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Research Article

Factors Affecting the Adoption of Blockchain Technology in the Complex Industrial Systems: Data Modeling

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Nowadays, Blockchain Technology (BCT) is contributing toward addressing the challenges of complex industrial systems (CISs). The BCT reduces the complexity of cash data storage as well as retrieval system of finance, marketing, supply chain, inventory, and other departments. The objective of the present study is to investigate the factors, which affect the intention of professionals to adapt the BCT in the CISs by using an extension of the technology acceptance model. To fulfill the research objective, a theoretical research model is constituted by multiple hypotheses (H1–H6), i.e., perceived usefulness, perceived ease of use, perceived innovativeness, knowledge, risk, and trust after conducting the relevant literature survey in the context of BCT. Next, each hypothesis is tested by exploring the survey data of a sample of 287 professionals of different BCT user's companies such as retailing, e-commerce, manufacturing, and construction. Survey data is analyzed by executing the structural equation modeling with AMOS software. The factors and latent constructs loadings, reliability, convergent, discriminant, model fit-measurement, structural model, and the path analysis are conducted. The results reveal that the H1, H2, and H4–H6 dropped the positive impact and effect on professionals' intention to use the BCT in CISs. But, H3 has no effect for enhancing the intention of professionals to use BCT.

1. Introduction

Disruptions in technology brought phenomenal changes in the function of CISs. The supply chain (SC) plays a critical role in enhancing the effectiveness as well as productivity of CISs. Firms using emerging and radical technologies in performing operations can outperform their competitors. Blockchain technology (BCT) is one such emerging technology, which brings a competitive advantage and enables the CISs to function smoothly. BCT is implemented for transactional databases, carried out between the consensuses of equal independent parties [1]. BCT is a "digital, immutable, distributed ledger that chronologically records transactions in near real time" making the processes simpler, efficient, transparent, and secured [2]. BCT differs from the existing technologies in four ways: nonlocalization (decentralization), security, auditability, and smart execution [3], and it has diverse applications in the CISs. Despite many advantages of BCT in different practices of CISs, the adoption of blockchain technology is limited [4]. BCT is still in its infancy, which has to overcome the many barriers—behavioral, organizational, technological, or policy for its adoption in the CISs as per [5, 6].

A few research studies are organized on the BCT acceptance models in different industries, where most of the published research documents dealt with security concerns of BCT. It is found that insufficient research documents are published for auditing attention of professionals in the adaptation of the BCT in CISs. Therefore, to address the above concerns, the current study focussed on examining

the factors, which can influence the attention of professionals in the adoption of BCT in today's CISs. Bag et al. [7], Grzegorczyk [8], Hsiao [9], Dalmarco et al. [10], Kouaib and Almulhim [11], Shi and Wang [12], Patanakul and Rufo-McCarron [13], Sahu et al. [14–16], and Sahu et al. [17] probed that multivariable analysis helps to examine and improve the performance of BCT. The technology acceptance model posited by Davis [18] is one of the widely adopted theories to describe an individual's behavior toward new technologies. It is found as one of the most appropriate models to examine an individual's desire and readiness toward the usage of a technology [19]. Two key antecedents, namely, perceived usefulness and perceived ease of use, explained the users' behavior toward BCT as per Patanakul and Rufo-McCarron [13].

It is seen that the factors such as perceived usefulness [18], perceived ease of use, [18, 20], innovativeness [21], trust, motivation [22], and risk [23] are found as the most significant factors to investigate the behaviors of professionals toward adapting the BCT in CISs. It is also observed that the technology acceptance model (TAM) can be extended with knowledge or expert data [24]. Blockchain technology (BCT) is relatively a new technology, and its acceptance is influenced by factors such as ease of use, usefulness, and risk. The technology acceptance model is the suitable framework to understand users' acceptance of BCT in CISs. The current researches focussed on investigating the effects of factors, motivating the professionals to adapt the BCT in ICSs by using the technology acceptance model [25–27].

The aim of the present study is to evaluate the influence of factors and its hypothesis to gain the intention of professionals to adopt the BCT in the CISs. To examine the outcomes, the authors plan to use structural equation modeling with AMOS software. A list of contributions toward framing the aims of the study is depicted as follows:

(i) To frame a new theoretical research model based on the reference of the technology acceptance model.

(ii) To construct the new theoretical research model by factors and its hypothesis via conducting extant literature survey in the area of BCT adoption in CISs.

(iii) To conduct reliabe, convergent, and discriminant tests for assessing the validity of the model.

(iv) To assess the model fitness for measurement and also assess the structure of the model.

(v) To conduct the path analysis to conclude the influence of factors and its hypothesis to gain the intention of professionals to adopt the BCT in the CISs.

The research study is organized into the following sections. Section 2 (theoretical background, research model, and hypotheses development) includes the following subsections: growth of BCT usage (Section 2.1), theoretical foundation-technology acceptance model (Section 2.2), theoretical research model (Section 2.3), and hypotheses development (Section 2.4). The research method (Section 3) is introduced with its associated subsections, i.e., measures (Section 3.1) and materials (Section 3.2). Section 4 deals with data analysis and model fit test, where reliability and validity assessment (Section 4.1) includes the reliability test (Section 4.1.1), convergent validity (Section 4.1.2), and discriminant validity (Section 4.1.3). Model tests include the model fit-measurement model (Section 4.2), model fit-structural model (Section 4.3), and path analysis results (Section 4.4). At last, discussion (Section 5), implications and contribution of the study (Section 6), and conclusion and future research directions (Section 7) are introduced.

2. Theoretical Background, Research Model, and Hypotheses Development

2.1. Growth of Blockchain Technology (BCT) Usage. BCT has a profound impact on business operations. The BCT is a distributed and highly secure platform, ledger, or database of values—everything from money, assets, stocks, bonds, intellectual property, and deeds, to music, art, and even votes [28, 29]. BCT is a "digital, immutable, distributed ledger that chronologically records transactions in near real time" making the processes simpler, efficient, transparent, and secured [2]. It is a potential technology applied in diverse industries for improved operational efficiency. The BCT-based applications cover the supply chain, finance, e-commerce transactions, product traceability, user credits, financial services, trust systems, new energy, etc. [30]. For instance, BCT has its applications in the areas of tourism for managing ticket booking and loyalty programs [31], data privacy, security and sharing in healthcare [32], and financial services [33]. It is vital for organizations to adopt BCT for improved efficiency and performance in complex industrial systems.

2.2. Theoretical Foundation-Technology Acceptance Model. The technology acceptance model proposed by [18] provides the conceptual framework for the research on the adoption of BCT. TAM serves as a model to understand the user behavior toward the acceptance of new technologies and information systems. It is based on the premise that individuals use certain technologies to derive benefits from the usage. According to TAM, usage attitude is based on two major predictors: perceived ease of use and perceived usefulness [18]. Perceived ease of use is "the extent to which use of the technology is thought to be easy and effortless" [34] whereas perceived usefulness is the "degree to which use of the technology is thought to be useful and helpful" [34]. The technology acceptance model has been widely validated in the context of mobile shopping [35], social media usage [36], and in-store technologies [37]. Though TAM is a suitable framework to adopt new technologies, the adoption of blockchain is critical at the organizational level. BCT is relatively a new technology and its adoption is influenced by certain factors. Therefore, the present study extends TAM with knowledge [24], innovativeness [21], trust, motivation [22], and risk [23] for a better explanation and understanding of users' behavior.

2.3. Theoretical Research Model. The current research focussed on investigating the factors, affecting the attentions or behaviors of industrial professionals toward adopting the BCT in CISs. To attain the same, the research study proposes a theoretical research model constituted by hypotheses H1–H6 such as perceived innovativeness, knowledge, risk, and trust. The model is built by using the foundation of the technology acceptance model proposed by Davis [18]. The theoretical research model is depicted in Figure 1 where hypotheses H1–H6 are displayed.

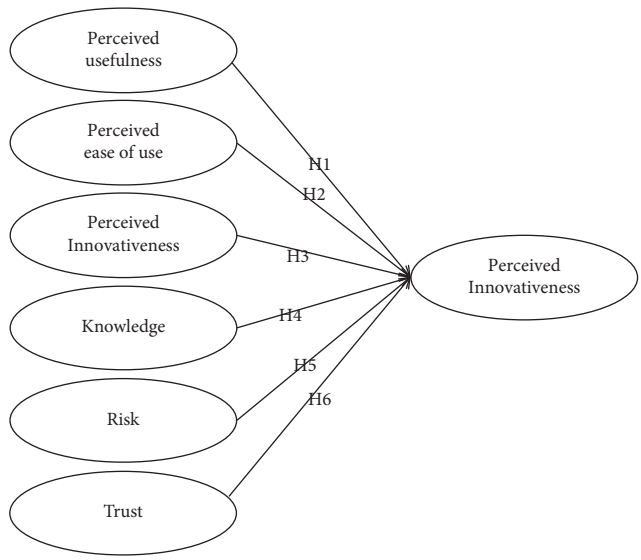

Figure 1: Theoretical research model.

2.4. Hypotheses Development

2.4.1. Perceived Usefulness. Perceived usefulness (PU) is found as a key influencer in determining the acceptance of technology by an individual. PU is conceptualized as "the subjective perspective of users about the specific merit application of system/technology that may either increase or decrease the job performance of users" [18]. Users tend to investigate new technology to ascertain if it will augment his/her job or activity performance. This investigation helps to develop a perception of the technology with respect to performance enhancement. They will continue to use the application if and only if there is no dissonance between perception and experience. Researchers established a significant relationship between the perceived usefulness and behavioral intention to use technology in the case of online shopping [21], e-government learning [38], mobile banking [22], online banking [39], and hotel tablet applications [40]. The positive relationship between perceived usefulness and intention to adopt BCT is confirmed by Kamble et al. [41] and Nuryyev et al. [42]. Therefore, we hypothesize the following:

> H1: Perceived usefulness has a positive effect on the intention to use BCT.

2.4.2. Perceived Ease of Use. Perceived ease of use is one of the key exogenous constructs proposed in the technology acceptance model, which influences the user acceptance of a specific information system/technology. It is defined as "the degree to which the specific technology will be free from physical or psychological effort" [18, 20]. In the present research, perceived ease of use to the extent that users are free from physical or psychological effort to use a specific technology is considered. Previous research showed a significant relationship between perceived ease of use and user intention to use technologies in mobile banking [22], online banking [39], hotel tablet applications [40], and agricultural technology [43]. In the case of BCT, a significant relationship between perceived ease of use and intention to adopt is recently audited by Nuryyev et.al. [42]. Therefore, we hypothesize the following:

> H2: Perceived ease of use has a positive effect on the intention to use BCT.

2.4.3. Perceived Innovativeness. Innovativeness is a personality trait that indicates an individual's intention to try new things [44] and a desire to be different [45]. Innovativeness is a key determinant to adopt emerging technologies. Research studies proved a positive relationship between users' perceived innovativeness and behavioral intention toward cloud classrooms [46], remote mobile payment services [47], mobile Internet [48], and mobile diet apps [49]. Nuryyev et al. [42] endorsed the relationship between perceived innovativeness and intention to use BCT. Therefore, we hypothesize the following:

> H3: Perceived innovativeness has a positive effect on the intention to use BCT.

2.4.4. Knowledge. Knowledge is defined as "awareness, consciousness or familiarity gained by experience or learning" [50]. Users' knowledge of the product is a prerequisite for understanding and using it. In the context of technology, knowledge refers to the expertise and skills, gained to understand the usage of a specific technology. Research studies asserted a significant positive relationship between knowledge and intention in the case of renewable energy [51] and website usage [24]. It is imperative to have know-how knowledge of BCT to use it at optimum level. Knauer and Mann [52] found a positive relationship between knowledge and behavioral intention to use BCT. Therefore, we hypothesize the following:

> H4: Knowledge has a positive effect on the intention to use BCT.

2.4.5. Risk. Mandrik and Bao [53] defined risk as "feelings of uncertainty or anxiety about the behaviour and the seriousness or importance of the possible negative outcomes of

that behaviour". Further, it is described as "a user's belief in the potential uncertain negative outcomes of using a product" [54]. Risk is one of the major reasons individuals avoid adopting new technology and it reduces the adoption intention (Chen [55]). Research revealed a negative association between individuals' perceived risk and adoption of e-commerce [56], mobile banking services [57], and remote mobile payment services [47]. Researchers found a negative relationship between risk and intention in the case of BCT [58, 59]. Therefore, we hypothesize the following:

H5: Risk has a negative effect on the intention to use BCT.

2.4.6. Trust. Trust is conceptualized as "existing when one party has confidence in the exchange partner's reliability and integrity" [60]. Trust is a key determinant of consumer behavior [61]; hence, it is crucial to develop user trust in a product, service, or technology. The concept of trust has gained importance to predict an individual's behavioral intention [62]. A number of studies indicated a positive relationship between trust and user intention regarding online travel purchase [63], e-commerce [64], mobile financial services [14], and remote mobile payment services [47]. In the case of BCT, trust exhibits a positive relationship with the behavioral intention [59, 65]. Therefore, we hypothesize the following:

H6: Trust has a positive effect on the intention to use BCT.

3. Research Method

3.1. Measures. The research has the aim to examine the factors that influence the behavior or attention of professionals about the adoption of BCT for addressing the supply chain operations of CISs. The measurement items for the current research are adapted from the previous researches. These items are modified to suit the context of BCT. The measurement items for both perceived usefulness and perceived ease of use are adapted from Childers et al. [66]. Perceived innovativeness's items are taken from Agarwal and Prasad [67]. Three items of knowledge factor are extracted from Golnaz et al. [15]. The measuring statements for the risk factor are obtained from Lu et al. [68]. Trust is measured with three items, which are drafted from Suh and Han [69]. Finally, behavioral intention is examined based on the technology acceptance model by Davis [18].

All the measurement items are examined by using a five-point Likert scale ranging from 1-strongly disagree to 5-strongly agree. A pilot test with 30 respondents is conducted to test validity. Industry experts using BCT to address the supply chain operations are consulted to ensure the content validity of the measurement instrument.

3.2. Materials. Supply chain managers/professionals using BCT in various industries such as retailing, e-commerce, and manufacturing are contacted via a web-based survey engine or instrument for collecting data. Respondents are consulted based on purposive sampling mode from different parts of India. Online questionnaires are shared with 700 employees, out of which 315 responses are returned/recorded. 28 questionnaires are incomplete. Finally, 287 usable samples were received with a 41 percent response rate for data analysis.

4. Data Analysis

4.1. Reliability and Validity Assessment

4.1.1. Reliability Test. Reliability of the constructs/factors is assessed based on Cronbach's alpha and composite reliability (CR) test, which used the surveyed sample data of latent constructs, shown in Table 1. Internal consistency of the constructs is measured using Cronbach's alpha, which should be beyond 0.70 as suggested by Hair et al. [16]. From Table 2, it is noted that Cronbach's alpha and composite reliability of the constructs exceed the cut-off value, which ensures the reliability of the constructs/factors.

4.1.2. Convergent Validity. Convergent validity is conducted by using the average variance extracted (AVE) test on the same surveyed sample data of latent constructs. For all the latent constructs, AVE values are above the threshold value, i.e., 0.60 as referred by Hair et al. [16]. From Table 2, AVE values calculated for all the constructs are more than 0.60 and thus well confirmed the convergent validity of constructs/factors.

4.1.3. Discriminant Validity. It is evaluated based on the shared variance between the factors [70]. Discriminant validity is confirmed if the square root of the average variance extracted is more than the correlation between the factor/construct and other factors/constructs. From Table 3, the diagonal values (square root of AVE) are more than the off-diagonal values (correlations between the factor/construct and other factors/constructs are confirmed). Hence, we can assure the discriminant validity of the constructs/factors.

4.2. Model Fit-Measurement Model. The measurement model is fit or not, which is tested after the latent constructs met the criteria for reliability and validity (convergent and discriminant validity) assessment. Structural equation modeling (SEM) tool under AMOS software is employed to test the fitness of indices. Model fit was examined by using Chi-Square/D*f* (CMID/d*f*), Root Mean Square Residual (RMR), Root Mean Square of Error Approximation (RMSEA), Comparative Fit Index (CFI), Normed Fit Index (NFI), Tucker-Lewis Index (TLI), and Goodness of Fit (GIF).

From Table 4, all the fit indices meet the criteria suggested by Bentler [71], Hu and Bentler [72], Hair et al. [16], Kim and Sundar [73], and Henseler et al. [74], which ensures that measurement model is fit. Table 5 has shown the measurement statements and sources of the model.

Table 1: Industry and work experience of the employees.

Work experience and industry ($n = 287$)	Frequency	Percentage
Work experience in the organization		
Less than one year	7	2.44
1-2 years	18	6.27
2–5 years	107	37.28
5–10 years	121	42.16
Above 10 years	34	11.85
Industry		
Construction	16	5.57
Manufacturing	95	33.10
Retailing	47	16.38
E-commence	65	22.65
Transport and storage	19	6.62
Information and communication services	38	13.24
Others	7	2.44

Table 2: Reliability and average variance extracted.

Factor	Cronbach's alpha	Composite reliability	Average variance extracted
Perceived usefulness	0.907	0.909	0.770
Perceived ease of use	0.933	0.934	0.826
Perceived innovativeness	0.860	0.864	0.680
Knowledge	0.923	0.926	0.808
Risk	0.918	0.919	0.791
Trust	0.918	0.848	0.741
Intention to use	0.907	0.909	0.770

Table 3: Intercorrelation matrix.

	PU	TR	PI	PEO	KN	RI	ITU
PU	0.877						
TR	−0.100	0.861					
PI	−0.072	0.366	0.824				
PEO	−0.030	0.293	0.258	0.908			
KN	−0.055	0.101	0.462	0.132	0.898		
RI	0.010	−0.036	0.289	0.034	0.481	0.889	
ITU	0.073	0.466	0.264	0.443	0.152	−0.058	0.877

Note. PU: perceived usefulness, TR: trust, PI: perceived innovativeness, PEO: perceived ease of use, KN: knowledge, RI: risk, ITU: intention to use.

Table 4: Measurement model.

	CMID/df	RMR	RMSEA	CFI	NFI	TLI	GFI
Cut-off value	<3	<0.5	<0.08	>0.9	>0.9	>0.9	>0.8
Actual value	1.317	0.025	0.033	0.989	0.957	0.986	0.935

4.3. Model Fit-Structural Model. After confirming the fitness of the measurement model, the model structure is assessed for its fitness by using the structural model. The test is conducted for the same CMID/df, RMR, RMSEA, CFI, NFI, TLI, and GFI indices. Table 6 shows that all the values are well above the threshold values referred by Bentler [71], Hu and Bentler [72], Hair et al. [16], Kim and Sundar [73], and Henseler et al. [74]. Hence, the structural model is found fit.

4.4. Path Analysis Results. It is observed from Table 7 that H1-perceived usefulness ($\beta = 0.133$, $p = 0.017$) and H2-perceived ease of use ($\beta = 0.309$, p=***) have the most significant influence on the intention of professionals to adopt BCT, whereas H3-perceived innovativeness has no influence on intention. H4-knowledge ($\beta = 0.139$, $p = 0.024$) and H6-trust ($\beta = 0.323$, p=***) exhibited positive influence, and H5-risk ($\beta = 0.16$, $p = 0.021$) proved to be a negative influencer on the intention to use BCT. Except for H3, all hypotheses, i.e., H1, H2, H4, H5, and H6, are accepted.

As discussed, Table 1 dealt with industries as well as the work experience of the employees, which are invited to address the survey questionnaires. 287 samples are received for data analysis. Table 8 depicted the factors and latent constructs loadings analysis, which confirmed the relevancy of factors/main construct and latent constructs. Table 2 showed the reliability analysis, which confirmed the reliability of factors. Table 3 confirmed the intercorrelation between the factors/constructs. Table 4 depicted the discriminant validity and confirmed the variances between the factors. Next, model fit-measurement and structural model are analyzed, where, in Table 4, the model fit-measurement confirmed the validity of the hypothesis and, in Table 6, confirmed the structure of the theoretical research model. Eventually, Table 7 exhibited the positive and negative

Table 5: Measurement statements and sources.

Factors/constructs	Latent constructs	Latent constructs (items) loading
Perceived usefulness	Usage of BCT improves the productivity. BCT is useful. BCT improves the effectiveness.	Childers et.al. [66]
Perceived ease of use	It is easy to understand BCT. It is easy to use BCT. Use of BCT does not require a lot of mental effort.	Childers et al. [66]
Perceived innovativeness	I like to experiment with BCT. In general, I would not hesitate to try out BCT. I would look for ways to experiment with BCT.	Agarwal and Prasad [67]
Knowledge	I understand BCT. I have sufficient knowledge about BCT. I have enough knowledge about BCT.	Golnaz et al. [15]
Risk	I do not feel very safe using BCT. I am worried about using BCT. I do not feel secure using BCT.	Lu et al. [68]
Trust	BCT is trustworthy. I trust in the benefits of BCT. I trust BCT.	Suh and Han [69]
Intention to use	I plan to use BCT in the future. I intend to use BCT in the future. I predict I will use BCT in the future.	Davis [18]

Table 6: Structural model.

	CMID/d*f*	RMR	RMSEA	CFI	NFI	TLI	GFI
Cut-off value	<3	<0.5	<0.08	>0.9	>0.9	>0.9	>0.8
Actual value	2.289	0.106	0.067	0.952	0.918	0.945	0.873

Table 7: Hypotheses testing.

Hypothesis	Estimate	SE	CR	*p* value	Result
H1: Perceived usefulness ⟶ intention to use	0.133	0.056	2.382	0.017	Accepted
H2: Perceived ease of use ⟶ intention to use	0.309	0.053	5.889	***	Accepted
H3: Perceived innovativeness ⟶ intention to use	0.048	0.056	0.859	0.391	Not accepted
H4: Knowledge ⟶ intention to use	0.139	0.062	2.257	0.024	Accepted
H5: Risk ⟶ intention to use	−0.16	0.069	−2.306	0.021	Accepted
H6: Trust ⟶ intention to use	0.323	0.049	6.565	***	Accepted

Table 8: Factor-latent constructs loadings.

Factors/constructs	Latent constructs	Latent constructs (items) loading
Perceived usefulness	Usage of BCT improves productivity.	0.933
	BCT is useful.	0.931
	BCT improves the effectiveness.	0.882
Perceived ease of use	It is easy to understand BCT.	0.897
	It is easy to use BCT.	0.919
	Use of BCT does not require a lot of mental effort.	0.917
Perceived innovativeness	I like to experiment with BCT.	0.817
	In general, I would not hesitate to try out BCT.	0.858
	I would look for ways to experiment with BCT.	0.837
Knowledge	I understand BCT.	0.899
	I have sufficient knowledge about BCT.	0.891
	I have enough knowledge about BCT.	0.857

Table 8: Continued.

Factors/constructs	Latent constructs	Latent constructs (items) loading
Risk	I do not feel very safe using BCT.	0.900
	I am worried about using BCT.	0.906
	I do not feel secure using BCT.	0.890
Trust	BCT is trustworthy.	0.901
	I trust in the benefits of BCT.	0.841
	I trust BCT.	0.915
Intention to use	I plan to use BCT in the future.	0.850
	I intend to use BCT in the future.	0.874
	I predict I will use BCT in the future.	0.894

attention of professionals/employees to adopt the BCT in addressing the supply chain operations of CISs.

5. Discussion

The research work investigated the subjective perception of employees of various firms against six critical factors/constructs, affecting the intention to use to adopt the BCT in addressing the supply chain operations of CISs. A theoretical research model based on the technology acceptance model is framed and tested using empirical data. The factors/constructs studied in the research work are perceived usefulness, perceived ease of use, perceived innovativeness, knowledge, risk, trust, and intention to use. The findings of the research indicate that perceived usefulness has shown a significant positive effect on the intention to use BCT (H1), in line with the research by Sharma [22] and Kamble et al. [41]. This shows that the usefulness of BCT is requisite to adopt the BCT. The perceived ease of use is positively related to intention to use (H2), consistent with the research studies by Kim [40] and Nuryyev et al. [42]. The perceived innovativeness has no significant effect on the intention to use BCT (H3). The results may be due to the small size of the sample and responses are drawn from various industries. Next, a positive relationship between knowledge toward the BCT and the intention to use it (H4) is found, which supports the results of the research performed by Bang et al. [51] and Knauer and Mann [52]. Risk is negatively related to the intention to use BCT (H5), similar to the results of Slade et al. [47] and Guych et al. [58]. Trust has a positive effect to draw intention to use (H6). It is evident from the hypothesis results in Table 7 that all the hypotheses (H1, H2, H4, H5, and H6) are accepted except H3.

6. Implications and Contribution of the Study

The research advances the literature in the field of BCT adoption for taking care of supply chain operations of CISs. The research tried to bridge the gap between the BCT and the adoption of the technology acceptance model. As a part of the contribution, a theoretical research model is constituted by multiple hypotheses (H1–H6), i.e., perceived usefulness, perceived ease of use, perceived innovativeness, knowledge, risk, and trust after conducting the relevant literature survey in the context of BCT. Next, each hypothesis is tested by exploring the survey data of a sample of 287 professionals of different BCT user's companies. To test each hypothesis to use BCT, as discussed from Tables 1–4 and Tables 6–8, factors as latent constructs loadings, reliability, convergent, discriminant validity, model fit-measurement, model fit-structural model, and path analyses are conducted to audit the positive and negative attention of professionals/employees to adopt the BCT in addressing the supply chain operations of CISs in today's industry 4.0. As a part of implications, the managers can adopt the presented work to investigate the positive and negative attention of employees of an individual or specific firm toward adopting the BCT and other advanced technologies, i.e., PayPal, Google Pay, Paytm, etc.

7. Conclusion and Future Research Directions

The conducted study proposed a theoretical research model constituted by multiple hypotheses (H1–H6), i.e., perceived usefulness, perceived ease of use, perceived innovativeness, knowledge, risk, and trust. The factors and latent constructs loadings, reliability, convergent, discriminant, model fit-measurement, and structural model are conducted. Eventually, the path analysis tested the constructs/factors, namely, perceived usefulness, perceived ease of use, perceived innovativeness, knowledge, risk, trust, and intention to use BCT with using the foundation on technology acceptance model. Perceived ease of use and perceived usefulness were found to be key predictors for the adoption of BCT in addressing the supply chain operations of CISs [75]. The study established the positive effect of H1, H2, and H4–H6 on professionals' intention to use the BCT in CISs, while H3 has no effect for enhancing the intention of professionals to use BCT.

The research has certain caveats that could be considered for future research. The research was conducted in India, the geographical limitation may affect the ability of the research, further studies may incorporate in other countries, and cultural differences could be tested. The research was cross-sectional and quantitative, and qualitative studies may produce better insights. The research is confined to a few select industries using blockchain technology in complex industrial systems. The research did not include attitude from the technology acceptance model; future research may include cost, hedonic value, and attitude as predictors of behavioral intention. Further research may test the moderating role of user experience in the adoption of blockchain

technology. The research focussed only on blockchain technology, and future research may integrate the Internet of things with blockchain technology.

Data Availability

The data used to support the findings of this study are available in Table 7.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this manuscript.

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