AN EMPIRICAL STUDY ON BLOCKCHAIN TECHNOLOGY IN BANKING SECTOR

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ABSTRACT

The research is carried out with the aim to analyze the impact of implementing blockchain technology in banking sector. It focus on the important aspects of blockchain technology and its applications in the banking stream. This technology overcome the struggles faced by the banking sector such as security, transparency, fraudulent activities, infrastructural cost, intermediaries etc. this study helps the banking sector to know about this technology as well as the pros and cons this technology and tries to find out the employees perception towards implementing this technology. The type of study used here is descriptive and the data is collected by framing questionnaires. The sampling method used is snowball sampling and the sample size is determined as 53. For the purpose of analysis the following statistical tools such as percentage analysis, chi square test, correlation were used. The interpretation is provided based on the analysis.

Keywords - Security, Transparency, Intermediaries, Infrastructural cost

I. INTRODUCTION

Blockchain was invented by Satoshi Nakamoto in 2008 which acts as a distributed ledger. The objective of this technology is to overcome all the struggles faced by the industry such as fraudulent activities, KYC regulation, peer to peer transfer, smart contracts, efficiency, cost etc. Though there are technological advancements certain backlogs in banking sector exists such as security, transparency, KYC regulation, peer to peer transfer, intermediaries etc. Therefore banking industry leads the way in exploring the potential blockchain technology. Blockchain has the capacity to increase the potential of the banking sector by reducing infrastructural cost, eliminating the role of intermediaries, enhances security, creates transparency, establishes peer to peer transfer etc. according to global fintech report 2017 most of the banking and financial institutions are expecting to adopt blockchain technology as part their system by 2020.

II. REVIEW OF LITERATURE

Smith used criteria such as confidentiality, integrity, availability for his concept " Blockchain for distributed cloud storage". But these do not differ from the CIA principle in IT security management.

Chinese researchers state that lack of clear product data(parameters) is the main difficulty in assessing blockchain suitability for different use cases. But in the later development process, when technical parameters are present the problem disappears. Multi-level framework can be created based on existing blockchain description technical forums.

Ovenden states that there are some factors that does not allow the technology to grow at reasonable pace. One of the main factor is current hype. Multinational companies such as IBM, Microsoft tries to create a centralized, commercialized blockchain products for which they are being criticized since the concept goes against initial idealogy.

Peck states that decision points are not so technically oriented but it gives more attention to functional aspects such as trust.

Victoria Limieux focused on applications of blockchain such as archival preservation and record keeping which brings lot of benefits such as transparency, efficiency, privacy. But still there exists a gap between desired and existing solutions. The reason there exists is a lack of risk evaluation due to the fear of slowing possible innovation. Lemieux research states that this leads to overhyping the blockchain which focus only on its possibilities.

III. OBJECTIVES OF THE STUDY

1. To root out the potential impact of blockchain technology.
2. To calculate scalability.
3. To explore the scope of blockchain.
4. To ensure validity.
5. To understand the data security implications.

IV. RESEARCH METHODOLOGY

1. Research design: Descriptive research
2. Sample design:
   i. Population – unknown
   ii. Population frame – various bank employees
   iii. Sampling method – snowball sampling
   iv. Sample size – 53
3. Data collection method:
   i. Primary data – first hand information collected through questionnaires
   ii. Statistical tools used - simple percentage analysis, chi square test, correlation.

HYPOTHESIS SETTING

CHI SQUARE ANALYSIS

Hypothesis I

Ho (Null Hypothesis): There is no significant association between educational qualification and knowledge about blockchain

Hypothesis II

Ho (Null Hypothesis): There is no significant association between educational qualification and ease of working with this technology

CORRELATION ANALYSIS

Hypothesis I

Ho (Null Hypothesis): There is no significant relationship between role of intermediaries and infrastructural cost

Hypothesis II

Ho (Null Hypothesis): There is no significant relationship between digital signature and cryptographic hash

V. ANALYSIS AND INTERPRETATIONS

Percentage analysis for demographic profile

Table - 1

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	below 25	6	11.3	11.3	11.3
	26-35	20	37.7	37.7	49.1
	36-45	16	30.2	30.2	79.2
	46-55	11	20.8	20.8	100.0
	Total	53	100.0	100.0	

Table – 2

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	27	50.9	50.9	50.9
	Female	26	49.1	49.1	100.0
	Total	53	100.0	100.0	

Table - 3

Level of education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	UG	32	60.4	60.4	60.4
	PG	21	39.6	39.6	100.0
	Total	53	100.0	100.0	

Table - 4

Bank_name

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SBI	14	26.4	26.4	26.4
	Canara bank	13	24.5	24.5	50.9
	Indian bank	15	28.3	28.3	79.2
	Bank of Baroda	11	20.8	20.8	100.0
	Total	53	100.0	100.0	

Table - 5

Knowledge about blockchain

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	16	30.2	30.2	30.2
	no	12	22.6	22.6	52.8
	somewhat	15	28.3	28.3	81.1
	heard about it	10	18.9	18.9	100.0
	Total	53	100.0	100.0	

Table - 6

Ease of working with this technology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	difficult	23	43.4	43.4	43.4
	easy	30	56.6	56.6	100.0
	Total	53	100.0	100.0	

VI. RESULTS AND DISCUSSION

Chi square test

1. Educational qualification Vs knowledge about blockchain.

H0: There is no significant association between educational qualification and knowledge about blockchain.

H1: There is a significant association between educational qualification and knowledge about blockchain.

Table - 7

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.839[a]	3	.417
Likelihood Ratio	2.846	3	.416
Linear-by-Linear Association	.390	1	.532
N of Valid Cases	53		

a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is 3.96.

Interpretation:

Calculated value - 2.839, Asymptotic significance value – 0.417. The asymptotic significance value is greater than 0.05. Hence Ho is accepted.

Inference:

Therefore there is no significant association between educational qualification and knowledge about blockchain.

2. Level of education Vs ease of working with this technology:

H0: There is no significant association between educational qualification and ease of working with this technology.

H1: There is a significant association between educational qualification and ease of working with this technology.

Table – 8

Chi-Square Tests

	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.398[a]	1	.528		
Continuity Correction[b]	.121	1	.728		
Likelihood Ratio	.400	1	.527		
Fisher's Exact Test				.581	.365
Linear-by-Linear Association	.390	1	.532		
N of Valid Cases	53				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.11.

b. Computed only for a 2x2 table

Interpretation:

Calculated value - 0.398. Asymptotic significance value – 0.528. Asymptotic significance value is greater than 0.05. Therefore null hypothesis H0 is accepted.

Inference:

Therefore there is no significant association between level of education and ease of working with this technology.

Correlation:

1. Relationship between eliminates the role of intermediaries and reduces infrastructural cost.

H0: There is no significant relationship between eliminate the role of intermediaries and reduces infrastructural cost.

H1: There is a significant relationship between eliminate the role of intermediaries and reduces infrastructural cost.

Table - 9

Correlations

		Eliminates role of intermediaries	Reduces infrastructural cost
Eliminates role of intermediaries	Pearson Correlation	1	.377**
	Sig. (2-tailed)		.005
	N	53	53
Reduces infrastructural cost	Pearson Correlation	.377**	1
	Sig. (2-tailed)	.005	
	N	53	53

**. Correlation is significant at the 0.01 level (2-tailed).

Interpretation:

It is inferred that Pearson's r value is positive which means that there is positive correlation between role of intermediaries and infrastructural cost. Significant value 0.005 is less than the critical value 0.05. Hence H0 is rejected and H1 is accepted.

Inference:

Therefore there is a relationship between eliminates the role of intermediaries and reduces infrastructural cost.

2. Relationship between digital signature and cryptographic hash

H0: There is no significant relationship between digital signature and cryptographic hash

H1: There is a significant relationship between digital signature and cryptographic hash

Table - 10

Correlations

		Digital signature enhances security	Cryptographic hash are extremely hard_to_break
Digital signature enhances security	Pearson Correlation	1	.355**
	Sig. (2-tailed)		.009
	N	53	53
Cryptographic hash are extremely hard to break	Pearson Correlation	.355**	1
	Sig. (2-tailed)	.009	
	N	53	53

**. Correlation is significant at the 0.01 level (2-tailed).

Interpretation:

It is inferred that Pearson's r value is positive which means that there is positive correlation between signature and cryptographic hash. Significant value 0.009 is less than the critical value 0.05. Hence H0 is rejected and H1 is accepted.

Inference:

Therefore there exist a relationship between digital signature and cryptographic hash.

VII. FINDINGS:

1. The majority of 38 % of the respondents are in the age group 26 – 35.
2. The majority of 51 % of the respondents are male.
3. The majority of 61 % of the respondents are under graduates.
4. The majority of 28 % of the respondents are from Indian Bank.
5. The majority of 30 % of the respondents have knowledge about blockchain.
6. The majority of 57 % 0f the respondents feels that the technology will be easy to work.

VIII. SUGGESTIONS

The following major suggestions has been placed through the study,

1. Some respondents are not aware about this technology and the benefits associated with it. So the management of the bank should provide necessary training to work with this technology.
2. By implementing this technology banking industry makes real time execution of payments and an absolute transparency would enable real time fraud analysis.
3. The best thing about this technology is that it is a decentralized database thus it reduces the reliance on centralized record keeping.

IX. CONCLUSION

The current study says about the analysis of blockchain technology in banking sector. The study explains that employees feel comfortable to work with this technology since it creates transparency, security, cost effective, decentralized database. Some of the employess are not aware about this technology and the management should take necessary efforts to provide training to the employees. From this study we can draw a conclusion that blockchain technology could change the e-commerce platform over the next decade. It resolves all the issues faced by the sector not only in one stream but it has its multi-faceted potential to overcome all the struggles. It offers high level of security, transparency and interoperability thus making the system a shared infrastructure. Banks and financial institutions need to step forward to implement this technology in order to save time, cost and to make the system more efficient.

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