

# Introduction to the KENDRIX Copyright Protection System Using Blockchain, eKYC, and Music Recognition Technologies

—Protecting the Rights of Music Creators—



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## 1. What is KENDRIX?

KENDRIX is the name of a musical works information management system equipped with a proof of existence (PoE) function using blockchain technology. It targets all sorts of individual music creators whether amateurs or professionals. The key message behind KENDRIX is “Toward a world where every creator can take part in a creation ecosystem” as reflected by a key visual undertaken by the illustrator Yusuke Nakamura (Figure 1). As an anagram consisting of the letters KENRI (where kenri is the Japanese word for rights) and DX (digital transformation), the name “KENDRIX” is a coined word based on the concept of promoting the digital transformation of copyright management (Figure 2).

A closed  $\beta$ -version of KENDRIX was released on June 28, 2022 and tested by a number of music creators invited by JASRAC as test users. It was released for public use on October 31, 2022 after making modifications and improvements based on reviews and feedback submitted by these test users.

KENDRIX allows the following functions to be used by anyone free of charge by simply registering an active name (real name or pen name) together with an e-mail address and password.

Figure 1: KENDRIX key visual



Figure 2: KENDRIX logo



### 1.1 Blockchain-based PoE

When uploading an audio file of a musical work to KENDRIX, the hash values of several types of information such as the user ID and audio file are registered together with a time stamp on the blockchain. Then, by setting a PoE page that includes the above information to “public,” a URL for public use can be issued and date-and-time information related to the existence (possession) of a copyrighted work can be presented to a third party (Figure 3).

On releasing a musical work to a user-generated content (UGC) service, social networking service (SNS), etc., attaching the public URL of the PoE page can convey to a third party that there is a music creator that has obtained PoE by KENDRIX, which should deter unauthorized use of that musical work.

Figure 3: PoE page (sample)



In KENDRIX, multiple audio files can be registered as “versions” of a single musical work. To stand up to a third party in the event of a conflict, it is recommended that PoE of an audio file be obtained from the pre-completion stage (during the creation process).

### 1.2 ID verification by eKYC

Although a music creator can begin to use KENDRIX by simply registering an active name together with an e-mail address and password, using the eKYC service on registering personal information enables an ID verification to be performed with respect to the music creator. It has become common for many music creators to carry out their activities using pen names instead of their real names, but when it comes time to exercise one’s copyright, it is surprisingly difficult to objectively link one’s activities under one’s pen name even if one’s real name has been made clear out of necessity. In actuality, there are not a few music creators who have encountered problems with impersonators (identity theft).

Additionally, even if the name of the releasing author on the KENDRIX PoE page is a pen name, performing an ID verification of that music creator on the KENDRIX side will increase the reliability of that information.

It has also become possible to conclude a trust contract for entrusting JASRAC with the management of one’s own copyrights online via KENDRIX, and identity verification in this online process makes use of eKYC. The plan going forward is to expand coordination with music-related services to make it easy for a music creator whose ID verification has been completed to use those services.

### 1.3 Information sharing with co-creators (project function)

KENDRIX recommends that PoE of an audio file be obtained from the pre-completion stage (during the creation process). Here, to enable KENDRIX to be used even if multiple individuals are dividing up the work of creating a musical work, a function has been implemented for inviting other KENDRIX users to musical work information registered by a music creator so that all concerned can reference the same information. This is called the “project function,” which enables invited users to add new audio files (versions) and to exchange comments on each version as project members.

Furthermore, provided that the user (owner) that initially registered the musical work information has concluded a trust contract with JASRAC, the owner can submit a work notification from KENDRIX to JASRAC. At that time, project members will also be notified of that fact by e-mail so that they can check the contents of that work notification on KENDRIX. This mechanism heightens transparency so that no copyright-related problems occur even among fellow co-creators.

### 1.4 Audio-file check function

A function has been implemented using audio fingerprinting technology to analyze audio files registered on KENDRIX and introduce existing musical works that have the possibility of being similar.

Although audio fingerprinting is generally applied to identify musical works used in television programs, movies, and other media, it can be used on KENDRIX for the following purposes before releasing a newly created musical work.

- Check whether part of an existing musical work has unintentionally been mixed in (for example, sample material obtained as free material turns out to be part of an existing musical work).
- Check whether a melody has a close resemblance to an existing musical work.

This function uses “Music Recognition” and “Cover Song Identification” solutions provided by ACRCLOUD. The purpose of Music Recognition is to discover use of that original audio file while that of Cover Song Identification is to find cover versions of the original musical work.

### 1.5 IPI number application function

A function is provided to enable a music creator who has not concluded a trust contract with JASRAC to obtain an Interested Parties Information Number (IPI number) via KENDRIX.

An IPI number is an international identifier assigned to authors, composers, etc. for identifying a copyright holder. This IPI number is conferred when a rights management organization like JASRAC in a certain country registers a copyright holder in an international database of rights holders. For this reason, a music creator who has concluded a trust contract with JASRAC can definitely obtain an IPI number.

There is also an International Standard Musical Work Code (ISWC) that acts as an international identifier for musical works. A rights management organization like JASRAC in a certain country that wishes to register musical work information in an international database of rights holders called CISNet and be granted an ISWC must provide the IPI numbers of all of the authors of that musical work.

When a music creator that obtains and confirms one’s own IPI number beforehand and conveys that number to domestic or international music publishers, co-creators, etc., the implication is that an ISWC can definitely be issued, which increases the possibility that one’s own musical work will be easily identified in an international copyright management network. For example, even if a trust contract hasn’t been concluded with JASRAC, an IP number can be obtained with this function as long as ID verification can be performed through eKYC on KENDRIX.

Additionally, while a user can begin using KENDRIX by simply registering an active name plus an e-mail address and

password as described above, everyone starts with a “basic” account. Then, if registering one’s real name, address, etc. and performing ID verification by eKYC, this account will be automatically upgraded to a “business account,” and if concluding a trust contract with JASRAC, the account will be upgraded to a “business+” account. Registering a copyright holder in the IPI system requires information such as the music creator’s real name and pen name, date of birth, etc., so the IPI number application function can only be used by users with a “business” account or higher.

## 2. JASRAC and Blockchain/KENDRIX

JASRAC’s involvement with blockchain technology began in 2017 when it was being said, “With blockchain, there will be no need for JASRAC.”

Incidentally, in a book promoting the business use of blockchain technology published in 2018, JASRAC was specifically mentioned in a chapter titled “Music Copyrights” as “possibly becoming unnecessary owing to blockchain.”

I have supervised a department in charge of data analysis and research at JASRAC. In this capacity, I have fed back any technologies, services, or approaches that might be beneficial to JASRAC to people within the company and made presentations on specific methods of using them. I have also compiled reports on blockchain technology while exchanging information with a variety of experts. Beginning with explanations of technical features such as making remittances via a wallet in bitcoin, Proof of Work mechanisms, etc., I have listed trends in generalizing blockchain technology and applying it to business using examples. One such example is the sequence of recording the transfer of numerical values as in bitcoin, recording the location and transfer of assets and service rights, and registering processing to be executed in the future (smart contract). In addition, I have compiled and introduced the opinions of experts attending blockchain-related events and seminars through a survey process. To digress a bit, the argument that JASRAC will become unnecessary will almost always be made whenever the topic of blockchain technology comes up at a music-related event, but there is often a misunderstanding about the actual situation at JASRAC. Based on the extremely unrealistic premise that “JASRAC distributions are based on poor accounting practices and almost all collected royalties go into JASRAC’s pocket and not returned to the author,” a model that differs from copyright management performed at JASRAC is called “copyright management”<sup>\*1</sup> and it has been said that JASRAC functions can be replaced by blockchain.

### 2.1 Blockchain-related technology verification

The following summarizes a report related to blockchain technology presented within the company in 2017.

- Blockchain technology cannot replace copyright management performed at JASRAC, but it has the potential of being used to update copyright management at JASRAC, create new services, etc.
- The positive application of blockchain technology has the potential of fortifying the role that JASRAC should play as a hub in the music industry.

It was later decided by management that concrete application of blockchain technology was difficult to investigate even if technical aspects could be verified simply through lectures, so verification of blockchain technology was carried out jointly with IBM Japan in 2018.

Here, nodes based on two organizations were virtually set up in a Hyperledger Fabric environment. A wallet for each work and a wallet for each rights holder were prepared and a model was constructed for distributing an original type of currency with royalties in mind through a smart contract. In this way, the feasibility of blockchain technology and smart contracts as well as the level of transparency that can be achieved were tested and evaluated. Although some problems became apparent in relation to transactions, the end result of this joint trial was a strong feeling for the attractiveness and potential of a consortium-type blockchain that could easily implement a mechanism for ensuring authenticity.

### 2.2 Two PoC trials in KENDRIX development

In February 2019, JASRAC publically announced that it was performing trials with the aim of making practical use of blockchain technology. Around this time, JASRAC had been exchanging information with Sony Corporation (now the Sony Group Corporation, referred to below as “Sony Group”) on the use of blockchain technology in the music copyrights field. In October 2018, Sony Group issued a press release together with Sony Music Entertainment and Sony Global Education titled “Sony Develops Rights Management System for Digital Content Utilizing Blockchain Foundation.” JASRAC, for its part, conducted proof of concept (PoC) trials jointly with Sony Group from 2019 to 2021 using the PoE function that forms part of the “Rights Management System for Digital Content Utilizing Blockchain Foundation.”

#### 2.2.1 2019–2020

Starting with the PoE function using the blockchain

<sup>\*1</sup> Please refer to the following article that takes up the issue of a “copyright management” model in the context of a blockchain or smart contract. CPRA news Review: “Digital Technology and Copyright Management—Is a Paradigm Shift Occurring?—”  
[https://www.cpra.jp/cpra\\_article/article/000654.html](https://www.cpra.jp/cpra_article/article/000654.html)

technology developed by Sony Group companies, JASRAC performed joint trials with the aim of making information sharing with music publishers and business processes more efficient. The development of a system for PoC purposes began in October 2019, and a PoC trial was conducted in February and March of 2020 together with 11 music publishers (represented by 15 individuals) who responded to a call for participation. Specific goals were to improve the reliability of data exchanged between professionals (JASRAC and music publishers) in copyright management, make information sharing more efficient, and automate the execution of some administrative processes in the future. Positive comments on the practical use of blockchain technology were received from participants, but no direction on developing a general-purpose module accommodating the business requirements of each company and achieving a smooth migration could be arrived at.

### 2.2.2 2020–2021

Continuing on, JASRAC together with Sony Group conducted interview-based research and a PoC trial targeting music creators who are the first users of the PoE function. Here, group interviews were conducted from December 2020 to January 2021 by dividing up 31 music creators (13 of which had concluded a trust contract with JASRAC) into 8 groups. As a result of these interviews, we were able to extract 13 issues related to music activities.

Then, from January 2021 on, we extracted two priority issues from those 13 issues and itemized the background to each issue and the measure to be taken. The two prioritized issues are summarized below.

- Issue 1: There are no means of opposing unauthorized use or release spoofing (for example, a third part uploads one's own audio file to a UGC service or streams it on a music subscription service)
- Issue 2: Existing copyright management systems are complicated presenting a high hurdle to using them (for

example, concluding a trust contract or registering a work with JASRAC is complicated).

A surprising finding from the group interviews was that so-called independent music creators who had not concluded a trust contract with JASRAC had experienced various kinds of copyright-related problems. On suffering damage from unauthorized use or release spoofing during independent musical activities, it was said that there was no third party that could provide evidence or proof that that author of that musical work was definitely oneself, which could make one fall into a state of despair. Although such music creators would like to receive the support of JASRAC or a music publisher with specialized knowledge, it became clear that they were overly self-critical thinking that their lack of commercial success would make it difficult to conclude a trust contract with JASRAC or receive the support of a music publisher.

The background to such issues is twofold. First, there is the proliferation of UGC services, SNSs, and music-streaming services that make it possible to release musical works without going through a record company or talent agency, and second, there is the spread of digital tools and knowledge that make it possible for even individuals to create high-quality musical works thereby expanding the productive range of music creators.

Table 1 summarizes the measures taken for each of the above issues.

### 2.3 Development of KENDRIX

Itemizing the issues extracted from the interviews with music creators revealed that simply providing a PoE function even in a primitive state was worthwhile. It was also recognized that there was a high hurdle for independent music creators to using services that JASRAC can provide despite their needs, and in many cases, that the provision of services failed without even having the opportunity for direct interaction.

It is a misunderstanding that JASRAC does not properly

**Table 1: Measures taken for priority issues**

	Functions That Could Help Resolve Issue	Measure
1	<ul style="list-style-type: none"> <li>• Enable centralized management of audio files and metadata</li> <li>• Enable recording of a musical work's author information by a system that prevents third-party tampering</li> <li>• Provide extremely reliable and highly public institutions that manage the same data</li> </ul>	Decentralized musical works information management system using blockchain technology
2	<ul style="list-style-type: none"> <li>• Improve/fortify the flow of registering works online at JASRAC</li> <li>• Make it easy for music creators without a deep knowledge of the law or business practices to use existing copyright management systems as needed</li> </ul>	Data linking, application submittal and registering, and the concluding of contracts are performed online with a business partner like JASRAC

distribute the royalty fees it collects. By returning compensation for the use of a copyrighted work to the author, JASRAC is proud of being able to achieve a “Creation Ecosystem” in which culture thrives through the creation of more copyrighted work while doing so in a way that is highly precise with low costs\*2 when compared with other fields of copyrighted work even from a worldwide perspective. JASRAC came to realize that providing a service (PoE function) that even independent music creators can enjoy without concluding a trust contract with JASRAC and that making it easy to participate in a Creation Ecosystem by concluding a trust contract with JASRAC or a copyright transfer agreement with a music publisher is none other than the mission of JASRAC. It was therefore decided to implement a prototype of a digital service constructed through PoC trials held from 2020 to 2021.

From August 2021 to January 2022, we again conducted interview-based research targeting music creators on a scale of 30 individuals. During this time, we also analyzed how Web services provided by major overseas copyrights management organizations were implemented while also analyzing JASRAC business operations, formulated a concept design and DX business plan, and produced creative output such as service name, logo, etc. Finally, in January 2022, we began the development of the KENDRIX system. As a result, we released a closed  $\beta$ -version of KENDRIX on June 28, 2022 as described above and officially launched KENDRIX in a public release on October 31, 2022.

### 3. Achievements after KENDRIX Release

Promotional content and events related to KENDRIX are being actively produced for music creators while progressively adding the functions described in sections 1.2–1.5. The KENDRIX YouTube channel regularly releases videos introducing the process of music production using KENDRIX to professional music creators, the experience of registering musical works on KENDRIX, etc. In addition, a music event sponsored by KENDRIX was held in March 2024 to provide music creators with a real opportunity to gather together and interact with each other. KENDRIX received good reviews at this event.

As of September 2024 at the time of writing this article, about two years has passed since the public release of KENDRIX. Positive results from the promotional activities described above are being felt and the number of users and registered musical works is increasing steadily. The feeling is that music creators are becoming increasingly aware and accepting of self-management tools for musical works information starting with the PoE of original audio files.

Going forward, we will devote our efforts to not only protecting personal rights and enabling stress-free release of musical works but also to developing functions that can contribute to the promotion of musical works after their release and the

promotion of music creators themselves. JASRAC aims to make KENDRIX a must-have tool for all music creators. In this way, we hope to create an environment in which copyrights are appropriately protected and compensations are reliably returned.

\*2 JASRAC distributed 135.12 billion yen to consignors in FY2023 (April 1, 2023 to March 31, 2024). The amount deducted here as commissions came to 14.35 billion yen (10.7% of distributions). Ordinary revenue after adding interest income, etc. to commission revenue came to 14.54 billion while ordinary expenses came to 12.99 billion yen (9.6% of distributions). At 1.55 billion yen, this difference between revenue and expenditures will be redistributed to beneficiaries in FY2024, so the actual commission rate can be said to be 9.6%.

### Cover Art



**Lumberyard at Fukagawa (Fukagawa kiba) from A Hundred Views of Musashi Province**

Woodblock prints depict famous landmarks in Tokyo.

Kobayashi Kiyochika (1847-1915)

Source: National Diet Library, NDL Image Bank (<https://rnavi.ndl.go.jp/imagebank/>)