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Factors and Challenges of Blockchain Technology and Record Management Performance Among Banking Institutions

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Abstract

This study explored the relationship between the factors and challenges of blockchain technology and record management performance among banking institutions in Guiuan, Eastern Samar. Specifically, it examined how key factors—usefulness, ease of use, innovativeness, knowledge, trust, risk, and intention to use—affect the influence and adoption of blockchain technology. Additionally, the study assessed challenges such as lack of understanding in scalability, dependability on computers and electricity, storage limitations, and slow processing speed, and how these impact record management. A descriptive-correlational research design was employed, utilizing a structured survey questionnaire administered to 31 bank employees from various banking institutions in Guiuan. The data collected were statistically analyzed using Pearson's r and eta correlation to determine the significance of relationships between the identified factors, challenges, and record management performance, which was assessed in terms of document capture, preservation, accessibility, retrieval, and disposition. Findings revealed that the respondents perceived blockchain-related factors (e.g., usefulness, trust, and intention to use) positively, with an overall mean score of 3.84, while the challenges faced (e.g., technical limitations and system reliability) were also rated as highly present with a mean score of 3.95. Record management performance was rated very good, with a mean of 4.16, suggesting general awareness and implementation of effective practices. Despite these results, statistical analysis showed no significant relationship between the identified factors or challenges and the record management performance of banks. Thus, the null hypothesis—that there is no significant relationship—was retained. The study concludes that although blockchain technology is perceived as promising in banking environments, particularly in improving workflow and data security, its adoption remains limited due to knowledge gaps and technological barriers. Therefore, the study recommends increased education and phased implementation strategies, enhanced regulatory support, and further research with broader samples to fully understand blockchain's potential in improving record management systems in financial institutions.

Keywords: Blockchain Technology, Record Management, Banking Institutions, Adoption Challenges

INTRODUCTION

Blockchain is a decentralized, distributed ledger technology that records encrypted blocks of digital transactions. Once added to the ledger, these transactions cannot be modified or removed, making blockchain a secure, transparent, and efficient solution for banking operations (Baranowska, 2021). It enhances payment systems, reduces costs, and increases transaction speed and trust. As a revolutionary innovation, blockchain is expected to transform how the financial industry operates (Ali et al., 2020; Chang et al., 2020). Despite its promise, adoption remains limited in developing nations due to knowledge gaps and hesitancy toward innovation (Asante et al., 2022).

Records management, a vital function for businesses and institutions, is strengthened by blockchain's immutability and transparency (Faulhaber, 2019). Banks, often seen as costly and inefficient, face growing pressure from fintech alternatives like PayPal. Blockchain offers a competitive edge, especially in areas like cross-border payments, which currently rely on vulnerable systems like SWIFT.

While global interest in blockchain is growing, Philippine banks—particularly in areas like Guiuan—have yet to fully embrace its potential. This study aims to explore how blockchain-related factors influence local banking performance and record management, offering insights that may guide more secure, modernized financial practices and contribute to the academic literature in the Philippine context.

This study investigates the adoption of blockchain technology in local banking sectors in Guiuan, Eastern Samar. It explores the key factors influencing adoption—usefulness, ease of use, innovativeness, knowledge, risk, trust, and intention to use. It also examines the challenges faced in adoption, such as scalability issues,

reliance on computers and power, and slow processing. The study further assesses the level of record management performance in terms of creation, storage, accessibility, retrieval, and disposition. Lastly, it seeks to determine the relationship between blockchain factors, its challenges, and the record management performance of banking institutions.

METHODS

This study used a descriptive correlational research design to explore the relationship between factors and challenges of blockchain technology and the record management performance of banking institutions in Guiuan, Eastern Samar. This method is ideal for identifying connections between variables without implying causality. The research was conducted among five banks in Guiuan, Eastern Samar, involving 31 bank employees selected from a population of 45 using simple random sampling to ensure fairness and minimize bias. A structured survey questionnaire, adapted from validated sources (Yu Chengyue et al., 2021), was used. The instrument had two parts: one measured factors and challenges influencing blockchain adoption, and the other assessed record

RESULTS AND DISCUSSION

The results obtained from the survey questionnaire were thoroughly examined employing a refined analysis involving mean, description, and interpretation. The data collected was precisely assessed utilizing a 5-point Likert scale, ranging from 'strongly disagree' to 'strongly agree' to measure the awareness and influence of the respondents regarding factors and challenges within the banking institutions of Guiuan

Table 1. Factors that Influence of Blockchain technology among banking institutions.

Factors of BT	Mean	Description	Interpretation
Usefulness			
1. Usage of blockchain technology improves productivity.	4.29	Strongly Agree	Highly Effective
2. Blockchain technology is useful.	4.35	Strongly Agree	Highly Effective
Ease of Use			
1. It is easy to understand blockchain technology.	4.00	Agree	Effective
2. It is easy to use blockchain technology.	4.10	Agree	Effective
Innovativeness			
1. I like to experiment with blockchain.	3.97	Neutral	Moderately Effective
2. I would not hesitate to use blockchain technology.	3.84	Neutral	Moderately Effective
Knowledge			
1. I have sufficient knowledge about blockchain technology.	3.19	Neutral	Moderately Effective
2. I have knowledge about blockchain technology.	3.48	Agree	Moderately Effective
Risk			
1. I am worried about using blockchain technology.	3.42	Agree	Effective
2. I do not feel secure using blockchain technology.	3.58	Agree	Effective
Trust			

1. Blockchain Technology is trustworthy.	3.81	Agree	Effective
2. I trust in the benefits of blockchain technology.	3.90	Agree	Effective
Intention to Use			
1. I plan to use blockchain technology in the future.	3.87	Agree	Effective
2. I intend to use blockchain technology in the future.	3.90	Agree	Effective
Overall Mean Score	**3.84**	**Agree**	**Effective**

Presented are the factors of blockchain technology in terms of its perceived usefulness, ease of use, innovativeness, knowledge, risk, trust, and intention to use. This indicates that all banking institutions that use blockchain technology agree to use the system in their daily operations. It resulted in a total mean of 3.84 and was interpreted as effective. It may be concluded that the banking institutions are inclined to acquire and practice the new technology to improve the ability of blockchain technology users in their daily operations. In addition, the bank also recognized the benefits of blockchain technology and is willing to integrate it into their systems, though it also implies that ongoing learning and adaptation are necessary for optimal use.

According to Rabindra, (2022), this study investigated why financial firms, particularly banks, decide to use blockchain technology. It discovered that trust, ease of use, and knowledge of the technology were key factors. Banks that understood blockchain and recognized its benefits were more inclined to implement it in their operations.

Table 2. Challenges encountered in the adoption of blockchain technology.

Challenges of Blockchain Technology	Mean	Description	Interpretation
Lack of Understanding in Scalability			
1. Blockchain technology users size increases massively, making it difficult to set up new transaction processing and verification.	3.48	Agree	Challenging
2.Increasing number of applications can make blockchain technology networks difficult to use.	3.61	Agree	Challenging
Dependability of Computers and Power			
1. Problems in computer can highly affect the blockchain technology. system.	3.94	Agree	Challenging
2. Viruses can highly affect the blockchain technology system.	4.19	Agree	Challenging
Storage Problems and Slow Processing Speed			
1. Expanding storage leads to accumulate more transactions.	4.03	Agree	Challenging
2. Systems error can delay to issues in transferring money.	4.42	Strongly Agree	Highly Challenging
Overall Mean Score	**3.95**	**Agree**	**Challenging**

Table 2 presented the challenges of blockchain technology in terms of lack of understanding in scalability, dependability of computers and power, storage problems, and slow processing speed. It resulted in an overall mean score of 3.95 and was interpreted as challenging. This implies that majority of the banking institutions managers found it challenging to use Blockchain Technology than to understand its underlying mechanisms.

According to Zheng et al. (2018), the limitations of blockchain technology in terms of lack of scalability, transaction speed, and storage capacity may find blockchain's underlying difficult to grasp, leading to resistance to adoption. Without proper understanding, banks might underutilize blockchain's potential or misuse the technology.

Table 3. Awareness of Record Management Performance among Banking Institutions.

Record Management Performance	Mean	Description	Interpretation
Capture/Creation			
1. Procurement records are representations and evidence of actual work done.	4.10	Agree	Very Good
1. Acquisition of items can proceed even without the necessary documentation.	4.16	Agree	Very Good
Preservation and Storage			
1. There is enough storage room for procurement records within this entity.	4.23	Strongly Agree	Excellent
2. Procurement records are filed and shelved appropriately.	4.16	Agree	Very Good
Accessibility			
1. There is ease in accessing procurement records within the entity.	4.03	Agree	Very Good
2. Procuring and disposing records are open to inspection by the authority (PPDA).	4.06	Agree	Very Good
Retrieval			
1. There is ease and less time taken when retrieving procurement records.	4.23	Strongly Agree	Excellent
2. There is a system and search criteria to facilitate efficient retrieval of records.	4.19	Agree	Very Good
Disposition			
1. There is a record disposal scheduled that we adhere to in the organization	4.39	Strongly Agree	Excellent
2. Records schedules are regularly reviewed and updated to ensure records are still relevant and transferred if they are not.	4.23	Strongly Agree	Excellent
Overall Mean Score	**4. 16**	**Agree**	**Very Good**

This section serves as the response to awareness of record management performance among banking institutions. Table 3 illustrated the record management performance of banking institutions in terms of capture/creation, preservation and storage, accessibility, retrieval, and disposition. From the data obtained, it shows that most of the respondents find it excellent, which means that efficient record management performance improved customer satisfaction and transaction speed, reducing operational efforts for banking staff. However, some are rated very good with the mean score of 4.16. This only implies that most of the managers in banking institutions who record management performance find it convenient.

According to the study insight of the government (2022), records, regardless of format and technological environment in which they are collected, should be captured and maintained in a recordkeeping system, and good records management enhances operational efficiency and helps protect records, emphasizing the importance of proper preservation practices ensuring long-term sustainability and trust in the banking sector.

Relationship between Factors, Challenges of Blockchain Technology and Record Management Performance.

This section serves as the response to the fourth question in this study, delving into the exploration of the relationships between variables. The tool employed for this purpose is Pearson's r, a statistical test renowned for its ability to yield reliable and valid results.

Table 4. Correlation between Factors, Challenges and Record Management Performance.

Variable 1	Variable 2	Correlation Coefficient	Interpretation	P-Value	Interpretation
Factors	Record Management Performance	.124	Negligible Correlation	.507	Not Significant
Challenges		.051	Negligible Correlation	.784	Not Significant

In Table 4, it is demonstrated that there was no statistically significant relationship between the identified factors, challenges, and record management performance. The following has a p-value of .507 and .784, respectively, which is interpreted as not significant. Comprehensively, the data implies that the factors and challenges faced by the banking institution did not significantly influence their record management performance among the Banking Institution of Guiuan.

According to the case study on business model innovations using blockchain, this analysis did not account for the potential disruptive impact of emerging technologies, particularly blockchain. Blockchain technology had the potential to displace or alter the services offered by existing financial intermediaries. This could have significantly impacted consumer behavior. While promising, challenges remained in effectively implementing blockchain's distributed nature in real-world financial applications.

Moreover, according to the study titled "Examining the Factors Affecting the Adoption of Blockchain Technology in the Banking Sector: An Extended UTAUT Model.". This study uses the Unified Theory of Acceptance and Use of Technology (UTAUT) to evaluate bankers' intentions to employ blockchain technology. The findings found that, while favorable conditions and performance expectancy were significant predictors, perceived dangers and regulatory uncertainty dampened overall intention to adopt blockchain, resulting in a cautious approach to implementation. This caution may explain why the technology had a not significant impact on record management performance (Rabindra, J.K., 2022).

SUMMARY

This study examined the relationship between the factors and challenges of blockchain technology and the record management performance among banking institutions in Guiuan, Eastern Samar. Specifically, it explored the perceived influence of factors such as usefulness, ease of use, innovativeness, knowledge, risk, trust, and intention to use, as well as challenges related to scalability, system dependency, storage issues, and processing speed.

The factors of blockchain technology were rated as effective, with an overall mean of 3.84. Respondents particularly emphasized the usefulness, ease of use, trust, and intention to use, while innovativeness and knowledge were perceived as moderately effective.

The challenges of blockchain technology were rated as challenging, with an overall mean of 3.95. Major concerns included system dependency, storage expansion, and slow processing speeds.

The level of record management performance among banks was evaluated as very good, with an overall mean of 4.16, especially in areas such as record retrieval, disposition, and preservation.

Statistical analysis showed that there was no significant relationship between the identified blockchain factors and challenges and the record management performance. Correlation coefficients yielded p-values of .507 and .784, indicating non-significance.

CONCLUSION

Based on the results, the study concludes that banking institutions in Guiuan perceive blockchain technology as effective and potentially valuable, especially in enhancing operational workflows. Key enablers include usefulness, trust, and ease of use, although limited knowledge and innovation reluctance remain barriers. Despite these perceptions, the study revealed that blockchain factors and challenges did not significantly influence record management performance. This suggests that while banks acknowledge blockchain's utility, its adoption and integration have yet to show a measurable effect on existing recordkeeping systems. The identified challenges—particularly related to scalability, power dependency, and storage—underscore the need for technical and organizational support. The findings also affirm the strong performance of record management practices, but highlight areas where efficiency and accessibility can be further improved through technology integration.

RECOMMENDATIONS

Based on the findings of the study, several recommendations are proposed to support the adoption and effective implementation of blockchain technology in banking institutions. First, banks may begin integrating blockchain technology through small-scale applications such as enhancing security, minimizing fraud, and verifying customer identities. This gradual integration can be complemented with targeted training programs to equip employees with the necessary knowledge and understanding of how blockchain operates. Collaborating with regulatory bodies and blockchain experts is also advised to ensure compliance with legal and technological standards.

Bank managers and decision-makers are encouraged to promote a culture of technological innovation by initiating pilot projects that test the practicality and efficiency of blockchain in daily banking activities. These initiatives should be coupled with open communication channels where employees can provide feedback and suggestions, thereby fostering a responsive and adaptive environment for technological change.

Policymakers, on the other hand, are urged to establish clear and supportive regulations that facilitate the safe and equitable use of blockchain in the financial sector. Engaging stakeholders from both the public and private sectors in policy development can help create guidelines that balance innovation with customer protection. Additionally, investing in blockchain-related research can guide evidence-based policymaking and further support the sustainable integration of the technology.

Information technology personnel play a crucial role in the successful deployment of blockchain systems. They must possess both theoretical knowledge and practical skills to develop secure, transparent, and user-friendly blockchain solutions that align with institutional goals and user expectations.

Finally, future researchers are encouraged to expand the scope of inquiry by involving a larger and more diverse sample population, including various types of financial institutions beyond the study locale. Exploring additional variables and conducting longitudinal studies may yield more robust insights into how blockchain influences record management performance over time. Investigating potential barriers to adoption and user attitudes toward blockchain will also contribute to a more comprehensive understanding of the technology's impact in the banking sector.

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