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Blockchain technology in the hospitality sector: Exploring opportunities and challenges in Bangladeshi hotels

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ABSTRACT

Blockchain technology creates a good opportunity with different challenges that can be applied in the hospitality industry. The vital question is how blockchain technology can be effectively integrated into Bangladeshi hotel operations to enhance efficiency, security, and customer satisfaction while addressing adoption challenges and opportunities. While previous research highlights blockchain's potential to transform hospitality operations, most studies are conceptual or focused on developed nations, revealing a need for empirical research that addresses the unique challenges and opportunities in Bangladeshi hotel operations. This study employs a qualitative approach, utilizing secondary data from literature and industry reports, along with expert interviews, and applies thematic analysis to explore blockchain adoption in Bangladeshi hotels. This study reveals that blockchain technology adoption in Bangladesh's hospitality sector is at a nascent stage, primarily due to low awareness, infrastructural deficiencies, high costs, and a lack of skilled personnel, despite its recognized potential to enhance data security, operational efficiency, transparency, and guest experiences. The findings underscore the urgent need for strategic interventions such as capacity building, regulatory support, and pilot projects to bridge the technological gap, highlighting blockchain's transformative significance for achieving smarter, more resilient hotel operations in Bangladesh, aligned with national development goals like Vision 2041 and the growing demand for digital innovation in tourism.

Contribution/Originality: This study contributes to the existing literature by investigating the unique challenges and opportunities of blockchain technology adoption in Bangladeshi hotels. It employs a qualitative approach, using thematic analysis to provide original insights into the barriers, perceptions, and potential for blockchain in the local hospitality sector.

1. INTRODUCTION

Blockchain, first known through the use of cryptocurrencies such as Bitcoin, has been recognized for its ability to disrupt industries with decentralized, transparent, and secure data management. And it's no small feat: Blockchain is supposed to be a transparent and tamper-proof distributed ledger that records transactions across several computers, in a way that makes it impossible to alter any transaction later. This capability delivers an immutable and distributed ledger that establishes trusted and secure relationships between digital entities. It is not limited to finance; opportunities can be found in various markets, including healthcare, logistics, and the hospitality sector. In the

hospitality sector, the transformative potential of blockchain lies in overcoming inefficiencies and security concerns. The hotel industry, an essential part of the overall hospitality industry, would particularly be able to take advantage of blockchain to automate processes, eliminate fraud, and improve the customer experience. Blockchain's potential to provide secure, transparent booking, payment, and loyalty networks may also optimize guest service delivery, reduce hotel operating expenses, and maximize efficiency. The importance of blockchain in digital transformation is that it does not require an intermediary, like a bank or a third-party service, to conduct a transaction within a decentralized environment. Blockchain uses a decentralized ledger, bypassing the need for a central authority, which strengthens transparency and cost-effectiveness. Its ability to bring transparency, prevent fraud, and lower transaction costs has generated interest across various applications.

Blockchain has been disrupting industries, such as finance and healthcare. For finance, it allows secure and inexpensive transactions between peers without a bank being involved. In healthcare, blockchain can improve patient data management through a decentralized and secure ledger of patient medical history that can be easily accessed by authorized personnel, thus guaranteeing privacy and data consistency.

In the hospitality sector, blockchain has the potential to enhance hotel operations by securely managing guest details, providing payment solutions, and developing fast booking systems. Traditional booking methods, which involve a series of intermediaries, often incur higher costs and carry a greater risk of errors. These intermediaries may be replaced with blockchain technology, facilitating direct, secure bookings between guests and hotels, making the process faster and more cost-effective. The hospitality industry in Bangladesh has shown significant growth, with country-wise foreign tourist arrivals exceeding 5 million in 2019, according to the Bangladesh Tourism Board (2020), indicating the potential for technological advancements. However, this growth has faced challenges such as obsolete technology, a shortage of manpower, and inefficiencies in hotel operations, particularly in smaller cities and rural areas where technology penetration has been relatively slow.

ICT uptake in hotels in Bangladesh has been weak, with large-scale city-center hotels in Dhaka and Chittagong offering basic digital services such as online booking systems or mobile payment services. However, many small businesses are still managing this process manually, opening themselves up to inefficiencies and mistakes. The slow speed of technology adoption is a concern: blockchain can fill the gaps, providing a secure and transparent framework related to booking, payment systems, and loyalty programs.

Blockchain has already shaken (or begun to shake) the global economy. In the field of finance, blockchain offers faster, cheaper, and more secure transactions. Take the example of cryptocurrencies, such as Bitcoin and Ethereum, which are developed using blockchain technology and support decentralized peer-to-peer transactions, eliminating the need for banks or any other financial intermediaries. In the supply chain, blockchain has introduced transparency by recording each step of a product's journey from producer to customer in an immutable ledger, which has helped to decrease the number of frauds and counterfeits.

Already, in the realm of hospitality, blockchain has been applied in several ways. Decentralized booking systems, such as on the blockchain, would reduce the need to trust other platforms such as Expedia.com or Booking.com. Not only can this reduce the cost of commission fees for hotels, but it also reasserts control for hotels. In addition, blockchain has the potential to give companies the ability to easily pay for services via cryptocurrency, which eliminates the high cost of fees using other forms of payment. Regarding customer loyalty programs, blockchain can establish a transparent and distributed environment where loyalty points are not only secure but can be transferred to each other or to any other platform, perhaps even to another hotel where the customer may be granted similar advantages if they are part of the blockchain network that the other hotel is.

The big draw of Blockchain has several positives for the hospitality industry, which is significant in Bangladesh. They include factors such as efficiency, transparency, and trust, safe payment systems, loyalty systems, and value chain management. Blockchain has the potential to automate and simplify certain hotel operations bookings, payments, and check-ins, reducing administration and its associated expenses and errors. It can also facilitate efficient

exchange of information between the hotel and customers, thereby saving time and transaction costs. The transactional aspect is open and immutable since the blockchain itself is a decentralized technology, making it taintless. This would help establish trust with customers, who would know that their personal information, payments, and reviews are secure (Kizildag et al., 2019). With blockchain, you can have trustful peer-to-peer transactions with a reduced (without a Schedule) need for banks or other third-party payment processors and bank accounts for both parties, which leads to lower fees. For example, cryptocurrencies could be used to make non-reversible transactions quickly and at low cost. It can build decentralized loyalty schemes, which would mean customers earn and redeem points on a range of sites, which should increase customer retention and satisfaction, with Booksy using the service's print as a case in point. The technology can also track products through the supply chain, providing transparency around where products are sourced and mitigating fraud and other quality control issues (Nam, Dutt, Chathoth, & Khan, 2021).

The Bangladeshi hotel industry has failed to incorporate blockchain technology, despite its tremendous potential for development. Your hotels still struggle with inefficiency, lack of visibility, and excessive operational friction. These challenges can be addressed by blockchain; however, very little work has been done on extensive applications and the challenges of blockchain in the context of Bangladesh.

Two general research questions are considered in the context of the application of blockchain technology in the hotel industry, with specific reference to the case of Bangladeshi hotels. The study is guided by two central research questions:

- How can the adoption of blockchain technology in Bangladeshi hotels be effectively facilitated to improve operational efficiency, data security, and customer satisfaction?
- What are the key barriers and enabling factors for blockchain implementation in the hospitality sector of Bangladesh, and how can these be addressed to maximize potential benefits?

These questions frame the investigation and provide direction for data collection and analysis. The questions are intended to investigate the application and impact of implementing blockchain in the hospitality industry in Bangladesh.

The main purpose of the study is to investigate the feasibility, potential advantages, and implementation challenges of integrating blockchain technology into hotel operations in Bangladesh. The specific objectives are:

- To assess the current level of technological implementation and digital readiness in the Bangladeshi hotel industry.
- To explore the potential benefits of blockchain in enhancing hotel service quality and operational efficiency.
- To identify the primary barriers to blockchain adoption and propose strategies to overcome them to incorporate blockchain within the Bangladeshi hotel service systems.

2. LITERATURE REVIEW

Academic interests in blockchain technology. In addition to corporate research, blockchain technology has attracted significant scholarly attention (Beck, Müller-Bloch, & King, 2018; Garagol & Nilsson, 2018; Zheng, Xie, Dai, Chen, & Wang, 2018). The potential for Blockchain possibilities is tremendous (Swan, 2015). There are potential applications of blockchains that can be applied to various industries, such as medical records management, supply chain management (SCM), banking and financial services, the insurance accountability and liability system, the Internet of Things (IoT), and the sharing economy (Azaria, Ekblaw, Vieira, & Lippman, 2016; Casey & Wong, 2017; Christidis & Devetsikiotis, 2016; Condliffe, 2017; Euroclear & Oliver Wyman, 2016; Lorenz et al., 2016; Pazaitis, De Filippi, & Kostakis, 2017; Treleaven, Brown, & Yang, 2017).

At present, industries and areas all over the world are exploring the opportunities provided by blockchain and the benefits it can bring to their fields by examining applications and use cases and creating PoCs (Zhao, Fan, & Yan, 2016; Ziolkowski, Parangi, Miscione, & Schwabe, 2019). It is poised to transform every aspect of the supply chain,

from raw material procurement to last-mile fulfillment and delivery (Babich & Hilary, 2020; Goyat, Kumar, Rai, & Saha, 2019). It enables supply chain reengineering using a blockchain-powered Business Process Reengineering (BPR) structure (Chang, Chen, & Lu, 2019). Casey and Wong (2017) express that the potential use of the distributed ledger is relationship management among the various shareholders within a global supply chain to manage the variety and complexity within organizations. Smart contracts, which provide programmable logic to deploy and execute contract agreements, are one of the most prominent features for the design and application of blockchain systems (Swan, 2015; Szabo, 1997). Several studies and consulting papers have indicated the principal benefits of using blockchains in a supply chain context (Madhwal & Panfilov, 2017; Nowiński & Kozma, 2017; O'Byrne, 2017). Blockchain can help to protect and safely store important patient information (Agbo, Mahmoud, & Eklund, 2019). Blockchain is considered to have several advantages for the security of healthcare data and the efficient management of patient identities (Bouras et al., 2020). It reduces risk and increases security, privacy, and interoperability by placing the patient at the center of the ecosystem (Paranjape, Houlding, & Car, 2019). As Pirtle and Ehrenfeld (2018) argue, blockchain technology can resolve some of the interoperability issues in the health-based industry and serve as a driver to focus on patient-centredness in the ecosystem. Blockchain is expected to enhance the ability to trace the source and authenticity of drugs and medical supplies, thereby improving supply chain security (Bocek, Rodrigues, Strasser, & Stiller, 2017; Rodrigues et al., 2017; Shanley, 2017; Vecchione, 2017). Blockchain for healthcare addresses four main challenges: data silos, slow access to medical data, systems interoperability, and patient control. It provides a solution to data quality and quantity for medical research (Azaria et al., 2016). Current investigations reveal that distributed ledger technologies, such as blockchain, are employed to implement e-voting systems, primarily because of their end-to-end verifiability attributes (Hajian Berenjestanaki, Barzegar, El Ioini, & Pahl, 2023). Another research "Blockchain Challenges and Opportunities: A Survey," offers a thorough examination of blockchain technology, focusing on its architecture, various applications, and key challenges such as scalability, security, and privacy (Zheng et al., 2018).

The authors also explore future research and development prospects of blockchain technology. Caddeo and Pinna (2021) consider blockchain technology for DMOs in the tourism sector. Their paper reviews the current literature and relevant software initiatives, highlighting the possibilities offered by blockchain for enhancing destination management and stakeholder communication. The benefits the authors highlight include trust, efficiency, and innovation, while they also discuss the challenges related to technology and common standards across an industry. They finally argue that blockchain represents great potential for reimagining tourism area management and experiences. Jain, Singh, Mishra, and Rana (2023) performed comprehensive research on blockchain technology's impact on the tourism and hospitality sectors. Based on an analysis of 56 articles in Scopus, Web of Science, and EBSCOhost (2012-2022), they found crucial research voids, in particular regarding technological awareness and maturity indicators for business models that are blockchain-integrated. Based on the Theory, Context, and Method (TCM) framework, the paper offers future research avenues for enhancing the understanding and utilization of blockchain in this domain. The use of technology has advantages and prospects in ensuring security and transparency in blockchain technology in the travel, tourism, hotel, and hospitality industries. Its adoption can significantly enhance both guest experience and operations in the hospitality industry (Barkel, Kurgun, & Groen, 2021; Sharma, Thomas, & Paul, 2021). The publication Blockchain for Tourism and Hospitality Industries offers a comprehensive examination of the ways in which blockchain technology can improve transparency, security, and traceability in the tourism and hospitality sector (Onder & Acikgoz, 2023).

They noted blockchain's ability to disrupt industry processes and called for further investigation into possible uses. Van Huy et al. (2024) investigate the use of blockchain technology by small- and medium-sized enterprises in Vietnam's hospitality and tourism industry. Grounded on the TOE and DOI models, benefits in transparency, security, and operational efficiency are shown. Technology readiness, management support, and competitive pressure are three leading factors for adoption; complexity and cost were not the blockages. The work focuses on technology

optimism and argues that blockchain, with appropriate strategic planning and communication with stakeholders, has tremendous future potential for implementation with long-term benefits in service quality, trust, and sustainable business. Pinna and Ruttenberg (2016) assess the potential of distributed ledgers for European equity post-trade, considering the reduction of reconciliation costs, speed of operations, and collateral management. They also find that the technology's immaturity and unresolved legal issues could preclude widespread implementation of DLTs over the next few years. Shrestha, Deters, and Vassileva (2019) presented an article entitled "User-Controlled Privacy-Preserving User Profile Data Sharing based on Blockchain," which describes a blockchain-based architecture for sharing travel industry data from the perspective of the user. It allows travel industry participants (like travel agencies, hotels) and others to securely exchange user profile data in a manner that the individual user context and privacy are maintained. The platform helps make the data open in order to be shared across platforms. Beta tests showed that nodes respond quickly, which provides an efficient experience for the user. Maythu, Kwok, and Teh (2024) interviewed early adopters in the USA and Europe to investigate the attributes that drive the adoption of blockchain technology in tourism. Their results highlight drivers (potential cost savings and more control over data) as well as barriers (lack of technical maturity and inertia), providing a reference model for the strategic introduction of blockchain in the industry. Önder and Gunter (2022) examine the possible application of blockchain in the tourism and hospitality sector and the potential benefits that it can provide, such as transparency, security, and efficiency in making transactions. They overview of use cases/payment, processing, and device identity, and discuss future applications with consideration to COVID-19. The feasibility of it emphasizes the development of new tourism products and systems with a view to consumer and supplier benefits. The blockchain technology and the ways of its use in hospitality activities article is dedicated to the potential of blockchain to change the way the tourism and hospitality industry functions in the direction of efficiency, transparency, and trust on the side of customers. This paper introduces blockchain and examines its existing uses and future potential in the field. The paper explains how blockchain can tackle known issues in hospitality management and offers some research directions for unlocking its potential in hospitality (Filimonau & Naumova, 2020). Khanna, Sah, Choudhury, and Maheshwari (2020) explore blockchain technology's disruptive power in the hospitality sector, focusing on increasing efficiency, driving operational profit, and enhancing security and privacy. They discuss the applications for this, such as speeding up booking a hotel, citing TUI Group, which is using blockchain to cut out the middlemen and their costs, as well as Trippki's blockchain-based customer loyalty program that rewards guests with crypto tokens. The authors argue that harnessing blockchain technology can lead to safer, faster, and more customer-oriented hotel operations. The chapter "Blockchain Implementation in Hotel Management," written by Flecha-Barrio, Palomo, Figueroa-Domecq, and Segovia-Perez (2019) analyzes the application of blockchain in the Spanish hospitality industry. Conducted among hoteliers, the research explores the low levels of blockchain awareness and adoption, with a large gap between its perceived benefits and real-world use. Notwithstanding this, tourism experts recognize blockchain as a nascent technology with far-reaching potential in tourism, suggesting potential for future convergence and further investigation. In the paper, The Blockchain Technology and the Scope of Its Application in Hospitality Operations (Filimonau & Naumova, 2020) examined the possible applicability of blockchain technology (BCT) in the hospitality sector. According to the authors, BCT can enhance transparency, security, and efficiency in a range of areas such as supply chain management, payment processing, and managing customer data.

However, the research also highlights barriers to adoption such as cost, technical complexity, and limited industry knowledge. The paper finds that despite its potential for application in the hospitality industry, the future of BCT is limited by these challenges, and this limitation can be addressed only through education and investment with realistic strategic planning. Bodkhe et al. (2019) in their work "BloHosT: Blockchain-Enabled Smart Tourism and Hospitality Management, proposes a smart management framework that leverages blockchain technology to improve transparency and operational efficiency in the tourism and hospitality industry. The BloHosT platform has been proposed for enhancing tourism and hospitality services using blockchain. The system allows a tourist to have a

common wallet identifier that maps to various other wallets associated with different stakeholders. You may notice how efficient and convenient this system is for payments from a unified wallet holder. Attributing this to an immutable ledger, repossession of identity credentials is countered using the BloHosT system. The system is designed to enhance the visibility of operations, quality control, and service delivery across the tourism and hospitality sectors. Tepe (2022) explored how blockchain technology impacts hotel booking systems. This study also examines the implementation of blockchain technology (BCT) in hotel booking systems. Utilizing a qualitative inquiry of ethnography and document analysis, the study analyzes more than 1,600 user-generated contents and 25 organizational documents.

They find that BCT can contribute to customer satisfaction and economic benefits, even though the use of BCT by companies is still limited by industry adoption barriers. The study highlights the importance of awareness and purposeful use of BCT within the hospitality setting (Flecha-Barrio, García-Muiña, González-Serrano, & Talón-Ballestero, 2024). Blockchain technology is progressively embraced in the tourist industry, improving service quality, operational efficiency, and sustainability through its use in marketing, logistics, and innovative business models (Prados-Castillo, Guaita Martinez, Zielińska, & Gorgues Comas, 2023). Their research exposes a gap between the acknowledged potential of blockchain and actual utilization and emphasizes the necessity of directed education, training, and strategic planning for adoption into hospitality operations. Stroumpoulis, Kopanaki, and Oikonomou (2021) explore the use of blockchain technology to improve food waste management in the hospitality sector. Their literature search illustrates blockchain's ability to enhance transparency, traceability, and coordination in the food supply chain and alleviate inefficiencies causing waste. The research demonstrates that the use of blockchain could enhance hotel performance and customer loyalty, and recommends more research to investigate its adoption in a sustainable development context in the hotel industry. Acikgoz, Stylos, and Lythreatis (2024) perform a systematic literature review to understand the attainment of blockchain technology (BCT) in the hospitality and tourism industries. Using templates such as the Technology-Organization-Environment (TOE) framework, RBT, and TOC, the study groups the findings into two main areas: enablers and barriers of BCT. This categorization is grounded in criteria such as the year of publication, the employed methods, the underlying theory, and the context.

The work provides a baseline knowledge for evaluating the growth and trajectory of BCT research in this area. A review of the literature on blockchain, FinTech, and knowledge management indicates that the possibilities of blockchain, FinTech, and knowledge management for transparency, financial efficiency, and innovation in the tourism and hotel industry are significant. The results suggest that such technologies may create new markets and opportunities, particularly in times of crises and digital transformation (Ratna, Saide, Putri, Indrajit, & Muwardi, 2024).

Although blockchain has been widely investigated both in the global hospitality and tourism industries, there is still a dearth of research on the use of blockchain in the context of Bangladeshi hotels. Nearly all current publications are restricted to developed countries and only discuss the theoretical benefits, application cases, and models while ignoring the specific conditions of developing countries, such as Bangladesh. There is scarce existing literature on the status of technology adoption, industry preparedness, and stakeholders' awareness in the context of the hospitality industry in Bangladesh.

Furthermore, first-hand practical guidance on how blockchain technology may help improve efficiency, security, and convenience in local hotel operations is limited. This research aims to fill this gap by exploring the blockchain opportunities and challenges in focusing on Bangladesh's hotel industry and offering practical guidelines to incorporate it strategically in the hotel context.

3. RESEARCH METHODS AND TECHNIQUES

Applying a qualitative research approach, the present study aims to identify the contemporary status, opportunities, and challenges of adopting blockchain technology in the hotel industry of Bangladesh. Given that the

topic is exploratory and little empirical work has been done on the specific management of m-learning in developing countries, a qualitative method was chosen to allow for an in-depth exploration. We leveraged two primary sources of data. Secondary data were collected through an extensive review of academic literature, industry reports, policy papers, and international best practices to inform a theoretical framework and identify international trends in blockchain applications in hospitality. Second, primary data were also collected in the form of semi-structured interviews from a purposively selected sample of informants, including hotel managers, IT experts, and industry pundits who were well-versed in digital transformation and decision-making in the hotel industry. The analysis of the data was based on using thematic analysis, relying on several stages including becoming familiar with the data, generating initial codes, searching for themes, reviewing themes (e.g., awareness and preparedness, perceived benefits, implementation challenges, strategic enablers), and developing meaningful descriptions of the adoption of blockchain technology in the Bangladeshi hotel industry.

4. RESULTS AND DISCUSSION

This paper investigates the extent of the adoption of blockchain technology (BCT) in the Bangladesh hotel industry, its possible advantages, and the crucial barriers affecting its deployment. This section integrates the results from interviews and experts' opinions, and reviews of related information to critically scrutinize the existing status, stakeholders' opinions, and the future of blockchain integration in the Bangladeshi hotel industry.

While the world is increasingly eager about blockchain in hospitality, it's an open secret that hotels in Bangladesh are yet to adopt the technology. The majority of hotels are still in the early stages of digitalization, and there is still very low awareness among stakeholders regarding blockchain technology (BCT). Fewer than 35% of hoteliers have heard of blockchain, and even fewer have attempted to use it. According to hotel managers and IT staff we spoke with, the limited presence of blockchain in hospitality has resulted in a lack of exposure to blockchain applications. There are also no known large-scale use cases in the Ethereum blockchain, such as smart contracts, guest identity management, and supply chain monitoring. Many hotels have poor or no existing digital infrastructure capable of supporting blockchain-based solutions. These findings highlight a notably low level of technological preparedness in the sector.

Table 1 highlights the important findings, evidence from interviews and literature, and their implications for blockchain implementation in the Bangladeshi hotel business. The findings suggest that, although the idea of blockchain is already recognized worldwide as a disruptive technology in the hospitality industry, hotels in Bangladesh are more backward compared to other industries at earlier stages of exposure and technical readiness. The greater part of hotels, for example, is not even acquainted with blockchain, and most do not have the ICT infrastructure to support such technology.

Instead, though there were several perceived benefits – including security improvements, operation automation through smart contracts, and increased trust through transparent systems – it does represent an in-principle willingness to adopt technology theory. But there are also significant practical impediments, such as the cost of implementation, lack of trained professionals, policy void, and a lack of political will. The disjuncture between global uptake and local stasis implies that a phased, use-case-specific approach, which applies blockchain to identity verification or secure loyalty programs, for example, is more likely. Young professionals' training, pilot projects, and adopting global best business practices can bridge the gap between the aspiration and real implementation of blockchain in the hotel sector of Bangladesh.

Table 1. Key findings on blockchain adoption in the hotel industry of Bangladesh.

Theme	Findings	Implications
Awareness & preparedness	- Fewer than 35% of hoteliers have heard of blockchain; even fewer have tried using it.	Indicates low digital literacy and readiness for blockchain adoption.
Technological infrastructure	- Most hotels lack the necessary ICT infrastructure; there are no major blockchain use cases in current operations.	Investment in foundational IT systems is essential for enabling blockchain integration.
Perception & willingness	- Large international hotel brands show more openness; local management is conservative and lacks blockchain comprehension.	Need for training and awareness programs for both managers and technical staff.
Potential advantages identified	- Enhanced data security and integrity - Smart contracts for automation - Fraud prevention and efficiency in operations	High potential for operational improvement and customer satisfaction if barriers are addressed.
Key barriers	- High cost of implementation- Lack of skilled professionals- Absence of government support and regulations	Policy development and incentives are necessary to reduce adoption risk.
Global vs. Local trends	International markets (US, EU, SEA) are piloting blockchain; no pilot or government-supported projects are present in Bangladesh.	Highlights a significant gap; global best practices could serve as models.
Sector-specific opportunities	- Blockchain for guest identity - Reward programs and sustainability tracking - Preventing double bookings via secure platforms	Targeted implementation areas could help gradually introduce blockchain without a full system overhaul.

Notwithstanding the slow uptake, the literature data as well as interviews suggested some of the potential advantages of how blockchain may be integrated into Hotel Operations. They agreed that blockchain has the potential to boost data security, especially when it comes to the protection of guest-related and payment-related details. The much-discussed blockchain technology ensures safety and data quality, thanks to its distributed, censorship-resistant, and transparent databases (Reiff, 2025). The empirical research by Shehzadi (2025) titled "Blockchain for Cybersecurity: Improved Data Integrity and Transparency" states that with a blockchain distributed ledger system, once data is put onto the ledger, it cannot be changed without the network's consent, hence sustaining data integrity. These non-changeable changes cannot be made without authorization, and the whole list is available as an auditable reference for each transaction. In line with these aspects, a blockchain research report, "Leveraging Blockchain (DLT) for Improved Information System Byte Leakage," demonstrates how blockchain could be incorporated into existing systems to enhance security (Welekar et al., 2024). The possibility of having booking confirmation, check-in/check-out, and SLAs (Service-Level Agreement) processes automated by smart contracts was unanimously perceived as a significant opportunity to improve the efficiency of operations. Smart contracts add efficiency to the booking process at a hotel with auto-execution of payments without middlemen. This not only saves on administrative work and costs but also enhances trust and safety. Automation reduces human error and boosts overall efficiency in handling reservations and customer interactions (Dogru, Mody, & Leonardi, 2018; Paktiti & Economides, 2023). Dogru et al. (2018) also point out that smart contracts are capable of automating operations, including payments, room sales, and guest check-ins. Elimination of human intervention can lead to shorter queues in hotels, less fraud, and predictable service. That leads to smoother relationships with travel agencies and a less chunky experience for customers. According to Demirel, Karagöz Zeren, and Hakan (2022) smart contracts can enable touchless hotel services such as ID verification and check-ins are essential in the post-pandemic period. The solution brings efficiency by automating administrative processes and providing real-time updates and compliance. Hotels save on staff time, and the guests are happier. The transparency of blockchain is valued as a trust enabler for financial transactions and customer loyalty programs. Blockchain technology, when applied to financial systems, promises secure and transparent transactions (i.e., cryptocurrencies) and provides trustworthy/anonymized analytics (e.g., user authentication and verification) while removing the centralization of data processing. By developing a tamper-proof, transparent worldwide database

of travel data records, it simplifies and improves the accuracy of booking payments, competitiveness, and real-time supply chain logistics monitoring, and other aspects to enhance transparency in hotel operations (Webisoft, 2025; WegoPro, 2024). Youssef, Dutta, Doshi, and Sajnani (2024) emphasize the role of AI and blockchain in transforming the hospitality industry and examine the integration of these technologies to enhance customer experiences, streamline operations, and promote sustainable development within the industry. For example, the booking system on the blockchain-based system can verify the guests' reservations/documents and the payment, and therefore double booking and fraud are minimized, and transparency in hotel management is improved. Both cited blockchain-enabled digital identity solutions as game changers that could help eliminate fraud and enhance guest experiences. The use of blockchain allows for the establishment of secure, decentralized digital identity solutions for hotel guests. Heavy reliance on the verification of guests' IDs can be drastically reduced by storing people's ID data on the blockchain and allowing guests to approve that their IDs be verified and validated without disclosing sensitive information. This process minimizes the chance of identity theft and fraud and makes the check-in process more secure and efficient (Treiblmaier, 2022). Blockchain supports self-sovereign identity frameworks that enable guests to maintain ownership and dining thresholds or statuses that need to be shared for dining discounts, etc. This gives guests more privacy and control over their data while still allowing hotels to verify guest identities quickly and easily. These systems also boost the trust of guests in hotel proprietors and save the access management process (Mohammed, 2021). For hotels that rely on external suppliers (food, amenities), blockchain technology could track quality control and traceability. Recent research in the International Journal of Contemporary Hospitality Management revealed that when blockchain is implemented in the food supply chain in restaurants, traceability and trust are greatly improved. This improvement stimulates greater consumer satisfaction toward perceived improvements in food safety, quality, and naturalness. The research concludes that the restaurants are of different types and located in different regions; therefore, blockchain implementation may differ from one place to another, though overall it proves helpful in improving supply chain transparency and efficiency (Hao, Guo, Zhang, & Chon, 2024).

Although the advantages are known in principle, application in practice in Bangladesh has been fraught with challenges. A majority of the hotels do not have the basic ICT infrastructure to support and maintain blockchain concepts. Cost, including hardware, software, and training, was widely cited as a barrier to adoption. In Bangladesh, there is a lack of blockchain developers and IT professionals who have an understanding of hospitality use cases. The lack of clear regulation on blockchain and data privacy makes hotel managers reluctant. Conservative management attitudes and caution towards unknown technologies cause hesitation in the adoption of disruptive interventions. Islam (2023) emphasized the role of new technologies like blockchain in business innovations, noting that sustainability-focused approaches could help address some of these barriers.

The Bangladeshi hotel industry has fallen far below compared to the global standards of implementation of blockchain technology. US and European hotels and some properties in Southeast Asia have already started using blockchain for supply chain management, loyalty programs, and identity authentication. In opposition to this, in Bangladesh, there are no pilot projects or government-supported projects to implement blockchain in tourism and hospitals. However, the study also found that younger managers and IT workers do have a dormant interest, which means that training and exposure to those areas will reduce the gap. Further, international case studies could serve as transition plans for the stepwise implementation. Research by Islam, Redwanuzzaman, and Hossain (2024) highlights how practices involving AI and blockchain can improve business infrastructure, which could also be applied in the hospitality sector.

The research has discussed a few sector-specific scenarios that are feasible for blockchain adoption in Bangladesh. Local travel identities: Blockchain can underpin secure, verifiable ID systems for local travelers, speeding up check-in times and improving guest experience. Local hotels do a poor job of running rewards programs. There is potential for blockchain to provide transparent and fraud-resistant systems. Subtitling: On booking platforms, integrating blockchain could help eliminate concerns around double bookings or false bookings. For eco-conscious travelers,

blockchain is already being employed by the industry to trace and support sustainability initiatives. Blockchain-based visitor management and data-gathering systems could be standardized, especially if hotels partner with government tourism boards in these efforts.

5. RECOMMENDATIONS AND PRACTICAL IMPLICATIONS FOR SMART ADOPTION (STRATEGIC USE OF BLOCKCHAIN)

These courses of study and workshops would need to be developed and conducted to raise the level of blockchain knowledge and understanding among hotel professionals. That means offering training programs, workshops, and learning sessions for hotel managers, hotel staff, and even IT professionals to get educated on blockchain technology and how it is used in hospitality to make operations and guest services more streamlined. Government departments should formulate policies for the encouragement of blockchain experimentation and for clear regulation. Clear regulations from government support will lead to less uncertainty, more trust from participants, and the faster spread of blockchain in the hospitality industry.

Efficacious pilots will make for a compelling demonstration, inciting wider replicas as hotels see the value of integrating blockchain. So, start with pilot deployments in a handful of adventurous hotels to showcase the possibilities that blockchain can bring to life outside of the labs. Provide hotels with subsidies, tax incentives, or grants to adopt new technologies, such as blockchain. By providing financial incentives, such as discounts, tax credits, or grants, the high upfront costs of implementing blockchain for hotels may be lowered. This backing is expected to further drive investment in groundbreaking technologies in general, advancing digital transformation in the industry.

Nurture innovation ecosystems through the incentivization of collaboration between hospitality companies, blockchain startups, and universities. Promoting alliances among hospitality companies, blockchain firms, and academia is conducive to an innovative ecosystem. These collaborations lead to research, development, and pragmatic solutions, expediting the adoption of blockchain in the hospitality industry. Establish a knowledge base on local case studies and best practices to overcome skepticism and inform implementation. Building a library of regional use cases will deliver concrete examples of successful blockchain implementation. Hotel managers can benefit from this resource as well to understand the potential advantages for their own cases and to manage the challenges of implementation.

As Bangladesh progresses towards achieving the Vision 2041 targets and also building smart tourism infrastructure, blockchain may have a major role to play. Integration should be phased and local, taking into account market realities, the preparedness of the workforce, and guest expectations. The rise of regional tech hubs and growing smartphone penetration also offer an enabling environment for blockchain uptake. There is a prospect of sustained blockchain implementation in hotels in Bangladesh through the combined efforts of the government, academia, technology providers, and the hospitality industry. Despite poor infrastructure and use cases being virtually non-existent, with the right policy and industry cheerleaders, Bangladesh has the potential to lead the way among other developing nations in embracing blockchain for tourism and hospitality.

6. CONCLUSION

The present study has investigated the current scenario, possible usage, benefits, and challenges of adopting blockchain technology in hotels in Bangladesh. The results indicate a considerable difference in the global progress in using blockchain technology and the preparedness of Bangladesh's hospitality industry to adopt it. Even though many global hotels are using blockchain for ease of operations, data security, and customer experience, Bangladeshi hotels are slow to adopt a digital transformation strategy and have hardly interacted with such enigmatic technology. One of the primary conclusions is that hotel stakeholders in Bangladesh have a low level of knowledge about blockchain. Conventional systems are being utilized by the majority of small to medium-sized hotels, with a tiny fraction tapping into digital technologies. Yet, this has not prevented a healthy degree of curiosity about the potential of blockchain. After being informed of the worldwide use cases of blockchain technology, which include smart

contracts to manage bookings, secure digital identity verification, and even transparent payment systems, the majority of hoteliers expressed an interest in exploring these innovations for increased efficiency and customer confidence. The advantages of blockchain stated by this research, are significant. It provides security through non-alterable records, increases operational efficiency by automating file transfers with smart contracts, and establishes credibility through its openness. These attributes are especially pertinent for the hospitality industry, where efficiency and guest satisfaction depend on secure data. Blockchain may also improve loyalty programs and digital payment security to redefine the guest experience in the T and T sectors in Bangladesh.

However, there are a number of obstacles to overcome in the adoption of the technology. Shortcomings in infrastructure, including a lack of access to the internet and obsolete IT equipment, are major obstacles. You're budget-pressed, so the cost of integrating blockchain is an additional weight on your shoulders. In addition, there is a noticeable lack of experts on the implementation and long-term maintenance of the developed blockchain technology. Another key concern is regulatory uncertainty. In Bangladesh, there are no directed policies or legislative infrastructure for the use of blockchain in commercial or business sectors. That ambiguity has generated stalling among some company leaders, just as businesses are questioning what they need to do and what is on the books. Furthermore, the absence of specific training and career development in blockchain reduces its applicability within the hospitality industry.

Yet, while some limitations are identified, the research finds that blockchain is potentially disruptive for the Bangladeshi hotel sector. With the right direction, training, and investment, blockchain has the potential to greatly increase operational transparency, customer data security, and service delivery. This requires a multi-stakeholder approach combining authorities with industry groups, universities, and technology companies. Suggestions involve encouraging pilot projects, providing incentives for digital innovation, and establishing regulations to ensure a safe and conducive environment for blockchain applications. Capacity-building programs should also be introduced to enhance the knowledge and skills of hospitality employees.

In conclusion, the application of blockchain in Bangladesh hotels is currently in its embryonic stage, but the groundwork has been laid. Strategic interventions now could unlock a path to more widespread adoption that would position the hospitality industry more efficiently and competitively, meeting the expectations of clients in a digitally oriented market.

7. SUGGESTIONS FOR FURTHER STUDY

In order to further develop the findings of this study, future researchers could follow a mixed-method design combining qualitative and quantitative data. This would enable the collection of a broad and statistically reliable insight into blockchain adoption in the Bangladeshi hospitality industry. Expanding the study to include different hotel categories (luxury or budget type, city or remote area) could provide a more profound understanding of the level of maturity and the applicability of blockchain in various operational environments.

In addition, the experimental or case studies, which illustrate the real-world applications of blockchain-based solutions in the hotel operation environment, would shed light on the difficulties, financial investment, and the expected payback of adopting such technologies. Such findings can potentially serve to verify the theoretical suggestions given in the present work and to assist in making decisions for future investment. It would also be interesting to investigate end users, such as hotel guests,' perceptions, expectations, and acceptance of blockchain applications such as digital identity verification, secure payment systems, or loyalty rewards. Knowing how consumers behave in this context can greatly help when designing blockchain-based solutions focusing on the user.

Finally, studies that compare cross-nationally with other developing countries can also provide important lessons and good practices. Such comparisons may help develop context-specific opportunities for the customization of blockchain technology and make strategic decisions on how the technology adoption can be realized in the hotel industry in Bangladesh.

8. NOVELTY OF THE STUDY

This research makes an original contribution as the first to investigate the adoption of blockchain technology (BCT) in the Bangladeshi hotel industry, a context that is largely unrepresented in the literature. Unlike international players, including airlines and hotel companies that are already tapping the potential of blockchain for their operations, hotels in Bangladesh are in a very early phase, with no one aware and ready with the infrastructure. Through expert interviews and empirical analysis, this paper presents a unique review of the barriers, stakeholder perceptions, and context-driven opportunities for BCT in Bangladesh's hospitality sector, and contributes to new knowledge about a digital backwater, yet potentially disruptive market.

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