

Major Project

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BLOCKCHAIN: DECENTRALIZATION AS THE FUTURE OF  
MICROFINANCE AND  
FINANCIAL INCLUSION

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# Certificate

This is to certify that the dissertation report titled “**Blockchain: Decentralization as The Future of Microfinance and Financial Inclusion**” is a bonafide work carried out by **Mr. Rajat Nigam** of **EMBA 2017-19** and submitted to Delhi School of Management, Delhi Technological University, Bawana Road, Delhi-42 in partial fulfillment of the requirement for the award of the Degree of Masters of Business Administration.

**Signature of Guide**

**Signature of Head (DSM)**

**Seal of Head**

**Place:**

**Date:**

# DECLARATION

I, **Rajat Nigam**, student of **EMBA 2017-19** of Delhi School of Management, Delhi Technological University, Bawana Road, Delhi – 42, hereby declare that the dissertation report “**Blockchain: Decentralization as The Future of Microfinance and Financial Inclusion**” submitted in partial fulfillment of Degree of Masters of Business Administration is the original work conducted by me.

The information and data given in the report is authentic to the best of my knowledge.

This report is not being submitted to any other University, for award of any other Degree, Diploma or Fellowship.

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## **Introduction**

### **Microfinance**

Microfinance has been a popular expression in the domain of financial advancement as far back as Dr. Muhammad Yunus was granted the Nobel Peace Prize 2006, because of his endeavours in improving the life of the least fortunate of the poor by the arrangement of miniaturized scale credits. In spite of the multiplication of Microfinance Institutions (MFIs) throughout the most recent two decades, the presence of miniaturized scale advances can be followed as far back as the 1970s when various national governments began to give advances to individuals in the agribusiness segment or growing private venture. By the by, the utilization of miniaturized scale advances as a component to coax individuals out of neediness was to be sure concocted by Yunus with the formation of the Grameen Bank, and the arrangement of advances bound to poor business visionaries in Bangladesh. Both the social and money related achievement that Grameen Bank experienced after its establishment, bring issues to light from various NGOs and National Governments, which at last duplicated or tropicalized Yunus' model all through the creating scene.

With the further extension of MFIs around the world, the model began having numerous changes that have brought a blend of positive and negative results, bringing up issues about the attainability and viability of Microfinance as a monetary advancement apparatus. Especially, the ascent of MFIs that have concentrated on producing benefits, rather than having the social objective of monetary strengthening through budgetary consideration, has been generally condemned because of various dubious cases that have brought about different suicides and the compounding of neediness in whole networks. Because of the ascent of such issues in the part, different researchers have created writing that not just evaluate the adequacy of Microfinance as device of financial advancement, yet in addition distinguishes their fundamental roots. While a portion of these cases are selective to specific nations or organizations, there are some that can be perceived as auxiliary issues that any monetary movement suffers, however that amplifies in the conditions where MF unwinds. Raised task costs, absence of money related supportability and versatility, the nearness of substantial data asymmetries, and little straightforwardness and terrible administration have been reviewed as the absolute most determined auxiliary issues behind Microfinance. The ascent of advanced innovations has brought trust as a remedial measure that can be increasingly productive and powerful that conventional guideline. In any case, agreement still can't seem to be found regarding which sort of innovation and which sort of design could render the best outcomes for the Microfinance part.

## **Blockchain**

The Blockchain has been an interesting issue throughout the most recent years because of the raise in cryptographic forms of money, particularly the upward run that bitcoin had in 2017. From that point forward, the tech division has been lauding all the potential executions that Blockchain could need to change pretty much every industry; an advancement that could be as problematic as the Internet has been. Notwithstanding all the publicity, doubters have been scrutinizing the attainability of such executions of Blockchain; not just on the grounds that something should be possible with Blockchain it bodes well to do it. Toward the end, everything aggregates up to the spread among advantages and costs, little gradual increases through Blockchain innovations don't really help an early advancement of the foundation. Having this as a main priority, the inspiration to evaluate the capability of Blockchain innovations in the Microfinance circle raises from 2 central perspectives select to the Microfinance business:

1. The data asymmetry between the moneylenders and the credit holders is route incredible than in customary business banking. Advance holders are in the least percentiles as far as budgetary proficiency and banking. Apparently, the problematic training the majority of the recipients have gotten drop them in a defenceless position when ideas, for example, contracts, chance, loan cost, protection, and obligation are presented to them. The wellspring of asymmetry is auxiliary, notwithstanding when every component of their credit is completely straightforward, there will dependably be space for certain operators exploiting them. In the meantime, Lenders have next to zero data from their recipients since these once in a while are incorporated in the standard monetary or budgetary division, subsequently there are no records to back up the dependability of such people, and a large portion of the salary producing exercises are profoundly factor or occasional.
2. The capital prerequisites per exchange are extensively little and, despite what might be expected, there is an incredible number of recipients to visit. The expense of procuring customers contrasted with the measure of the credit is definitely higher in Microfinance contrasted with standard business advances. Consequently, the high financing costs for small scale advances. Since the MFIs can't recuperate the activity costs legitimately from expenses, the salary from intrigue instalments should be as high as could reasonably be expected. In this way, a productive and safe approach to deal with these exchanges could definitely help both the moneylenders, with higher advantages by wiping out or changing the idea of the centre men, and the advance holders, by having less premiums to pay and systems that can avoid over-utilizing.



## **Objective of Project**

- To study the effect of human sentiments expressed on social platforms over the rise and fall of prices and volume of cryptocurrencies.
- To study the quantitative aspect of blockchain technology as a decentralized implementation of existing Microfinance system based on their awareness about cryptocurrency platform.

The above-mentioned objectives aim to assist budding or established entrepreneurs to invest in the domain of blockchain technology and consider it a potential market of high returns in the field of Microfinance.

## **Literature Review**

### **Financial Inclusion and Microfinance**

#### **What is Financial Inclusion?**

Destitution Eradication, a point that ascended all through the Cold War to end up one of the principle fields of concentrate in the Public Policy and one of the 8 Millennium Development Goals (MDGs) directed by United Nations Development Program (UNDP). Likely none of the MDGs has been as analysed and broke down as the Poverty. By and by, while numerous approaches have been endorsed to destroy it, and incredible advancement has been accomplished (1 billion of poor less from 1982 to 2013), there is as yet far to go per secure that the greater part of humankind could have a conventional way of life.

Among the numerous reasons for destitution, the one that ostensibly has called the a large portion of consideration in arrangement producers, think much appreciated, and compassionate associations, has been the absence of incorporation into the money related framework by the general population at the Bottom of the Pyramid (BOP). Per Lopez and Winkler (2018), the Financial Inclusion (FI) has been a noteworthy theme in the field of Development Economics in the course of the most recent few decades (Demirgüç-Kunt and Klapper 2012; Allen et al. 2012; Kumar, Narain, and Rubbani 2015; Sahay et al. 2015).

The quantity of individuals prohibited from the money related segment far and wide is simply overpowering. Per the United Nations (UN), around three billion individuals on the planet needed access to FFS in 2008, even with the quickened development of the part this number was decreased to achieve the two billion imprint in 2014 (Lopez and Winkler, 2018). Among the items and administrations that the FFS gives, and that those rejected are missing, there are ledgers, credit, protection, sparing records, and effective approaches to exchange or get social advantage instalments – through an authority Financial Institution (Chibba, 2008).

The majority of the populace that lives without access to banking or money related administrations are experiencing numerous types of Social Exclusion, which at last end up framing a positive circle that disentangles into an endless loop; for the most part a Poverty Trap (Adunda and Kalunda, 2012). Per Kempton et. al (2000), Social Exclusion is an expansive idea that incorporates a blend of connected issues, for example, low pay, poor lodging, determined joblessness, absence of abilities, medical problems, high wrongdoing conditions, unavoidable neediness, and breakdown of the family core. Social avoidance encourages the social divisions and classes. The general population inside an adequate social structure ends up dreadful 8 of the general population in rejection and the barred end up despising the included. This endless loop in the end converts into

energized social orders that are not alluring for solid economies or majority rule governments (Adunda and Kalunda, 2012).

Per Kempson and Whyley (1999, referred to by Adunda and Kalunda, 2012), there are six kinds of monetary rejection:

1. Physical Access avoidance: is gotten from the remoteness wherein the majority of defenceless gatherings live in, in particular country territories or even ghettos inside urban settings.
2. Access rejection: alludes to the limitation to monetary administrations through the procedures of a hazard appraisal not fit for the truth of those barred.
3. Condition avoidance: is the place the conditions appended to the money related items (for instance reimbursement terms) make them insufficient for the requirements of specific gatherings.
4. Value avoidance: comes when a few gatherings can just access to money related items or administrations at costs they can't manage (in particular financing costs or commissions).
5. Advertising rejection: is the point at which somebody is successfully avoided by the promoting and deals strategies of the Financial Institutions.
6. Self-prohibition: gets from people choosing that there is no addition in applying for money related administrations or items since they anticipate dismissal from the Financial Institutions; in synopsis, it very well may be translated as a pessimistic self-determination predisposition.

## **Issues with current financial system**

Any existing system will have some issues. Let us look at some of the most commonly faced issues with the Banking system:

### **High Transaction Fees**

Let's look at an example to understand this issue better:

Here, Chandler is sending \$100 to Joe but it must pass through a trusted third party like a Bank or Financial service company before Joe can receive it. A transaction fees of 2% is deducted from this amount and Joe only receives \$98 at the end of the transaction. Now this may not seem a big amount but imagine if you were sending \$100,000 instead of \$100, then the transaction fees also increase to \$2,000 which is a big amount. As per a report from SNL Financial and CNNMoney, JPMorgan Chase, Bank of America and Wells Fargo earned more than \$6 billion from ATM and overdraft fees in 2015.

### **Double Spending**

Double-spending is an error in digital cash scheme in which the same single digital token is spent twice or more.

To help you understand this problem better, let me give you an example:

Here Peter has only \$500 in his account. He initiates 2 transactions simultaneously to Adam for \$400 and Mary for \$500. Normally this transaction would not go through as he doesn't have sufficient balance of \$900 in his account. However, by duplicating or falsifying the digital token associated with every digital transaction, he can complete these transactions without the needed balance. This operation is known as Double Spending.

### **Net Frauds and Account Hacking**

In India, the number of fraud cases related to credit/debit cards and Internet banking was 14,824 for the year 2016. The net amount involved in these frauds was Rs 77.79 crore, of which Rs 21 crore was from internet frauds and Rs 41.64 crore was from ATM/debit card-related frauds.

### **Financial Crisis and Crashes**

Imagine giving all your saving to someone you trust only to know that they have gone and lost it somewhere else. That's what happened in the 2007-08 when Banks and Investment Organizations had borrowed heavily and lent it as subprime mortgages to people who could not even pay back these loans. This in turn lead to one of the greatest financial crisis ever seen and was estimated to have caused losses close to \$11 Trillion (\$11,000,000,000,000) worldwide. This was just one of the most popular examples, how often have we heard of Banks and Financial service companies

crash due to internal frauds? The whole third-party system is something that is built on blind trust on the middle man.

### **How does Financial Inclusion reduce poverty?**

While seemingly Financial Exclusion (FE) prompts different sorts of social avoidances and feeds the elements of Poverty Traps, it is critical to comprehend the components behind the impacts that the FI could have in the BOP. The market analyst Joseph Schumpeter, set up in 1911 that the Financial Institutions assume a key job in the asset allotment process by giving exchange between those overabundance of capital and those needing it. Additionally, Diamond and Dybvig (1983) thought about that the principle job of the financial frameworks is the arrangement of liquidity that empowers more interests in profitable resources, which upgrades the productivity of capital gathering and monetary development. Beck et al. (2009) portrayed that a well-created money related framework, open to all, diminishes data and exchange costs, guides sparing conduct, speculation choices, and development, and impacts the long-run development rates.

Research referenced by the World Bank (2008) recommend that Financial Development (FD) creates monetary development that limits the pay differentials between the diverse quintiles. Beck, Demirgüç-Kunt, and Levine (2007) locate a positive connection between Financial Depth (which for this situation is communicated by the proportion of private credit to GDP) and the adjustment in the offer of the least quintile in complete national nonessential salary. This infers a more profound money related framework quickens the national financial development, yet in addition quickens the augmentation of the most minimal quintile's salary share. The World Bank (2008) additionally specifies that "Li, Squire, and Zou (1998) and Li, Xu, and Zou (2000) locate a negative connection among account and the dimension of salary imbalance as estimated by the Gini coefficient, a finding affirmed by Clarke, Xu, and Zhou (2006), utilizing both cross-sectional and board relapses and instrumental variable strategies." (World Bank, 2008). A similar report by Beck, Demirgüç-Kunt, and Levine (2007) likewise identifies that nations with larger amounts regarding FD wound up with a higher number of individuals leaving the \$1 USD/day destitution line amid the 1990s.

Chibba (2008) states that numerous proof demonstrates that FI goads ace poor development and has the ability to mitigate destitution. Moreover, minimized individuals in creating nations can be improve their living quality through FI because of upgraded cash the executives, access to fund at reasonable costs, reserve funds wellbeing, and annihilating the reliance from the casual cash banks.

To focus on the issue of determination inclination, Karlan and Zinman (2006a, referred to by the World Bank, 2008) persuaded a customer moneylender from South Africa to extricate its hazard assessment criteria for a gathering of hardly disposed of credit candidates that was chosen serendipitously. Along these lines, they had the option to look at between the arbitrarily picked borrowers and the control gathering of scarcely denied solicitors, and arrived at the resolution that

six to a year after the home loan endorsement, beneficiaries were essentially progressively conceivable to hold wage business, barely experienced appetite in their nuclear family, and probably not going to be destitution struck.

Besides, an instance of concentrate in Peru infers that lack of money related access diminishes the odds of nuclear families in neediness of sending their youngsters to class. In the interim, examines did in Tanzania, Guatemala, and India propose that family units lacking access to credit are increasingly plausible to diminish their youngsters' school participation and place them in the process of childbirth if necessary than those subjects to credit. Likewise, smaller scale business people in Guatemala gathered information that show a constructive relationship between credit use and upward class versatility (World Bank, 2008).

### **Financial Inclusion Advancements and Setbacks**

Applicable progressions have been accomplished in expanding the FI levels around the world. Demirguc-Kunt et al. (2015) gauge that the quantity of unbanked individuals on the planet has dropped by 20% achieving the two billion imprint in the time of 2011-2014 (Lopez and Winkler, 2018). The World Bank Group evaluated in that more than 500 million individuals have been profited legitimately or in a roundabout way by from Financial Inclusion approaches (Investopedia, 2018). Furthermore, Market MIX (2015) evaluated that worldwide Gross Portfolio of MFIs overpassed the \$92bn USD mark by 2015.

In the course of the most recent few decades, the customary Financial Institutions have turned out to be mindful of the conceivable outcomes that the market at the BOP holds. Additionally, new associations, for example, the Microfinance Institutions (MFIs), have rose to meet the sparing/account needs of these gatherings by growing new administrations, smaller scale protection strategies, and duty sparing items are very infamous, and actualizing new techniques, for example, versatile branches, influence of Self Help Groups (SHG), store authorities, and portable banking/instalments. This pattern does not appear to back off, and seemingly, there are two principle angles pushing it. To start with, the utilization of Microfinance and MFIs as the fundamental vehicle to convey money related administrations utilizing microcredits as a stay, and the fast combination of advanced innovation to give answers for the repetitive difficulties that originate from serving individuals at the BOP.

The hypothetical dangers on budgetary soundness get from the particularities of low-salary recipients, the nearby Financial Institutions, the development in monetary administrations, and from redistributing capacities. The support of the poor in the FFS determines into high data and exchange costs, which go before to wasteful aspects that are difficult to counter. The impacts of the data asymmetries could develop. What's more, the enormous regional fixation, absence of guideline, and between institutional loaning, makes the nearby Financial Institutions helpless

against both exogenous and endogenous stuns (Garcia, 2016). There is still minimal exact proof on the antagonistic impacts of FI in FS, in any case, the presence of such origination debilitates the hypothetical and political soundness of the Financial Inclusion as an advancement development.

The nonappearance of force in country FI is ascribed to the harder condition the Financial Institutions face when serving provincial customers and attempting to remain monetarily manageable. There is proof that MFIs with a high rustic nearness can't use on economies of scale and efficiency impacts at a similar degree as the country situated MFIs. This is principally because of the higher activity costs and hazards and the less ideal contracting setting rustic arranged MFIs face (Lopez and Winkler, 2018).

### **Microfinance: Funding and Banking for the Bottom of the Pyramid**

Tackling extraordinary neediness by giving money related instruments, particularly small scale credits, to those out of the framework, started in the 80's when Mohammed Yunus, beneficiary of the 2006 Peace Nobel Prize, established the Social Banking Model (SBM) behind the Grameen Bank of Bangladesh (Chibba, 2008). From that point forward, Microfinance turned into the primary vehicle to bring powerless gatherings into the monetary frameworks of the creating scene.

Bounty observational research gives solid proof in help of the positive job of microfinance in the decrease of destitution (Karlan and Zinman, 2007; Cotler and Woodruff, 2008; Setboonsarng and Parpiev, 2008), there have been commentators with respect to the technique actualized in the evaluation of MF programs and in the absence of replicability of the outcomes (impacts that are just nation or site-explicit). Additionally, there have been numerous cases where the awful execution of MF approaches and the ascent of foundations with ulterior targets have exacerbated the unsafe states of those whom they should profit.

Per the World Bank (2008), life and medical coverage for poor people have been progressively offered by both revenue driven banks and NGOs. For these to be monetarily feasible for the business guarantor, it was important to discover a conveyance channel that had the trust from the objective clients. Normally, MFIs, NGOs, and sparing cooperatives become the most appropriate vehicles to connect the two sections.

Another fascinating administration that has been packaged with the MFIs offer is the exchange of International Remittances, which have turned into a significant wellspring of pay in must of creating nations. For the most part, settlements sent by means of formal establishments are liable to exorbitant charges that goad the utilization of casual settlement channels. The vast majority of these expenses are the impression of the high exchange costs that formal organizations face in achieving the beneficiaries or of the absence of rivalry of bank in remote territories. Once more,

the geological effort and the trust worked by MFIs settle on them a characteristic decision to complete settlements exchanges in rustic regions, including this administration into their portfolios.

## **Blockchain: The Future for Transparent Transactions**

### **What is Blockchain?**

The inception of Blockchain can be followed back to October 2008, when Satoshi Nakamoto distributed the white-paper behind the possibility of Bitcoin. In it, Nakamoto uncovered how the Blockchain innovation can take care of the twofold spending issue and be the structure stone behind decentralized monetary standards (Zwitter and Boisse-Despiaux, 2018). The arrangement proposed by Nakamoto comprises in utilizing a decentralized record with system authorized procedures that are bolstered on a proof-of-work accord instrument for refreshing the records (Davidson, De Filippi, and Potts, 2016).

A Blockchain, otherwise called Decentralized Ledger Technology (DLT), is an information structure which permits to make sealed computerized records and to share them. The cryptographic part empowers anybody to access and include into the record safely. There is definitely not an outsider going about as a go between or specialist. It is close to difficult to expel or adjust information recorded on the record.

### **Elements of the Blockchain and its Implications**

All the potential advantages that lay behind the Blockchain Technology (BT) originate from three principle components of its structure: The piece of the obstructs, the agreement system, and the decentralization and receptiveness of the record.

A hash is a computerized component that packs information into a particular configuration with a decided length. For instance, the hashing calculation utilized by BTC is SHA-256, which represents Secure Hashing Algorithm, with a hash length of 256 bits. Along these lines, by utilizing this calculation the subsequent hashed information will dependably be 256 bits in length (ConsenSys, 2016). Along these lines, the hash goes about as numerical unique finger impression 39 which contains every one of the components of the exchange and is imbedded in all future the exchanges, turning into the connecting factor among every one of the squares. Also, the usage of hash works in the Blockchain is the key component to guarantee changelessness in light of the fact that, so as to adjust an exchange, all the past exchanges and their duplicates ought to alter all the while. Something else, the hash numbers won't coordinate the records existing in all the Blockchain duplicates (Zwitter and BoisseDespiaux, 2018).

The Blockchain is sheltered because of its decentralized nature. Since the historical backdrop of each exchange is put away in squares of information that are cryptographically tied and this square is recreated on each PC inside the system, Blockchain is "a changeless, secure, and straightforward record of all exchanges that have ever occurred" (Zwitter and Boisse-Despiaux, 2018).



## Comparison between Traditional Ledgers and Blockchain Technology

Traditional Ledgers	Blockchain Technology
<b>Centralized:</b> A single entity validates every transaction, making them vulnerable by having just a single point of failure.	<b>Decentralized:</b> Every member of the network holds a copy of each transaction, eliminating the single point of failure.
<b>Opaque:</b> Only authorized members have access to the information in the ledger.	<b>Transparent:</b> Any member of the network can access the data in the ledger without restrictions.
<b>Changeable:</b> Information can be modified by members with overriding privileges.	<b>Immutable:</b> The information on the ledger is set in stone.
<b>Vulnerable to Theft:</b> Multiple cases of identity and information theft by hackers.	<b>Encryption and Pseudo-Anonymity:</b> Cryptography impossible to break.
<b>Time Lag:</b> Depending on the systems used the transactions can take days to be registered and validated.	<b>Fast entries:</b> Transactions are completed, registered, and validated in matter of minutes (depending on the Blockchain's architecture and computational power).

Ultimately, the principle ethics of Blockchain can be condensed as:

1. Oversight Proof: no element can singularly choose which substance will be stores in the Blockchain.
2. Dependable: the Blockchain can be confided in clearing up and exchanging resources accurately.
3. Pseudo Anonymous: the Blockchain identifies resource proprietors extraordinarily utilizing individual nom de plumes, it can likewise hold this present reality character.
4. Secure: it blocks the control, the duplicate, or the twofold spending of any benefit proprietorship.
5. Flexible: it checks, illuminates, and exchanges possession in any case noxious endeavours.
6. Reliable: consistency increments after some time.
7. Upstanding: the Blockchain keeps the information uprightness and consistency, and ensures security to each exchange, and the whole history of exchanges (Drescher, 2017; referred to by Zwitter and Boisse-Despiaux, 2018).

## **Benefits of blockchain**

Below are some of the ways through which the Blockchain technology tackles the above-mentioned issues:

### **Decentralized System**

The Blockchain system follows a decentralized approach when compared to banks and financial organizations which are controlled and governed by Central or Federal Authorities. Here, everyone who is part of the system becomes equally responsible for the growth and downfall of the system. Rather than one single entity holding the power, everyone who is involved with the system holds some power.

### **Public Ledgers**

The ledger which holds the details of all transactions which happen on the Blockchain, is open and completely accessible to everyone who is associated with the system. Once you join the Blockchain network, then you can download the complete list of transaction since its initiation. Even though the complete ledger is publicly accessible, the details of the people involved in the transactions remains completely anonymous.

### **Verification of Every Individual Transaction**

Every single transaction is verified by cross-checking the ledger and the validation signal of the transaction is sent after a few minutes. Through the usage of several complex encryption and hashing algorithm, the issue of double spending is eliminated.

### **Low or No Transaction Fees**

The transaction fees are usually not applicable but certain variants of Blockchain do implement certain minimal transactions fees. These transaction fees are however relatively quiet less when compared to the fees implied by banks and other financial organizations. If a transaction needs to be completed on priority, then an additional transaction fees can be added by the user so as to have the transaction verified on priority.

Now that we have spoken about the issues with the current existing system and understood how the Blockchain technology overcomes these challenges, I am quite sure you must have got some understanding of the Blockchain System.

## Research Methodology and Analysis

### Social Media Twitter Analysis

Platform: Twitter

Duration: (1-Jun-2018 to 15-May-2019)

Type of research design: Correlational

Language and packages: Python, sentimental 2.2.3, Watson (Natural Language Processing), OpenWhisk (Server-less Platform)

Over the weekend that web crawlers started monitoring Twitter, China made a bold statement on crypto-currencies by banning ICO's. An ICO is essentially a crowdfunding event where companies raise large sums of money via cryptocurrency — think Kickstarter, but on the order of millions of dollars rather than a few thousand. It was interesting to observe the price of Bitcoin fluctuate and the public opinions shift hour-by-hour.

It's not possible to monitor every hashtag over Twitter that are used to tag user messages for bitcoin. So, top 3 hashtags i.e. (**#BUYBUYBUY**, **#Notsofast**, **#bitcoin**) are taken into consideration for further analysis.

### Public Surveys

Platform: Google Forms

Type of research design: Descriptive

URL:<https://docs.google.com/forms/d/e/1FAIpQLSczz8yEyNYIZprLFR55TFmwFeDcBke-IqIOhTsJtvI5ZVdAPA/viewform>

Statistical Analytic Tool: SPSS “Statistical Package for the Social Sciences”

A questionnaire of following 24 questions was created using google forms.

- When was the first time you owned a digital asset?
- How many different digital assets do you currently own?
- Approximately how frequently do you make digital asset transactions?
- Do you own bitcoin?
- How do you feel about the current overall state of bitcoin?
- What do you compare bitcoin most to?
- Do you believe bitcoin's maximum block size limit should be raised above 1 MB in 2019?

- Do you believe bitcoin will experience a contentious hard fork or blockchain split in 2019?
- When do you think bitcoin's Lightning Network will be live?
- Do you own ether?
- How do you feel about the current overall state of Ethereum?
- Which of the following do you consider to be the most negative aspect of Ethereum today?
- How do you believe mining will evolve in the future? (in case of BitCoin)
- How do you believe mining will evolve in the future? (in case of Ethereum)
- What sector of blockchain applications are you most bullish on?
- How do you feel about the current overall state of Distributed Ledger Technology (sometimes called 'permissioned' or 'enterprise' blockchains)?
- Do you believe banks will ever issue their own form of digital asset?
- Do you believe governments will ever issue their own form of digital asset?
- How do you believe regulation will affect the proliferation of digital assets?
- How much do you know about the following? [Bitcoin]
- How much do you know about the following? [Ethereum]
- How much do you know about the following? [Enterprise Ethereum Alliance]
- How much do you know about the following? [Ripple]
- How much do you know about the following? [Hyperledger]

#### Target platforms for audience response

- Facebook post's comment sections
- Youtube's top 10 trending videos comment sections
- Sent to various google groups over emails
- Various Whatsapp groups

#### Type of audience

- Naïve
- Supervised
- Unsupervised
- Sophisticated.

#### Reponses

As a result, 51 responses were received. This is taken as a sample set for quantitative analysis.

## Twitter Sentiment Analysis



The graph represents the fluctuations in bitcoin prices and volumes when any of the following hashtags gets trending on Twitter. This graph is generated using PyGraph based on sentiment analysis metrics generated using Watson NLP API (application programming interface).

### #BUYBUYBUY

On 20, April 2019 between 2am and 10am, \$BTC hiked nearly \$1200USD — that's a dramatic shift in price over 8 hours, but the response is even more interesting to me. In the graph, you see a noticeable shift in positive sentiment. Summarizing the tweets, a lot of people were less concerned with the price drop and more optimistic that \$BTC would quickly recover, thus being a good time to buy.

### #Notsofast

After the first dip, the price did show some signs of recovery, but continued to plummet until the evening of 1<sup>st</sup>, May 2019. Overall, the market cap of Bitcoin dropped nearly \$11 billion USD over 2 days, the sentiment on Twitter reflects this dramatic shift — people were overwhelmingly pessimistic without much relief.

**#bitcoin** is passing \$10000 again on 15<sup>th</sup>, May around 1pm to 5pm, the new bottom?

## SPSS output based on responses of Google Forms

### Comparison of Frequencies

When was the first time you owned a digital asset?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 2014	5	9.8	9.8	9.8
2015	8	15.7	15.7	25.5
2016	3	5.9	5.9	31.4
2017	9	17.6	17.6	49.0
2018	6	11.8	11.8	60.8
2019	8	15.7	15.7	76.5
Never	12	23.5	23.5	100.0
Total	51	100.0	100.0	

Approximately how frequently do you make digital asset transactions?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid A couple times a month	13	25.5	25.5	25.5
A couple times a week	12	23.5	23.5	49.0

A couple times a year	6	11.8	11.8	60.8
I've never made a transaction	20	39.2	39.2	100.0
Total	51	100.0	100.0	

**How do you feel about the current overall state of Bitcoin?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Extremely negative	5	9.8	9.8	9.8
Extremely positive	23	45.1	45.1	54.9
Moderately positive	8	15.7	15.7	70.6
Slightly positive	15	29.4	29.4	100.0
Total	51	100.0	100.0	

**Do you own Ether?**

	Frequency	Percent	Valid Percent	Cumulativ e Percent
Valid I have never owned ether	34	66.7	66.7	66.7
Yes	17	33.3	33.3	100.0
Total	51	100.0	100.0	



**How do you feel about the current overall state of Ethereum?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Extremely positive	17	33.3	33.3	33.3
Slightly negative	17	33.3	33.3	66.7
Slightly positive	17	33.3	33.3	100.0
Total	51	100.0	100.0	

**What sector of blockchain applications are you most bullish on?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Asset management tools	17	33.3	33.3	33.3
Identity	17	33.3	33.3	66.7
Prediction markets	17	33.3	33.3	100.0
Total	51	100.0	100.0	

**How much do you know about the following? [Hyperledger]**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid A bit	17	33.3	33.3	33.3
A lot	3	5.9	5.9	39.2
Almost	31	60.8	60.8	100.0

nothing				
Total	51	100.0	100.0	

**Do you believe banks will ever issue their own form of digital asset?**

	Frequency	Percent	Valid Percent	Cumulative Percent
No	17	33.3	33.3	33.3
Yes	34	66.7	66.7	100.0
Total	51	100.0	100.0	

**How do you believe regulation will affect the proliferation of digital assets?**

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Digital assets will be helped by regulation	34	66.7	66.7	66.7
Digital assets will be hurt by regulation	17	33.3	33.3	100.0
Total	51	100.0	100.0	

## Comparison of Means

How many different digital assets do you currently own? Approximately how frequently do you make digital asset transactions? Do you own bitcoin? \* When was the first time you owned a digital asset?

When was the first time you owned a digital asset?	How many different digital assets do you currently own?	Approximately how frequently do you make digital asset transactions?	Do you own bitcoin?
2014 N	5	5	5
2015 N	8	8	8
2016 N	3	3	3
2017 N	9	9	9
2018 N	6	6	6
2019 N	8	8	8
Never N	12	12	12
Total N	51	51	51

How many different digital assets do you currently own? Approximately how frequently do you make digital asset transactions? Do you own bitcoin? \* How do you feel about the current overall state of bitcoin?

	How many different digital assets do you	Approximately how frequently do you make digital asset	Do you own

How do you feel about the current overall state of bitcoin?		currently own?	transactions?	bitcoin?
Extremely negative	N	5	5	5
Extremely positive	N	23	23	23
Moderately positive	N	8	8	8
Slightly positive	N	15	15	15

How many different digital assets do you currently own? Approximately how frequently do you make digital asset transactions? Do you own bitcoin? \* How do you believe mining will evolve in the future? (in case of BitCoin)

How do you believe mining will evolve in the future? (in case of BitCoin)		How many different digital assets do you currently own?	Approximately how frequently do you make digital asset transactions?	Do you own bitcoin?
Much more decentralized	N	34	34	34
Slightly more centralized	N	17	17	17
Total	N	51	51	51

How many different digital assets do you currently own? Approximately how frequently do you make digital asset transactions? Do you own bitcoin? \* How do you feel about the current overall state of Distributed Ledger Technology (sometimes called 'permissioned' or 'enterprise' blockchains)?

How do you feel about the current overall state of Distributed Ledger Technology (sometimes called 'permissioned' or 'enterprise' blockchains)?	How many different digital assets do you currently own?	Approximately how frequently do you make digital asset transactions?	Do you own bitcoin?
Extremely positive      N	17	17	17
Moderately positive      N	17	17	17
Slightly negative      N	17	17	17
Total      N	51	51	51

How many different digital assets do you currently own? Approximately how frequently do you make digital asset transactions? Do you own bitcoin? \* How much do you know about the following? [Bitcoin]

How much do you know about the following? [Bitcoin]	How many different digital assets do you currently own?	Approximately how frequently do you make digital asset transactions?	Do you own bitcoin?
A bit      N	17	17	17
A lot      N	34	34	34
Total      N	51	51	51

How many different digital assets do you currently own? Approximately how frequently do you make digital asset transactions? Do you own bitcoin? \* How much do you know about the following? [Hyperledger]

How much do you know about the following? [Hyperledger]		How many different digital assets do you currently own?	Approximately how frequently do you make digital asset transactions?	Do you own bitcoin?
A bit	N	17	17	17
A lot	N	3	3	3
Almost nothing	N	31	31	31
Total	N	51	51	51

## **Blockchain Landscape**

### **Bitcoin and Cryptocurrencies**

In mid 2009, BTs were utilized to control the well-known Bitcoin, a digital currency based convention for the exchange of tokens called bitcoin. The Bitcoin (BTC) and the cryptographic forms of money picked up reputation in 2013 with the precarious ascent in the Bitcoin value which passed the \$1,000 USD mark (Mainelli and Smith, 2015). At that point, in 2017 the Bitcoin went standard when it achieved the estimation of \$19,900 USD, subsequent to having an estimation of \$960 toward the start of that year. In a similar period, Bitcoin achieved a market capitalization of \$320 billion USD outperforming that of multinationals, for example, Walmart and even the all-out estimation of all UK money notes available for use. Silicon Valley identities, for example, Steve Wozniak (Co-Founder of Apple Inc.) and Jack Dorsey (Founder of Twitter) bolstered the BTC, expressing that it ought to be an overall cash (Koticha, 2018).

### **Ethereum and the Smart-Contracts**

Ethereum permits to compose and implement what is known as Smart-Contracts (SCs), which can bolster decentralized applications including Distributed Autonomous Organizations (DAOs). SCs and DAOs encourages the usage of the Internet of Things (IoT), "which eventually should require a decentralized register since its scale will limitlessly surpass any conceivable unified record" (Davidson, De Filippi, and Potts, 2016).

The SCs are essentially financial balances for contracts implanted in Blockchains as code with foreordained conditions that self-execute and consequently disperse reserves once these conditions are met. Consequently, SCs can diminish reaction time to emergency via consequently appropriating assets to defenceless gatherings when certain catastrophic events occur or if the capability of a pandemic separates (Hernandez, 2017).

### **Prospects for Social Innovation**

In the course of the most recent decade, the inclusion of the Non-Financial private division has demonstrated as being fundamental to FI. The urgent job of computerized and correspondence innovations, and market-based ways to deal with serve the BOP through collusions that include Financial and Non-Financial associations is coming about into promising items and administrations. Among numerous advances, the cell phone entrance, the exponential development in data innovations, and the presence of biometric solid innovation have entered the standard account circle (Chibba, 2009). With such transparency from the money related part and quicker reaction originating from controllers, it is simply a question of time to see BTs upsetting the entire division.

## **Remittances and International Payments**

Exchanges done utilizing Blockchain advances are borderless. The negligible expense charged for these exchanges is fixed paying little respect to the cause or the goal. The exchange costs on settlements have generally been exceptionally high. By and large, foreigners use settlements administrations, for example, Western Union, which cost up to 7% of the assets exchanged. In exchanges from South Africa to neighbouring nations, exchange charges can change from 5% to 23% of the exchange esteem contingent upon the sort of administration utilized (Kshetri, 2017). Also, Hernandez (2017), bolsters these evaluations by expressing that the worldwide normal settlement cost ranges from 7.6% to 20% of the sum sent (contingent upon the nations of birthplace and goal).

In 2015, Santander executed a preliminary form of a Blockchain-based application that can permits exchange from £10–10,000 in Euros to 21 nations, and in USD to the US. In Mexico, mexBT propelled a Blockchain stage for settlements among LatAm and Asia, the framework permits moves in both BTC and fiat monetary forms (Kshetri, 2017).

## **Fair-Trade and Ethical Sourcing**

A few specialists have accentuated the conceivable effect that BTs could have in the supply chains. The ramifications of BTs execution around there could prompt overflow impacts in the improvement and social domains. The detectability attainable through Blockchain could recognize wages and work mishandles, or even to monitor the veracity of certain reasonable exchange programs.

Distinguishing the inception of items and administrations crosswise over complex supply chains need straightforward and changeless metadata framework, which must be trusted by every one of the partners while, all the while, be adaptable to adjust to numerous conditions and situations (Thiruchelvam, et. al, 2018). Moreover, BTs license the development of notoriety to interface exchanging accomplices legitimately. For instance, enormous multinationals with complex supply chains, for example, Walmart, can give direct financing to their providers in the creating scene to assemble limit or improve forms (Kshetri, 2017).

A standout amongst the most striking instances of the execution of BTs in supply chains is in the espresso business. The selection of Blockchain in the Coffee Supply Chain could be vital to rearrange the inventory network process by means of digitalization and automatization, which can follow the source of crude materials and certification reasonable exchange strategies (Thiruchelvam, et. al, 2018). The Swiss Coffee Alliance, - an espresso exchange bunch that bolsters makers with mechanical ability and Ambrosus – a Blockchain and IoT integrator for quality affirmation in nourishment and pharma - reported an organization in 2018. This cooperation tries to diminish the unscrupulous practices, particularly the uneven benefit dissemination in the espresso inventory network.



## **Reduction of Corruption**

The decentralized and trust less nature of BT can possibly diminish debasement by permitting straightforwardness and responsibility among the administration exchanges. In view of a similar design of production network arrangements, open Blockchains with recognized gatherings can destroy fixes, extortion, and assets deviation from open substances. For MFIs, completely unveiled records, end-to-end from givers to recipients, could be an achievement that guarantees that reserves are allotted appropriately, with no maltreatment to the partners, or the presence of assets with "untrustworthy" sources or endings in the money related store network (Zwitter and Boisse-Despiaux, 2018).

The ascent of prominent fakes has encouraged BTs engaging quality among budgetary organizations. As far back as Standard Chartered lost about \$200 million USD from the Qingdgo extortion, the worldwide has joined forces with DBS gathering and Singapore's Infocomm to make Blockchain-based arrangements. Indeed, even the enormous business banks, for example, Bank of America and HSBC have started their examination on Blockchain usage for exchange fund and different applications. In 2015, the Bitcoin Foundation Ukraine and KUNA Bitcoin Agency marked a MOU with Kyiv Regional State Administration to do a Blockchain-based e-administration framework in the city of Odessa. The target of this activity to guarantee reasonable and straightforward sales, and destroy the opportunity of archive falsification (Kshetri, 2017).

As recently observed, misrepresentation in the Microfinance business has been unbridled in numerous topographies. In the 2010-2012 period, the leader of the Adoor Sree Narayana Dharma Paraipalana Union, in India, got credits of around \$1.15 million USD from the Bank of India for the benefit of 5,000 families. The families had not requested the credits but rather bear the obligation gathering procedures. To anticipate such maltreatment, Tech Bureau and Infoteria executed a Microfinance administration in Myanmar utilizing the Blockchain stage Mijin to exchange credits and the record information in the framework to neighbourhood MFIs (Kshetri, 2017).

## Summary & Conclusion

### Blockchain as a Correction Mechanism

When all is said in done, frameworks keep an eye on centralization since this type of association is the most productive to devise, settle, and authorize rules. Centralization blocks duplications, sanctions progressions, and gives exchange in questions. Be that as it may, these characteristics represent a risk if the experts of such frameworks have office to misuse them. "Centralization brings request, however this request can be fragile, and adjustment toward decentralization starts to make the framework progressively powerful, adaptable, secure and productive" (Davidson, De Filippi, and Potts, 2016). Centralization is conceived by and for trust, which can be utilized to subtract benefits when the trust is politically constructed. This prompts lease looking for practices, which can be identified as an endemic brokenness of brought together frameworks originating from the scattering of assets in the inquiry of getting such advantages. Decentralization has the 49 guarantee to be an antibody against lease looking for practices when trust originates from cryptographic instead of political methods (Davidson, De Filippi, and Potts, 2016).

At the point when Blockchain gets broke down under the monetary umbrella, unmistakably Blockchains act like markets because of its decentralized nature. "Markets are regularly proficient administration organizations for spot gets (an unadulterated trade economy), yet where financial action requires facilitated speculation through time (resource particularity), or a continuous connection between gatherings (recurrence), or includes uncontactable dealings (vulnerability), elective administration foundations, including chains of command and social contracting, can be effective approaches to manage the risks of advantage". In a political-economy viewpoint, the Blockchain can be considered as a kind of private request aggressive federalism, since no passage hindrances to at least one Blockchains is identical to "casting a ballot with ones feet". Along these lines, effectiveness picks up originate from the destruction of lease looking for conduct, which in like manner is gotten from the annihilation of a brought together syndication command over the laws or the guidelines of the game (Davidson, De Filippi, and Potts, 2016).

Thinking about the past conflicts, this work contends that the Blockchain Technologies can possibly radically decrease the difficulties that have hampered the beneficial outcome of the Microfinance Movement. Likewise, it can avert the presence of lease looking for conduct and maltreatment from poorly proposed MFIs' supervisors by giving the best possible instruments to guideline and appropriate contract 50 authorization. In addition, it can prepare to the presence of new players in the Microfinance business and another sort of MFIs, which could broaden the dimension of effort and give better advance conditions to the most unfortunate of poor people.

## **Transparency to Reduce the Information Asymmetry**

Decentralized Ledgers improves the straightforwardness of data trades, rendering trust commitments simpler to dispose of between executing parties. The administration of assets exchange is generally provided by budgetary go-betweens. Blockchain and DLTs redistribute the obligations of exchange the executives to calculations and PC code. Because of the P2P setup of BTs, the Blockchain speaks to a troublesome advancement that can definitely decrease the data asymmetry in all kind of exchanges (Kewell, Adams, and Parry, 2017).

Various institutional and monetary components set up whether guideline, data dispersion, and contracting impede data asymmetry, or leave generous asymmetries. Among these components there is the ability to compose, track, and authorize ideal contracts, and the expenses of unveiling data for every one of the partners (Healy and Palepu, 2002).

To begin with, ideal gets that contain statements upholding full straightforwardness between the gatherings can handle antagonistic determination. Second, solid guideline could request more exposure in the overseeing bodies to stay away from the ethical peril (Healy and Palepu, 2002). In principle, the BTs could control savvy contracts in which the terms and states of credits could be completely straightforward for every one of the partners. In like manner, an open record of exchanges accessible on a Blockchain will make the credit profiles for borrowers, deciphering in less over-obligation and appropriate loan costs for poor people. Besides, this total honesty will encourage the announcing and the control by controllers, which guarantee to improve the acts of the whole segment.

## **Self-regulation to prevent Moral Hazard.**

As it were, BT are coordinated to construct social and monetary establishments. BTs are intended to make and execute the sort of principle frameworks, (for example, Smart-Contracts, and DAOs) that encourage custom financial coordination (Davidson, De Filippi, and Potts, 2016).

But gatherings may be in a debate inside an agreement, there is as yet a typical advantage in keeping up the trustworthiness of a Blockchain, or their reputational capital inside it, due to the esteem that notoriety has in open decentralized frameworks. Flagging or screening components are relied upon to turn out to be increasingly modern and effective inside the Blockchain setting (Davidson, De Filippi, and Potts, 2016).

By and large, guidelines in MFIs are connected with task costs, for example, security frameworks, IT speculations, and the backing off of MFI advancements. In this manner, at times the advantages of the guideline are weakened by these expenses (Mersland, 2009). While the structure and usage of the guidelines are the principle determinant of such advantages, advancements that empower straightforward and shoddy self-guideline prepare to authorize plans that keep maltreatment from MFIs' chiefs or representatives.

## **Reduction of Transaction Costs.**

In a financial point of view, decentralized records are probably going to be more cost-effective contrasted with the current incorporated frameworks as Blockchain experiences three exponential cost bends: Moore's law (cost of handling advanced data diminishes exponentially), Kryder's Law (cost of putting away computerized data diminishes exponentially), and Nielsen's Law (the expense of exchanging computerized data diminishes exponentially) (Wiles 2015). (Davidson, De Filippi, and Potts, 2016). In opposition to the present records middle people, the Blockchain is "dispersed, open, straightforward, encoded and changeless" (Hernandez, 2017).

Garmaise and Natividad (2010) uncover that credit assessments have a solid beneficial outcome in lessening the expenses of money for MFIs. In their examination, they find that the financing cost charged to the MFIs by institutional moneylenders diminishes by 550 premise focuses after an assessment. Once more, the decrease of data asymmetries has a positive effect in costs decrease (Garmaise and Natividad, 2010). The BTs could encourage the accumulation of data and even can possibly totally change the manner in which assessments are performed utilizing Smart-Contracts

In conclusion, exchanges executed with savvy contracts should confront less loss of effectiveness because of data asymmetries (both unfavourable choice and good peril). In this way, it could be relied upon to see less counter systems, for example, flagging and screening. Likewise, Smart Contracts could be a successful intend to set a significant number of low likelihood state-possibilities into contracts, which at last mean a decrease in exchange costs identified with composing contracts. In any case, haggling costs, both ex-bet revelation and ex-post renegotiation, are hard to be influenced by the reception of BTs. Along these lines, the consequences for implementation costs will rely upon the degree where human perceiving stays pertinent in the exchanges (Davidson, De Filippi, and Potts, 2016).

## **Challenges for Blockchain Solutions**

### **Internet Bandwidth Requirements**

With regards to assess the plausibility of new advancements, the key inquiry spins around the purpose of minimum amount; per an innovation to flourish, specialized prevalence versus substitutes isn't sufficient. The best possible nearness of three components is required for Blockchain to succeed and go standard: request, rivalry, and expertise (Mattila, 2016).

Among the conceivable negative externalities that may come from BTs, the extra transfer speed required to convey exchanges over the system is a rising concern. With regards to creating nations, the normal impacts might be progressively serious since system blockage is a typical issue in such countries (Kshetri, 2017). Despite the fact that BT could have an uncommon effect in land library

and resident distinguishing proof, cynics contend that Blockchain probably won't give the proposed arrangements because of its intricacy and its vitality and data transmission necessities; components that could be absent amid numerous philanthropic emergency (Zwitter and Boisse-Despiaux, 2018).

### **The Front-end as a Central Bottleneck**

The greatest boundaries for Blockchain adjustment likewise incorporate the nonattendance of training, data, and easy to use interfaces. Sadly, there has been little familiarity with Blockchain focal points among the key partners in the Microfinance area. For instance, Saldo – a Mexican MFI centered in budgetary education found that it is exceptionally mind boggling to discuss Blockchain with both funders and recipients. The key is to begin first with the MFIs, which are bound to be comfortable with BTs, to downstream and propel the development of information (Kshetri, 2017).

Arrangements controlled by DLTs should be planned with a moral and good base, by taking in thought the computerized partitions and disparities that can emerge in reality. Experimental proof demonstrates that the gatherings in the higher strata will in general adjust and advantage from new advancements first. Individuals in creating nations, country networks, or underestimated are less inclined to have the advanced education to appropriately cooperate with BTs, which eventually can dissipate the potential for good inside the DLTs (Hernandez, 2017).

### **Volume of Transactions and Cost-Efficiency**

These days Blockchain dull when contrasted with the set up exchange and record advances. Bitcoin, which was made to supplant standard fiat monetary forms, can just perform 7 exchanges for every second (tps). Ethereum, which was intended to handle this confinement, is restricted to under 50 tps. In this manner, there is as yet a major hole when contrasted with PayPal's 450 tps Visa's 24,000 tps (Koticha, 2018).

These figures open questions on how better BTs can progress toward becoming regarding computational limit and vitality proficiency. While bends, for example, the Moore's law leaves trust in Blockchain to accomplish versatility, the speed where the innovation develops is essential to meet the desires that have been raised in the course of the most recent few years.

### **Regulation and Validation**

The danger of not adjusting the Blockchain as an answer isn't just restricted to the absence of advanced proficiency or the wrong execution of the front-end. Activities utilizing mechanical advancements to handle social issues consistently "find that getting purchase in is the hardest piece of conveying a viable arrangement, not the innovation". The upfront investment not just needs to

originate from those utilizing the innovation however to every one of the partners associated with the social activity.

It is normal that Governments that have a background marked by responsibility with straightforwardness are bound to greet Blockchain-based arrangements. Then again, those that search for hazy situations will probably upset these endeavours. The personal stake of certain gatherings in power could be the significant snag to for the usage of DLTs in the hunt of better straightforwardness. The profound comprehension of the monetary, social, and political setting is key for the accomplishment of Blockchain-based mediations (Hernandez, 2017).

At last, a legitimate system is by all accounts imperative for Blockchain to achieve its maximum capacity, paying little heed to the field the innovation is connected to. Zwitter and Boisse-Despiaux (2018) express that, at any rate for the compassionate segment, BTs should agree to worldwide lawful structures, for example, the Human Rights Law or the International Humanitarian law. For the Microfinance circle this may demonstrate to be all the more testing since both compassionate and monetary ought to be incorporated in the structure of an answer. Sending out fruitful arrangements may demonstrate infeasible when national money related guidelines don't coordinate the components of effective executions.

### **Rigidity and Privacy Issues**

While the unchanging nature of the data in a Blockchain and the mechanized idea of the Smart Contracts are apparently the most engaging highlights for MFIs, certain worries raise in regards to the inflexibility of the innovation and the infringement of security rights.

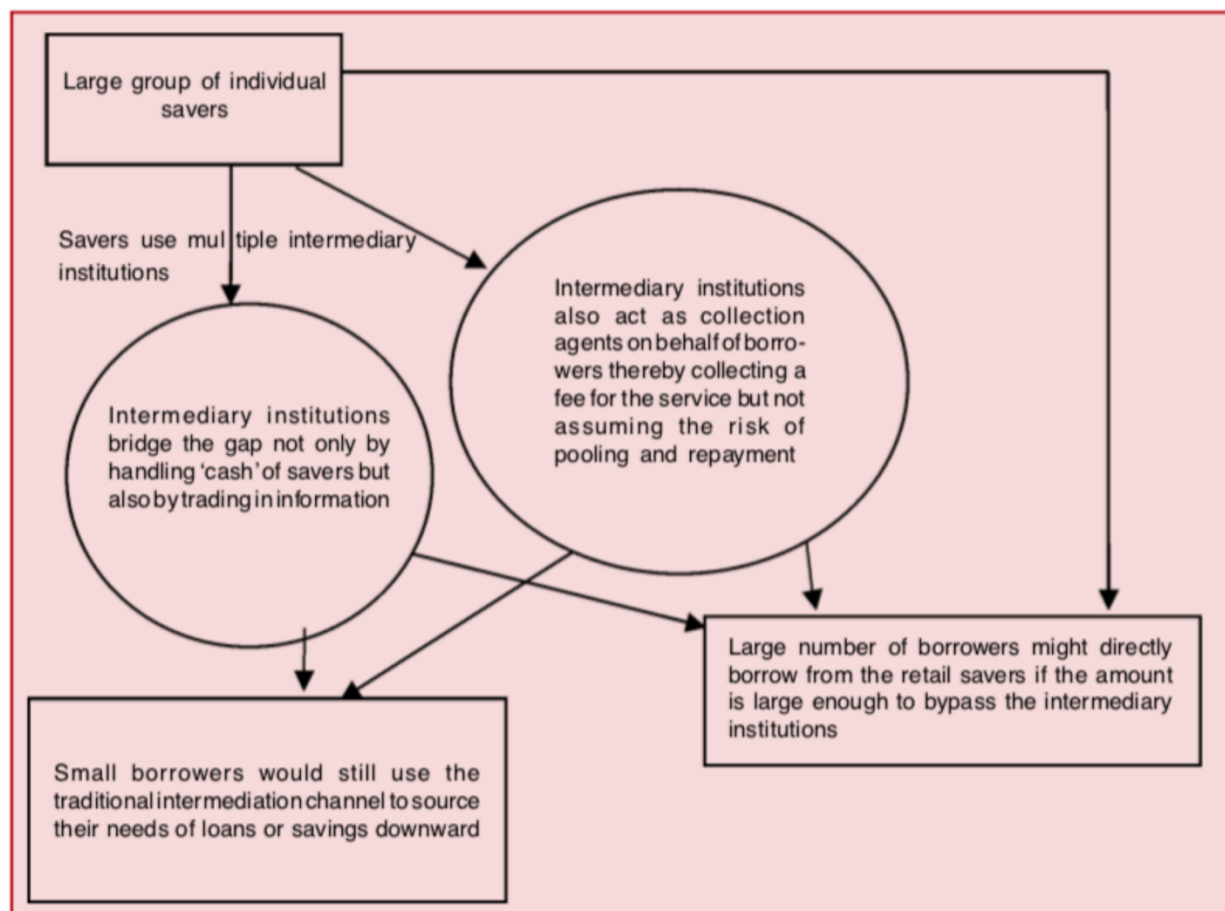
The capability of making changeless ID records and consequently execute contracts, while promising, will likely convey unbending nature to the procedures by taking the human edge of thankfulness out of the condition (Zwitter and Boisse-Despiaux, 2018). While considering the outrageous conditions the poor face in their lives, full inflexibility probably won't be as alluring for the Microfinance and Financial Inclusion developments.

Likewise, there is no lucidity in how to forestall the abuse of information, or authorize the privilege to be overlooked, when Blockchains give changeless and decentralized exchange data. In this manner, security and information assurance represents an impressive deterrent for the execution of DLTs, strikingly when character vaults and different databases contain actually recognizable data (Zwitter and Boisse-Despiaux, 2018). In this manner, the full substitution of the human gratefulness in the Microfinance business is probably not going to occur. The partners ought to be cautious in how Blockchain is sent in giving arrangements, generally the endeavours can be weakened by fights in court and notoriety misfortune.

### **The Future of Blockchain in Microfinance**

Sriram (2015) states that in a develop model where innovation empowers stockpiling and recovery of enormous information, the capacity of intermediation could be as spoken to as following:

**Figure 3: Role of Institutions of Intermediation in Mature Societies where Technology Bridges the Information Asymmetry Gap**



Taking into account that the principle job of Financial Institutions is the one of intermediation between the individuals who hold capital surpluses and those with transient capital needs, the execution of DLTs could reshape the whole Microfinance scene. Also, if the maximum capacity of BTs is unfurled, singular savers could be associated legitimately to those with capital needs, including the least fortunate of poor people. This kind of result would ostensibly disturb the whole organization and job of MFI as they are known.

### **For Entrepreneurs and Non-Financial Institutions**

Since Blockchain can change the scene of the Microfinance part, there is space for new players to enter at various phases of the esteem chain. For instance, by understanding that the advanced proficiency and an easy to understand interphase are imperative for the appropriation of Blockchain, Start-ups could centre in making computerized instruments for money related instruction and in giving programming creating to MFIs Blockchain interphases.

Likewise, there are instances of huge producers, retailers and wholesalers that are playing a gradual and correlative job in giving particular money related administrations. For instance, in Mexico,

purchaser credit from Banco Wal-Mart and small scale provider credits from Cementos Mexicanos (Cemex) are tending to the necessities of poor people.

In addition, in another budgetary condition controlled by the Decentralized Ledger Technologies, local players of such innovations can gradually dislodge the officeholder MFIs from the initiative of the area. Effective Blockchains that can hold exchanges every second at comparable rates as PayPal or other computerized installment stages, with hearty Smart-Contracts intended to support poor people, and the best possible effort channels to give advanced and budgetary education, could make another kind of MFIs that just would associate savers straightforwardly with borrowers at a generally little charge for every exchange.

### **For Incumbent MFIs (Micro Finance Institutions)**

As contended in this work, BTs can possibly decrease the impacts of the basic imperfections in the Microfinance business. MFIs could use the transparency and unchanging nature of the Blockchain to make credit records that make chance appraisal and the executives progressively effective. The work of SCs could make the gathering procedure progressively proficient and could decrease the need of unsafe insurances. Besides, the close time segment in the account of exchanges would make the revealing procedure progressively proficient and straightforward, boosting the upgrades in execution and decreasing the presence of lease looking for conduct.

Thinking about all the past disputes, it is protected to guarantee that leaving into BTs is a shrewd choice for the MFIs. Significantly more, doing it on a beginning time could counteract the removal by Fintechs or business banks, which hold a more noteworthy ability in advanced arrangements. By utilizing their present field ability and information of the recipients, MFIs could direct the production of Blockchain-based arrangements that are appropriately provided food for the least fortunate of poor people.

### **For Governments and Regulators**

Numerous arrangements of the Blockchain may be utilized to encourage FI utilizing Microfinance as a vehicle. For this issue, the Microfinance area could conceivably profit by various application including open, private, unified or consortium Blockchain. Taking a gander at the present situation and at the various players associated with the microfinance parts, BTs could be executed at different dimensions and with altogether different destinations.

In any case, the best test for the controllers would discover approaches to accomplish these dimensions of straightforwardness without disregarding protection rights and ensuring the privilege to be overlooked. The figure of consortium Blockchain or cross breed open/private plans could be the way to outdo the two universes.

### **Sentiment Analysis using Social Platforms**

Every time when the social media platform Twitter got populated by **#BUYBUYBUY**, **#Notsofast** and **#bitcoin** there is a shallow or deep rise and fall in bit coin prices are observed. Hence, short



messages of users on Twitter in order to automatically people opinions, sentiments, evaluations and attitudes.

Public sentiments, as expressed in large-scale collections of daily Twitter posts, can be used to predict Bitcoin market. The result of our analysis suggests that a significant relationship between future Bitcoins prices and volume of tweets exist on daily level.

### **Quantitative Analysis using Public Survey**

The stats and data currently available on Bitcoin usage obtained from public survey (Google Forms) are largely — Quantitative data.

These metrics can be used to measure the scope & vibrancy of the Bitcoin Ecosystem, such as transaction volume or network size.

Despite the wave of news coverage over the exchange price rise of Bitcoin, around 65% of respondents were not familiar at all with it. Of those respondents who are familiar with Bitcoin, consistently over 80% have never actually used it.

### **Recommendation**

The Microfinance Movement has been a token of the advancement financial matters area in the course of the most recent 3 decades. While there is still debate in regards to the profundity of effect that Microfinance in rising individuals out of neediness, experimental and hypothetical research demonstrates that it is significant device for accomplishing Financial Inclusion and Economic Growth in poor families.

Notwithstanding the steady advancement and complexity of the Microfinance business, auxiliary difficulties still thwart the maximum capacity of the MFM. Particularly, the persevering nearness of Information Asymmetries in the Microfinance segment baffles the endeavours to decrease task and subsidizing costs, accomplish money related maintainability and versatility, and actualize appropriate detailing plans. Ostensibly, the decrease of such asymmetries could definitely augment the effort and inclusion objectives of the part.

Among all the innovation advancements that could upset the monetary division, this work contends that Blockchain can possibly disturb the whole segment. The permanence, straightforwardness, transparency, and security of the innovation makes it the ideal possibility to shield the poor from maltreatment from not well planned players. All things considered, BTs designers should remember the absence of computerized education in poor people, the exchanges that BTs can hold, and the potential endeavours against security rights. Regardless of whether BTs could disturb Microfinance will depend in how quick the innovation develops and how much trust this framework can make on loan specialists, borrowers, and controllers.

## Glossary

BT	Blockchain Technology
BTC	Bitcoin
DAO	Distributed Autonomous Organizations
DLT	Decentralized Ledger Technology
FI	Financial Inclusion
FS	Financial Stability
IoT	Internet of Things
MFI	Microfinance Institutions
MFM	Microfinance Movement
MOU	Memorandum of Understanding
NLP	Natural Language Processing
P2P	Peer-to-Peer
SC	Smart-Contract
tps	Transaction Per Seconds

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## Annexures

MEANSTABLES=Howmanydifferentdigitalassetsdoyoucurrentlyown  
ApproximatelyhowfrequentlydoyoumakedigitalassettransactionsDoyouownbitcoinBYWhenwast  
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KURTOSIS SEKURT

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# BLOCKCHAIN: DECENTRALIZATION AS THE FUTURE OF MICROFINANCE AND FINANCIAL INCLUSION

*by* Rajat Nigam

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