 'slow and steady wins the race'. The major issue that the cryptocurrencies are facing is the ban from its usage by many countries and also because of some of the misinterpretation in the minds of people because of no proper law in terms of usage of cryptocurrencies.

Bitcoin Mining Process:

The easiest way to understand bitcoin mining process is to use the analogy of gold mining. Just like precious metal, the number of bitcoins is also limited to 21 million bitcoins. The number of bitcoins has been growing since the creation of this virtual currency in 2009 and reached approximately 16.95 million in March 2018 as shown in figure-3

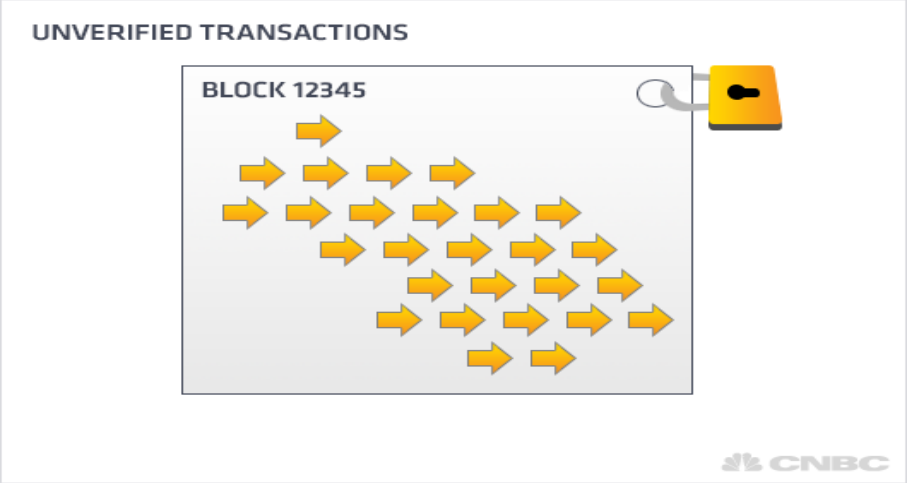
Figure-3



(Source: The Statistics Portal)

Bitcoin mining process serves two purposes. Firstly, to add transactions to the block chain and secondly to add new bitcoins. The mining process involves compiling the recent transactions to blocks and solving a computationally difficult puzzle. The person who first solves the puzzle gets the chance to put the new block on the blockchain and to claim the rewards. The reward being release of new bitcoins and that is how the new bitcoins gets added to the circulation. Suppose say Mr. A buys a mobile handset through bitcoins. Miners will start verifying the transaction to check whether the transaction is genuine or not. It is not just one transaction, but many such transactions will be verified by different miners and the group of transactions is termed as a block as shown in figure-4. Now miners run the software to find out the key to verify the transaction. Once the computer finds it, the transactions gets verified and for this the miner gets few bitcoins awarded. The current number of attempts it takes to find the correct key is around 1,789,546,951.05. Despite these many attempts, 25 bitcoins used to be awarded every ten minutes. Now it has been halved to 12.5 bitcoins.

Figure-4



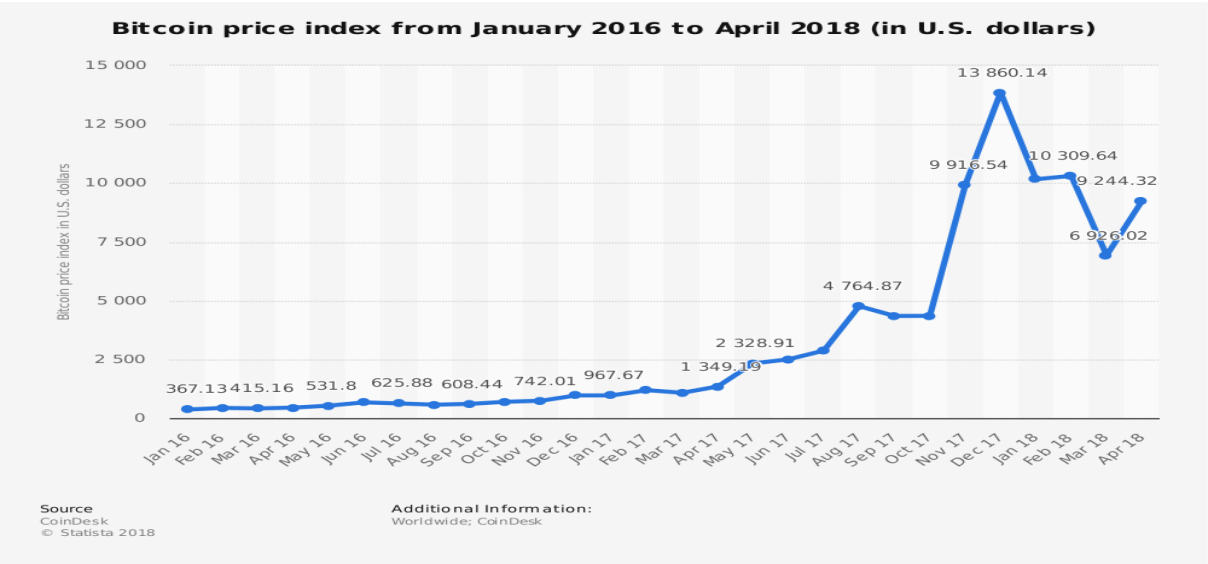
(Source:www.cnbc.com)

Bitcoin mining can be done by computer novice with basic software and specialised hardware. A prospective miner must have a bitcoin wallet. The problem is most of these wallets are unregulated and prone to attacks. The second piece of software required is the mining software itself. The faster the software runs, the chances of verifying the transactions is high and in turn chances of reward of bitcoins increases.

Price Movement of Bitcoins

Bitcoin is a traded instrument and investors started looking at this as a good investment option. Price movement of bitcoins started increasing since 2016, skyrocketed by the end of 2017 and then had a fall as lot of frauds, scams and hacks started being reported from bitcoin exchanges. The below given figure shows the price movement of bitcoins from 2016 till 2018.

Figure-5



(Source: The Statistics Portal)

Frauds in Bitcoin Exchanges

As bitcoins being considered as an important financial instrument, the bitcoin industry is hit by several scams and investors have lost huge amount of money. Crypto Aware a decentralised token investment management community has found that more than 1.7 billion USD worth cryptocurrency has been lost due to hacks and scams between 2011 to 2018. It is

interesting to note that out of total loss, 670 million USD is lost in the first 3 months of 2018. As crypto currency started receiving more and more industry validation, lot of unseasoned investors entered the market. These investors whose knowledge about trading in cryptocurrency and online security became vulnerable targets for the hackers and scamsters. This has created panic in the cryptocurrency markets as investors are losing their money. In India, a whopping amount of INR 2000 crore scam was unearthed in April 2018 and the fraudster have been arrested. After so many scams came to light, many governments have taken regulatory measures. Reserve bank of India banned the banks from transferring money to the bitcoin wallets. Many countries are coming up with strict guidelines and regulations to deal with the frauds and scams in cryptocurrency markets. All these events are creating bottlenecks for the growth of bitcoins as a credible financial instrument and a payment gateway.

Understanding Blockchain Technology

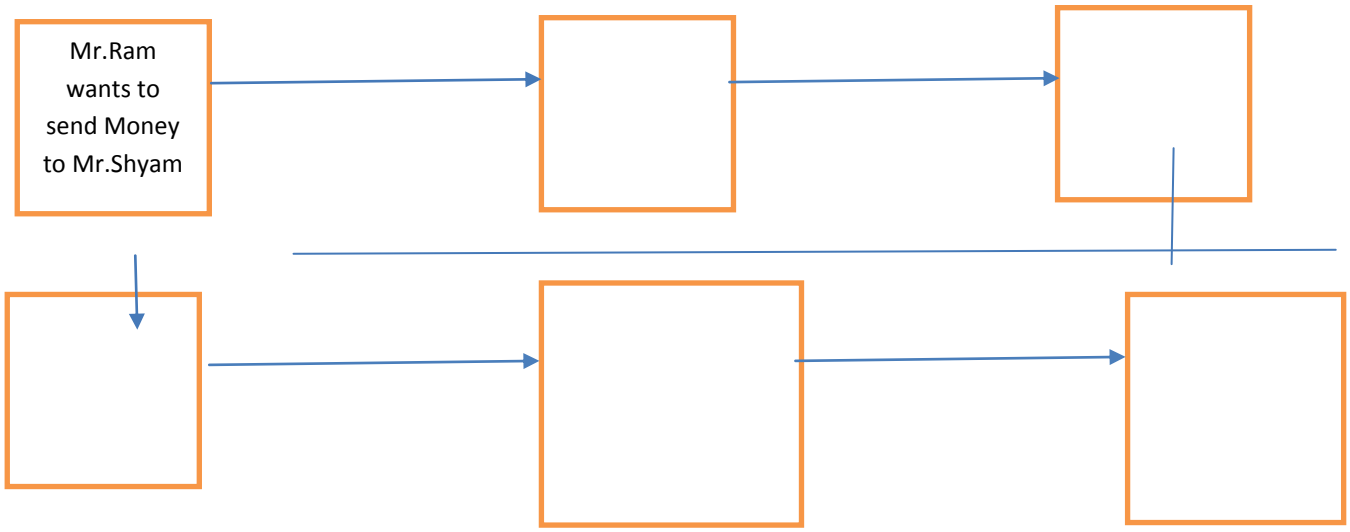
One of the important factors for the success of bitcoins as digital currency is the blockchain technology. This technology allows digital information to be distributed but not copied, which means everyone can see the information but individual piece of data has only one owner and hence others can't change or alter the data. What does this mean and how does it help? Secondly, how is this different from a banking transaction?

Bank as we understand is an intermediary between depositors and withdrawers. So when a person withdraws money or deposits money, it is the job of the bank to update the details. For banks this is a huge cost and it should happen on time. Customers will also expect utmost transparency in their transactions. So the task of books of accounts becomes the job of the bank.

In case of blockchain, whenever there is a transfer of digital currency, it gets updated when the transaction is triggered by the buyer and seller. The transfer gets highlighted and the transaction gets distributed to all the participants, but no one can change/alter the transaction as the person who initiated the transaction is the owner of this piece of data. The information is constantly updated and stored in multiple locations. This mean the records are public and verifiable. There is no central location for the data storage. This technology was invented in the year 2008, but it became public when bitcoin was launched. A block means a record of a new transaction. When a transaction is completed, it is added to the chain and hence it is termed as a blockchain. Bitcoin owners have the private password which is a complex key to an address on the chain which is where their ownership is recorded. There is no need of a third party like a bank or a financial institution to keep a track of the transactions. This helps in avoiding the transaction cost.

How a Blockchain Works?

Figure-3



(Source: https://medium.com/the-mission/a-simple-explanation-on-how-blockchain-works-e52f75da6e9a)

Blockchain technology is not going to be restricted to cryptocurrency industry. This powerful technology is being experimented in various sectors. Industry is taking this new technology very seriously. In IBM around 1000 employees are working in blockchain powered projects. Going forward, we can expect many sectors trying blockchain technology for their transactions. The advantages users see in this technology is, it is transparent, nobody can change/alter the transactions and at the same time it erases the intermediary due to which cost of transaction gets reduced.

Understand the perception of industry professionals about bitcoins from a transaction perspective

A questionnaire was circulated to collect the data. The respondents represent financial services, audit and consulting, information technology, FMCG, management students, manufacturing, telecommunications, and gaming industry. Total number of respondents to the questionnaire are 70.

Age group of the respondents:

Age (Years)	Number of respondents
Below 25	15
25 to 35	25
35 to 45	15
45 to 55	15
Total	70

Important findings of the study:

1. Among all the cryptocurrencies in the market, bitcoin was the most popular one and all the respondents were aware of bitcoin
2. Out of 70 respondents, 27 respondents were aware of other type of cryptocurrencies like litecoin, stellar, ethereum, dash etc.
3. Though most of the respondents know about cryptocurrency, 12 of the respondents thought they are very new to this and their knowledge is limited, 38 respondents said they have fundamental knowledge, 6responded that they have advanced knowledge, 3 said they are experts and 11 respondents said they are at the intermediate level when it comes to cryptocurrency functioning.
4. Out of the total respondents only 3 respondents said they have invested in bitcoins.
5. Newspapers, television, blogs and article were the sources through which respondents gathered information with regards to cryptocurrency.
6. 16 respondents felt bitcoins will dominate the cryptocurrency market in the next 5 years, 36 felt no and 18 respondents said they don't know.
7. 50 respondents were aware of the blockchain technology and the rest said they don't know about this new technology
8. Lack of education, lack of technical knowledge, no trust and no government regulation were the reasons cited by the respondents for not investing in the cryptocurrency.
9. 24 respondents said they regularly track the price movement of cryptocurrency where the rest said they don't follow the price movements.
10. 90% of the respondents said they will invest in cryptocurrency if government comes up with proper rules and regulations & if there is proper buying and selling procedure.

11. If given a chance, 66 respondents said they will invest between INR 10000 to INR 50000 in cryptocurrency and 4 respondents said they will invest between INR 50000 to INR 100000
12. 40 respondents felt cryptocurrency is a bubble and it will fall, 22 said they can't predict and 8 respondents said cryptocurrency is here to stay and it will go strong.

Conclusion: The major advantage of having cryptocurrency in place is it eliminates the intermediaries and transactions are transparent. With blockchain technology in place, it is impossible to change or alter the data. Though in the beginning it showed a tremendous growth and potential to grow as an alternate to physical currency, towards the end of 2017 due to various scams and hacks, value has come down drastically and investors have lost huge amount of money. Absence of any kind of regulation is also a major issue in this market. Many countries including India have banned and put lot of restrictions on cryptocurrency transactions. One good outcome of this is blockchain technology. Whether bitcoins will exist in couple of years or not, blockchain is being adopted by various industries wholeheartedly and lot of research is happening with reference to different sectors. Blockchain technology promises transparency and it is impossible to fudge the data which is a major advantage to avoid all kinds of frauds and scams. Currently people are having lot of doubts and confusion with reference bitcoins and cryptocurrency as a viable investment option.

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