The Effectiveness of Decentralized Autonomous Organization for University in the Web 3.0 Era

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Abstracts

The objectives of this research were: (1) to explore key effectiveness of decentralized autonomous organization for university in the Web3.0 era. And; (2)to propose guideline to enhance effectiveness of decentralized autonomous organization for university in the Web3.0 era. The research method was a mixed method, including qualitative research and quantitative research. The sample was 401 people included dean, professor, administrator from Beihang University, Tsinghua University and expert of DAO included web 3.0 investor, founder of DAO organization, A16Z, THE MATRIX, REPUBLIC, LD capital, MARK DAO, and METAVERSE ALLINCE respectively, among which 376. Selecting by cluster random sampling, obtained by purposive sampling method. The instruments used for data collection were semi-structured interview form, five-point rating scale questionnaires and focus group discussion form. The response rate of questionnaires was 100%. Statistics used for data analysis included frequency, percentage, mean, Standard Deviation, Exploratory Factor Analysis, and content analysis was employed.

The research findings revealed that; (1) The effectiveness of decentralized autonomous organization for university in the Web3.0 era consisted of 5 Component as follow; Component 1 contains 30 variables that describe the component; Component 2 contains 27 variables, Component 3 contains 11variables, Component 4 contains 8 variables, and Component 5 contains 4 variables, and the factor load ranges from 0.719-0.797;and (2) the guideline to enhance effectiveness of decentralized autonomous organization for university in the Web3.0 era. There are 22 guiding principles for the to enhance effectiveness of decentralized autonomous organization for university in the Web3.0 era, including 4 guiding principles for Blockchain technology components, 2 guiding principles for the Legal and regulatory components, 5 guiding principles for the The web3.0 trait components, 1 guiding principles for the Economic and operational 4 guiding principles for the management of teaching achievements output components. And 12 guiding principles for the Management and governance components.

Keywords: Key Effectiveness; Decentralized Autonomous Organization; University in the Web3.0 era.

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Introduction

In view of the DAO field has shown obvious technology and industry innovation driven development trend, the industry is lack of in-depth research, the rise of decentralized organization design management team, requires what is DAO leadership for new inquiry, this paper is committed to a certain range of successful cases, systematic analysis and discussion, understand the nature of DAO leadership, trying to find the effective leadership model to reference in the future, to help more DAO sponsors and participants more effective organization management construction. The year 2021 is a big explosion year for the whole blockchain industry. DAO, with blockchain as the bottom core, naturally also shows a trend of surge, and this trend is still expanding .According to statistics, in the entire blockchain network, the number of effective DAO proposals was more than 700 in early 2021, and by April 2022, it has exceeded 6,000, an increase of nearly 8.8 times. The rapid growth in the number of DAO proposals also reflects the strong interest in and active participation in the model of decentralized governance. More people are trying to explore this new model of decision-making governance. governance tokens of a DAO. . (James Howell, 2016)

The employment relationship and management mode of traditional organizations have been difficult to adapt to the complex and changeable environment and the requirements of the new generation of individuals. Decentralized autonomous organization will be decentralized, autonomy, autonomy and token economic incentives, the elements of the system as assets, make monetary capital, human capital and other elements of capital full fusion, so as to better stimulate the efficiency of the organization and realize the value circulation, to solve the problem of existing organization management, provides a good way of thinking. However, DAO is not a completely new concept. Self-organization phenomenon in nature, dynamic cyber movement organizations s (CMOs) in the Internet, and an important branch of artificial intelligence, distributed artificial intelligence (distributed) artificial intelligence, DAI) and so on can be considered as the prototype of DAO, The ideal decentralized self-governing organization (DAO) has no central leadership entity. It essentially consists of a group of people who contract with each other to achieve a coordinated goal and can be anything. Unlike the typical top-down management style applied in many organizations today, decisions are made bottom-up in DAO, and each member has a say in how and direction the organization operates. In short, the DAO has a "flat hierarchy" without leaders, and relies on the entire community to make decisions (Jeremy,H., 2022 : 1)

At present, there are a lot of gaps in the research on DAO. Firstly, the concept of DAO has been known by the public for a very short time; secondly, Web 3.0 is still a very cutting-edge topic. Although it is widely concerned by the crypto and investment circles in business, the focus is often placed on speculation and benefit input-output ratio. DAO is expected to become the fourth organizational form outside of the country, the market and the company, maximizing the efficiency and value flow of the organization, and forming a new business change. However, throughout the academic circle, with the theme of "distributed autonomous organization, distributed autonomous company, decentralized autonomous organization" as the search in Google Academic and CNKI, after excluding the unrelated literature, it can be found that there is little research on DAO, and there is a lack of theoretical context. In view of the DAO field has shown obvious technology and industry innovation driven development trend, the university is lack of in-depth research, the rise of decentralized organization design management team, requires what is effectiveness of DAO for new inquiry, this research committed to a certain range of successful cases, systematic analysis and discussion,

understand the nature effectiveness of DAO, trying to find the key effectiveness of decentralized autonomous organization for university in the Web3.0 era to reference in the future, to help more DAO sponsors and participants more effective organization management construction. (Chowdhury, N. 2019 : 1).

For further research on DAO is helpful to sort out ideas in business and education web projects, and is helpful to guide the practical and theoretical support of the projects running. The expected outcomes is find key effectiveness of decentralized autonomous organization for university in the Web3.0 era and guideline to enhance effectiveness of decentralized autonomous organization for university in Web3.0 era.

Research Objectives

1. To explore key effectiveness of decentralized autonomous organization for university in the Web3.0 era.

2. To propose guideline to enhance effectiveness of decentralized autonomous organization for university in the Web3.0 era.

Research Methodology

1. Population and sampling

Step 1 To explore key effectiveness of decentralized autonomous organization for university in the Web3.0 era. 1) To study the key effectiveness leadership model of decentralized autonomous organization From select about 30 related papers at home and abroad. 2) 9 Key informants in related fields were interviewed. Selecting by purposive sampling. And 3) Questionnaire to exploratory factor analysis key effectiveness of decentralized autonomous organization for university in the Web 3.0 era.

Population included dean, professor, administrator from Beihang University, Tsinghua University and expert of DAO included web 3.0 investor, QHS representatives of ten active DAO organizations in the Web3.0 field. A total of 10,640 industry workers were surveyed.

Sample were included dean, professor, administrator from Beihang University, Tsinghua University and expert of DAO included web 3.0 investor, founder of DAO organization, A16Z, THE MATRIX, REPUBLIC, LD capital, MARK DAO, and METAVERSE ALLINCE respectively. QHS representatives of ten active DAO organizations in the Web 3.0 field., among which 376. Selecting by cluster random sampling.

Step 2 To propose guideline to enhance effectiveness of decentralized autonomous organization for university in the Web 3.0 era. 9 Key informants in related fields of decentralized autonomous organization for university in the Web 3.0 era. Selecting by purposive sampling who are different group of step 1.

2. Research Instrument

The questionnaires were developed by the researchers, which consists of three parts. The researchers used a three-part questionnaire; Part One: Demographic variables, general information (8 items). Part two: Variables of to exploratory factor analysis key effectiveness of decentralized autonomous organization for university in the Web 3.0 era (five-rating scale).

Part Three: Suggestions and supplementary opinions. The instrument evolves from step (l) to questionnaire. Content validity and reliability were used to evaluate the quality of the questionnaire. The content validity was tested by 5 experts and analyzed by the index item-objective congruence (IOC) method, and the item value between 0.67-1.00. For reliability, Cronbach's Alpha was used for analysis at 0.965.

3. Data collection procedure

Data collection is done by researcher, who make contact with key informants and identify themselves. Send the questionnaire by email or other means. The steps of data collection are as follows:

Step 1: Apply to the BTU Faculty of Education, Bangkokthonburi University for permission to collect research data.

Step 2: Apply for a letter of recommendation from a researcher at the BTU Faculty of Education, Bangkokthonburi University.

Step 3: Collect data from the samples. The questionnaires were sent online, mail, and researcher. And collect questionnaires online and by researcher.

Step 4: Collect data on the selected samples by sending questionnaires to the coordinating teachers and administrators. The coordinating teachers will assist in collecting data on the selected samples of each school.

4. Data Analysis

The collected data were analyzed including descriptive statistics. Descriptive statistics were used to analyze demographic variable data. Frequency and percentage. Descriptive statistical analysis of effectiveness of decentralized autonomous organization for university in the Web 3.0 era, variables; Mean, standard deviation (S.D). Exploratory Factor Analysis (EFA) is used to analyze the factors that effectiveness of decentralized autonomous organization for university, so as to reduce the irrelevant variables.

Research Conceptual Framework

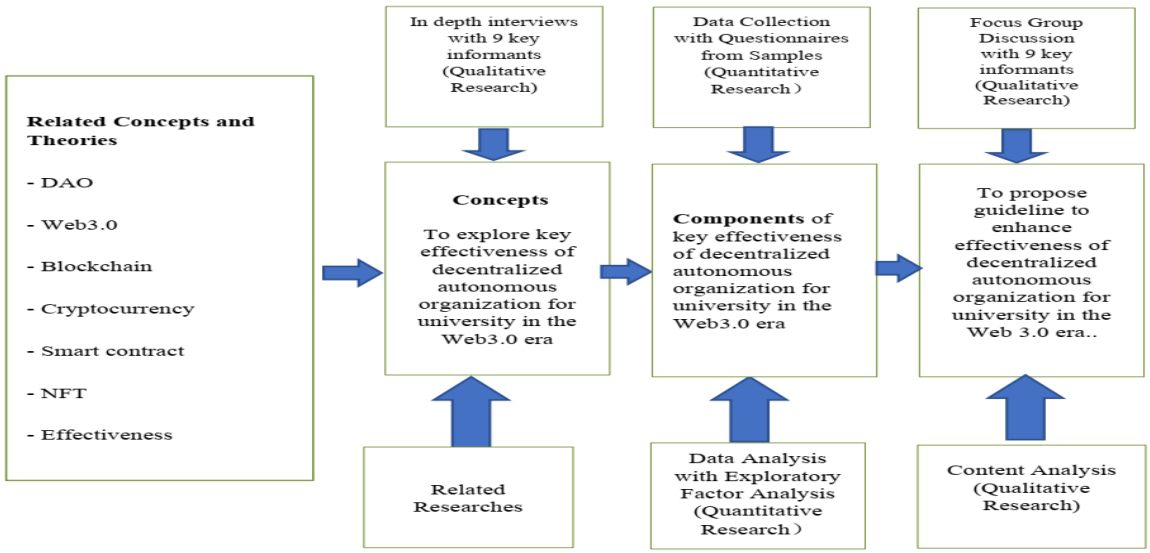


Figure 1 Conceptual framework for research

Results

The researcher reviews literature found 82 Sub Variables and there were 18 variables from the interview of key informants. The researcher was to combined the content analysis of the literature review and the analysis of semi-structured interviews with experts, a total of 82 variables are obtained and screened A total of 65 Main Variables with a frequency greater than 50% were identified. After the expert IOC certification, variables with a score of less than 0.6 were removed, Finally, with 6 dimensions and 82 variables, and 82 variables will be used for questionnaire distribution. And prepared a research instrument as a five-point evaluation subscale questionnaire.

The items that had scores higher than or equ0al to 0.5 were reserved. As a result, it was found that there were 81 items of questionnaire.

Section 2 Result of Data Analysis for Research Objective 1

Identify and identify effective components of effective DAO organizations in universities, There were 401 valid questionnaires, which were 10 running DAO groups, which were distinguished according to their identity attributes 401 questionnaires were issued in this adjustment, and all of them were collected, among which 401 were selected as the final questionnaire results.

Part I: Result of Data Analysis on Questionnaire: Demographic Information

As can be seen from the above table, in terms of (1) Gender distribution, most samples are "1. Female", accounting for 50.62%. And 2. From the Age distribution (2), most samples are "31-40 years old ", with a proportion of 46.13%. (3) Select "1. Teaching assistant" for more than 50% of Your professional title samples. 2. The percentage of Lecturer who understood the sample was 57.81 percent.

Part II questionnaire data analysis results: variable analysis 81 questions are generally about arithmetic, and the mean value (Mean) is between 3.19-4.06, indicating that respondents have opinions on variable values at this level. The mean value of arithmetic is from moderate to high, and the standard deviation (S.D) is between 0.501- 2.032. It indicates that respondents' views on variables are quite different. The variable with the largest arithmetic value ($\bar{X}$) is variable 1.Blockchain technology. The arithmetic mean ($\bar{X}$) and standard deviation (S.D) were 4.06 and 2.032, indicating that all researchers had a relatively consistent acceptance degree of the project. The minimum value Skewness is between 0.001 -0.231, indicating that there is no extreme value. The minimum value Kurtosis is between 0.189-2.009 indicating that there is no extreme value.

Table 4.5 Data analysis results of the third part of the questionnaire: Kaiser Meyer Olkin and Bartlett test

KMO and Bartlett		
KMO price		0.972
Bartlett Sphelicity test	Approximate california	26433.082
	df	3321
	p price	0.000

Factor analysis and exploration of quantitative data can be condensed into several aspects (factors), each aspect (factors) and the corresponding relationship;

The data of this study were rotated using the maximum variance rotation method (varimax) to find out the correspondence between the factors and the study items. The above table shows the information extraction of the factors for the research items, and the correspondence between the factors and the research items. It can be seen from the above table that the corresponding common degree value of all the research items is higher than 0.4, which means that there is a strong correlation between the research items and the factors, and the factors can effectively extract the information. After ensuring that the factor can extract most of the information of the study item, then analyze the correspondence between the factor and the study item (when the absolute value of the factor load coefficient is greater than 0.4, the correspondence with the factor is indicated).

Table 4.6 Variance interpretation rate

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	%of Variance	Cumulative %	Total	%of Variance	Cumulative %	Total	%of Variance	Cumulative %
1	32.590	39.265	39.265	32.590	39.265	39.265	19.092	32.590	39.265
2	9.060	10.915	50.180	9.060	10.915	50.180	17.839	9.060	10.915
3	5.390	6.494	56.675	5.390	6.494	56.675	7.472	5.390	6.494
4	3.379	4.071	60.745	3.379	4.071	60.745	4.785	3.379	4.071
5	1.617	1.948	62.693	1.617	1.948	62.693	2.840	1.617	1.948
6	1.017	1.226	63.919	1.017	1.226	63.919	1.025	1.017	1.226
7	.960	1.156	65.075						

The above table analyses the situation of factor extraction and the information amount of factor extraction. It can be seen from the above table: A total of 6 factors were extracted from factor analysis, and the variance interpretation rates of these 6 factors after rotation were 39.265% , 50.180 % 56.675 % 60.745 %, 62.693 %, 63.919 %, respectively. The interpretation rate of cumulative variance after rotation is 63.919 %.

Table 4.7 Variance interpretation rate

Variance interpretation rate table						
Factor	**Rotational front difference interpretation rate**			**Explanation rate of variance after rotation**		
	Characteristic root	Variance interpretation rate %	Cumulative %	Characteristic root	Variance interpretation rate %	Cumulative %
1	32.590	39.265	39.265	32.590	39.265	39.265
2	9.060	10.915	50.180	9.060	10.915	50.180
3	5.390	6.494	56.675	5.390	6.494	56.675
4	3.379	4.071	60.745	3.379	4.071	60.745
5	1.617	1.948	62.693	1.617	1.948	62.693

Table 4.7 analyses the situation of factor extraction and the information amount of factor extraction. It can be seen that: A total of 5 factors were extracted from factor analysis, all of which had characteristic root values greater than 1. The variance interpretation rates of these 5 factors after rotation were 39.265% , 50.180 % 56.675 % 60.745 %, and 62.693 %, %, respectively, and the cumulative variance interpretation rates after rotation were 62.693 %.

In addition, the factor loading, variables described in each of the main components after rotating the axis as shown in Table 4.8.

Table 4.8 Factor loading, variables described in each of the main components after rotating the axis

Variable	**Component**				
	1	2	3	4	5
a4 Decentralized ownership	.794				
a52 The impact of blockchain privacy protection technology on user trust	.788				
a7 Consensus mechanism	.788				
a50 The impact of cross-chain interoperability on blockchain project cooperation	.774				
a43 Energy efficiency and environmental impact of the blockchain system	.771				
a45 Resilience and stability of the consensus mechanisms	.768				
a2 Decentralized decision-making	.768				

a1 Blockchain technology	.766				
a51 The influence of new incentives on participants' behaviour	.765				
a49 Maturity and stability of decentralized financial markets	.763				
a16 Venture capital financing structure	.762				
a10 Cryptographic primitives (like a verifiable random function)	.760				
a8 Scalability of the decentralized networks	.759				
a11 Smart contract	.759				
a42 Legal and regulatory compliance	.759				
a12 Legal and regulatory framework	.757				
a46 Security and privacy risks of blockchain systems enabled by the Internet of Things	.757				
a39 IP tracking, licensing, and enforcement	.755				
a5 Decentralized identity	.754				
a41 Venture capital financing success and innovation	.752				
a14 Intellectual property management system	.751				
a17 Network integration	.750				
a47 Satisfaction and engagement of the DAO members	.749				
a40 Vulnerabilities and challenges in decentralized exchanges	.748				
a44 Scalability and performance of a blockchain network	.736				
a15 Decentralized exchanges	.736				
a9 The security and privacy of the blockchain system	.733				
a6 Governance mechanism	.731				
a3 Decentralized ownership	.727				
a13 Energy consumption and mining costs	.719				
a55 Impact of Web 3.0 infrastructure and protocols on the Internet industry		.759			
a54 Sustainability and profitability of the DAO		.747			
a72 Smart contract		.746			

a69 Solve economic problems		.743			
a79 Long-term, effective and sustainable return on investment model		.735			
a80 The application mode of blockchain technology in the education field		.730			
a53 The impact of mortgage and DeFi services on financial markets and innovation		.730			
a66 Inspire participants		.729			
a74 Optimize management tools and new protocols		.729			
a57 Non-homogenized Tokens (NFT)		.728			
a68 Improve the teaching quality and research level		.727			
a81 Promote the transformation of the global education industry		.726			
a65 Reasonable project allocation		.721			
a60 Decentralized Application (DApps)		.721			
a58 Network effect		.720			
a76 Fair allocation of resources		.719			
a64 Weight mechanism design		.718			
a61 Oracle Problems and solutions		.716			
a62 DAO mergers and forks		.715			
a75 Academic and scientific research resources		.714			
a77 Local decentralization		.713			
a59 Developer and user education		.710			
a70 Improve the treatment of faculty and staff		.705			
a78 Academic development and career planning		.704			
a67 Efficient resource allocation		.702			
a73 System security, scalability, and interoperability		.700			
a63 Community governance model		.697			
a56 The impact of blockchain standards and interoperability on the entire ecosystem		.682			
a22 Cross-chain interoperability			.736		

a27 Types and business model of the DAO			.726		
a28 Web 3.0 infrastructure and protocols			.716		
a21 Under-chain governance structure			.705		
a30 Cross-chain interoperability			.695		
a20 Engagement and community activity			.694		
a23 Incentive mechanism design			.686		
a24 Programmability of smart contracts			.682		
a25 Privacy protection technology (such as proof of zero knowledge)			.675		
a26 Mortgage and decentralized finance (DeFi) services			.671		
a19 Governance tokens			.653		
a35 Collective wisdom of a decentralized organization				.767	
a34 Decision autonomy				.748	
a37 The value and price of cryptocurrencies (such as Bitcoin)				.720	
a36 The application of blockchain technology in various industries				.708	
a33 Transparency of a decentralized organization				.693	
a38 Market dynamics and disruption				.687	
a31 Efficiency of a decentralized organization				.672	
a32 Trust in a decentralized system				.636	
a48 The penetration rate of blockchain technology in different industries					.797
a18 Coin economy					.786
a29 Blockchain standards and interoperability					.786
a71 Blockchain technology applications					.764

The data in this study were rotated using the maximum variance rotation method (varimax) in order to find out the corresponding relationship between factors and study items. The above table shows the information extraction of research items by factors and the corresponding relationship between factors and research items. It can be seen from the above table that the common degree value of all research items is higher than 0.6, which means that there is a strong correlation between research items and factors, and factors can effectively extract information. After ensuring that the factor can extract most of the information of the

research item, the corresponding relationship between the factor and the research item is analysed (when the absolute value of the factor loading coefficient is greater than 0.4, it indicates that the item has a corresponding relationship with the factor).

Table 4.9 Components of design major education management

Order	Assembly	Number of variables	Factor loading
1	Component 1	30	0.719-0.794
2	Component 2	28	0.682-0.759
3	Component 3	11	0.653-0.736
4	Component 4	8	0.636-0.767
5	Component 5	4	0.764-0.797
	All	81	

According to Table 4.9, there are 5 qualified parts as follows: Component 1 contains 30 variables that describe the component. Coefficient load is between 0.719-0.794; Component 2 contains 27 variables, and the load coefficient of component is between 0.682-0.759. Component 3 contains 11 variables describing components with factor loads ranging from 0.653-0.736. Component 4 contains 8 variables, describing the load between components and factors ranging from 0.636-0.767; Component 5 contains 4 variables, describing the load between components and factors ranging from 0.764-0.797; the total number of variables describing these 5 variables is 53 variables, and the factor load ranges from 0.719-0.797.

On the basis of exploratory factor analysis (EFA), the variables were extracted and the key component variables were analysed seems to get five effectiveness of decentralized autonomous organization for university in the Web3.0 era.

Component 1 can consist of 30 variables, there is no value below 0.5. All variables can be used the researchers named it **" Blockchain technology ".**

Component 2 can consist of 28 variables, there is no value below 0.5. All variables can be used the researchers named it **" Legal and regulatory ".**

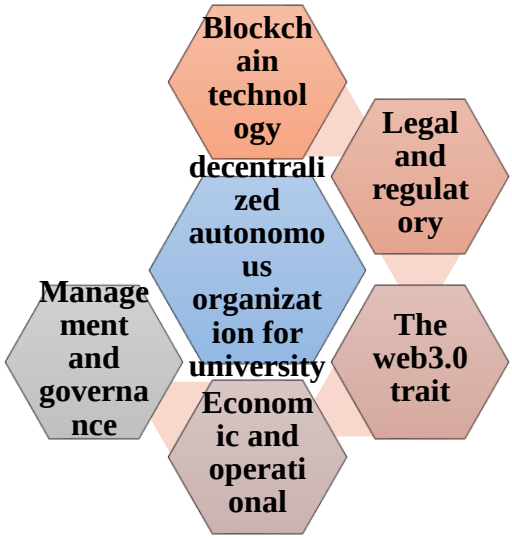
Component 3 can consist of 11 variables, there is no value below 0.5. All variables can be used the researchers named it **" The web3.0 trait ".**

Component 4 can consist of 8 variables, there is no value below 0.5. All variables can be used the researchers named it **" Economic and operational ".**

Component 5 can consist of 4 variables, there is no value below 0.5. All variables can be used the researchers named it **" Management and governance ".**

Exploratory factor analysis was used for management. It can be summarized as follows

Figure 4-1 The effectiveness of decentralized autonomous organization for university in the Web3.0 era..



4.2 Result of Data Analysis for Research Objective 2

The guideline to enhance effectiveness of decentralized autonomous organization for university in the Web3.0 era. Through qualitative research, quantitative research and factor analysis, the researchers obtained The guideline to enhance effectiveness of decentralized autonomous organization for university in the Web3.0 era. A total of seven experts participated in the panel's five sections. Finally, the relevant content is summarized, and There are 22 guiding principles for the to enhance effectiveness of decentralized autonomous organization for university in the Web3.0 era, including 4 guiding principles for Blockchain technology components, 2 guiding principles for the Legal and regulatory components, 5 guiding principles for the web3.0 trait components, Can guiding principles for the Economic and operational 4 guiding principles for the management of teaching achievements output components. And 12 guiding principles for the Management and governance components..

Conclusion

The study procedure included two steps:

(1) result of key effectiveness of decentralized autonomous organization for university in the Web3.0 era. The researcher reviews literature found 82 Sub Variables and there were 18 variables from the interview of key informants. The researcher was to combined the content analysis of the literature review and the analysis of semi-structured interviews with experts, a total of 82 variables are obtained and screened A total of 65 Main Variables with a frequency greater than 50% were identified. After the expert IOC certification, variables with a score of less than 0.6 were removed, Finally, with 6 dimensions and 82 variables, and 82 variables will be used for questionnaire distribution. And prepared a research instrument as a five-point evaluation subscale questionnaire.

On the basis of exploratory factor analysis (EFA), the variables were extracted and the key component variables were analysed seems to get five effectiveness of decentralized autonomous organization for university in the Web3.0 era. Researchers then analysed The effectiveness of decentralized autonomous organization for university in the Web3.0 era consisted of 5 Component as follow; Component 1 can consist of 30 variables, there is no value below 0.5. All variables can be used the researchers named it **" Blockchain technology ".** Component 2 can consist of 28 variables, there is no value below 0.5. All variables can be used the researchers named it **" Legal and regulatory ".** Component 3 can consist of 11 variables, there is no value below 0.5. All variables can be used the researchers named it **" The web3.0 trait ".** Component 4 can consist of 8 variables, there is no value below 0.5. All variables can be used the researchers named it **" Economic and operational ".** and Component 5 can consist of 4 variables, there is no value below 0.5. All variables can be used the researchers named it **" Management and governance ".**

(2) the guideline to enhance effectiveness of decentralized autonomous organization for university in the Web3.0 era. A total of seven experts participated in the panel's five sections. Finally, the relevant content is summarized, which are divided into 5 parts as There are 22 guiding principles for the to enhance effectiveness of decentralized autonomous organization for university in the Web3.0 era, including 4 guiding principles for Blockchain technology components, 2 guiding principles for the Legal and regulatory components, 5 guiding principles for the The web3.0 trait components, 1 guiding principles for the Economic and operational 4 guiding principles for the management of teaching achievements output components. And 12 guiding principles for the Management and governance components.

Discussion

This research finding was in accordance with the theories which was found that Blockchain, which is one of the most cutting-edge technologies to emerge in the last decade, has received substantial attention since it burst onto the scene in 2008. As a field that is still in its infancy, there are a plethora of potential applications in various domains, and the movement to incorporate blockchain technology into traditional systems is gaining momentum around the world. For example, in sub-Saharan Africa, there is a growing market for cryptocurrencies based on blockchain technology, with a large proportion of users now utilizing such currencies for regular financial interactions, such as savings, retail commerce, and international remittances, rather than as a vehicle for speculation, thus deeply integrating cryptocurrencies into their daily financial activities (Grauer et al., 2022b). Another example is the adoption of the first such cryptocurrency, Bitcoin, as legal tender by El Salvador in September 2021, with the aim of promoting financial inclusion for the approximately 70 percent of Salvadorans who do not have access to traditional financial services (Aleman, 2021; Government of El Salvador, 2021). Furthermore, its potential extends beyond digital money. In December 2021, Dubai officially announced that it had completed a full transition to a paperless government. Blockchain has contributed significantly to its implementation (Government of Dubai, 2021; Malak, 2021). However, this relatively immature technology simultaneously raises new challenges. For instance, Grauer et al. (2022a) reported that the blockchain industry is fueling a large number of criminal activities, including money laundering, malware, dark web markets, and scams.

A blockchain is a decentralized, distributed ledger that is used to record transactions across a network of computers. It consists of a series of blocks, each of which contains a record of multiple transactions. The blocks are linked together in a chain, with each block containing a unique code called a "hash" that identifies it and links it to the previous block in the chain.Cryptographer David Chaum first proposed a blockchain-like protocol in his 1982 dissertation "Computer Systems Established, Maintained, and Trusted by Mutually Suspicious Groups." Further work on a cryptographically secured chain of blocks was described in 1991 by Stuart Haber and W. Scott Stornetta. They wanted to implement a system wherein document timestamps could not be tampered with. In 1992, Haber, Stornetta, and Dave Bayer incorporated Merkle trees into the design, which improved its efficiency by allowing several document certificates to be collected into one block. Under their company Surety, their document certificate hashes have been published in The New York Times every week since 1995. The design was implemented the following year by Nakamoto as a core component of the cryptocurrency bitcoin, where it serves as the public ledger for all transactions on the network.In August 2014, the bitcoin blockchain file size, containing records of all transactions that have occurred on the network, reached 20 GB (gigabytes). In January 2015, the size had grown to almost 30 GB, and from January 2016 to January 2017, the bitcoin blockchain grew from 50 GB to 100 GB in size. The ledger size had exceeded 200 GB by early 2020. The words block and chain were used separately in Satoshi Nakamoto's original paper, but were eventually popularized as a single word, blockchain, by 2016.Industry trade groups joined to create the Global Blockchain Forum in 2016, an initiative of the Chamber of Digital Commerce. In May 2018, Gartner found that only 1% of CIOs indicated any kind of blockchain adoption within their organisations, and only 8% of CIOs were in the short-term "planning or [looking at] active experimentation with blockchain". For the year 2019 Gartner reported 5% of CIOs believed blockchain technology was a 'game-changer' for their business.

1. Decentralization: Blockchain technology is decentralized, meaning that it is not controlled by a central authority or server. Instead, it relies on a network of computers to validate and record transactions.

2. Immutability: Once a transaction has been recorded on the blockchain, it cannot be altered or deleted. This makes the blockchain a secure and tamper-proof record of transactions.

3. Transparency: Transactions recorded on the blockchain are visible to all participants in the network, making the blockchain transparent.

4.Smart contracts: A smart contract is a self-executing contract with the terms of the agreement between buyer and seller being directly written into lines of code. Smart contracts can be used on the blockchain to automate and enforce the terms of an agreement.

5.Cryptocurrency: Cryptocurrency is a digital asset that uses cryptography for security and is based on the principles of blockchain technology. It can be used as a medium of exchange or a store of value, and is often used in conjunction with blockchain technology.

This research finding was in accordance with the theories or research of Chowdhury, N. (2019 : 1). Inside Blockchain, Bitcoin, and Cryptocurrencies There are two main different types of blockchains available, public and private. All other blockchains are public or private blockchains with various Settings, structures and controls. Public blockchains have absolutely

no access restrictions. Anyone with an Internet connection can act as a participating node, sending transactions and being a verifier. To keep such a network running and incentivise miners to keep digging, blockchain offers some form of financial incentive or reward. It usually comes in the form of a gift of some local currency, but sometimes it can also be a fee. Private blockchains, on the other hand, require permissions because node participation and validator access are limited in such blockchains. You cannot join a private blockchain unless invited by the network administrator. This type of blockchain can be seen as a middle ground for companies interested in blockchain technology in general but not comfortable with the level of control offered by public networks. Typically, companies seek to incorporate blockchain into their accounting and record-keeping procedures without sacrificing autonomy or risking exposing sensitive data to the open Internet. And the same direction with Wohrer,M.;Zdun, U. (2018)"Smart contracts: security patterns in the ethereum ecosystem and solidity," : Smart contracts that build up on blockchain technologies are receiving great attention in new business applications and the scientific community, because they allow untrusted parties to manifest contract terms in program code and thus eliminate the need for a trusted third party. The creation process of writing well performing and secure contracts in Ethereum, which is today's most prominent smart contract platform, is a difficult task. Research on this topic has only recently started in industry and science. Based on an analysis of collected data with Grounded Theory techniques, we have elaborated several common security patterns, which we describe in detail on the basis of Solidity, the dominating programming language for Ethereum. The presented patterns describe solutions to typical security issues and can be applied by Solidity developers to mitigate typical attack scenarios.

Recommendations

This research finding may provide itemized recommendations based on research findings in three aspects:

Education and Research:

a. Design courses specifically for decentralized autonomous organizations (DAO) to improve the understanding and understanding of DAO.

b. Participate the students in the creation and management of DAO through practical projects, and improve the practical operation ability.

c. Scholars are encouraged to carry out academic research in the field of DAO and promote the development of theory and practice.

d. Improve the teaching management and evaluation through DAO, and improve the quality of teaching.

Management and governance:

a. Use DAO to achieve fair and transparent resource allocation and improve management efficiency.

b. Explore the application of DAO in university governance, and realize the partial decentralized or comprehensive decentralized governance model.

c. Use DAO to manage university investment projects to ensure a long-term, effective and sustainable return on investment.

d. Optimize the project management process through DAO to improve the efficiency and quality of project execution.

e. Use DAO to improve staff treatment management and improve staff satisfaction.

Technology and Innovation:

a. Focus on the latest technological advances in the DAO field and apply it to teaching, research and management in universities.

b. Cooperate with DAO enterprises, research institutions and government departments to jointly promote the development and application of DAO technology.

c. Cooperate with enterprises in different industries to discuss the application and development prospects of DAO technology in various industries.

d. Focus on the security and privacy issues of DAO, and carry out relevant research and technical improvements.

5.3.1 Recommendation for Policies Formulation

As a form of decentralized autonomous organization (DAO), based on blockchain technology

1. Establish a special DAO committee, responsible for formulating and implementing DAO policies within universities.

2. The committee shall include representatives of teachers, students, administrators and other parties to ensure a diverse perspective and full participation.

3. Provide courses on blockchain and DAO, including basic theory, practical operation and case analysis.

4. Encourage teachers and students to participate in DAO related projects, provide necessary support and guidance, and promote the improvement of academic research and practical ability.

5. Formulate detailed resource allocation policies to ensure that teaching, research and other activities are fully supported.

6. A DAO supervision group is set up to supervise and evaluate the DAO operation within universities to ensure that it is fair, transparent and effective.

7. Strengthen the cooperation with other universities, research institutions and enterprises in the field of DAO, and share resources and technologies.

5.3.2 Recommendation for Practical Application

1. Create a decentralized academic copyright management platform. Using blockchain technology, universities or academic institutions can create a decentralized academic copyright management platform. The platform will provide a transparent, credible environment for the registration, storage, tracking and management of academic achievements, and facilitate the joint participation of authors, publishers and users.

2. Registration and certification of academic achievements to the decentralized platform and register the copyright on the platform. Blockchain technology will ensure that the information stored on the chain cannot be tampered with, ensuring the originality and uniqueness of academic results.

3. Equity distribution and incentive mechanism, The platform can formulate fair equity distribution rules to ensure that the rights and interests of authors, publishers and users are reasonably protected. At the same time, through the smart contract technology, can automatically execute the copyright income distribution, improve the efficiency of income distribution.

4. Tracking and supervision of academic achievements. The decentralized academic copyright management platform can track the dissemination and use of academic achievements in real time, and help authors to detect potential copyright infringement in time. At the same

time, academic institutions and universities can also use platforms to monitor the dissemination of academic achievements to ensure that academic norms are observed.

5. Intellectual property rights protection and rights protection. The decentralized academic copyright management platform can provide strong support for intellectual property protection. Once an infringement is found, authors and academic institutions can quickly take measures to protect their rights through the platform to ensure that their rights and interests are not infringed. More what is important is that academic papers can be made into non-homogeneous tokens (NFT) to achieve the economic feedback brought by citation.

5.3.3 Further research recommendations

Here are some further research recommendations for the application of university decentralized autonomous organizations (DAO):

- Develop efficient voting and consensus mechanisms to better meet diverse needs involving curriculum setting, resource allocation, and decision-making.
- Study how to introduce incentives to stimulate the active participation of teachers, students and administrators while ensuring the quality of teaching.
- Explore how to develop rational pricing strategies for academic NFT to reflect its influence and value in academia.
- To study how to design effective incentives in the NFT market to encourage the creation, dissemination and application of academic papers.
- Explore how to use blockchain and smart contract technologies to manage project progress, evaluate results, and assign credits.
- To study how to use decentralized platforms to promote interdisciplinary and cross-departmental cooperation to achieve higher quality project-based courses.
- Analyze how to encourage teachers and students to actively participate in the project-based courses through the incentive mechanism to improve the teaching quality and student satisfaction.

Reference

Anil ,D (2021). *"NFTs Weren't Supposed to End Like This"*. The Atlantic. Retrieved May 5, 2021.

Alan,S.T.; Farid,J; Zhang, H; Enis,J (January 2019). "On the Origins and Variations of Blockchain Technologies". *IEEE Security Privacy*. 17 (1), 72–77. arXiv:1810.06130. doi:10.1109/MSEC.2019.2893730.ISSN 1558-4046. S2CID 53114747.

Alexander,O. (20 July 2017). "Crypto Exchange FTX Valued at $18 Billion in Funding Round". *The Wall Street Journal.* ISSN 0099-9660.

Aaron,B. (2017)."Are Cryptocurrencies an Asset Class? Yes and No". www.bloomberg.com.

Bernard,B.M.(1990). From transactional to transformational leadership: Learning to share the vision,*Organizational Dynamics*,Volume 18, Issue 3,Pages 19-31,ISSN 0090-2616, https://doi.org/10.1016/0090-2616(90)90061-S

Bob,S (2021). "*A 1997 PROPHECY: BITCOIN AND THE UNFOLDING OF 'THE SOVEREIGN INDIVIDUAL' THESIS*". Bitcoin Magazine.

Chowdhury, N. (2019). *Inside Blockchain*, Bitcoin, and Cryptocurrencies (100050770X, 9781000507706th ed.). CRC Press.

Crypto, Web3 and the Metaverse" (PDF). Bennett Institute for Public Policy. Archived (PDF) from the original on August 15, 2022.

David,Y. (2022). "*Crypto's Long-Awaited 'Merge' Reaches the Finish Line*". The New York Times. Retrieved 16 September 2022.

Elizabeth,H (March 17, 2021). *"Explainer: NFTs are hot. So what are they?"*. Reuters. Retrieved April 6, 2021.

Gilad,E.(2022)."*What Is Web3, Anyway?"*. Wired. ISSN 1059-1028. Archived from the original on.

Greenberg.A. (2011). *"Crypto Currency"*. Forbes. Archived from the original on 31 August 2014.

Ingolf ,P.G, A.; Brett,S (2021). *"Cryptocurrency"*. Internet Policy Review. 10 (2). doi:10.14763/2021.2.1561. ISSN 2197-6775.

Ian,A (8 September 2015). *"If Banks Want Benefits of Blockchains, They Must Go Permissionless"*. International Business Times. Archived from the original on 12 September 2015.

Jan,L (January 2018). "Possible State Approaches to Cryptocurrencies". *Journal of Systems Integration.* 9 (1), 19–31. doi:10.20470/jsi.v9i1.335.

Jeremy,H (2022). *"FTX Goes Bankrupt in Stunning Reversal for Crypto Exchange"*. Bloomberg News. Retrieved 28 December 2022.

Joel,K (2022). "*The Fallout of the FTX Collapse*". Wired.

Julie,P. (2017)"Requiem for a Bright Idea". Forbes. Archived from the original on 30 August 2017. "How To Make A Mint: The Cryptography of Anonymous Electronic Cash". groups.csail.mit.edu. Archived from the original on 26 October 2017. Retrieved 11 January 2018.

Killer,H.(4 May 2018). *Only 1% of Companies Are Using Blockchain, Gartner Reports | Artificial Lawyer"*. Artificial Lawyer.

Liu, Z; Xiang, Y; Shi, J; Gao, P; Wang, H; Xiao, X; Wen, B; Li, Q; Hu, Y (2021). "Make Web3.0 Connected". *IEEE Transactions on Dependable and Secure Computing*. 19 (5): 2965–2981. doi:10.1109/TDSC.2021.3079315. ISSN 1941-0018. S2CID 236732697.

Liu, J; Sajjadu,Rr; Apostolos.S (2020). "Cryptocurrency Shocks". *SSRN Electronic Journal.* doi:10.2139/ssrn.3744260. ISSN 1556-5068. S2CID 233751995.

Mak, Aaron (November 9, 2021). "*What Is Web3 and Why Are All the Crypto People Suddenly Talking About It?"*. Slate. Archived from the original

Maria,J.(12 May 2020). Blockchain in Digital Marketing: A New Paradigm of Trust. *Maria Johnsen.* p. 6. ISBN 979-8-6448-7308-1.

Monia,M .(2018). *"Cryptocurrency"*. Ekonomika. 64 (1): 105–122. doi:10.5937/ekonomika 1801105M. ISSN 0350-137X.

Panetta,K. (2018). *"Digital Business: CIO Agenda 2019: Exploit Transformational Technologies."* Gartner website

Potts,J . Rennie,E (27 Sep 2019). A Research Agenda for Creative Industries,Chapter 6: Web3 and the creative industries: how blockchains are reshaping business models ,Monograph Book

MacKenzie,S (27 August 2021). "*Cuba's central bank now recognizes cryptocurrencies such as bitcoin"*. CNBC.

Sumeet,C; MeganG; AhmedA; ,John,M; Lananh,N; Elizabeth,H;Saeed,A; John.S.F (2022). *"After FTX collapse, pressure builds for tougher crypto rules"*. Reuters.

Rob,W (28 December 2022). *"After FTX's spectacular collapse, where does crypto go from here?"*. NBC News.

Sarah,C (May 7, 2021). *"Sotheby's Is Selling the First NFT Ever Minted – and Bidding Starts at $100"*. Artnet News.

Paul,V (2022). "*NFT Sales Are Flatlining"*. The Wall Street Journal.

Sigalos, MacKenzie (2021). "Cuba's central bank now recognizes cryptocurrencies such as bitcoin". CNBC.

Sumeet,C; Megan,D;Ahmed,A; John,M; Lananh,N; Elizabeth,H; Saeed,A;John,F.S (2 December 2022). "After FTX collapse, pressure builds for tougher crypto rules". Reuters.

Oberhaus, D. (2018, August 28). The World’s Oldest Blockchain Has Been Hiding in the New York Times Since 1995. Https://Www.

Narayanan,A. Joseph, B., Edward, F., Andrew, M., & Steven , G. (2016). Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction. ISBN 978-0-691-17169-2.

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