



**A Blockchain Framework for Preserving Music Intellectual
Property Rights**

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<i>Article History</i>	<i>Abstract</i>
<p>Received: 7 May 2023 Revised: 1 October 2023 Accepted: 7 November 2023</p>	<p>The continuous strengthening of intellectual property protection has made the analysis of music intellectual property framework a research hotspot, and also promoted the integration of blockchain and intellectual property. The original IP protection framework could not solve the problem of music IP protection, and IP protection was ineffective. Therefore, this paper proposes a framework based on blockchain technology to analyze the protection of music intellectual property rights. Firstly, the blockchain server is used to store the music intellectual property rights, and the continuity judgment is made according to the characteristics of the intellectual property data to form the block data of the time series. Then, according to the intellectual property results stored in each server, the blockchain framework with different protection levels is compared with the intellectual property protection requirements. After simulation test and analysis, the framework based on blockchain technology can improve the security of music intellectual property data, reduce the tampering rate of property rights data, remove the centralization of intellectual property rights, and simplify the intellectual property protection process.</p>
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1. Introduction

1.1 Research on Blockchain Technology

With the continuous development of blockchain technology and the deepening of its application in the field of intellectual property[1], the intellectual property framework has also changed. The survey results show that from 2015 to 2022, the impact of blockchain technology on intellectual property protection has gradually increased[2], from the original 10% to 55%. This shows that the application of blockchain technology in the field of intellectual property protection is increasing, and it has a profound impact on the intellectual property protection framework[3]. At present, the blockchain has established its own intellectual property database and formed a series of property rights database chains[4], which not only removes the center of intellectual property protection, but also improves the security of intellectual property. However, IP protection data shows an exponential growth and is integrated with mathematics, policy, economics and other fields, generating a huge amount of data every year[5]. The original intellectual property protection

methods and intelligent methods cannot realize the data analysis of massive intellectual property rights, resulting in the decline of intellectual property protection and the excessive cumbersome intellectual property protection process[6], which cannot achieve effective intellectual property protection. How to build an intellectual property framework in a targeted manner and accurately and reasonably select intellectual property protection methods are the focus of current research on music intellectual property.

Table 1. Music IP Protection in 2010~2022

Time	Protect content		
	copyright	patent	trademark
2010	91.32	74.89	178.98
2011	81.46	66.52	122.66
2012	92.85	77.82	139.10
2013	64.69	90.84	154.54
2014	83.59	138.66	118.07
2015	83.53	167.88	178.28
2016	107.21	113.21	165.26
2017	110.69	144.39	238.15
2018	157.62	159.09	148.28
2019	189.54	162.88	226.98
2020	105.19	173.56	215.74
2021	152.62	223.04	212.98
2022	148.97	117.32	253.06
Sum	1469.28	1710.1	2352.08
mean	113.0215	131.5462	180.9292
maximum	189.54	223.04	253.06

It can be seen from Table 1 that the protection of copyright, patent and trademark rights of intellectual property rights has increased year by year, and there is a significant upward trend. Among them, the music copyright in 2019 was the highest, the patent right in 2021 was the highest, followed by the music trademark right in 2022. On the whole, the protection of music intellectual property rights has increased year by year, indicating that the demand for the protection of music intellectual property rights is relatively strong[7]. At present, the protection of music intellectual property rights has problems such as complex protection processes, quantitative protection data, and increased protection security requirements[8]. Therefore, finding an effective intellectual property protection method to meet the quantitative needs of intellectual property data and effectively simplify the intellectual property protection process is an inherent requirement for the construction of intellectual property framework.

1.2 Intellectual Property Protection Process

Some scholars put forward an intellectual property protection concept[9], integrating blockchain technology into music intellectual property protection, and the specific protection process is shown in Figure 1.

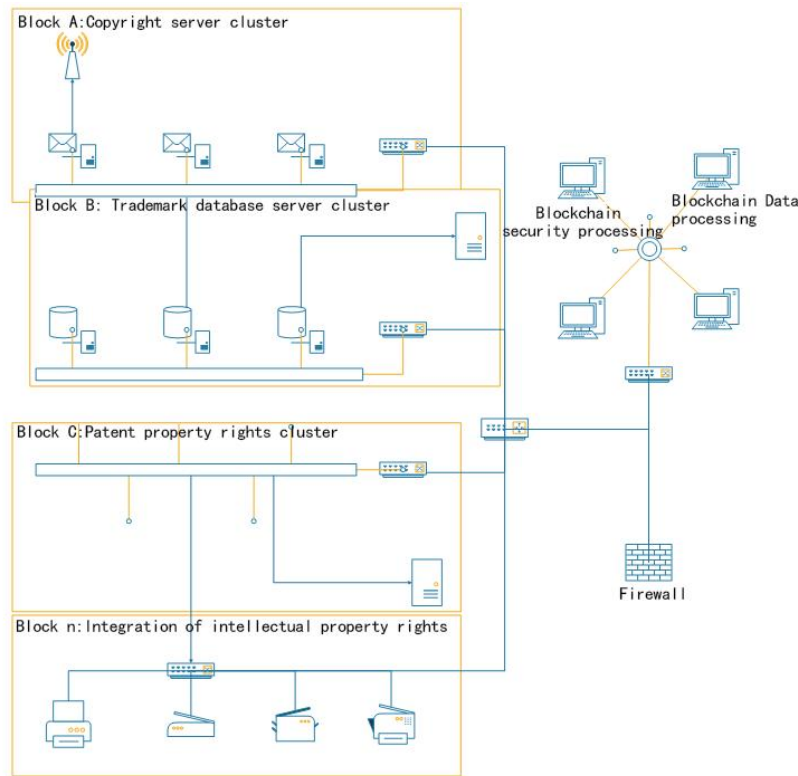


Figure 1. Schematic Diagram of Intellectual Property Protection of Blockchain

The intellectual property framework based on blockchain technology can carry out dynamic data processing capabilities[10], realize block encryption, call and coordination of music intellectual property information and music intellectual property data, judge the operation of the server, and realize the consistency analysis of intellectual property data protection. Aiming at the high complexity of music intellectual property rights, blockchain technology mines the intellectual property protection factors, content and processes to verify the analysis effect of the above links. Some scholars have integrated the continuous server in blockchain technology with intellectual property rights, and the results have proved that blockchain technology has an auxiliary decision-making role and can analyze data with a higher level of security[11]. Some scholars believe that blockchain technology belongs to the category of computers and mathematics, and the application of this technology to intellectual property protection can realize quantitative and complex data calculation, and provide support for copyright and patent protection[12]. At the same time, blockchain technology can give full play to the advantages of distributed computers to encrypt, decrypt, and set keys for intellectual property rights, and complete comprehensive analysis of supporting property rights. In addition, blockchain technology is combined with other protection measures to achieve a comprehensive analysis of intellectual property.

1.3 Impact of Block Technology on Intellectual Property Protection

The impact of blockchain technology on intellectual property protection is mainly reflected in several aspects: 1) clarify the basic framework of music intellectual property, including: the protection direction of intellectual property rights is to strengthen the protection of copyrights and patent rights, and reduce the risk of intellectual property misappropriation. Property rights data stored within distributed servers are more secure, detailing the source, author and content of music intellectual property. In addition, in the process of music intellectual property protection, it is necessary to have more than 50% of the server data support, otherwise it is difficult to realize intellectual property calls, so the overall protection security is higher[13]; 2) Process complex intellectual property data, including email information, text information, video information, and other types of natural language. Therefore, blockchain technology can mine music intellectual property rights, simplify the protection process of intellectual property rights, and propose redundant and irrelevant intellectual property data. The processing of complex data by blockchain can greatly improve the protection effect of intellectual property rights and the integrity of intellectual property

rights[14]; 3) Integration with other intelligent algorithms. Blockchain technology itself has high complex data processing capabilities and simplifies the data processing process. At the same time, the use of ant colony algorithm and Bayesian algorithm in each server can encrypt the key of intellectual property rights, ensure the accuracy and rationality of transmitted data, and improve the accuracy of protection calculation. To sum up, blockchain technology is the product of computer development to a certain stage, which can more safely analyze intellectual property and integrate with other algorithms to calculate high-precision results. In addition, the distributed server can calculate massive intellectual property data, eliminate redundant intellectual property data, and improve the efficiency of intellectual property protection.

Based on this research background, this paper conducts a theoretical analysis of the protection framework of intellectual property rights, and conducts practical case analysis combined with blockchain technology, aiming to improve the protection effect of intellectual property rights.

2. Related Works

2.1 Framework based on Blockchain Technology

The blockchain framework can realize the protection of music intellectual property rights, ensure the completeness and consistency of intellectual property rights, and have the characteristics of strong correlation and fast processing speed. Blockchain is a distributed ledger technology that realizes the sharing of information through a distributed database, removes the centralization of music intellectual property protection, and reduces the chance of data concatenation[15]. The framework based on blockchain technology can quickly process complex data in music intellectual property protection, and make intellectual property judgments based on continuous database sorting. At present, the framework based on blockchain technology is widely used in the research field of intellectual property, but it is less applied in the protection of music intellectual property. In order to conduct a more comprehensive analysis of intellectual property protection and build a reasonable blockchain technology framework, it is necessary to set the music intellectual property content, intellectual property protection standards, and intellectual property constraints, and the results are as follows.

Characteristics of music intellectual property rights: the implementation conditions of intellectual property rights is k_{ij} , the distributed computer number is NO_{ij} [16], the music intellectual property storage function is $f(x_i \cdot x_j)$, and the random selection of intellectual property rights number is $\Delta \zeta_{ii}$, then the calculation of music intellectual property rights is shown in Equation (1):

$$f(k) = \begin{cases} x_{ij} \div y_{ij}, k > 1 \\ \zeta \cdot x_{ij}, k = 1 \\ \Delta x_{ij}, k < 1 \end{cases} \quad (1)$$

Music intellectual property protection standards: The intellectual property protection function is $pro(x \cdot y)$ and belongs to any distributed computer is x_{ij} [17], and the standard calculation of intellectual property rights is shown in Equation (2):

$$\varphi(x \cdot y) = \overline{\sum_{j=1}^n k_{ij} \xrightarrow{x_{ij}} y_{ij}} \quad (2)$$

Music IP Framework: The field of music IP is dom_{ii} , the IP framework function is $cr(x)$, and the calculation of the IP framework is shown in Equation (3):

$$dom(x, |a) \propto \zeta \cdot \log(k_{ij} \cdot \frac{1}{\sqrt{x_{ij}}}) \quad (3)$$

3. Methodology

3.1 Standardized Processing of Music IP Data

The standardization process of music intellectual property data is complicated, and copyright, patent and trademark rights show iterative changes[18], so it is necessary to map the intellectual property data and build an intellectual property framework with key data values as nodes. In addition, random functions are added to simulate the information construction between distributed databases to realize reasonable calls of intellectual property data, as shown in Figure 2.

```
names = {'alpha' 'beta' 'gamma' 'delta'};
G = graph(A,names,'upper','omitselfloops')
H 'Content-Type: application/son' \
-d {{
"model": " Intellectual property ",
"prompt": " Blockchain ",
"Quantity of intellectual property rights ": 11,
"Block": 0
{
{id": " GeJL5i3A4016",
"object": "text_ property ",
"created": 0023221122323,
"model": "service-davinci-003",
"choices": [
{
" property ": "\nthis is indeed a test",
"index": 11,
"log robs": 7238232,
"finish reason": "result"
}
],
"usage": {
" Copyright _ property ": 5,
" Trademark _ property ": 7,
"total_ property ": 12
}}}
```

Figure 2. Procedure for Patent and Trademark Rights Data

As can be seen from Figure 2, the programming language is used to initialize the data of music intellectual property to ensure that the digitized data has no other attributes and realize the normality of the data. Among them, the data of copyright, patent and trademark rights are relatively discrete in terms of spatial distribution, indicating that the data of copyright[19-20], patent and trademark rights are more comprehensive and can be better projected in the plane, and the changes in the processed data are shown in Figure 3.

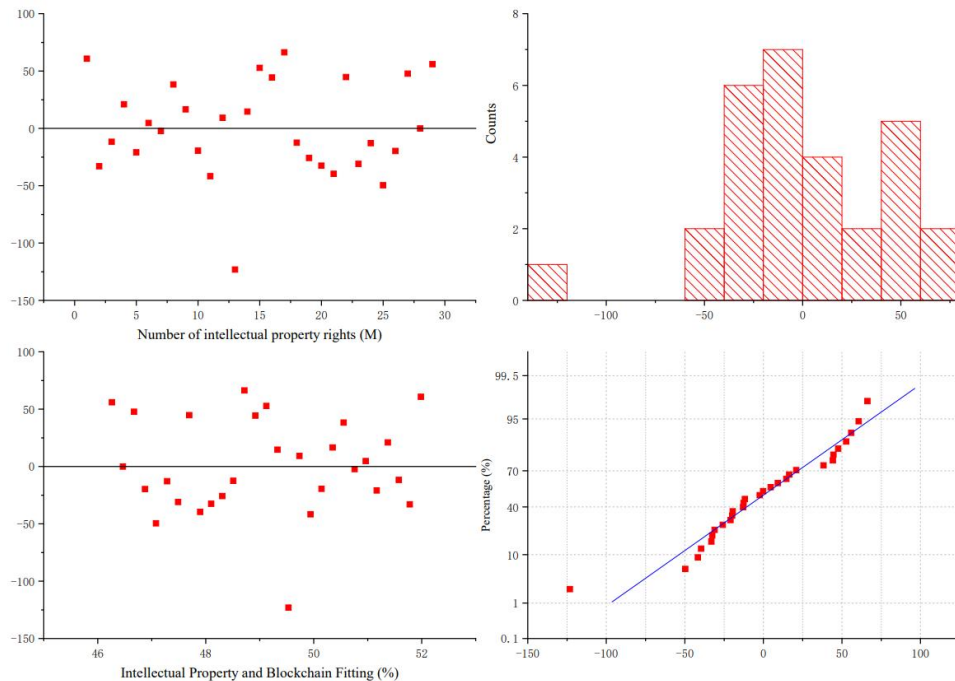


Figure 3. Residuals Processing of Music Patents (data fitting of the Sound of Music property rights on the left, corresponding residuals on the right)

The distribution of copyright, patent, and trademark data in the blockchain is shown in Table 2.

Table 2. Numerical Standardization of Patent and Trademark Rights

Block	Numeric value	Block	Numeric value	Security
NO.1	4	NO.5	4	5
	5		8	3
	8		8	4
NO.2	6	NO.6	4	2
	5		8	4
	8		4	5
NO.3	6	NO.7	7	1
	6		6	1
	8		5	3
NO.4	6	NO.8	5	4
	6		6	5
	4		5	3
Intercept	0.237	Intercept	0.215	0.142

From the data indicator processing in Table 2, it can be seen that all patents and trademark rights are standardized, and the result after processing is less than 10, indicating that the value processed by the entire blockchain meets the requirements. In addition, the numerical error of intellectual property rights is relatively small and the security is high, which further indicates the effectiveness of intellectual property data standardization.

3.2 Calculation of the IP Framework

There are three main types of intellectual property frameworks: copyright, patent and trademark. Mathematics from the above three IP perspectives.

Copyright is described using blockchain technology, calculated as shown in Equation (4):

$$F_1(x) = \sum_{i=1}^n [x_i^2] \tag{4}$$

Patent rights are the protection of intellectual property rights through the patent holder and the content of the patent, and its calculation is shown in Equation (5):

$$F_2(x) = \sum_{i=1}^n [x_i^2 - 10 \cos(2\pi x_i) + 10] \tag{5}$$

Trademark right is the integration of copyright and patent to produce intellectual property trademarks and protection, the calculation of which is shown in Equation (6):

$$F_3(x) = -20 \exp\{-0.2 \sum_{i=1}^n \sqrt{\frac{1}{n} \sum_{i=1}^n x_i^2}\} - \exp\{\frac{1}{n} \sum_{i=1}^n \cos(2\pi x_i)\} + 20 + e \tag{6}$$

After calculating the above formula, the following intellectual property protection framework can be obtained, and the results are shown in Table 3.

Table 3. Preliminary Framework for Intellectual Property Protection

Intellectual Property Content	Permissions	Intellectual Property Content	Permissions
Copyright	Regional right of publication	Trademark	Enroll
	Partial Rental Rights		Permission

	Regional broadcasting rights		Transfer
	Regional translation rights		Additional permissions
Patent	Patent	Comprehensive protection	Commercial
	Exclusivity		Public welfare
	Right of assignment		Temporality
	Permissions		Attributes

It can be seen from Table 3 that the framework based on blockchain technology can realize the initial protection of intellectual property rights, and the corresponding protection content is associated with the blockchain, and the maximum association value has been obtained, as shown in Figure 4.

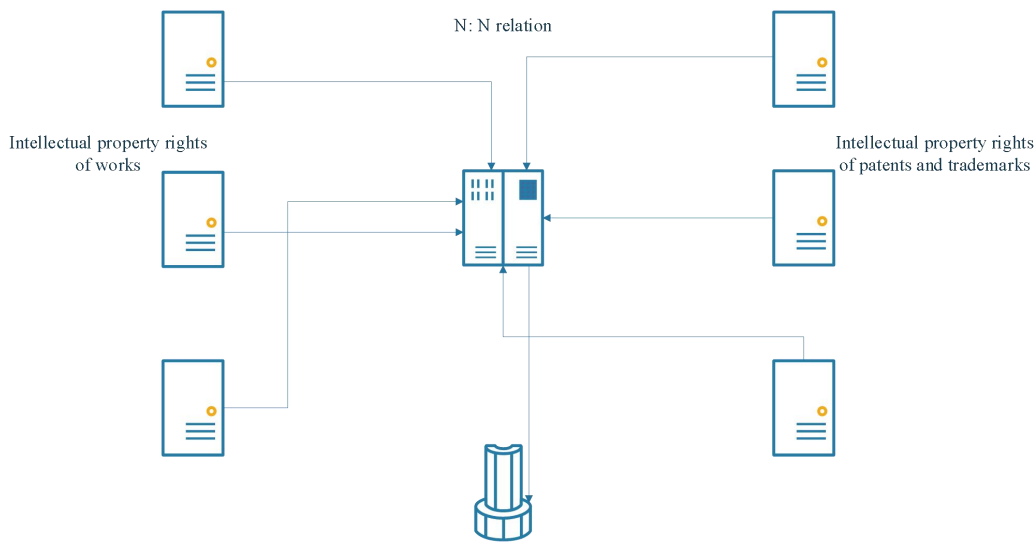


Figure 4. The Relationship between Blockchain and Music Intellectual Property

3.3 Strategies for Building IP Frameworks

The framework based on blockchain technology to build the framework of music intellectual property needs to adopt different construction strategies, and calculate the protection effect after construction, etc., the specific calculation is as follows:

- 1) The copyright construction strategy, calculated as shown in Equation (7):

$$y_{ij}(t+1) = \omega \cdot y_{ij}(t) \cup g_{ij}^k[x(t)] \quad (7)$$

- 2) The strategy for structuring trademark rights, calculated as shown in Equation (8):

$$y_{ij}(\Delta k) = \lim_{x \rightarrow \infty} \omega \cdot y_{ij}(k) \quad (8)$$

- 3) The strategy for structuring patent rights, calculated as shown in Equation (9):

$$y_{ij}(\Delta x) = n \cdot \Delta \delta \cdot \min\{g_{ij}^k\} \quad (9)$$

- 4) The selection strategy of the blockchain protection server, calculated as shown in Equation (10):

$$y_{ij}(t+1) = \max \omega \cdot \sum y_{ij}(t) \xrightarrow{x_{ij}} g_{ij}^k \quad (10)$$

The protection of intellectual property framework based on blockchain technology should realize two aspects: on the one hand, the analysis of music intellectual property copyright, trademark right and patent right is carried out, and the protection focus of different music intellectual property rights is determined; On the other hand, the analysis of blockchain technology determines the technical advantages of blockchain and the development direction. Finally, the framework of blockchain technology is preliminarily constructed, forming a collection of copyrights, patents and trademark rights.

3.4 The Process of Building a Framework for Music Intellectual Property

The framework based on blockchain technology is to integrate manual data, intellectual property evaluation standards, and intelligent algorithms, and determine protection indicators through security probability calculation, and the specific protection process is shown in Figure 5.

Standardized treatment of intellectual property rights

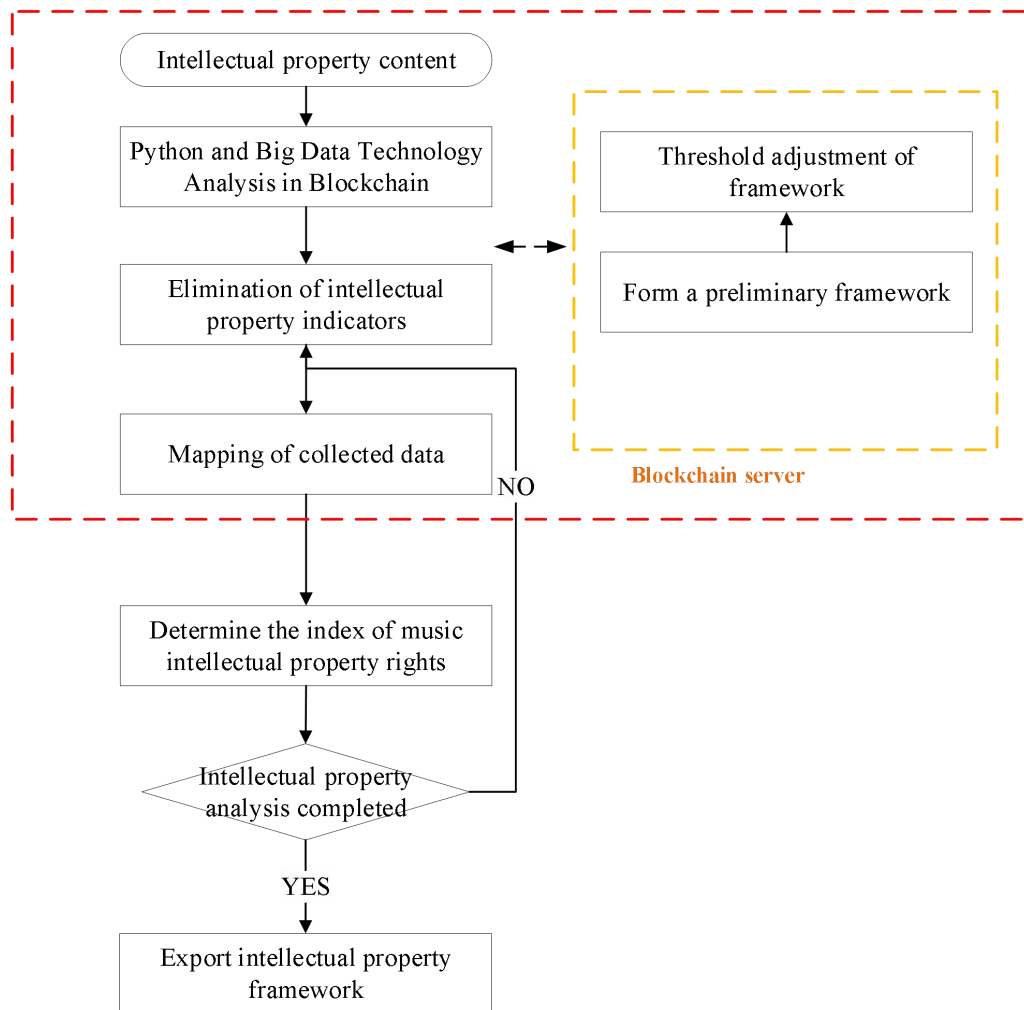


Figure 5. Framework Construction Process based on Blockchain Technology

Step 1: Determine the music intellectual property data collection and blockchain technology data collection, select the blockchain area according to the characteristics of music intellectual property, and determine the blockchain construction scheme. At the same time, the initialization data and constraints of music intellectual property rights are translated to obtain a preliminary list of music intellectual property rights.

Step 2: The data processing process of authors, patents, and trademarks should go through standardization and mapping processes to eliminate abnormal attributes of data.

Step 3: Generate blockchain functions, and use blockchain technology to describe the framework, calculate indicators, and verify initial weights and constraints.

Step 4: Calculate the maximum probability of the framework, as well as the threshold of authorship, patent and other data, simplify the amount of data calculated by the blockchain, optimize the data structure, and preliminarily determine the music intellectual property rights.

Step 5: After determining the music IP framework, calculate the maximum probability of the music IP framework, and compare and mine with other methods to verify the accuracy of blockchain technology and the advantages of blockchain technology.

Step 6: Traverse analysis of music intellectual property data collection and blockchain technology collection. If all sets are analyzed, stop the framework construction, otherwise repeat steps 2~6, and output the best framework indicators and constraints.

4. Case for Building a Music IP Framework Based on Blockchain Technology

4.1 Protection of Music Intellectual Property Rights

This article takes the intellectual property protection of popular music as an example to analyze works, patents and trademarks. The data comes from local intellectual property protection institutions and is mainly based on paper materials, electronic materials, videos, mail, and other forms, and the specific protection situation is shown in Table 4.

Table 4. Protection of Intellectual Property Rights in Music

Music genre	Application rate	Tampering rate	Protective
HOUSE	86.33	2.96	4
Britpop	85.83	1.30	3
Trip-Hop	82.60	1.60	2
Gangsta	66.01	2.07	3
Rap	87.62	1.91	2
Synth Pop	72.61	2.29	4
ORCHESTRA	34.78	3.97	2
CHAMBER POP	42.14	4.83	1
FOLK	41.35	4.45	1
Intercept		Slope	Slope
Value	Standard deviation	Standard error	After adjustment, R square
52.190	16.259	-0.204	0.946

4.2 Comprehensiveness of IP Framework for Music

Comprehensiveness is an important part of music intellectual property, so a comprehensive analysis of the framework of blockchain technology is carried out, and the results are shown in Table 5.

Table 5. Synthesis of the IP Framework

Scope of analysis	Content	Index	Comprehensive	Probability >F
Independent regional chains	copyright	publication	80.04	4.12
		hire	81.55	7.48
		disseminate	83.31	8.54
	Patent	Exclusivity	76.20	8.51

		Right of assignment	81.12	2.65
		Permissions	77.32	7.54
	Trademark	enroll	80.52	1.53
		permission	85.51	9.27
		transfer	77.64	8.70
		Additional permissions	81.16	2.14
	Comprehensive intellectual property		78.80	4.97
Local area chain	copyright	publication	80.41	8.40
		hire	77.62	1.36
		disseminate	82.26	2.40
	Patent	Exclusivity	82.01	4.76
		Right of assignment	84.35	6.92
		Permissions	80.03	2.96
	Trademark	enroll	76.48	1.65
		permission	75.45	9.30
		transfer	79.41	7.03
		Additional permissions	76.40	9.19
	Comprehensive intellectual property		81.31	1.95
Inter-region	copyright	publication	80.04	4.12
		hire	81.55	7.48
		disseminate	83.31	8.54
	Patent	Exclusivity	76.20	8.51
		Right of assignment	81.12	2.65
		Permissions	77.32	7.54
	Trademark	enroll	80.52	1.53
		permission	85.51	9.27
		transfer	77.64	8.70
		Additional permissions	81.16	2.14
	Comprehensive intellectual property		78.80	4.97

The data results in Table 5 can be displayed graphically, and the results are shown in Figure 6.

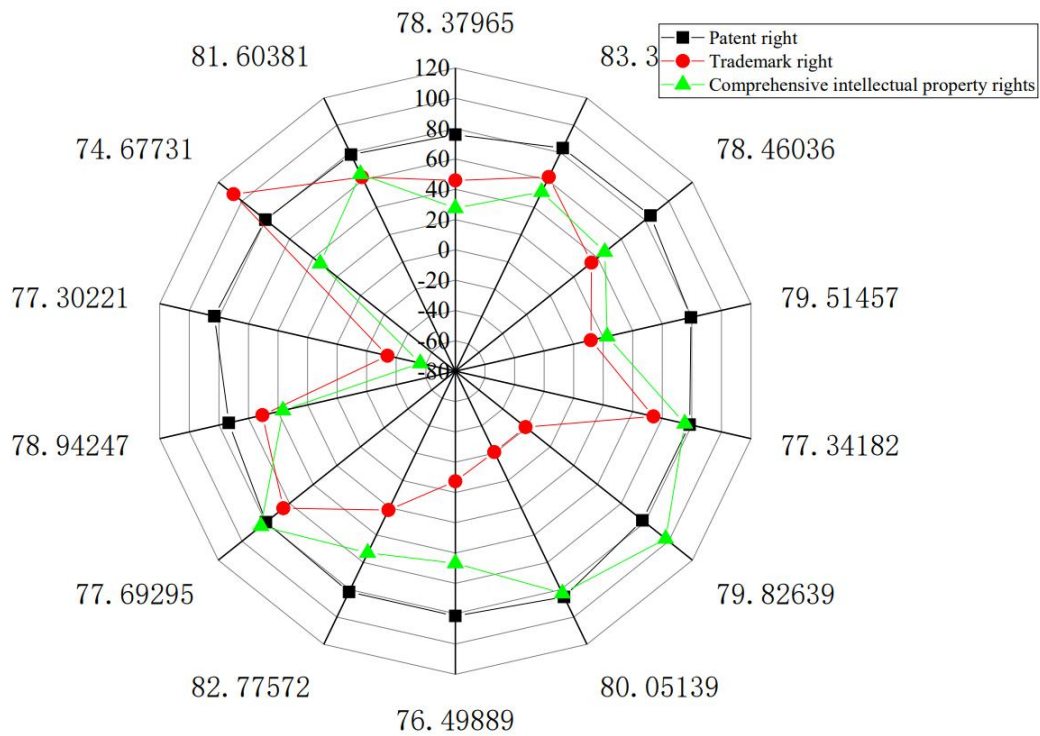


Figure 6. Synthesis of Music IP Data

It can be seen from Figure 6 that the comprehensiveness of music intellectual property rights is good, indicating that the framework construction based on blockchain technology has a good comprehensiveness, and the goal of decentralization has been achieved, which indirectly shows that the advantages of blockchain technology have been effectively played. The reason for the above problems is that blockchain technology performs distributed computing on the content of the music intellectual property framework, simplifying the complexity of intellectual property data analysis and simplifying the process of intellectual property analysis.

4.3 Conditional Compliance Rate for Music IP Framework

The basis of the construction of the music IP framework is to verify the compliance rate of the framework, and compare the compliance rate of the blockchain framework construction from different angles, and the specific results are shown in Table 6.

Table 6. Conditional Compliance Rates for the Framework of Regional Chains of Music Intellectual Property Rights

Peak type	Fit the crest area of the data	FWHM	Maximum height	Crest weighted average center	Fit the percentage of crest area of the data
Gaussian	-74.625	5.194	-25.202	75.645	-100
share	standard error	T value	Probability> t	correlation	
0	0	0	--	--	
0	1.402	53.952	0	0.898	
0	74.651	-1.866	0.076	0.945	
0	2.105	2.467	0.022	0.884	
Conditional compliance rate of music IP regional chain framework = 95.6%					

Under the conditions of the data in Table 6, the conditional compliance rate distribution results of the music IP data are obtained, as shown in Figure 7.

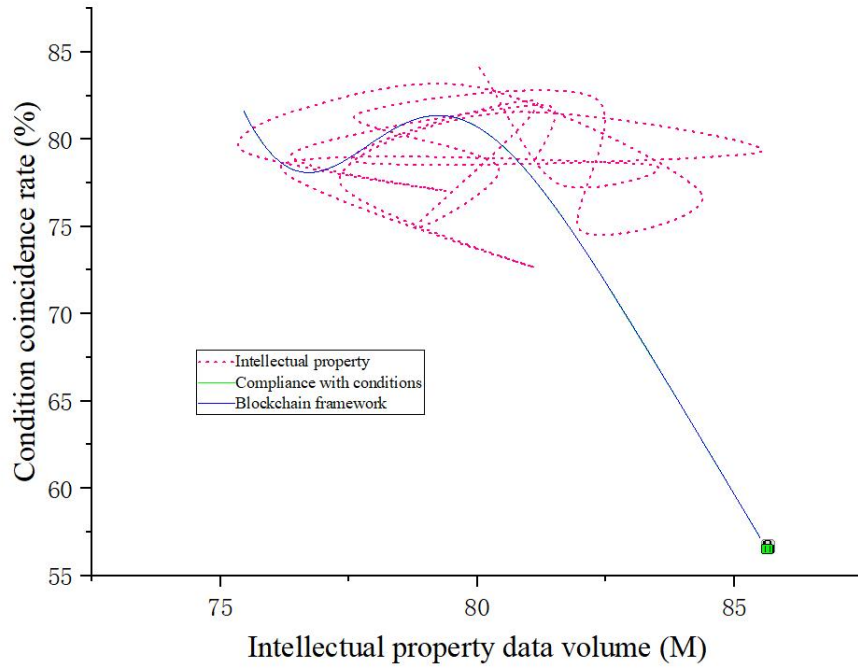


Figure 7. Blockchain Construction Compliance Rate of Music Intellectual Property

It can be seen from Figure 7 that the framework based on blockchain technology has a high compliance rate for the construction of music intellectual property framework, concentrated in about 75~85%, which is significantly higher than the previous intellectual property protection results. In addition, the framework based on blockchain technology realizes the simplified calculation of intellectual property rights, eliminates abnormal data, and increases the correlation between blockchains to 65%, so as to ensure the rationality of the music intellectual property framework.

4.4 Data Inclusion of Music IP Framework

Data inclusion is also an important part of the construction of intellectual property framework, which plays a very important role in the calculation and adjustment of music intellectual property rights, and the specific results are shown in Figure 8.

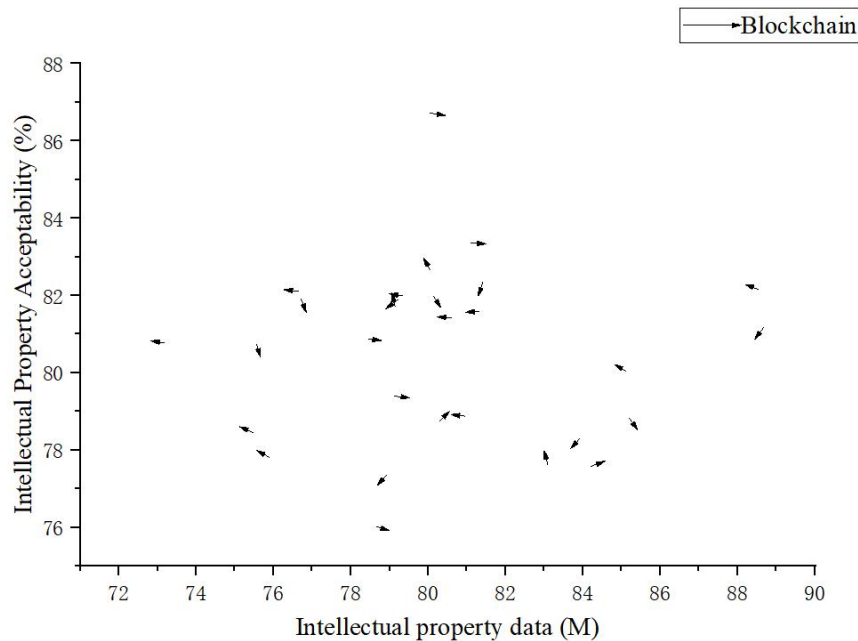


Figure 8. Data Inclusion of Music IP Framework

As can be seen from Figure 8, the direction of intellectual property changes in different blockchains is different, and there is no corresponding central point, indicating that blockchain realizes the decentralization of intellectual property. The transformation from arbitrary music intellectual property data to the central point, and the data of the central point is relatively concentrated, indicating that the framework based on blockchain technology has good tolerance, so that discrete music intellectual property data presents a centralized situation. A comparison of different methods is performed on the data in Figure 6, and the results are shown in Table 7.

Table 7. Comparison of Music IP Copyrights by Different Methods

Method	Content	Accommodation	Change direction
Blockchain technology	writings	90.62	random
	patent	97.34	random
	trademark	99.70	random
Server technology	writings	79.36	+
	patent	81.57	+
	trademark	82.03	+
Previous IP protection schemes	writings	80.69	+
	patent	78.44	+
	trademark	77.21	+
Analytic hierarchy	writings	81.63	+
	patent	75.11	+
	trademark	81.58	+

Compared with other methods, it is found that the framework based on blockchain technology is more reasonable, the accommodation of music IP data is better, and the direction of blockchain computing meets the actual requirements. The reason is that based on blockchain technology, non-structured data can be mapped in the server, and the central processor can iteratively analyze abnormal data to reduce the abnormal attributes of music intellectual property data.

4.5 Compliance Rate of Music IP Framework

In order to verify the results of the framework based on blockchain technology, the results are compared with the actual operation results, and the results are shown in Figure 9.

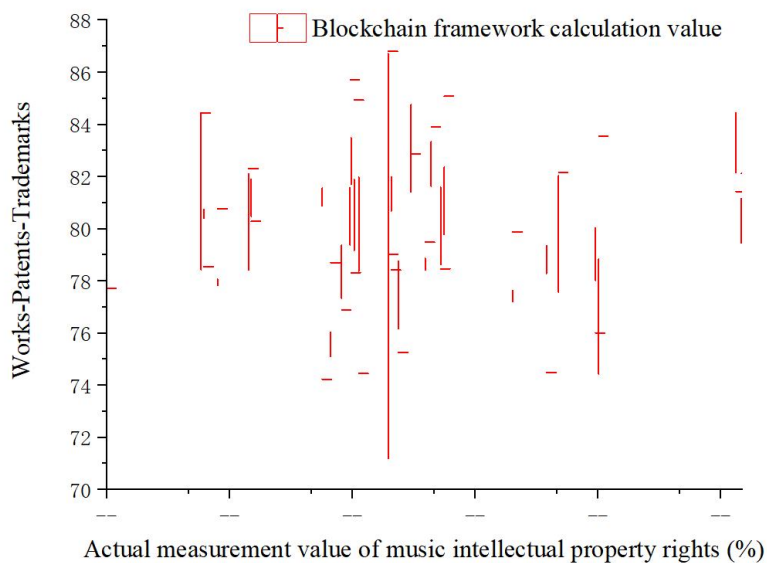


Figure 9. Intellectual Property Compliance Rate under Blockchain Framework

It can be seen from Figure 9 that the degree of protection of music intellectual property rights by the blockchain framework is basically the same as the actual requirements, and the protection level of works, patents and trademarks is consistent, indicating that the framework of blockchain technology can protect music intellectual property rights. Among them, the detailed results of intellectual property protection are shown in Table 8.

Table 8. Accuracy of Protection of Musical Intellectual Property Rights

Block number	Blockchain standardizes data	Blockchain encryption	Data Protection Accuracy (%)	Error (%)
1	-0.47933	83.92036 - 0.47933i	74.82	1.12
2	1.43382	78.44623 + 1.43382i	80.91	1.19
3	-2.45402	84.21628 - 2.45402i	81.02	0.92
4	6.1929	80.13028 + 6.1929i	74.49	0.86
5	-2.80025	76.64548 - 2.80025i	74.24	1.00
6	-0.68476	83.09386 - 0.68476i	82.16	1.05
7	1.65672	81.10601 + 1.65672i	78.42	1.13
8	2.02843	78.64856 + 2.02843i	82.31	0.87
9	-1.99179	79.12533 - 1.99179i	79.88	0.99
10	0.41339	81.41874 + 0.41339i	83.90	0.95
11	0.29518	81.33205 + 0.29518i	78.70	1.14
12	5.24371	78.91834 + 5.24371i	85.71	0.88
13	-2.49909	73.1837 - 2.49909i	85.08	0.78
14	-2.94544	80.30442 - 2.94544i	78.47	0.92
15	-5.3563	75.55473 - 5.3563i	76.90	1.16
16	-9.71278	88.54837 - 9.71278i	77.73	1.30
17	5.7047	88.6759 + 5.7047i	75.25	1.10
18	3.04841	79.3357 + 3.04841i	78.55	0.96
19	1.20483	80.95754 + 1.20483i	81.43	1.06
20	-0.64086	80.05321 - 0.64086i	82.12	1.11
21	1.07471	85.11679 + 1.07471i	74.46	1.06
22	6.59423	79.22248 + 6.59423i	79.49	1.14
23	-0.40389	76.7098 - 0.40389i	86.81	1.17
24	0.69842	80.61132 + 0.69842i	76.01	1.01
25	1.66361	79.14733 + 1.66361i	84.94	1.11
26	2.35206	75.88889 + 2.35206i	80.28	1.12
27	-6.49164	75.47865 - 6.49164i	82.88	1.19
Average			79.89	0.85

As can be seen from Table 8, the intellectual property data is standardized and processed, and then parsed by the data to obtain the encrypted information of the blockchain and stored in the server. Then, the framework of blockchain technology is applied to intellectual property protection to obtain the final accuracy of intellectual property protection. The results showed that the average protection accuracy of the samples reached 79.89%, while the error was less than 2%. The framework based on blockchain technology sets synergy coefficients between blocks, increases the weight of intellectual property rights in the same block, and reduces the complexity of initial data through standardized processing.

5. Conclusion

Aiming at the protection of music intellectual property rights, this paper proposes a framework analysis method based on blockchain technology. This method combines the analysis of music intellectual property data based on blockchain technology and constraints, determines the weight of copyright, patent and trademark, and encrypts and standardizes the collected data. The results show that the intellectual property protection results of the blockchain technology framework are better, which can improve the accuracy of intellectual property protection, and the comprehensive and compliance rate of the blockchain framework is high, which can realize the protection of music intellectual property rights and reduce the process of intellectual property protection. However, there

are also certain limitations when analyzing music IP data, mainly reflecting the refinement of music IP indicators and the setting of secondary weights of indicators, which will be handled in the future.

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