

# Bitcoin: Banking the Unbanked At the Bottom of the Pyramid

Mr Joel John<sup>1</sup>

## Abstract

*In a world of laissez Faire capitalism and migration at unprecedented levels, it has become a birthright to have access to a system that enables the common man to store and transfer money with ease. Over 4 billion people, living in the bottom of the pyramid, with daily wages as low as 1.56 \$ and a combined purchasing power of over 5 trillion dollars are ignored by financial organizations that cater largely to urban customers with higher income. If we combine the core benefits of banking • saving, credit, loans and money transfers with what the internet has to offer today, we will be able to find scalable, cheap solutions that can penetrate low income societies with great levels of efficiency. Over the past 5 years, the financial world has seen a phenomenon called cryptocurrencies. They remain largely unregulated, are used by (almost) anonymous entities and have facilitated cross border transactions like never before. Unlike banks, they do not require physical facilitators or offices. Transactions made via such crypto•currencies are often stored on a public ledger, referred to as a “block chain” and can be easily verified by anyone at will. This stands to be drastically different from existing banking systems where ledgers are often maintained in a highly secretive fashion and transparency is kept to a bare minimum. The fact that just about anyone with a computer and an internet connection can set up his or her own (unlimited) account(s) in less than 10 minutes and use the same as a medium of storage and transfer of value makes cryptocurrencies like Bitcoin, appear to be a highly appealing solution for banking for those at the bottom of the pyramid. This paper aims to compare existing financial organizations, their services and their competency against cryptocurrencies like Bitcoins in providing services for those at the bottom of the pyramid. The purpose of this paper is to provide insights into how technology can be better leveraged to enhance the lives of the poor around the globe and thereby accelerate the establishment of a better planet*

**Key words:** Bitcoins, financial organization, cryptocurrencies

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<sup>1</sup> Student, Symbiosis Centre for Management Studies, Symbiosis International University, Pune  
joeljohn@gmail.com

## **Bitcoin: Banking the Unbanked At the Bottom of The Pyramid**

### **Introduction**

Man's wanderlust and his desire to attain and control more, often takes him far and wide from his near ones. His desire to save for times of hardship leaves him wishing for a service that would keep his income safe from external dangers such as theft. This inherent desire of keeping one's "earnings" safe and finding a better system of transferring value is what helped finance evolve from primal barter to the modern day system of banking. However, leaving one's hard earned money with external organization often requires trust. Trust in the fact that the money would be stored safely, optimally invested, made ready for withdrawals when needed and hope that the value of the stored money would not dip owing to inflation. In the modern era of e-commerce and digital payments, this trust would also mean banks playing the role of an intermediary.

Any organization involved with handling payments between multiple parties would have to ensure transaction costs remain minimal, verified for legitimacy and guaranteed to remain irreversible. A person involved in the act of trade is expected to know who he is dealing with to ensure he isn't being subject to fraud. The world has tried to solve these issues for hundreds of years, but what the economy has taught us in the recent past in the form of countless recessions and bailouts, is the fact that banking has been highly ineffective in serving towards the best interest of the common man. Conflict of interest has often arrived between serving customers and massive profits at corporate houses with great levels of influence on the way money is stored, transferred and invested. This leads us to looking at better solutions that are available around us. In the age of computerization one could find our solution in an electronic payment system based on cryptographic proof instead of mere trust, allowing any two parties sitting in any corner of the globe to transact and trade without the need for external parties.

In an ideal banking system, anyone should be able to access a banking system and have complete control on his saving without external parties having access to it. His money should not dip in value owing to inflation and he should have an incentive to save his money. A man should be able to store the fruits of his labor with ease and transfer it to those near to him at will with minimal transaction costs. No central entity should be able to print money at will and thereby inflate the supply of existing currency and bring a dip in its value. An ideal bank would

not look into fractional banking or bailouts as a means of survival or profiteering. The state and the economy would remain largely separated leaving both parties with enough space to function independently and autonomously. In order to bring forth such a system, we'll need to combine computational resources that are already available to mankind with basic economic principles and enforce them via instructions or lines of code given to the machines.

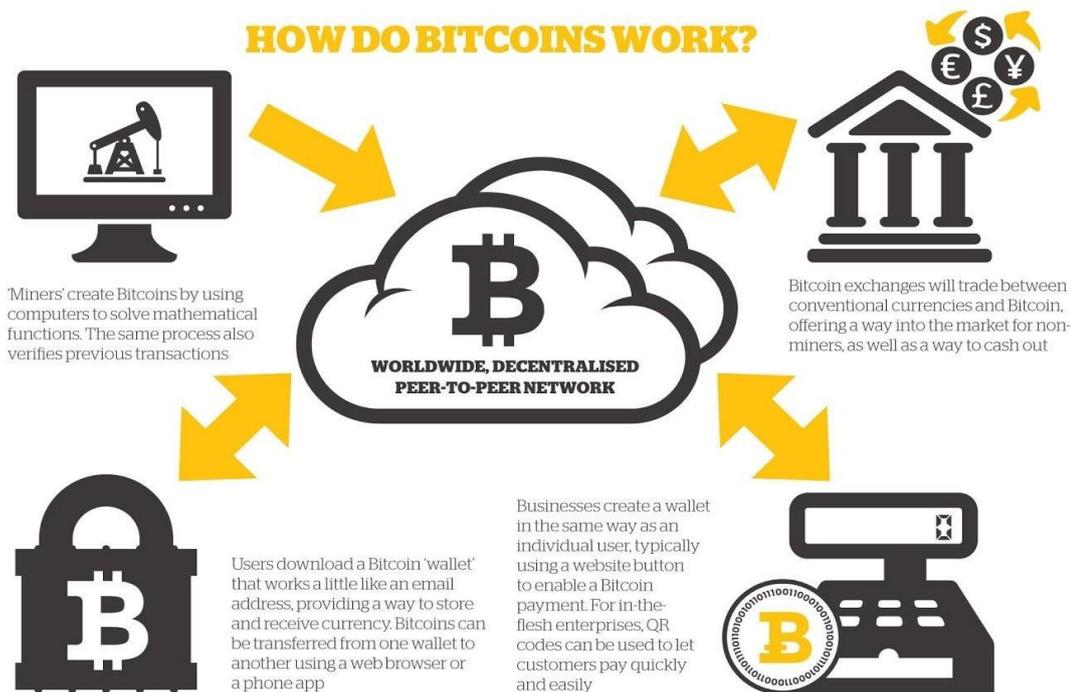
Somewhere in 2008, an anonymous person that went by the pseudonym Satoshi Nakamoto displayed his brainchild to the world. "Bitcoin" as he'd call it was a revolutionarily new way of transferring value between any 2 places with access to internet without the involvement of any third parties. It enabled people to have complete control on their income, engage in irreversible transactions and transfer high amounts of value with minimal transactional value. Anyone with the ability to make a few computer clicks could now open a wallet online and transfer money without dependence on external players. While mainstream markets never bothered about adapting it, the anonymous and quick to transfer nature of bitcoins made them largely appealing to drug dealers and other miscreants on the interweb. The existence of a publicly available ledger known as the "block chain", made it easy for anyone to verify transactions. This ledger was shared by thousands of computers linked to the network and the "double spending problem" that had haunted banking for hundreds of years was now wiped away. Satoshi's code disrupted banking as we know with a few lines of code and a peer to peer distributed time-stamp server that generated computational proof of the chronological order of transactions. With the passing of time, Satoshi's invention went beyond the world of the dark deep webs and was covered by major news outlets. The taking down of Silk Road in November 2013, brought massive attention to the coin and before anyone expected it, the value of the coin soared from a mere 70 dollars to over 1200 dollars.

The fact that bitcoins can (and has) enable anyone in the world to open an account and store his income within a matter of few seconds makes it largely appealing for emerging economies such as India, Bangladesh, Philippines and so forth. Most of these economies are yet to find a proper system of storage of value or credit. The people in these countries live with the bare minimum and are often at the edge of poverty and starvation. Their incomes do not leave much to be saved, but it is important that our policy makers find ways to empower these people with access to the benefits of banking. Entrepreneurs and job makers are produced when banking reaches the bottom of the pyramid. This enables more and more people to be

self-sustained and thereby further strengthens the economy. Bitcoin, is theoretically the finest form of banking the common man can access. In an era where more people have access to phones than to toilets (in India), Bitcoin stands high as a medium of storage and transfer of value. The fact that no external party is to be engaged in these transfers, transactions are irreversible and ideally the value of Bitcoin does not dip, makes it greatly appealing for markets that are massive in size and requires technology to help attain a level of scale that works towards the best interest of all parties involved

### **Bitcoin: A brief overview**

Bitcoins are a form of digital currency that are created and stored electronically. Unlike normal currencies, no single entity control the production/printing of this form of cash. In order to attain bitcoins, people are made to “mine” by using computational resources in order to solve mathematical problems. Thousands of computers that are synced across the network of computers maintain a ledger known as the block chain. The block chain is a central repository of every transaction that has ever occurred via bitcoins. It is a time-stamped ledger mentioning the accounts involved in a transaction. This ledger is public and is often used by people across the globe to confirm and verify transactions. The block chain also makes it greatly easy for businesses or individuals to account for financial transactions that have occurred through their wallet. The block chain cannot be edited or made at will; it is maintained by every single computer within the network and due to the same cannot be edited at will.



Source: <http://www.aatcomment.org.uk/wp-content/uploads/2013/10/bitcoin-1-300x185.jpg>

Bitcoin first emerged in early 2009 in the form of an open source code that was available for anyone to go through and verify. Satoshi Nakamoto strived to form a peer to peer transaction system that did not depend on a central entity to process transactions. Bitcoins share similarity with the US dollar in the fact that it is a fiat currency in that it is not redeemable for some amount of another commodity, such as an ounce of gold. Unlike the dollar, a bitcoin is not a legal tender, nor is it backed by any government or legal entity. The system is open with anyone granted access and no single entity controlling any part of the system.

In the present day scenario, people access bitcoins via exchanges that facilitate the trade of Bitcoins. Speculators sell and purchase bitcoins on basis of market demand and supply and profit upon short sells, while “hoarders” store bitcoins for the long run with hopes of cashing out once the value of the coin increases. Under an ideal financial system, anyone should be able to purchase or transact bitcoins at the click of a button. One of the best examples of an emerging economy relying upon Bitcoin for remittances and storage of value would be Kenya’s Bit-pesa. The fact that the nation has a good mobile coverage and its economy is almost in ruins, leaving people searching for better alternatives, enabled an easy adaptation of what Bitcoins could offer the masses there.

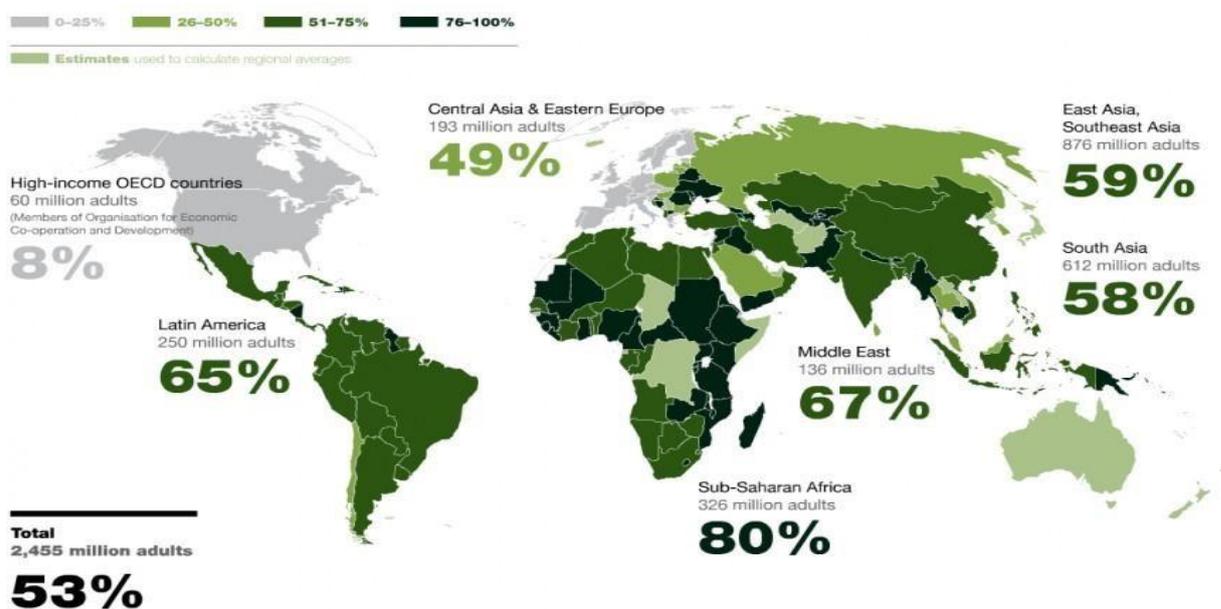
## Bitcoin in the context of banking

Banks are expected to have 3 basic functions.

1. To act as a safe place for storage of anything of value
2. To provide loans and fund short term requirements of money of the general public
3. To be a means of easy and quick transfer of funds.

While conventional banks venture further into a wide array of other services, for the sake of simplicity and empowering the poor with the bare minimum of financial services, we will be focusing on these three aspects and analyzing what Bitcoin can offer the masses as a banking solution

Percentage of total adult population who do not use formal or semiformal financial services



Source :[http://bravenewcoin.com/assets/Uploads/\\_resampled/ResizedImage870561•UnBanked•World•Map.PNG](http://bravenewcoin.com/assets/Uploads/_resampled/ResizedImage870561•UnBanked•World•Map.PNG)

### Leveraging Technology to enable storage of value at the bottom of the pyramid

Given the peer to peer nature of Bitcoin, it is safe to presume Bitcoin will do to banking, what torrents did to the way media and content was earlier shared. Sectors that haven't been disrupted or seen any ounce of innovation will soon have to revamp their strategy for survival. The reason why Bitcoin stands to be such a huge threat to conventional banking system is the fact that its level of entry is quite low. Unlike traditional banking systems, in order to open a bitcoin wallet, people are not required to have a permanent address or any document for that matter. All that is required is a cheap phone with access to the internet. This comes highly

attractive in growing economies like India, where the total internet user base is more than the total population of America. It astounds me to realize India has over 800 million telephone connections, but less than 600 million people use proper sanitary facilities such as well-built toilets. What one needs to realize is that technology has penetrated at levels that were unprecedented and we have now attained the scale required to leverage digital tools to beat our infrastructural disabilities.

A very good example of the internet being used for access to data across the country is Innoz Technologies. Launched by an engineering dropout in Kerala, the company has successfully churned a revolution that enables “dumb” phones to be smart via access to search engine results delivered by SMS. Google and a number of other manufacturers in the country have begun shipping smart phones with 3g access to internet for costs as low as 75 dollars. Given the current rapid adapter rate of smart phones across the nation, it would be safe to presume the people using these phones will be able to use their mobile devices as a means of storing money online.

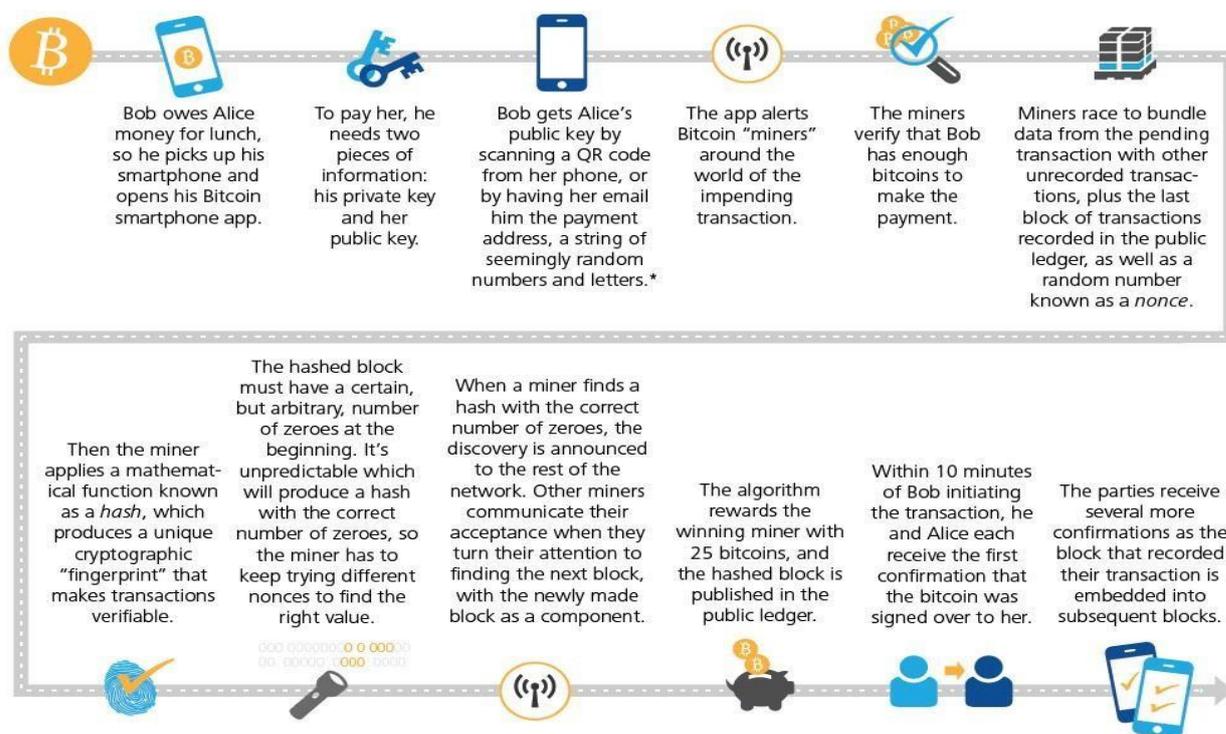
#### Indian Telecommunication Penetration Figures

- Total mobile Subscriptions • 886 million
- Total Internet users 243 million
- Active social media users • 106 million
- Total number of mobile internet users • 185 million
- Average time spent on the internet via phone 2 hours

If businesses come forward being gateways to storage of money on the block chain and develop apps that enable those at the bottom of the pyramid to have proper access to their finances via their mobile devices, the current banking situation at the bottom of the pyramid would see drastic changes. Such solutions will be massively scalable as they require very little human interaction and can be fixed for error via means of code. The block chain is the world's single finest storage of value as anything entered onto it is auditable and verifiable by anyone, anywhere in the globe. The money stored in the form of these coins are relatively safe from theft and fraud, provided the mobile devices are well protected from malware. In addition to this money stored on the block chain can't be stolen at any point of time by an external party as it is on the internet and does not exist in real life. Even if the mobile devices are stolen, the

consumer will be able to retain his coins, given the fact that the block chain is synced across thousands of devices across the globe. Until and unless the consumer enters his “private key” or password in layman’s terms, his coins remain safely in a “Wallet” largely similar to a real life banks vault.

**Figure 1. How Bitcoin works**



\* Anyone who has a public key can send money to a Bitcoin address, but only a signature generated by the private key can release money from it.

Source: American Banker, <http://cdn.americanbanker.com/media/ui/how-bit-works-big.jpg>.

Graphic: Deloitte University Press | DUPress.com

## Bitcoins and Microfinance: Untapped opportunities

Micro•finance can be traced to as far as the 18th Century. The economist Lysander Spooner wrote about the impact of small loans given to the economy and how they enable the production of entrepreneurs in growing economies. On basis of numbers released by Forbes, one can verify that there are over 600 micro•financing organizations spread over 60 countries catering to over 800 million people. A peek into the top 50 micro•finance organizations would show that the major chunk of organizations dealing with microfinance come from 3rd world nations and emerging *economies*. Enabling people at the bottom of the pyramid to be in charge of their lives and take responsibility can have a major role in raising welfare, literacy rates and living standards. It can just about pave the way to a better future for all of mankind.

When one looks at micro•finance from the eyes of a bitcoin enthusiast it doesn't take him long to realize how the two can be leveraged for the establishment of a stronger economy. The fact that anyone anywhere in the globe can now transact money across continents without having to pay exorbitant rates to banks involved in the process and maintain a public ledger that can be seen and verified by the globe makes bitcoin that much more appealing to someone looking to combine Bitcoin with micro•finance. For example, if a person in America were to fund a farmer in Mizoram, India using normal methods he would have to undergo terrible exchange rates, massive remittance fees and comply with the long list of legalities and procedures involved. Ideally, if he did the same using Bitcoin he'd be able to transfer money in over 10 minutes and have a publicly registered transaction that can be used as proof. The fact that the "financier" can now save money on pointless fees charged by the banks, will make even more amounts of money available to those seeking finance in third world nations.

A very good explanation of what micro•financing can do for a community was given by Seth Godin

"If money circulates freely within the tribe, the tribe will grow prosperous more quickly. I give you some money to buy seeds, your farm flourishes, and now we both have money to give to someone else to invest. The faster the money circulates, the better the tribe does. The alternative is a tribe of hoarders, with most people struggling to find enough resources to improve productivity. When I make an interest free loan to you, I'm trusting you and giving you a gift at the same time. This interaction increases the quality of our bond and strengthens the community. Just as you wouldn't charge your husband interest on a loan, you don't charge a tribe member."

If micro-financing is to reach the 4 billion people at the bottom of the pyramid we'd need a system that makes it easy to record transactions of money loaned and a systematic approach to maintaining reputation of those that finance and those that seek money. It has to work towards the best interest of both parties involved and should be one that is easily scalable. In the age of digitalization, approaching this issue with back office solutions that require individuals to handle such transactions won't be viable. Due to the same it remains largely important that we integrate a system like that of Bitcoin into maintaining records, transaction of money and verifying repayment of previous loans. The reason why Bitcoin can be highly effective in comparison to any other solution is that it permits cross border funding with great amount of

ease. It bridges those with excess funds in developed economies with those that need funds in developing economies without the need of an external intermediary and brings down expenses by a very large margin

### **Remittance: Transmitting dollars wrapped in care on the blockchain**

The crux of the issues associated with remittance, is the fact that the charges associated work towards the best interest of relatively richer customers with deeper pockets. Banks have pricing policies that do not work in the favor of the average low end laborer. For example: Banks charge up to 15 dollars for each 500 \$ sent. In most cases a laborer does not have 500 dollars to send together. His payment is sent in chunks of 100 or 200 \$. He ends up losing up to 20 percent of his money in exchange rates, bank fees and other charges involve. What's even more shocking is the fact that in most of the growing economies the migrants send cash to, the fees the middle men charge can pay for a year's worth of school fee. The fee eaten up by these remittance houses to satisfy their greed can often be used elsewhere to empower the poor and create a better future, by helping them attain much needed education or make drastic improvements to existing infrastructure.

Bitcoins can bring in a drastic difference to the situation due to its low transactional fee and easy to access nature. The fact that anyone can send money to anyone located at any corner of the globe within a matter of minutes make it a lot more attractive in comparison with existing systems that are cumbersome and barely cost effective. Bitcoin transactions cost as low as .003 dollars in comparison with the existing market rates of 8•15 dollar for a medium level transaction. What this would mean for the average person is that a major chunk of his or her money would reach him safely in a matter of minutes from anywhere in the world without having external parties eat into it. In addition, the fact that these transactions can be made via mobile devices make it a lot more convenient than existing systems that require people to go to local kiosks and fill up forms to remit money. Bitcoin is the single fastest and most secure way to transfer cash to anyone in the globe. Existing businesses in 3rd world nations like Kenya's Bitpesa and Phillipine's Coin.Ph testify to the same.

### **Bitpesa • Cost Comparison**

BitPesa is a remittance service based in Kenya that allows users to exchange Bitcoin for Kenyan Shillings that are sent directly to a recipient's mobile money account. Mobile money is

a growing phenomenon in multiple growing economies around the globe. People lean towards using technological advancements available to them to make up for the lack of infrastructure. People tend to deposit money into an account associated with their phone numbers and then use it for transfer of money or purchase of commodity. Bitpesa is an important innovation in the field of remittance as it permits money from any corner of the globe to enter Kenya in a matter of minutes. What was impossible and largely time consuming is now possible within a matter of minutes. Since the transfer occurs largely online and the block chain foresees the remittance of money, there is little human labor or infrastructural requisites for such modes of remittance to take over.

**Fig : Remittance charges while transferring money via western Union**

Amount sent (£)	Western Union transfer fee (£)	Total used (£)	Amount received (KSH)	Effective exchange rate (KSH/£)*
2	2	4	295.24	73.81
5	2	7	738.27	105.47
10	2	12	1476.2	123.02
50	4.9	54.9	7380.98	134.44
100	4.9	104.9	14761.96	140.72
500	19.9	519.9	73809.82	141.97

Source : <http://letstalkbitcoin.com/blog/post/in•depth•review•bitpesa>

**Fig : Remittance charges while transferring money via Bitpesa**

Amount sent (£)	1% Bitcoin purchase fee + £0.09 purchase fee + £0.04 miner fee* (£)	Total used (£)	Amount received (KSH)	Effective exchange rate (KSH/£)
2	0.15	2.15	289	134.42
5	0.18	5.18	723	139.58
10	0.23	10.23	1447	141.45
50	0.63	50.63	7235	142.90
100	1.13	101.13	14470	143.08
500	5.13	505.13	72349	143.23

Source : <http://letstalkbitcoin.com/blog/post/in•depth•review•bitpesa>

As the data given above shows, Bitcoin is a solution that can work for those at the bottom of the pyramid. While existing solutions like Western union provides its users incentives to send larger amounts by charging lower fees as the amounts go higher, most of the people at the bottom of the pyramid rarely have such high amounts to send back home. In addition, money saved in terms of remittance transfers often reach home and thereby supplements the income of those in 3rd world nations. More inward remittances could make the difference between a child attending a school or not, between nutrition and malnutrition or even between having access to proper sanitary facilities and not having them at all.

Services like Coin.Ph and Bitpesa do a lot more than merely permitting people in 3rd world nations to have access to external funds. They permit users from these growing economies to access the features of banking that was earlier denied to them. They provide incentives to people to work harder and save and thereby establish a stronger economy. At an age and time where banking services are limited to those in the middle and upper classes and banks across the globe are struggling to find cheap, sustainable, scalable solutions that can work at the bottom of the pyramid, Bitcoin stands to be a potential solution.

## **Associated Issues**

### **1. Lack of early adopters due to technicalities involved**

For any new technology to thrive and be adapted globally it has to be presented in the simplest form to its end users. While Bitcoin stands to be largely appealing as a cost effective solution for those that are unbanked, technical terms and jargon such as “cryptography” and “blockchain” can keep people away from using what Bitcoin could potentially offer them. Man tends to be fearful of what he knows the least and due to the same chances are high anyone would trust an emerging technology with their hard earned money. If Bitcoin is to be taken as a serious contender, those working with the technology have to ensure it is presented in the simplest form to the end users and they are not left confused with a lot of confusing procedures or requirements.

### **2. Government policies and lack of regulation**

Countries across the world are still coming to grips with Bitcoin. A few have come off as pro-bitcoin, while a large chunk have stayed back as neutral. Governments issuing “warning

notices” against cryptocurrency can often be detrimental to the growth and establishment of Bitcoin as a currency or mode of banking. Governments tend to hold anti-bitcoin stances as they feel they stand to lose power with people adopting a means of banking that gives them the rights to minimal intrusion and influence into the way money is handled. Unless experts on Government panels across the globe go the extra mile to convince policy makers about the need, impact and urgency for adaptions Bitcoin, the technology could remain largely stagnant and unused.

### **3. Lack of early stage players in the industry**

The fact that Bitcoin stands to be in a regulatory loophole with no clear regulations can often keep entrepreneurs away from coming forward with innovative solutions that can benefit the masses. While pro-Bitcoin countries like USA have had millions of dollars flowing into various ventures focused on Bitcoin, countries with no clear regulatory stance like India has seen only one start-up in the recent past. If the benefits of Bitcoin has to reach the average man, then businesses need to come forward and bridge the gap between the technology and the end user. Apps and websites that facilitate the purchase, hoarding and transfer of Bitcoin should come forth and establish themselves to further enhance consumer confidence and early adapter rates.

### **4. Fluctuating rates**

The fact that Bitcoin is a highly volatile currency in its current form stands to be a huge threat to anyone looking to have their finances held in Bitcoin. People in emerging economies won't be open to storing their savings in Bitcoin if the value of the currency dips at random. Between November 2013 to November 2014 • the value of Bitcoin has gone from over a 1000 dollars to near 300. If a person see's his or her income dropping down to 70 or 80 percent of its initial value when stored in a particular mode of storage, he or she would be largely wary of adopting it. This will be a relatively small issue as more people begin adapting Bitcoin. however until then bitcoins won't be a smart choice for the storage of one's income.

### **Conclusion**

As a technology bitcoin is still in its very nascent stage. The fact that a few lines of code written by a relatively unknown person could shake up banking as an industry stands to be

astounding. The form of fiat currency we see today took over 600 years to evolve in comparison with cryptocurrency's 5 year life-span. To make a judgement on the technology would be a lot similar to analyzing Nikola Tesla's creations in the 20th century and wondering where this could take us. Asset management, contracts, decentralized storage • the creations being built upon the peer to peer nature of Bitcoin goes far and wide.

This is a technology that gives power to the people. It empowers them with benefits that were otherwise kept away from them. Anyone in the globe can now access the basic functions of a bank with a device that costs as little as 50 dollars. Hard earned wages of employees toiling abroad can now be sent home without intermediaries eating into it. Sweat, toil and labor of blue collar workers will now benefit their homeland more than ever before. This will have a substantial role in enabling growing economies to develop faster and helping them establish much needed infrastructure.

Bitcoin has seen tremendous growth in the 5 years of its existence. Statistics reveal, investments made into bitcoin start-ups have crossed the amount of money invested into Internet start-ups in 1995. With the passing of time, the industry would be relatively mature and bigger players would enter the market enabling the benefits of Bitcoin to reach the average man. Bitcoin will do to money, what the e-mail did to snail mail. While what the future holds remains to be largely speculated, what we've seen in the recent past from the technology is an emerging revolution that isn't afraid to question the status quo.

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