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A Model for predicting the behavioral components of blockchain adoption in the banking industry using agent-based modeling

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Abstract

Blockchain is a technology that can be used in various organizations. Blockchain, through a decentralized computer network, leads to the facilitation of high-level transactions of organizations as well as their registration, in order to better respond to people's needs. In this research, a preliminary conceptual model consisting of the behavioral factors of blockchain technology acceptance in the banking industry, which is derived from theoretical literature and research background, is presented. Behavioral factors include facilitating conditions, attitude, literacy and skill, perceived risk, technology, perceived behavioral control, external motivation, internal motivation, competition and mental norm. Then, in order to check the fit of the model, structural equation modeling and smart pls software were used using a researcher-made questionnaire extracted from the research model. For this purpose, due to the unlimited size of the statistical population, 384 samples were randomly selected and the questionnaire was distributed among them. The result indicates that all the relationships are significant and the factors cause more than 80% of changes in technology adoption. In addition, agent-based modeling and Anylogic software have been used in order to predict changes in the adoption of blockchain technology over time, affected by the identified behavioral factors. The results showed that with the improvement of behavioral factors, the adoption of blockchain technology increases over time. In this study, insight is generated for key decision makers and relevant policy makers to propagate the adoption of blockchain technology in the banking industry.

Keywords: Blockchain, Behavioral Factors, Technology Acceptance, Structural Equation Modeling, Agent-based Modeling.

1- Introduction

Blockchain technology enables organizations to store and exchange electronic message data in a decentralized environment. Since blockchain has data encryption technology, it is possible to store and

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carry out transactions with high security, and it also has transparency due to the fact that these transactions are available for public viewing. These features lead to the development of electronic government (Aghaei et al. 2018).

The public organization is owned by the government and is managed with the aim of providing services to citizens. The structure of these organizations in third world countries is basically based on a very large government body. Public organizations implicitly carry the concept of bureaucracy and inefficiency in responding to public needs. The customers and service recipients of government and government-affiliated organizations are the people, so these organizations face a large number of clients every day. Therefore, through a decentralized computer network, blockchain technology facilitates the transactions of public organizations, which leads to a better response to people's needs.

Organizations invest more in information technology (IT) in order to increase the efficiency of business processes, support management decision-making, and improve productivity. In other words, information technology has become a strategic tool to gain competitive advantage in organizations. In this regard, the banking industry also widely relies on information technology to improve employee productivity and efficiency, as well as to improve customer satisfaction (Ham et al. 2005, Lam et al. 2007).

The study in the field of technology acceptance has been of great interest by researchers and practitioners (Siguawm et al. 2000; Nozari et al., 2022). Also, some studies have shown that there is a positive relationship between IT investment and organizational productivity and performance (Byrd et al. 2001, Powell et al. 1997, Rai et al. 1997). However, researchers have stated that even if there are positive effects and benefits, the new information technology will not be fully accepted if the barriers of external factors affect the adoption of information technology (Davis. 1989, Davis et al.1992).

People can make innovation succeed or fail. Corporate decision makers can be both facilitators and barriers in the field of technology. Factors related to behavioral sciences clearly affect acceptance decisions and behaviors, this is while they have not been fully investigated. Consequently, understanding these factors is essential for organizations wishing to accelerate technology adoption, as well as for innovators who face multiple barriers when introducing their new products to the industrial market (Roberts et al. 2021).

The purpose of theories and models of technology acceptance is to know how users may understand and accept new technology and how they can use it. For any new technology, many variables affect people's decision-making process about how and when to use it (Fishbein et al. 1975; Nozari , 2023). These variables have been investigated and analyzed in several studies (Triandis. 1979, Venkatesh et al. 2003). Although much work has been done up to now, further studies are necessary to determine the appropriate model for the adoption of blockchain technology.

For the acceptance of innovative technologies, user acceptance, satisfaction, and perceived usability are considered as very important factors. The goal of human-computer interaction research is to understand and use the determinants of user technology acceptance to influence technology design and implementation processes and ultimately minimize user resistance. In this kind of research, the emphasis is on understanding the behavior of users using technology through usability testing and evaluation methods to ensure that users can implement a technology efficiently, effectively, and satisfactorily. Although user characteristics (or critical psychological elements) significantly contribute to users' understanding of technologies, researchers have placed less emphasis on their evaluation (Holden et al. 2011; Rahmaty & Nozari 2023).

The main goal of this research is to design the behavioral model of blockchain acceptance in public banks. For this purpose, the behavioral indicators of blockchain technology acceptance in public banks are identified. The relationships of the behavioral indicators of blockchain technology acceptance are determined on the behavioral acceptance of blockchain in public banks. Finally, agent-based modeling is performed in order to predict the behavioral acceptance of blockchain in public banks.

2- Literature Review

The word blockchain consists of two words of block and chain. This technology is actually a chain of blocks. In each block, any information can be recorded and the blocks are linked together in a chain. Blockchain is a shared and immutable ledger that facilitates the process of recording transactions and tracking assets in a business network. An asset can be tangible or intangible. Tangible assets such as

houses, cars, cash, and land and intangible assets such as intellectual property, patents, copyrights, and trademarks. Almost anything of value can be tracked and traded on a blockchain network, reducing risk, and reducing costs for all involved (IBM, 2022).

In general, acceptance is defined as "the opposite of rejection and means a positive decision to use an innovation" (Simon, 2001). Decision makers should have an understanding of the factors that influence users' decisions to use a particular system, so that they can develop that system considering those factors (Mathieson, 1991). Why people accept new technologies is the question of many researchers. The answer to this question will help them find better ways to design, evaluate, and predict users' responses to new technologies (Dillon and Morris, 1996). Technology acceptance models and theories have been applied in various fields to understand and predict user behavior such as voting, diet, family planning, blood donation, women's career orientations, breast cancer screening, transportation mode selection, financial circulation, and their use. Acceptance of technology is influenced by individual, group, and organizational factors of the organizational behavior model. In the individual dimension, we can refer to motivation, in the group dimension to social influence, and in the organizational dimension to culture and organization.

Using technology acceptance models is a way to understand the attitude of users towards new technologies (Heidari et al. 2017). Models and frameworks have been created to explain user acceptance of new technologies and these models introduce factors that can influence user acceptance. These models and theories include: Technology Acceptance Model, Theory of Planned Behavior, Diffusion of Innovation theory, Theory of Reasoned Action, Model of PC Utilization, motivational model, Unified Theory of Acceptance and Use of Technology, Social Cognitive Theory. Researchers used these traditional frameworks to conduct their research, combined the rest of the previous models, or added new structures to the developed models (Taherdoost. 2018). Technology acceptance models focus on all three levels of organizational behavior management. For example, the theory of reasoned action, which emphasizes the attitude and subjective norms, emphasizes the individual and group levels of organizational behavior. In addition, the technology-organization-environment (TOE) model focuses on the organization level.

3- Research Background

The purpose of Farsijani and Karampour's article (2022) is to evaluate the level of readiness to use blockchain in Iran's National Gas Company. For this purpose, organizational, technological, human and environmental factors have been identified, and organizational factors have the most weight and environmental factors have the least weight. Also, the sub-criteria of the senior manager's support were the highest and the size of the organization was the least important. The research of Rahimi et al. (2022) was compiled with the aim of identifying the key obstacles to the application of blockchain technology and developing its hierarchical model in the supply chain of the food industry. The results of the research showed that internal barriers as well as legal barriers are the most important barriers to the application of blockchain technology in the supply chain of the food industry.

The purpose of Hosseini Sarkhosh's study (2022) is to prioritize the factors related to the acceptance of blockchain technology in the electronic health record system. The factors were divided into five categories: technological, legal, financial, environmental, and organizational. The purpose of the study by Taherkhani and Amouzad Khalili (2022) is to identify the factors that affect the acceptance of blockchain technology in the supply chain of various industries. This study focuses on technological features, organizational features, and external environmental factors. Blockchain can help fundamentally change aspects of circular economy (CE) activities and overcome sustainability problems. The aim of the study by Rejeb et al. (2022) is to provide a comprehensive review of the obstacles that prevent the acceptance of blockchain technology in CE. The findings of this method showed that lack of knowledge and management support, reluctance to change and technological immaturity are the most important obstacles. On the other hand, the least obstacles are investment costs, security risks and scalability issues.

Fathi and Sadeghi (2021) have used the technology-organization-environment framework. The findings show that the sub-criteria related to the environment are more vital. The purpose of Shrestha et al.'s (2021) study was to evaluate user acceptance of the active blockchain-based system by observing the features that affect the development of users' attitudes and intentions to use the system. By

considering the observed facts of causal relationships and their consequences, they identified various issues that affect users' attitudes and intentions to accept a blockchain-based system.

Tyan et al.'s (2020) study aims to advance blockchain research and increase understanding of blockchain acceptance in the tourism industry. According to Duan et al.'s (2020) research, since blockchain has features such as decentralization, security, immutability, smart contract, it is expected to improve sustainable food supply chain management and food traceability. In the research of Queiroz & Wamba (2019), it is stated that blockchain is an advanced technology that is currently changing and rebuilding the relationships between all members of logistics and supply chain systems. This study aimed to fill this gap, particularly by helping to understand individual blockchain acceptance behavior in the context of logistics and supply chain in India and the United States.

Knauer & Mann (2019) have stated that from the point of view of consumers, blockchain technology has the potential to reduce transaction costs, improve privacy and redesign social interactions, which potentially leads to an increase in consumer power in transactional relationships. Francisco and Swanson (2018) have stated that blockchain makes transactions significantly more transparent than transactions provided by centralized systems. Post et al. (2018) have stated that blockchain technology is increasingly attracting the attention of academics as well as professionals and has the potential to disrupt traditional ways of working in most industries.

Heidari et al. (2017) conducted a study with the aim of investigating factors affecting customers' behavioral intention to use blockchain capabilities as a financial tool. By using a combination of several technology acceptance models, they determined factors which encourage users to use blockchain capabilities as a financial instrument. The results of the research showed that the intention to use blockchain capabilities as a financial tool is due to a social need. And users were interested in using blockchain despite some limitations of this technology.

The purpose of Lou and Li's (2017) article was to examine the research and application prospects of blockchain technology acceptance by following a more comprehensive approach to addressing blockchain technology acceptance. In the research of Folkinshteyna & Lennon (2016), it is stated that the technology acceptance model (TAM) is an important analytical tool in the study of the social mechanisms of technology acceptance, and this model has received much attention in the literature.

5-Research Conceptual Model

Derived from the behavioral theories of technology acceptance that were explained earlier; Like the theory of planned behavior, theory of reasoned action, Triandis model, and motivational model, the following conceptual model can be presented.

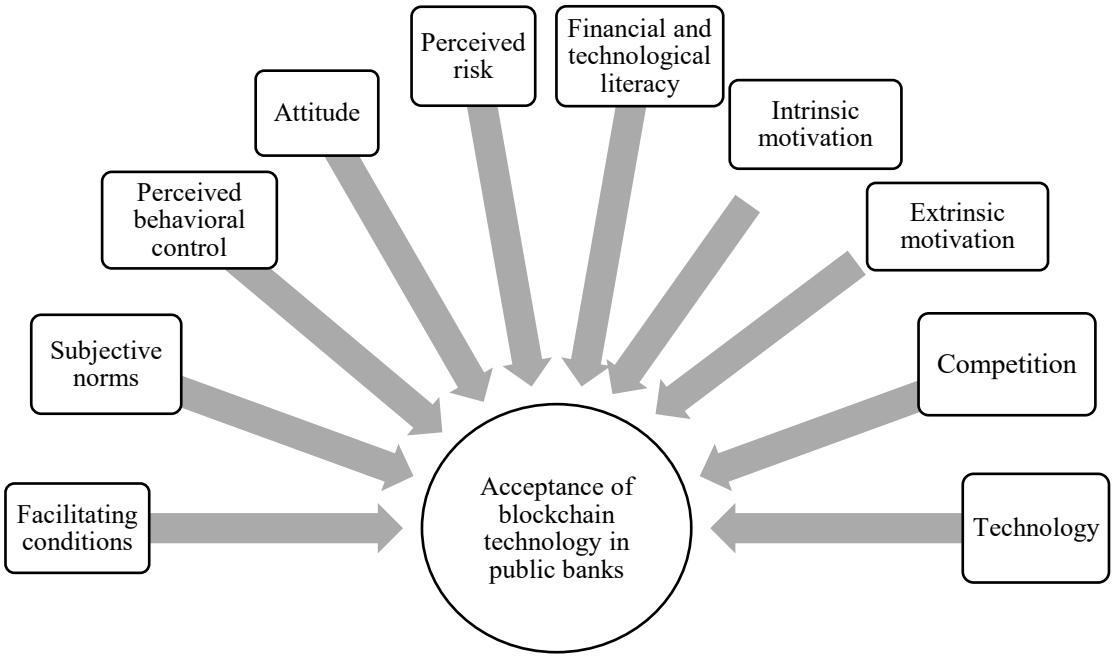

Figure 1. Research conceptual model.

Table 1. Potential indicators affecting the adoption of blockchain technology.

Factor	Reference	Sub - factor
Perceived risk	Chao (2019)	• Data confidentiality • Data encryption • Perceived security • Unsuccessful experience • Incompatibility of reality with mental image • Loss of job security
Subjective norms	Safa & Solms (2016) Ajzen (1985)	•Communicating and recommending colleagues to use blockchain technology •Peers' expectation of using blockchain technology
Facilitating conditions	Safa & Solms (2016) Triandis (1977)	•Having the necessary technical infrastructure to use blockchain technology •Having sufficient financial resources to use blockchain technology •Legal and regulatory support for the use of blockchain technology •Existence of supporting policies for the use of blockchain technology •Management support •Strategic orientation
Financial and technological literacy	Arias-Oliva at al. (2022)	•Having literacy and skills in the financial field •Having literacy and skills in the field of blockchain technology
Attitude	Safa & Solms (2016) Ajzen (1985)	•Interested in using blockchain technology •Perceived usefulness of using blockchain technology
Perceived behavioral control	Safa & Solms (2016) Ajzen (1985)	•Ensuring learning to use blockchain technology •Ensuring the ability to use blockchain technology
Intrinsic motivation	Safa & Solms (2016)	•A sense of relaxation in the use of block gene technology •Trying to achieve the success of the organization in the implementation of blockchain technology •Performing tasks in the field of blockchain technology • Cooperation
Extrinsic motivation	Safa & Solms (2016)	• Getting rewarded for participating in the deployment and use of blockchain technology • Appreciation • Promotion due to participation in the establishment and use of blockchain technology • Ensuring job security due to participation in the deployment and use of blockchain technology • Access to facilities and opportunities due to participation in the deployment and use of blockchain technology
Technology	Taherkhani and Amouzad Khalili (2022)	•Complexity • Scalability •Flexibility • Cost • ease of use
Acceptance		•Intent to use •Forecast usage

6- Methodology

The aim of the current research is to disseminate and develop existing knowledge in the field of behavioral factors of blockchain technology acceptance in the country's public banks. Therefore, this research is developmental in terms of purpose. Since the purpose of this research is to provide solutions in the field of the acceptance of blockchain technology and their use, therefore, this research can be considered practical in terms of its purpose. Also, in terms of research design, this research is one of the descriptive-analytical researches. This research is a descriptive one that describes the role of behavioral factors in the acceptance of blockchain technology, and it is an analytical reason that the research model was designed and tested using structural equations modeling as well as agent-based modeling.

The data collection tool is a questionnaire taken from theoretical literature. The members of the statistical sample were selected from among the employees of the country's public bank. "Morgan" sample size table was used to determine the sample size. In this research, considering that the number of members of the statistical population is equal to 92 thousand people, the sample size is equal to 384 people.

In this research, the validity of the questionnaire has been checked with the method of face validity and content validity. In order to measure the face validity, the experts were surveyed about whether the measures accurately measure the subject of the research and whether the measures have the ability to measure the concepts and constructs of the research in terms of appearance, and the face validity of the questionnaire was confirmed by the experts.

Content validity is checked with qualitative and quantitative methods. Qualitative content validity is evaluated by surveying experts, and quantitative content validity is also evaluated by calculating content validity ratio (CVR) and content validity index (CVI). In the current research, to measure the validity of the qualitative content of the questionnaire, experts were surveyed about whether the measures represent all the characteristics that the researcher intended to measure and whether the questionnaire includes the full content of the concepts, and the validity of the content of the questionnaire was confirmed by the experts. Also, to check the validity of the quantitative content, the questionnaire was given to 30 experts and they were asked to express their opinion about the appropriateness of each of the items based on the Likert scale. Then, to ensure that the most important content (essential questions) were selected, the content validity ratio coefficient was calculated. The content validity ratio index was designed by Lawshe (1975). In order to calculate this index, the opinions of experts in the field of the test content were used and they were asked to classify each of the questions based on the three-part spectrum including "the item is necessary", "the item is useful but not necessary" and "the item is not necessary". Then, based on the following formula, the content validity ratio was calculated:

$$CVR = \frac{n_E - \frac{N}{2}}{\frac{N}{2}} \quad (1)$$

Noting that:

N: total number of experts;

n_E: The number of experts who have chosen the necessary option.

According to the number of experts who evaluated the questions, the minimum acceptable CVR value of 0.33 has been observed in this research

In the present research, the reliability of the questionnaire was investigated by Cronbach's alpha method. To measure reliability, 30 questionnaires were first distributed among 30 experts. Then, based on the obtained data and by calculating Cronbach's alpha coefficient by SPSS software, the reliability of the questionnaire was calculated. The resulting value for Cronbach's alpha was 0.9, which indicates very good reliability.

Descriptive data analysis according to the demographic characteristics of the participants (gender, age, and education level), behavioral factors (facilitating conditions, attitude, literacy and skill, perceived risk, technology, perceived behavioral control, extrinsic motivation, intrinsic motivation, competition, and subjective norms), and the questions related to them have been calculated in the questionnaire. Based on this, women with 59.12% of respondents make up a higher percentage of the research sample than men with 40.88% of respondents. In addition, the most educational group of

respondents is related to bachelor's degree, which constituted 67.19% of the respondents. Also, the largest age group of respondents is between 22-30 years old, which constitutes 85.42% of the respondents.

Participants responded to two items related to blockchain acceptance, in the form of a 5-point Likert scale from very low (1) to very high (5). The items were almost equally important according to the respondents. The item "preparation of the infrastructure of the organization based on the use of blockchain technology" was the most important factor in facilitating conditions. The item "understanding the usefulness of using blockchain technology" was the most important in the attitude factor. The item "the existence of technological literacy and skill among employees" has been the most important in the factor of literacy and skill. The item "loss of job security" was the most important in the perceived risk factor. The "scalability" item was the most important in the technology factor.

According to the data analysis algorithm in the PLS method, after fitting the measurement models (validity and reliability check), the fit of the structural model of the research is checked. Unlike the measurement models in which the relationship between the latent variable and manifest variables is considered, in the structural model review the relationships between the latent variables were analyzed and the criteria of the significant coefficients, t-values, R^2 were examined for the fit of the structural model.

A) Significant t values: The first and most basic criterion for evaluating the fit of the structural model of the research is the Z significance coefficients or the t-value values, which are shown on the path lines by executing the bootstrap command. If the t values are greater than 1.96, it indicates the validity of the relationship between the constructs and the confirmation of the research hypotheses at the 95% confidence level.

B) R^2Criterion: The second essential criterion to check the fit of the structural model is to check the determination coefficients related to the endogenous variables of the model. This criterion is used to connect the measurement part and the structural part of structural equation modeling and it expresses the effect of an exogenous variable on an endogenous variable. The coefficient of determination values is calculated only for the endogenous (dependent) structures of the model, and for exogenous structures this value is zero. According to China, three values of 0.19, 0.33 and 0.67 are criteria for weak, medium and strong coefficient of determination and its high value indicates a better fit of the model.

In order to investigate the relationship between the behavioral factors of blockchain technology acceptance and its acceptance, the structural equation model fit test of Smart PLS software was used.

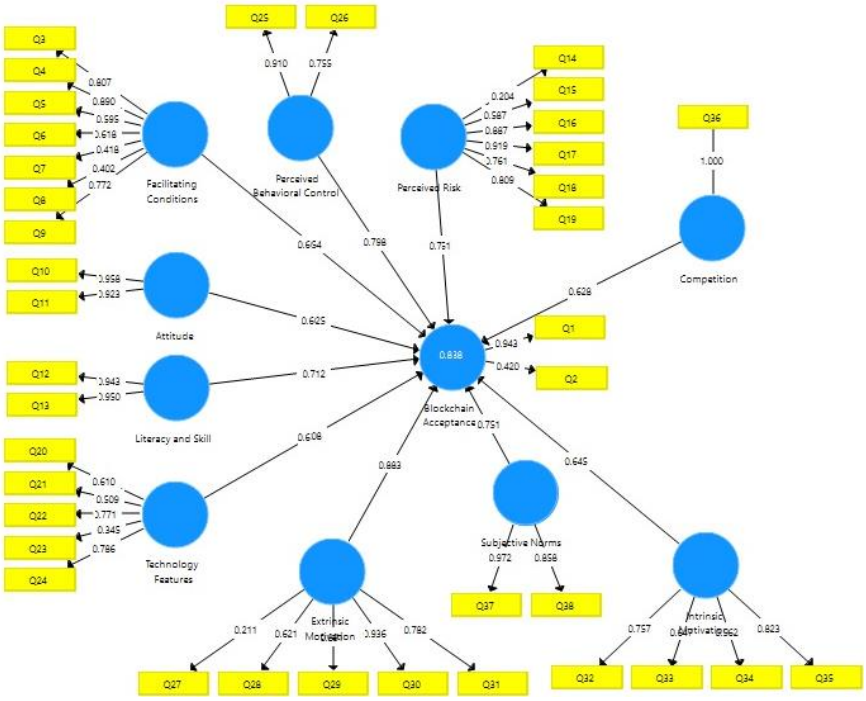

Figure 2. Standard coefficients of the model

Table 2. Standard coefficients of the model

	Blochchain Acceptance
Blockchain Acceptance	
Attitude	0.625
Competition	0.628
Extrinsic Motivation	0.883
Facilitating Conditions	0.654
Intrinsic Motivation	0.645
Literacy and Skill	0.712
Perceived Behavioral Control	0.798
Perceived Risk	0.751
Subjective Norms	0.751
Technology Features	0.608

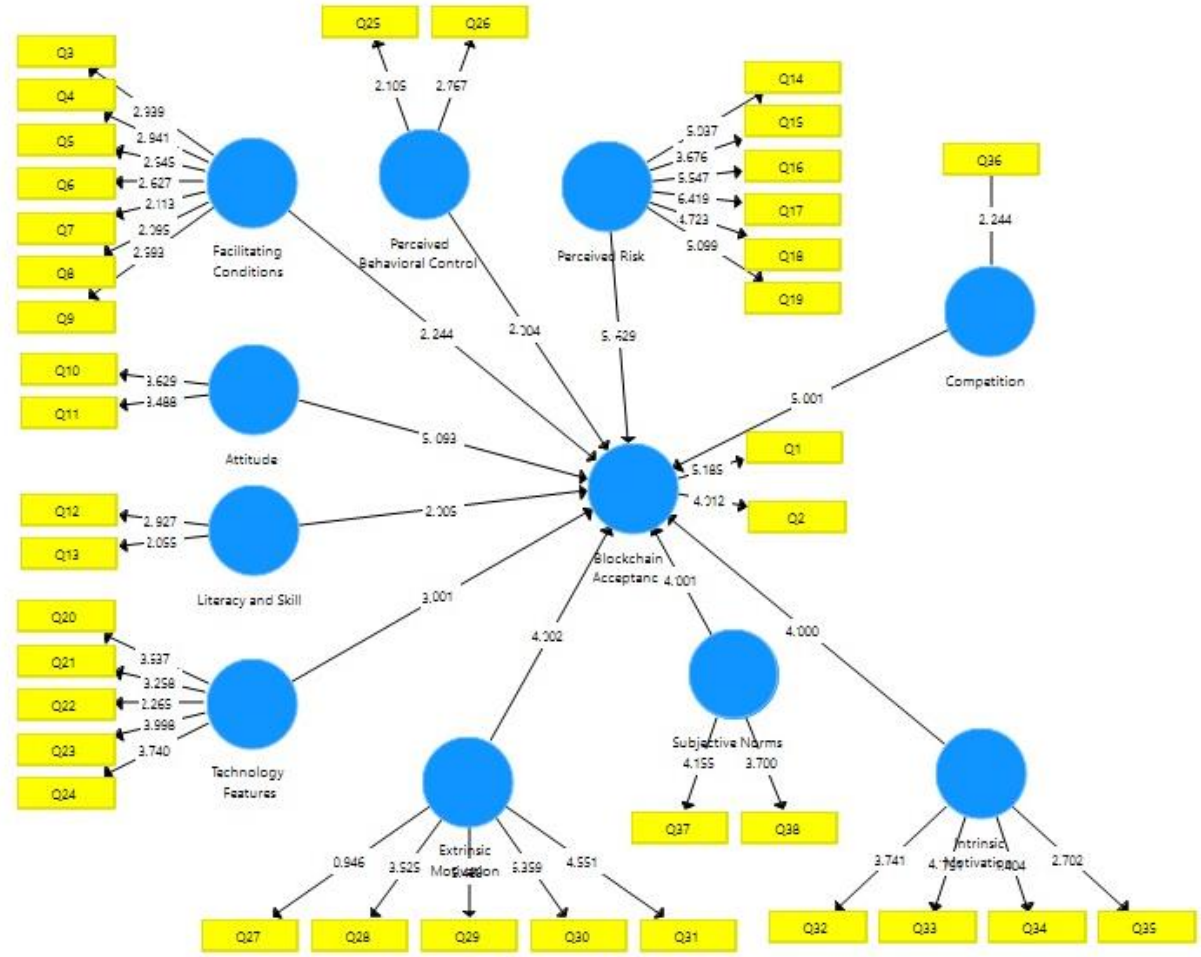

Figure 3. The value of the t statistic of the model

This figure shows that all relationships are significant.

For agent-based modeling, derived from the diffusion model, two states or two behaviors of non-acceptance of blockchain technology and acceptance of blockchain technology are considered. With AnyLogic simulation software, extensive facilities are available to create and analyze agent-based or agent-oriented models, and by using the StateCharts that exist in the software, the behavior of the agents is drawn. In this part, the basic analysis model for the behavior of agents is drawn.

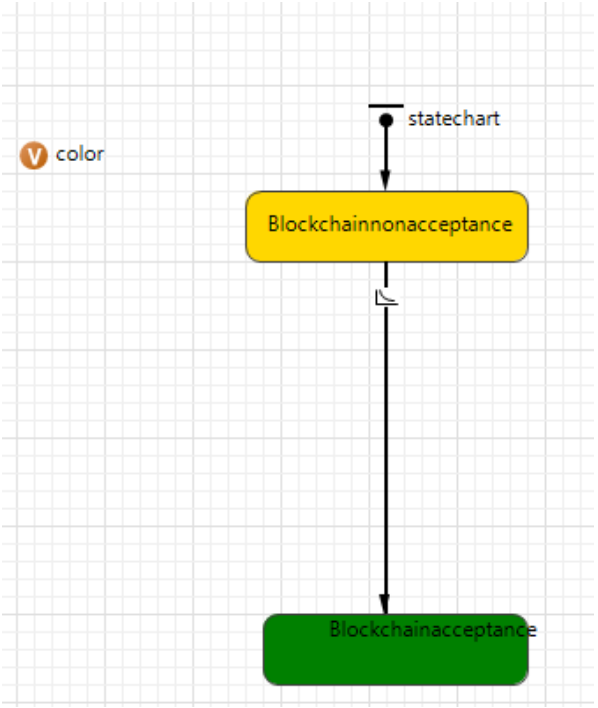

Figure 4. Research State Chart

As seen in the research statechart, two behaviors of acceptance and non-acceptance are defined, which are related by a transition. This transition is of the rate type and in this research, it is the square of R. The codes of this chart are as follows.

Name: Blockchainnonacceptance
Entry action: get_Main ().nBlockchainnonacceptance++;
Color = GOLD;
Exit action: get_Main ().nBlockchainnonacceptance--;
Name: Blockchainacceptance
Entry action: get_Main ().nBlockchainacceptance++;
Color = GREEN;
Exit action: get_Main ().nBlockchainacceptance--;

- The agents in this research are the research population, which is 92 thousand employees.
- The rate and output of the model is per year.

In order to investigate the effect of behavioral factors on the acceptance of blockchain in public banks, the R square in this research was more than 0.8, which is the same as the transition rate of the two states in the model. The results of running the model are as described in Figure 5.

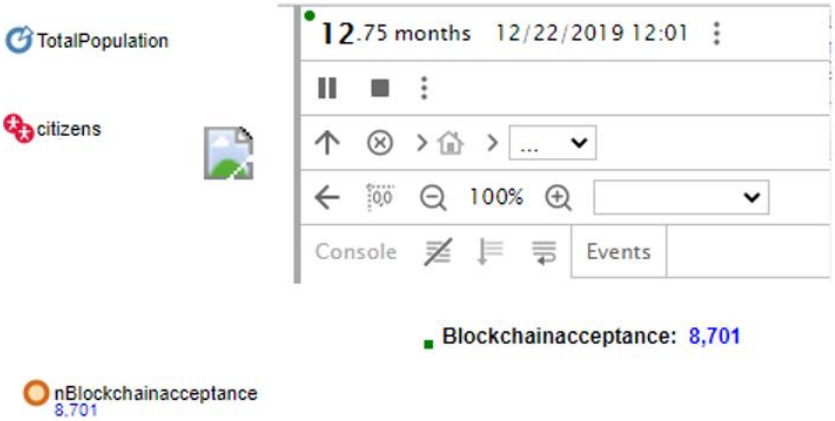

Figure 5. Output of the influence of behavioral factors on blockchain technology acceptance

As can be seen from Figure 5, after one year, there will be more than 8 thousand admissions.

Since in this research before agent-based modeling, statistical structural equations have been used. This confirms the validity of agent-based modeling. Statistical model reliability is an emerging challenge in agent-based modeling (ABM). Therefore, in 2017, Mertens et al. introduced Structural Equation Modeling (SEM) as a promising statistical model method for analyzing the behavior of ABMs. SEM enhances the validity and reliability of ABMs by describing the interactions between a varieties of factors. There is a growing interest in reliable results from complex dynamic agent-based models. Recently, coupled systems or interrelated agents have complicated agent-based modeling (ABM) analysis. Thus, it can be difficult to present the model for ABM, especially for the stakeholders to understand and therefore uncertainty remains about the behavior of the simulation model. In addition, the analysis of ABMs consumes a lot of resources. ABM emphasizes descriptive questions in the social and behavioral sciences. However, it may be easier to obtain interesting results using standard statistical models because it reveals relevant effects in the system. In this research, the structural equation model is presented for the simulation model in ABM to provide an accessible method to understand the complex behavior of the model. SEM's ability to estimate interrelationships and obtain latent emerging social behavior using constructs and pathways contributes to agent-based simulation as well as behavioral assessment of the simulation model. In addition, reliable statistical results based on SEM help to explain and interpret the simulation results.

In 2021, Ebrahimi has conducted a study to investigate the effect of customer relationship management (CRM) in the dissemination and acquisition of innovative products and services using agent-based modeling (ABM). She has investigated the effect of CRM components including customer orientation, organizational structure, knowledge management, and information technology on the release stages of innovative products and services including awareness, interest, evaluation, testing, and acceptance. In this analysis, she first performed modeling based on structural equation modeling and used its results in agent-based modeling and simulation. In this way, in addition to presenting the simulation model, the results of the simulation can also be evaluated and a more understandable description of the results can be presented to the stakeholders.

7- Conclusion

In this research, the behavioral model of blockchain acceptance in public banks was designed. From public banks, 384 samples were randomly selected and data were collected using a questionnaire tool taken from the theoretical literature and behavioral theories of acceptance. Then the relationships of behavioral factors including: facilitating conditions, attitude, literacy and skill, perceived risk, technology, perceived behavioral control, extrinsic motivation, intrinsic motivation, competition, and subjective norms on blockchain acceptance through structural equation modeling were analyzed. The results showed that all relationships are significant and the factors cause more than 80% of changes in blockchain acceptance. In this research, agent-based modeling has been used to predict changes in the acceptance of blockchain technology over time, affected by behavioral factors, which showed that with the improvement of behavioral factors, the acceptance of blockchain technology increases over time.

In order to confirm the results of the research, Pourbabadi and Tamimi (2015) showed that the perceived ease of use has a positive and significant effect on the acceptance of internet banking at the level of 95%. Nowrozi and Afrideh (2019) investigated and determined the impact of individual components, usefulness, ease of use, cost, complexity, and perceived risks of information technology on the level of acceptance of information technology in the insurance industry and found that ease of use has a significant effect on the acceptance of information technology.

Social influence has been shown to deeply affect human behavior in general and technology acceptance in particular. Graf-Vlachy et al. (2018) examined how social influence is conceptualized in technology acceptance research. A systematic review of the prominent literature reveals that existing interpretations of social influence (1) are largely conformity-based, thereby ignoring the risk of identification- and internalization-based influences. (2) It is primarily targeted at the individual level and non-social technologies, thereby avoiding the influence of socially enriched environments. and (3)

a heavy reliance on survey-based and US/China-centric samples, which compromises the generalizability and predictive validity of the findings.

Khodami et al. (2016) in a research investigating the factors affecting consumers' use of mobile advertising based on UTAUT showed that personal innovations in information technology, perceived pleasure, social influence, performance expectation, and adaptability have a positive and significant effect on the behavioral intention to use mobile advertising, and self-efficacy, facilitating conditions, and effort expectation do not affect the behavioral intention.

Motaharinejad and Mohammadi Fard (2013) have stated that information literacy is the basic axis of literacy in the 21st century. Information literacy has been proposed as a factor to express the concept of information technology acceptance. Shirazian (2017) has investigated the role of financial literacy and money management on the personal financial management of Tehran Stock Exchange investors and the findings of this study confirm the positive and significant effect of financial literacy and money management and their components on the personal financial management.

In this study, by presenting the behavioral model of blockchain technology acceptance in public banks, an insight is created for the main decision-makers and relevant policy makers to implement blockchain technology in public banks.

Every research, especially in the field of human sciences, has limitations. Paying attention to these limitations makes the researcher better equipped to defend his findings. The main limitations of this research are as the following:

• Due to the busyness of people and their little time, many questionnaires were not completed and only 384 questionnaires were completed.

According to the results of the research and in order to help researchers and future researchers, the researcher suggests the following research topics:

• To prioritize the acceptance criteria of blockchain technology with decision-making methods.

• To predict the acceptance of blockchain technology with other or combined simulation methods.

The findings of the research show that organizational, individual, environmental, and technological factors affect the acceptance of blockchain technology in the country's public banks, and improvement in these factors leads to improvement in blockchain acceptance.

• The government should support the acceptance of blockchain technology. For this purpose, it can facilitate these conditions with policy making and legal and financial support.

• In addition to developing a bank strategy, public banks should also develop a technology strategy and pay attention to blockchain technology.

• Developing a technology strategy gives the vision to organization managers to increase the organization's readiness for deployment before the implementation: they can

• run training courses on blockchain technology,

• develop the necessary infrastructure,

• improve the literacy and financial and technological skills of personnel in this field,

• provide training courses to change the attitude of personnel towards blockchain technology if it is negative.

• improve extrinsic motivational mechanisms in this direction.

• hire people who have acceptable literacy and skills in the field of blockchain technology, have a positive attitude towards this technology, and have a high intrinsic motivation to use this technology.

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