Understanding the role of viability and benefits in influencing Blockchain Technology adoption in the hospitality industry

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Abstract

Blockchain possesses the potential to disrupt and reshape a plethora of industries in the next decade. However, the UK has still only seen a limited adoption in the tourism and hospitality industry. Therefore, this study aimed to develop a model to explain the role of viability and benefits variables in influencing managers intentions to adopt blockchain in the hospitality industry. Surveys were conducted in the UK with 410 hotel managers. Data were analysed using structural equation modelling/Partial least square. The findings revealed that both viability and benefits variables are key drivers of Blockchain adoption in the hospitality context.

Keywords: Blockchain adoption, Functional benefits, Symbolic benefits.

1. Introduction

With the advent of cryptocurrencies such as Bitcoin, blockchain technology was initially hailed as a breakthrough for financial transactions, but it has shown enormous potential across a wide range of industries (Willie, 2019). A disruptive technology, this technology presents an unprecedented opportunity for improving transparency, security, and efficiency, qualities that are particularly valuable in the hospitality industry, which places a high value on service quality, customer satisfaction, and intricate supply chain networks (Prados et al, 2023).

Additionally, blockchain technology is becoming increasingly important due to its rapid adoption rates. For instance, in a recent report by the International Data Corporation (IDC), global spending on blockchain solutions reached $2.7 billion in 2019, an increase of 79.6% over 2018 , with the financial sector accounting for nearly 60% of the total (IDC, 2019).

Moreover, Global Blockchain Business Council (GBBC) and World Tourism Organization (UNWTO) conducted a survey of the hospitality industry specifically, which revealed that 20% of organizations are considering or have already adopted blockchain in their operations, suggesting that blockchain has the potential to revolutionize service delivery and operational efficiency (UNWTO and GBBC, 2020).

Several dimensions contribute to the concept of 'viability' when it comes to technology adoption: financial resources, IT infrastructure, and top management support. These factors are crucial in determining whether or not an organization is able to adopt and effectively utilise new technologies (Queiroz & Telles, 2021). Therfore, a blockchain implementation requires financial resources that are not only sufficient to cover the initial implementation costs, but also ongoing maintenance and training expenses (Rogers, 2003). On the other hand, information technology infrastructure describes the technical capability of existing systems to be integrated with blockchain (Queiroz & Telles, 2021).As part of the implementation process, top management support is identified as a critical component as it influences the organization's strategic alignment towards new technologies and effectively support the process during the implementation process (Basole, 2014). In addition to viability, perceived 'benefits' play an important role in the adoption decision. In general, these benefits can be categorized into functional and symbolic benefits. The functional benefits are directly related to the enhancement of efficiency, cost reduction, and overall operations, while the symbolic benefits are related to intangible gains, such as brand enhancement and market differentiation (Queiroz & Telles, 2021).

Although Blockchain technology appears to have an array of advantages, its adoption remains low in developed countries such as the UK, especially in non-financial sectors such as hospitality (Hjalmarsson et al., 2018). In light of this slow adoption rate, this paper addresses the following research question: What are the key factors affecting managers behaviour to adopt the Blockchain in the hospitality setting?. Therefore, the paper aims to fill a critical gap in the literature by examining how various viability and benefit considerations influence the intention of hotel managers to adopt blockchain technology and provide a clearer understanding of the factors that drive blockchain adoption within the hospitality industry.

2. Literature Review

Blockchain technology has been confirmed as an important innovation and a transformational force in modern business, capable of revolutionizing the way in which transactions are conducted and information is shared (Wang et al, 2022). In the hospitality industry, the benefits of blockchain technology include the enhancement of transaction security, the improvement of supply chain management, and the creation of new avenues for customer engagement through loyalty programs (Filimonau and Naumova, 2020).

The literature indicates that adoption rates vary across industries and geographic regions, with studies suggesting a slower uptake in hospitality than in sectors such as finance or healthcare (Ratna et al, 2024). This hesitancy is caused by a lack of knowledge regarding the technology's potential, concerns about implementation costs, and a lack of clarity about the potential benefits (Jain et al, 2023).

Blockchain integration is still at an early stage in developed countries such as the United Kingdom where the hospitality industry contributes significantly to the economy. In addition to the intricacies of customer data management, researchers argue that the complex nature of hospitality services makes blockchain an especially appealing solution that has not yet been fully utilised (Treiblmaier, 2020).

3. Conceptual Framework and Hypotheses Development

Organizations have extensively studied the adoption of new technologies under the framework of several theories, including Technology Acceptance Models (TAM), Theory of Planned Behaviours (TPBs), and Diffusion of Innovations (DOIs) (Davis, 1989; Ajzen, 1991; Rogers, 2003). Through the use of these models, hypotheses about technology adoption have

been developed by considering factors such as perceived usefulness, perceived ease of use, and social influence.

Based on these theories, the conceptual framework for blockchain adoption in the hospitality sector can be formulated, proposing a model that includes both viability and perceived benefits as determinants of adoption (Figure 1). According to this model, viability can be dissected into three categories: financial resources, IT infrastructure, and support from the top management (Tornatzky & Fleischer, 1990). According to Hirschman & Holbrook (1982), perceived benefits are divided into functional benefits, which contribute directly to operational efficiency, and symbolic benefits, which contribute to brand positioning and recognition.

Hypotheses derived from the conceptual framework showed that there is a positive relationship between the viability factors and the intention to adopt blockchain technology, with top management support having the greatest impact (Table 4). Similarly, the functional as well as symbolic benefits are predicted to positively influence the intention to adopt, with symbolic benefits being expected to have a greater impact due to their role in competitive differentiation (Table 4).

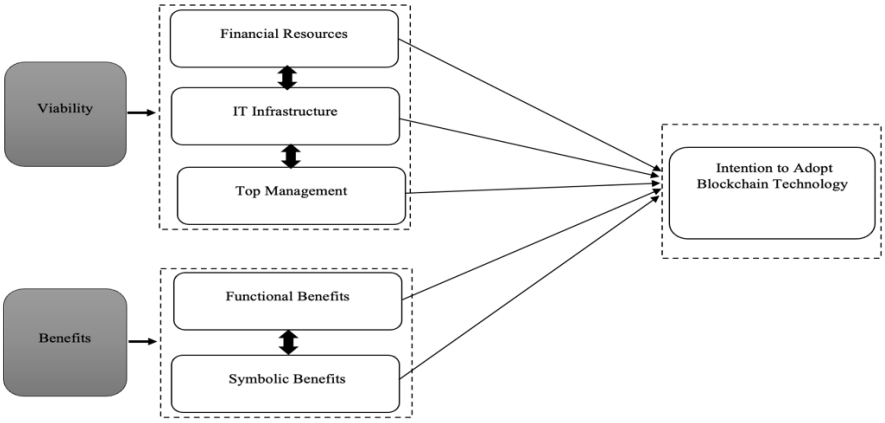

Figure 1. research mode

4. Methodology

4.1. Sample and Data Collection

A cross-sectional survey was conducted among hotel managers across the UK, providing a broader perspective on blockchain technology adoption in the hospitality industry. In Table 1, participants' demographics are presented in terms of gender, educational background, tenure, and departmental affiliation, demonstrating a variety of samples, which supports generalisability.

An organised questionnaire was used for the purpose of collecting data. The questionnaire was targeted at managers who are considered to have influence over the decisions made by their organizations regarding technology adoption. Through industry forums, professional networks, and direct contact with hotel management, participants were recruited. Dillman's tailored design method was utilized to ensure a high response rate (Dillman, 2007), which emphasizes the importance of multiple contacts and respondent-friendly survey design.

In order to encourage candid responses, confidentiality and anonymity were assured to participants. Data collection yielded 410 usable responses, providing a significant dataset for analysis based on a satisfactory response rate. For structural equation modelling, the sample size should be ten times the number of items in the most complex construct (Kline, 2011), which indicates the adequacy of the samples for analysis.

Demographics	**(n=410)**	
	Frequency	**Percent**
Gender		
Male	221	54%
Female	189	46%
Education		
High school diploma	53	13%
Some college	86	21%
Bachelor's Degree	139	34%
Master's Degree	107	26%
PhD degree	25	6%
Tenure		
Below 1 (year)	33	8%
1-5 (under)	49	12%
5-10 (under)	119	29%
10-15 (under)	86	21%
15-20 (under)	82	20%
Above 20	41	10%
Department		
Information Technology	29	7%
Research & Development	49	12%
Financial	66	16%
Human Resource	90	22%
Planning	41	10%
Management	45	11%
Sales	33	8%
Others	58	14%

Table 1. Participant demographic

4.2. Measures

In this research, constructs were measured using established scales adapted to the context of blockchain technology and the hospitality industry. For instance, intention to adopt blockchain technology was measured using three items adopted from Venkatesh et al, (2003). Financial resources were assessed utilising four items from Barney (1991). IT infrastructure was evaluated using three items adopted from study of Broadbent et al, (1999). Top management support was examined using four items adopted from Jarvenpaa and Ives (1991). Functional benefits were examined using five items adopted from study of Melville et al, (2004). Finally, symbolic benefits were examined using six items adopted from D'Aveni (1999). All measures used Likert scale on a 5-point scale. Following the recommendation of Podsakoff et al. (2003), Common Method Bias was assessed, and the analysis indicated no significant concerns.

Construct/Indicators	Standard Loading	CR	VIF	Cronbach's α	AVE	Mean	SD	t-statistic	Skewness	Kurtosis
Intention to Adopt Blockchain Technology (INT)		0.95	1.903	0.94	0.593					
INT1	0.97					2.83	0.73	10.29	-1.23	1.43
INT2	0.92					2.10	0.81	15.23	-1.90	1.71
INT3	0.96					2.92	0.79	18.34	-1.72	1.04
Financial Resources (FIR)		0.94	2.328	0.93	0.691					
FIR1	0.96					2.73	0.75	13.29	-1.84	2.74
FIR2	0.91					2.36	0.80	15.10	-1.13	2.12
FIR3	0.97					3.02	0.81	24.12	-1.22	1.43
FIR4	0.93					2.83	0.84	16.43	-1.74	1.58
IT Infrastructure (ITF)		0.92	1.849	0.91	0.599					
ITF1	0.93					2.36	0.80	8.29	-1.54	2.10
ITF2	0.96					2.90	0.81	12.37	-1.89	1.66
ITF3	0.91					2.14	0.77	19.04	-1.07	1.15
Top Management (TPM)		0.94	1.849	0.92	0.544					
TPM1	0.94					2.04	0.82	10.15	-1.43	1.06
TPM2	0.98					2.67	0.80	22.93	-1.61	1.42
TPM3	0.91					2.12	0.81	15.10	-2.90	2.01
TPM4	0.90					2.94	0.85	16.28	-1.62	1.55
Functional Benefits (FCB)		0.96	1.890	0.95	0.518					
FCB1	0.93					2.40	0.77	14.23	- 1.84	1.05
FCB2	0.91					2.12	0.80	20.34	-1.23	1.34
FCB3	0.95					2.92	0.81	21.23	-1.10	1.06
FCB4	0.90					2.36	0.80	15.30	-1.78	1.13
FCB5	0.89					2.16	0.79	18.35	-1.45	2.08
Symbolic Benefits (SYB)		0.93	1.874	0.91	0.508					
SYB1	0.93					2.01	0.81	14.12	-1.49	1.54
SYB2	0.91					2.64	0.77	23.89	-1.23	1.90
SYB3	0.96					2.15	0.79	21.45	-2.20	2.45
SYB4	0.93					2.64	0.83	13.49	-1.99	1.92
SYB5	0.91					2.89	0.82	10.56	-1.41	1.41
SYB6	0.90					2.00	0.84	24.28	-1.66	1.09

Table 2. Measurement statistics of construct scale

5. Analysis and Results

5.1. Data Analysis Procedure

Structured equation modelling (SEM) using partial least squares (PLS) was applied to the data collected from 410 UK hotel managers. As PLS-SEM does not impose strict assumptions about the distribution of data, it is particularly suitable for predictive studies and complex models. The Smart PLS software was used to evaluate both the measurement model (the relationships between observed variables and their latent constructs) and the structural model (the relationships among latent constructs).

5.2. Measurement Model

In assessing the measurement model, reliability and validity of the constructs were the primary concerns. Reliability was established, as all constructs were consistent within the 0.70 threshold, indicating adequate internal consistency as determined by Cronbach's alpha. Furthermore, the composite reliability (CR) values were far above the recommended level of 0.70, which contributes to the confirmation of internal consistency (Nunnally, 1978).

As a result of analysing the Average Variance Extracted (AVE) for each construct, convergence validity was evaluated, with all AVEs exceeding the 0.50 benchmark, indicating that the majority of variance in the indicators can be attributed to the constructs themselves (Fornell & Larcker, 1981). In Table 2, the measurement statistics provide strong support for the validity of the conceptual model.

The Fornell-Larcker criterion and cross-loading analyses were conducted in order to determine the discriminant validity of the constructs. The correlation matrix in Table 3 indicates that constructs are more strongly related to their own measures than to other constructs.

Constructs	**INT**	**FIR**	**ITF**	**TPM**	**FCB**	**SYB**
INT	**0.770**					
FIR	0.403	**0.831**				
ITF	0.451	0.438	**0.774**			
TPM	0.412	0.610	0.463	**0.737**		
FCB	0.389	0.538	0.619	0.629	**0.719**	
SYB	0.512	0.499	0.488	0.553	0.410	**0.713**

Table 3**.** Correlations between Constructs

5.3. Structural Model

The hypotheses were tested by evaluating the structural model after validating the measurement model. In addition, path coefficients were employed to produce standard errors and t-statistics in order to assess the importance of the hypothesised correlations between constructs (Chin, 1998).

The results indicated that all hypothesized paths were significant. Financial resources ($\beta = 0.43$, $p < 0.001$), IT infrastructure ($\beta = 0.31$, $p < 0.001$), and top management support ($\beta = 0.59$, $p < 0.001$) were positively associated with the intention to adopt blockchain technology, providing strong support for the proposed approach. In addition, both functional benefits ($\beta = 0.22$, $p < 0.001$) and symbolic benefits ($\beta = 0.36$, $p < 0.001$) were found to be significant predictors of hotel managers' intent to adopt blockchain technology. This model showed that 61% ($R^2 = 0.61$) of the variance in intentions to adopt blockchain technology, which is considered substantial in behavioral science research (Cohen, 1988).

5.4. Hypotheses Testing

As shown in table 4 the detailed results of the hypothesis testing confirmed the significant role of both viability factors and perceived benefits in influencing managers' intentions to adopt blockchain technology in the hospitality industry. Furthermore, it was found that all paths in the research model (Figure 1) were supported, emphasizing the importance of financial resources, IT infrastructure, top management support, functional benefits, and symbolic benefits as key drivers for the adoption of blockchain technology.

Path	Beta	Std. error	t Statistics	Decision
FIR → INT	0.43	0.061	18.283***	Supported
ITF → INT	0.31	0.039	11.478***	Supported
TPM → INT	0.59	0.042	22.410***	Supported
FCB → INT	0.22	0.018	9.208***	Supported
SYB → INT	0.36	0.040	12.349***	Supported

Table 4. Hypotheses testing results

6. Discussion and conclusion

6.1. Key Findings

Based on the research model (Figure 1), it has been possible to identify the determinants of blockchain adoption within the hospitality industry in the UK. A key

conclusion of this study is that viability and benefits play a crucial role in shaping the intentions of managers to adopt blockchain technology. Specifically, top management support emerged as the most influential viability factor ($\beta = 0.59$, $p < 0.001$), underscoring the critical role of leadership in technology adoption decisions (Table 4). Also, financial resources also had a significant impact ($\beta = 0.43$, $p < 0.001$), suggesting that the perceived availability of financial means is essential for the adoption of blockchain technology. Finally, the significance of IT infrastructure ($\beta = 0.31$, $p < 0.001$) indicates the necessity for a robust technical foundation to support blockchain integration. Regarding benefits, symbolic benefits ($\beta = 0.36$, $p < 0.001$) exhibited a stronger influence on adoption intention than functional benefits ($\beta = 0.22$, $p < 0.001$), suggesting that managers in the hospitality industry are motivated to adopt blockchain technology due to its potential to enhance their brand's image and competitive edge.

6.2. Theoretical Implications

The findings contribute to the extant body of knowledge on technology adoption by validating and extending existing theoretical models within the context of blockchain technology. By incorporating viability and benefits as central constructs, this study aligns with the principles of the Technology-Organization-Environment (TOE) framework, which posits that technological adoption is influenced by technological, organizational, and environmental factors (Tornatzky & Fleischer, 1990).

The strong influence of top management support on adoption intention adds to the theory by emphasising the need for strategic alignment and leadership endorsement in the successful adoption of innovative technologies, consistent with the Upper Echelons Theory (Hambrick & Mason, 1984). Moreover, the greater impact of symbolic benefits over functional benefits extends the understanding of the motivational factors behind technology adoption, suggesting that beyond the operational advantages, the strategic value of technology plays a crucial role in managerial decision-making processes.

6.3. Managerial Implication

The findings provide practitioners with several actionable insights. Using blockchain technology requires top management support, which means mobilizing the resources needed and championing the change.

Financial resources and IT infrastructure are crucial to ensuring the availability of capital and the readiness of technical systems before embarking on blockchain projects. Investing in IT capabilities and seeking funding are crucial to successful adoption. Finally, the emphasis on symbolic benefits indicates that managers should communicate blockchain's strategic advantages to stakeholders in order to garner support and encourage innovation.

7. Limitations and Future Research Directions

Despite providing significant findings, the study does have some limitations. In addition, the cross-sectional design limits causal inferences and the focus on UK hotel managers limits the scope of the study, also it would be beneficial to expand the study's international sample and to include data from different hospitality sectors. Furthermore, unexplored factors such as regulatory, competitive, and consumer factors may also influence the viability of blockchains (Baker, 2012). For future research, a comparative analysis across nations or industry segments and deeper exploration of the blockchain ecosystem can be utilized as a means of obtaining a richer, more detailed understanding of managerial attitudes and blockchain adoption complexities.

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