Impact of Blockchain Technology in the Financial Sector

Vannala Lavanya
PGDM Student, International School of Management Excellence

Dr. Raja Sankaran
International School of Management Excellence

Abstract

Purpose: The purpose of the study was to examine the factors influencing the adoption of Blockchain Technology in Financial Sector in India. For this study, four factors namely, Regulatory Support, Trust, Social Influence, Perceived Usefulness, and Design were used to determine the consumer perception of Blockchain Technology in India.

Methodology/Approach: An online survey was used to collect data from 161 consumers performing financial transactions in India. IBM SPSS and IBM SPSS AMOS were used to test the conceptual model and to validate and statistically analyze the results.

Findings: The factors Regulatory Support and Design were found to be significant on behavioral intention, whereas Trust, Social Influence and Perceived Usefulness were found not to be significant.

Implications: This study can be used by government agencies, banks, financial institutions, as well as fintech firms in India to strategize and to attract customers to adopt financial transactions using blockchain technology.

Keywords: Blockchain Technology, Regulatory Support, Perceived Usefulness, Social Influence

Introduction

Blockchain can be considered as a block of digital information stored in a chain of public database. A block basically contains the information about all the transactions, their date, the amount of transaction and the time the transaction is made. It also contains information about which parties are taking part in this transaction and also the unique information of that specific buyer and seller. Cryptocurrency is a form of digital currency and an application of Blockchain (Albayati, Kim, & Rho, 2020). Some of the common examples of Cryptocurrency are Bitcoin (BTC), Litecoin (LTC), Ethereum (ETH), Ripple (XRP) etc. It basically provides its users with encrypted digital currency, which is independent of any centralized banking system, but rather it is in the form of units or blocks.

Blockchain is a digital ledger that allows performing transactions from one person to another. Blockchain is decentralized and
distributed publicly and privately across the entire network of computer systems on the blockchain to all users. Each block in the blockchain refers to the number of transactions that have taken place in that blockchain. Each transaction is recorded in the ledger, which is transparent to all the participants of that ledger (Jameela & Nader, 2019). A blockchain offers transparency and eliminates the need for intermediaries or third-party administrators. Blockchain technology comes with another name called Distributed Ledger Technology (DLT). It refers to the distributed, decentralized ledger that can be maintained, secured, and authenticated by relying on a network of computers (decentralized) rather than a single, centralized authority. As a result, copies of the ledger can be kept and maintained by many individuals or organizations (distributed) and no copy is the master or lead copy (Sher, Gerson S., 2019).

The Indian Financial system is quite possibly the main part of the financial improvement of our country. The financial system manages the flow of funds between the people, who do savings of the country and the ones who are expert in investing those funds, for the gain of both people and the investors.

The utilization of blockchain advances empowers monetary associations to excuse a few enduring noticeable issues. Due to a lack of sufficient and accurate information, financial institutions are also struggling to conduct accurate customer profiling (Hameed & Ibrahim, 2019) such that they can efficiently conduct product differentiation and personalization. Along the same lines, insurance products offered by financial institutions encapsulate a complex insurance claims process, requiring the involvement of numerous stakeholders before the finalization and payment of a claim. Finally, existing critical infrastructures that facilitate the majority of the transactions of financial organizations are primary targets for cyber-attacks (Polyviou et al., 2019).

Blockchain use cases in the financial sector: a) cryptocurrency b) know your customer (KYC) and know your business (KYB) c) credit risk scoring for SMEs, d) customer profile management and product personalization e) insurance claims management f) collaborative security in the financial services chain.

Review of Literature

Blockchain technology is a new tool with potential applications for organizations, enabling secure transactions without the need for a central authority. A blockchain relies on an existing network, cryptographic, and recordkeeping technologies but uses them in a new manner. It will be important that organizations are able to look at the technologies and both the advantages and disadvantages of using them (Yaga et al., 2019).

According to (Bosco, F., Croce, V., & Raveduto, 2018), Information about cyber-security and physical security, including financial organization information, can be shared via blockchain technologies. As a means of facilitating the collaboration of security experts through the use of distributed ledgers, such a system allows for the sharing of information in a trustworthy manner.

As blockchain technology encapsulates unique properties of decentralization, security, transparency, and anti-tampering, it has recently been considered beyond cryptocurrencies for use in a plethora of other applications (Polyviou et al., 2019). Such properties are particularly advantageous for a variety of prominent issues experienced in the financial sector. Blockchain technology, as a result, holds the potential to revolutionize the financial industry by changing the way different services are provided.

(Rennock et al., 2018) A new study examines how blockchain tech is embedding itself into the finance and financial services industries. As cryptocurrencies become increasingly common, and the number of blockchain applications continues to grow, industry participants will be subjected to increased regulatory scrutiny, even as the regulatory landscape shifts.
Research Methodology

Conceptual Model & Hypothesis

Blockchain technology is a promising tool for sustainable development of the global economy. It is expected that blockchain technology will produce massive benefits to consumers, the banking system as a whole, and society at large in general (Hameed & Ibrahim, 2019). This technology is essential for the development of the future market. As a result, not only do the health care and media industries, retail, telecommunications, among others, improve their service quality. As an emerging technology for financial applications, blockchain is low on customer adoption. This is because the majority of people continue to use traditional banking, which keeps transactions lengthy, without privacy, and without control. In the research study, the factors Regulatory Support (RS) (Albayati, Kim, & Rho, 2020), Trust (TI) (Sankaran & Chakraborthy, 2022), Social Influence (SI), Perceived Usefulness (PU), and Design (DI) are highlighted as influences on people’s behavioural intentions when they perform financial transactions supported by blockchain technology.

![Figure 1: Conceptual Model of Factors Influencing Behavioral Intention of Consumer](image)

Regulatory Support (RS)

Regulatory support is the legal framework provided by the government to ensure that the technology service providers and the customers using the technology should abide by the rules and obligations related to the technology (New York Codes, 2015). In blockchain technology, government support provides trust and legalizes the adoption of blockchain technology in financial transactions. Hence we hypothesize that regulatory support by the government has a significant impact on the consumers behavioural intention in adopting blockchain technology applications and financial transactions.

**H1**: Regulatory Support has a positive effect on Indian Consumers Behavioral Intention to use Blockchain Technology in finance

Trust (TI)

Trust is the level of confidence and reliability a consumer believes while using new technology. In the case of performing financial transactions, trust plays a prominent role that needs to be maintained with consumers (Sankaran & Chakraborthy, 2022). In addition, blockchain technology eliminates the need to involve third parties or intermediaries, reducing fraud and criminal activity. It provides high degree of security and trust, frankness, transparency and dependability. Trust is the core element for a consumer adopting blockchain technology in financial transactions.

**H2**: Trust has a positive effect on Indian Consumers Behavioral Intention to use Blockchain Technology in finance
Social Influence (SI)

Social influence factor effects the consumer’s adoption of blockchain technology. Social influencers include roles, environments, values, and norms that have an effect on consumer decision-making (Tapscott, 2017). Social influencers could be friends, family, or community where the exchange of information takes place. The communication impacts the consumers level of acceptance towards new products and services (Chaouali, Yahia, & Souiden, 2016). This factor mostly influences the consumer in adopting new technology.

**H3**: Social Influence has a positive effect on Indian Consumers Behavioral Intention to use Blockchain Technology in finance

Perceived Usefulness (PU)

Perceived usefulness describes the level of simplicity of the technology (Sankaran & Chakraborthy, 2022). Using blockchain technology in financial applications makes transactions easy and fast to complete. The information could be stored easily and securely. It is impossible to change the information which is being stored, where the alteration of data can not be performed (Lavanya, Yousuf, & Sankaran, 2021). Traditional banking can be a time-consuming and complicated process because of the complexity of transactions. Blockchain technology reduces the time in performing financial activities and is easy to understand.

**H4**: Perceived Usefulness has a positive effect on Indian Consumers Behavioral Intention to use Blockchain Technology in finance

Design (DI)

Design of the application effects the user’s behavior. Technology should be secure, easy to use and understandable. Blockchain technology is a secure platform designed with set of blocks that stores information (Zhou & Wang, 2009). It refers to the distributed, decentralized ledger that can be maintained, secured, and authenticated by relying on a network of computers (decentralized) rather than a single, centralized authority. As a result, copies of the ledger can be kept and maintained by many individuals or organizations (distributed) and no copy is the master or lead copy (Sher, Gerson S., 2019).

**H5**: Design has a positive effect on Indian Consumers Behavioral Intention to use Blockchain Technology in finance

Research Methodology

Population refers to the group of individuals having same and specified characteristics. For the study, the population size of consumers performing financial transactions in India is very large and infinite. A small portion of the sample has been drawn from the population for the study. A sample is a subset of the population that represents the population. Convenience sampling technique is being used to extract the sample from a large set of population performing financial transactions. Convenience sampling technique is a non-probability sampling technique that involves the sample drawn which is easily available.

Sampling Procedure

A sample set of 161 responses has been collected from a large population of consumers performing financial transactions. Out of 161 responses, 3 have been recognized as duplicate responses, which are being removed. Other 7 responses are found to be unengaged, which has the same responses for all the items in the 7-point Likert scale provided. After removing unengaged responses and duplicates, the sample size used for this study is 150 responses.
Instrument Development
Data has been collected by circulating google forms which consisted of 26 structured questionnaire and used a seven-point Likert scale. The scale items are regulatory support, trust, social influence, perceived usefulness, and design, which are adopted from (Sankaran & Chakraborthy, 2022). The Likert scale used consisted of 1 to 7 range (whereas 1 indicates strongly disagree and 7 indicates strongly agree) of questionnaire based on the factors influencing the consumer adoption of blockchain technology in performing financial transactions.

Data Collection
Primary data is collected from 161 respondents by circulating google forms by online mode. Microsoft Excel was used to remove unengaged and duplicate responses, which resulted in 150 responses. The data used for the study is with no duplicates and no missing values.

Data Analysis
Microsoft Excel was used for descriptive analysis of the data. IBM SPSS and IBM SPSS AMOS were used for conducting statistical analysis of the data. Cronbach Alpha was used to find the internal consistency of the factors.

Descriptive Statistics

| Items          | Values       | Frequency | Percentage |
|----------------|--------------|-----------|------------|
| Age            | 18 - 25      | 60        | 40%        |
|                | 26 - 35      | 48        | 32%        |
|                | 36 - 45      | 25        | 17%        |
|                | 45 - 60      | 17        | 11%        |
| Gender         | Female       | 60        | 40%        |
|                | Male         | 89        | 59%        |
|                | Prefer not to say | 1 | 1%         |
| Profession     | Employee     | 64        | 43%        |
|                | House wife   | 5         | 3%         |
|                | Self-Employee / Business | 35 | 23%        |
|                | Student      | 46        | 31%        |
| Education      | CA           | 13        | 9%         |
|                | Diploma / Polytechnic | 2 | 1%         |
|                | Masters/ PH.D. Degree | 72 | 48%        |
|                | Undergraduate Degree | 63 | 42%        |
Out of 150 respondents, 60 are female and 89 are male. Respondents are from the age group of 18 to 60 years, out of which 72% are from age group of 18 to 35 years. 64 respondents are employed and 35 respondents are self-employed. The education qualification of the respondents shows, 72 are Masters/PhD. Degree holders, 63 are undergraduates and 13 respondents are chartered accountants.

**Instrument Validity**

The purpose of this study is to examine the factors affecting consumer financial transactions, Cronbach Alpha value was used to find the internal consistency. Cronbach Alpha values of all the factors obtained are mentioned in table-2. The item TI5 was removed for greater consistency of the factor Trust (TI). All the factors were having Cronbach alpha value of greater than 0.7 recommended by (Hair et al., 2010).

| Table 2: Values of Cronbach Alpha |
|-----------------------------------|
| Factor                            | Cronbach Alpha |
|-----------------------------------|----------------|
| Regulatory Support (RS)           | 0.886          |
| Trust (T)                         | 0.908          |
| Social Influence (SI)             | 0.835          |
| Perceived Usefulness (PU)         | 0.943          |
| Design (D)                        | 0.898          |
| Behavioral Intention (BI)         | 0.912          |
From the below table, the value of Kaiser-Meyer-Olkin Measure of Sampling Adequacy is 0.827 which is significant. The significance value and KMO measure P-value is 0.00, which is less than 0.05, that shows the data is suitable for further proceeding with factor analysis.

**Table 3: KMO and Barlett’s Test Summary**

| KMO and Bartlett's Test |  |
|--------------------------|--|   |
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | 0.827 |   |
| Bartlett’s Test of Sphericity | Approx. Chi-Square | 2745.6 |   |
|                           | df | 300 |   |
|                           | Sig. | 000 |   |

**Factor Analysis**

By using IBM SPSS, factors were identified and minimized into prominent ones by factor analysis. Refer table-4 wherein 6 distinct factors were observed and item TI5 is being removed for internal consistency. All the 6 factors were showing high factor scores of above 0.705.

**Table 4: Factor Analysis Pattern Matrix**

| Pattern Matrix* | Component |
|-----------------|-----------|
|                 | 1        | 2        | 3        | 4        | 5        | 6        |
| RS1             | .843     |          |          |          |          |          |
| RS2             |          | .705     |          |          |          |          |
| RS3             |          |          | .908     |          |          |          |
| RS4             |          |          |          | .922     |          |          |
| T1              |          |          |          | .893     |          |          |
| T2              |          |          |          | .897     |          |          |
| T3              |          |          |          | .911     |          |          |
| T4              |          |          |          | .839     |          |          |
| SI1             |          |          |          |          | .815     |          |
| SI2             |          |          |          |          | .847     |          |
| SI3             |          |          |          |          | .831     |          |
| SI4             |          |          |          |          | .768     |          |
| PU1             |          |          |          |          |          | .808     |
| PU2             |          |          |          |          |          | .934     |
| PU3             |          |          |          |          |          | .929     |
| PU4             |          |          |          |          |          | .939     |
| PU5             |          |          |          |          |          | .879     |
| D1              |          |          |          |          |          | .871     |
| D2              |          |          |          |          |          | .911     |
| D3              |          |          |          |          |          | .917     |
| D4              |          |          |          |          |          | .775     |
| BI1             |          |          |          |          |          | .903     |
Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.

The Scree plot below figure-4 shows the downwards sloped curve from left to right. This curve indicates the number of factors obtained by conducting factor analysis. Following figure-4, the curve clearly demonstrates six factors, where it levels off after the sixth factor. It indicates the 6 significant factors obtained from factor analysis.

![Figure 4: Scree Plot](image)

The conceptual model used for the study was tested by using IBM SPSS AMOS. The model fit measures were as per acceptable limits detailed in table-5. The measures were found to be CMIN/DF as 1.567, CFI as 0.944, SRMR as 0.055, and RMSEA as 0.062. The cutoff criteria was adopted from (Sankaran & Chakraborthy, 2022).

**Table 5: Model Fit Indices**

| Measure   | Estimate | Threshold       | Interpretation |
|-----------|----------|-----------------|----------------|
| CMIN/DF   | 1.567    | Between 1 and 3 | Excellent      |
| CFI       | 0.944    | >0.95           | Acceptable     |
| SRMR      | 0.055    | <0.08           | Excellent      |
| RMSEA     | 0.062    | <0.06           | Acceptable     |
| PClose    | 0.051    | >0.05           | Excellent      |

The R square was found to be 0.20, which describes that the independent factors used for the study i.e., regulatory support, trust, social influence, perceived usefulness, and design, indicates 20% of the behavioral intention on the consumer performing financial transactions supported by blockchain technology.
Figure 5: Path Model

According to IBM SPSS AMOS test results, factors regulatory support (RS) and design (DI) are significant with a P-value less than 0.05. The other three factors trust (TI), perceived usefulness (PU), and social influence (SI), were found to be not significant, and it indicates the three factors are not supported.

Table 6: Hypothesis Testing Result of the Model

| Hypothesis | Independent Variable | Dependent Variable | Beta value | p-value | Result    |
|------------|----------------------|--------------------|------------|---------|-----------|
| H1         | RS                   | BI                 | 0.34       | ***     | Supported |
| H2         | TI                   | BI                 | -0.023     | 0.751   | Not Supported |
| H3         | SI                   | BI                 | 0.108      | 0.143   | Not Supported |
| H4         | PU                   | BI                 | -0.077     | 0.296   | Not supported |
| H5         | DI                   | BI                 | 0.249      | ***     | Supported |

Conclusion

Blockchain Technology is an emerging technology that solves various challenges in financial sector applications and transactions. It refrains intermediaries and third party administrators’ involvement, which reduces the chances of frauds and crimes and reduces the time consumption in reporting transactions. The information is stored securely and provides accuracy. This study aims at the blockchain technology adoption and determines the factors effecting the consumer adoption behavioural intention. From the study (Alexis & Klara, 2016), governments, financial organizations, banking and decision-makers should use the information and results provided. Government regulation should be considered when implementing blockchain-based applications for consumers. The design should also be easy to understand and use. The blockchain supported financial services should provide a clear understanding of the application to the consumer and should provide the security and trust. Majority of the respondents in the study are between age group of 15 to 35, who are new technology adopters and are highly educated. By increasing consumer trust and regulating the blockchain technology, consumers can easily adopt it to conduct financial transactions and applications.

Limitations

The study is limited to only 150 respondents. The population of consumers performing financial transactions in India is infinite. Large sample size could provide better results. Most of the
respondents are between the age group 16-25 years, results might change with the behavioural intentions of people above 25 years of age. According to the study, factor Trust (TI) was not significant, which is a prominent factor impacting the behavioural intention of consumer using new technology based applications or financial transactions. Results may differ with an increase in sample size and respondents of age above 25 years.

### Questionnaire

| Factors                      | Items | Description of Items                                                                 |
|------------------------------|-------|---------------------------------------------------------------------------------------|
| Regulatory Support (RS)      | RS 1  | Government supports of blockchain technology would provide an incentive to use in finance. |
|                              | RS 2  | Government regulations and monitoring would reduce the risks associated with using blockchain technology in finance. |
|                              | RS 3  | The government should support and be responsible for regulating the use of blockchain technology in finance. |
|                              | RS 4  | Regulations and government insurance should increase to protect the users of blockchain technology in finance. |
| Trust (TI)                   | TI 1  | I trust blockchain technology                                                          |
|                              | TI 2  | I trust using blockchain enabled transactions to be reliable.                         |
|                              | TI 3  | I believe the blockchain enabled transactions keep my best interests in mind.          |
|                              | TI 4  | I believe blockchain technology are trustworthy                                        |
|                              | TI 5  | I trust blockchain technology to be secure                                             |
| Social Influence (SI)        | SI 1  | I will use this blockchain technology if the service is widely used by people in my community. |
|                              | SI 2  | I will adopt this blockchain technology if my supervisors / seniors use it.            |
|                              | SI 3  | I will adopt this blockchain technology if my friends use it.                          |
|                              | SI 4  | I will adopt this blockchain technology if my family members / relatives use it.      |
| Perceived Usefulness (PU)    | PU 1  | Using this blockchain technology would improve my transaction quality.                |
|                              | PU 2  | Using this blockchain technology would increase my productivity.                      |
|                              | PU 3  | Using this blockchain technology would enhance the transaction effectiveness.          |
|                              | PU 4  | Using this blockchain technology would reduce the transaction time.                   |
|                              | PU 5  | I believe this blockchain technology is useful for conducting financial transactions.  |
| Design (DI)                  | DI 1  | I expect this blockchain technology's design to be similar with other systems that I used or know of. |
|                              | DI 2  | I expect this blockchain technology is simple to navigate.                            |
|                              | DI 3  | I expect this blockchain technology to clearly show my financial transaction activities. |
Overall, I expect this blockchain technology to operate effectively and free from technical issues.

If I have access to this blockchain technology, I intend to use it.

If I have access to this blockchain technology, I would use it.

I plan to use this blockchain technology within the next months

I will always try to use blockchain technology in my daily life

References

1. Ahmed, M., Olov, S., & Karl, A. (2019). A Survey of Blockchain From the Perspectives of Applications, Challenges, and Opportunities. IEEE Open Access Journal, 7. doi:https://creativecommons.org/licenses/by/4.0/

2. Albayati, Kim, K., & Rho, J. (2020). Acceptance of financial transactions using blockchain technology and cryptocurrency: A customer perspective approach. Technology in Society, 28. doi:10.1016/j.techsoc.2020.101320

3. Alexis, C., & Klara, S. (2016). Blockchain / Distributed Ledger Technology (DLT): What Impact on the Financial Sector. DIGIWORLD Economic Journal.

4. Chaouali, W., Yahia, I., & Souiden, N. (2016). The interplay of counter-conformity motivation, social influence, and trust in customers’ intention to adopt Internet banking services: The case of an emerging country. Journal of Retailing and Consumer, 209-218.

5. Dusko, K. (2018, March). Impact of Blockchain Technology Platform in Changing the Financial Sector and Other Industries. Montenegrin Journal of Economics, 14, 109-120.

6. Hair et al., J. F. (2010). Multivariate Data Analysis (7th ed.). Upper Saddle River, NJ. Pearson Prentice Hall.

7. Hameed, & Ibrahim, B. (2019, November). Blockchain and Cryptocurrencies Technology: a survey. INTERNATIONAL JOURNAL ON INFORMATICS VISUALIZATION, 3. Retrieved from https://www.researchgate.net/publication/337152829

8. Hassani, H., Huang, X., & Silva, E. (n.d.). Banking with blockchained - big data. Journal of Management, 5(4), 256-275.

9. Jameela, A.-J., & Nader, M. (2019). Blockchain in Industries: A Survey. IEEE Open Access Journal, 7.

10. Jarvenpaa, S. (2000). Consumer trust in an Internet store. Information technology Management science, 1(1-2), 45-71.

11. Lavanya, V., Yousuf, M., & Sankaran, R. (2021). A Study to Examine the Factors Influencing M-Banking Adoption in India. Shanlax International Journal of Management, 191–199. doi:https://doi.org/10.34293/management.v8iS1-Feb.3775

12. New York Codes, R. (2015). REGULATIONS OF THE SUPERINTENDENT OF FINANCIAL SERVICES PART 200. VIRTUAL CURRENCIES.

13. Pinyaphat, T., & Chian, T. (2018, July 17). Blockchain: Challenges and Applications. Research Gate. doi: 10.1109/ICOIN.2018.8343163

14. Sankaran, R., & Chakraborthy, S. (2022). Factors impacting mobile banking in India: empirical approach extending UTAUT2 with perceived value and trust. IIM Kozhikode Society & Management Review, 11(1), 7-24. Retrieved from googlescholar: https://doi.org/10.1177/2320206820975219

15. Sasra, J. (2019, December 12). 5 Common Blockchain Applications in Financial Services. Retrieved from Hydrogenplatform.com: https://www.hydrogenplatform.com/blog/5-common-
blockchain-applications-in-financial-services#::~text=Blockchain%20is%20essentially%20a%20ledger,an%20accurate%20record%20of%20transactions.
16. Tapscott, A. T. (2017). How Blockchain Is Changing Finance. HARVARD BUSINESS SCHOOL PUBLISHING CORPORATION.
17. Wunsche, A. (2016). Technological Disruption of Capital Markets and Reporting? An introduction to blockchain. Chartered Professional Accountants Canada.
18. Zhou, T. Y., & Wang, B. (2009). The relative importance of website design quality and service quality in determining consumers’ online repurchase behavior. Information Systems Management, 26(4), 327-337.