Improving Music Streaming Services Through Metadata: Case Study from JOOX Indonesia

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Abstract

Background of this Study: This article examines how digital music handled on music streaming services, JOOX Indonesia in particular.

Purposes: The aims was to bring insight that metadata management skill could help an enhancement over music streaming services through metadata and to improve the user experience when using music streaming services.

Method: A single case study is chosen as the research method for this paper. The researcher did three months internship to see how the music file handled on the back end of JOOX. Semi-structured qualitative interviews and documentary analysis were used to collect and triangulate the qualitative data.

Findings: The result shows JOOX using its operational self-possession procedures to handle its digital music file and using its own metadata standard with adaptation from music metadata standard. JOOX has a feature that utilizes music lyric. We found that lyric metadata embedded as a distinct entity on their backend system. Since lyric frequently used by the user as an access point when they do the retrieval, we propose to embed lyric as a field on music metadata to improve search result.

Conclusion: These research shows are lyric as the essential part when users enjoy the music in music streaming services. By embed lyric on music metadata, lyric could be able as an access point for retrieval. Moreover, lyric as metadata could be part of music digital file handling.

Keywords: *music metadata, music streaming services, lyric, describing*

Introduction

Music streaming is changing how we play and listen to music. Streaming services such as Spotify, Apple Music, and others become the most popular method to listen to music. In 2017, Music streaming service provider relish 41,1% growth in streaming revenue with 45,5% growth of paid subscription(IFPI, 2018). This means that the music is stored on the consumer's device within the memory of the streaming service app. The user does not own any of the music in the catalogue; in this way, it is similar to how people rent books from a library. Users are also unable to access the individual MP3 files within the catalogue, and therefore they cannot make copies for their own use. Through a monthly subscription, whether paid or free, users are able to stream their favourite artists easily on their own devices.

One of the most popular music streaming services in the world is Spotify. Spotify first launched in Asia about five years ago. Being a global music streaming platform, its most attractive unique selling point is its vast music library, with millions of titles. In 2018, it had over 140 million subscribers globally(Ipsos, 2018). However, the other hands, in Asia, JOOX, which launched in 2015, are the most downloaded music streaming app in Asia regions such as Hong Kong, Indonesia, Malaysia and Thailand. As McKinsey report (2016), JOOX accounts for more than 50 percent of all music streaming app downloads in Asian markets with over 50 million downloads. Emphasizing the need to stay highly relevant to local consumers, JOOX uses a team of dedicated local experts to monitor trends and broadcast content in the form of curated playlists and live broadcasts.

Business models such as JOOX which is called music streaming services are the result of changes in terms of the way we enjoy the music. This phenomenon has resulted in changes in business models in the music industry. Previously the focus on selling music was a copy of the song so that the music file was considered a collection of libraries that had many duplicates. Whereas now, digital files categorized as evidence to get commercial value. Each label and musician ensure that his work can be available online and entered into the music streaming service in order to get commercial numbers of each music played by having a unique code such as ISRC. ISRC (International Standard Recording Code) is the globally recognized standard numbering system for audio and music video recordings. It comprises a 12-digit alphanumeric code and functions as a universal identification number for each sound recording. ISRC codes are primarily used to identify and catalogue individual songs (tracks) on an album. The ISRC allows musician or music producer to get paid for digital music sales by ensuring that royalties tracked adequately(International Standard Recording Code, 2005). Another unique code for song identifier which used for economic right as counts for music played in music streaming services is UPC Code. UPC conceptually same as ISRC, otherwise in some digital music streaming used as standard. JOOX Indonesia in case used UPC as a song identifier.

Blackmon (2019) said metadata sounds like one of the small things and might most annoying things in music. However, as it turns out, it is one of the most important, complex, and broken, leaving many musicians unable to get paid for their work. However, Based on previous research, music digital industry research theme aim to dig the development of a new business idea and selling the music(Galuszka, 2015; Santos, 2016). More over, Metadata which was considered trivial when it was still in the form of vinyl, cd, cassette, now internet usage changes from analogue to digital makes metadata incredibly crucial and is needed as a reference for commercial values for the musician. This fact are shows the information management also has a big role in music industry.

Hence, Music management as a record is needed so that there are no errors in data

input and commercial value sharing. Metadata as a product of indexing demands consistency in term of produced it. This research aims to give a new perspective about the importance of information manager skill related to metadata and try to give an insight that information manager competencies has a flexibility to take part in any industries. The main research question of this study is: How Joox Indonesia managed and handled their digital music file? Moreover, what metadata they used for the index in their backend system? From those question, we sought to improve on music digital handling on streaming music services through metadata and indexing activities.

Method

Joox Indonesia was chosen as music streaming services as a locus for this research since Joox Indonesia is the one of popular music streaming services in Indonesia. Joox Indonesia headquarter are located in Menara BCA, Jakarta. As users, we already know Joox Indonesia has a unique feature that utilizes lyrics. Since that phenomenon, authors assume that digital music as archive handling can help the better presentation of music to users by providing appropriate and relevant metadata.

We do an internship as an indexer in the Content Division on Joox Indonesia for almost four months. We do indexing, create metadata, prior to standard operational procedures on Joox Indonesia. We note day to day basis work how digital music file been handled. Every task was identified to understand the flow of work on digital music filehandle. As every day, we create day work report.

Another method for data collection is we interview Music Manager and Head of Content division from Joox Indonesia in the semi-structured interview question. For elaborate data about lyrical usage in music streaming services, we did the focus group on seven-person who spent much time to enjoy music streaming services, Joox in particular. As we believed Qualitative methods focus on the whole of human experience and the meanings ascribed by individuals living the experience; broader understanding and more in-depth insight into complex human behaviours (Mason, 2006).

The results of direct observation are compiled and made in a narrative form, while the interview results are used to collect and triangulate data, when the study literature is used to support the analysis. The limitation of this research is that researchers only get the opportunity to access the backbone directly. However, due a shared policy, we cannot put the CMS nor interface they use in their backbone in this paper.

Result & Discussions

Digital Music File as Record

Anglo American Cataloguing Rules(AACR) define music which needs to be described are published music. Published record means that are recorded the product of song sung by singer or artists. Record as define as Information created, received, and maintained as evidence and as an asset by an organization or person, in pursuance of legal obligations or the transaction of business, including emails(Information and Records Management, 2015). Whenever documents are placed in the file, they become records if those documents are not subject to change. For example, the documents that make up the planning application would become a record of the planning application procedure(Adam, 2008). Archival materials can be in many different formats: paper; graphic images, sound recordings, moving image recordings, and recently, in digital formats (Taylor, 1999). Record is the same page, As record could be an email, research data, or even web-page, depending on its content and usage(Information and

Records Management, 2015). In a broader term, sound recording is usually called as library materials as they divided into a multitude of forms— books, journals, computer files (often on CD-ROM), audio recordings (on CDs, tape, or LPs), and loose materials (in file cabinets or individual boxes) to name the major categories(Donald, 2007; Eberhart, 2006). However, with this logic, digital audio files such as music could be records when its use as a by-product from business activities.

Music Streaming Services

The presence of the Internet is changing the way people listen to music. Starting from the sound can be recorded through analogue methods until it can be converted into digital format. Format digital spread via physical disc in the 1980s. Internet drive even faster the way how we listen. RealNetworks' RealAudio Player, for example, was released in April 1995 and was one of the first media players capable of streaming media over the Internet. Now, recorded music is more accessible than ever before. Until finally now people can enjoy music without having to possess the music, but enough to have access rights to listen to it. Two main ways to listen to music in the internet era include downloading audio and streaming audio. Downloading audio then users download the song and store it on their personal computer and then listen directly from their computer without the need for an internet connection to run it. While streaming audio, users must be continuously connected to the network to listen to songs. The streaming audio service methods there are several ways, listen to on-demand services; internet radio-style services; streaming audio as a value-added option; and social networking and user-generated sites(Wiercinski & Mason, 2010)

Metadata Music

Metadata and music are like two different coins. When music sounds so groove while on the other hand's metadata sounds boring things. However, in terms in nowadays industries, metadata for music are one of the most critical, complex when means it is broken leaving many musicians unable to get paid for their work(Blackmon, 2019). Metadata in music ensure the songs are ready for distribution and release. If the metadata is not in order, the music is not ready to share. Music royalties are also dependent on his metadata. Without correct data attached to the music, it makes up the risk of not receiving the proper credit for the streams(Landr, 2019).

Metadata music depends on the format, rather physical or digital. Physical releases, The master file and its metadata usually include all data on musicians and necessary information on works (so-called label copy data) as the information is delivered. Digital releases, There are two further tracks: o Major record companies deliver masters and metadata directly to digital service providers(DSP). In Indie companies usually deliver masters and metadata first to the distributor (either major label or aggregator), who delivers them further to DSP((Finnish Music Publisher Association, 2017). A field used in music metadata, even though there is no international standard, some institution or association tried to develop metadata standards. One of them is Music Business Association(2014) which divide music metadata by ten areas. Ten areas are consists, album release; artist; content; digital merchant, Digital Services Provider(DSP), or Digital Retailer; Music Video; Ringtone; Sound Recording; Song; Title; and Track Release.

Managing Music as Records for Music Streaming Services

Online music streaming services manage digital music archives produced by various

musicians and artists. The file goes through a series of processes until the listener's ear can finally enjoy it through the music streaming service application. Before the era of digital music services, musicians had to have a record label to produce and market their work. Now with the music streaming service, they can immediately publish their work more options. However, before it can broadcast digitally, both musicians and record labels need an aggregator. The aggregator is a company that distributes music works to online music streaming services. In accommodating creators and musicians, the aggregator collaborates with streaming music applications, one of which is the JOOX Indonesia application. The process begins with recorded music and has a digital output. Digital files that can be accepted by JOOX have technical standards including the MP3 encoded format in 320Kbps bit rate. This format become standards since a bit rate of 160 Kbps or higher if they want the MP3 file to have the same sound quality as a CD(Brain, 2007)

The music creator then gives the digital file metadata through file properties. The metadata provided by the music creator includes necessary information such as the song title or album title, the creator of the music, and the artist who performed the song. At this stage no standards are used, both for writing and naming, so it is possible to use uncontrolled vocabulary. After the file has been given metadata, the file is distributed by the music creator by email or direct file transfer, depending on the method that was decided before. The file is called a master file by the aggregator.

The aggregator then adds additional metadata to the music file. Aggregator requests data from music creator, if self-publishing, or record label data such as Producer, music release date, takedown date. Takedown date is the date when the song is terminated from the music application, following a contract that has been agreed in advance. Metadata plays a important roles in this part, thus the aggregator somewhat could understand about metadata and indexing competencies. After the metadata addition is complete, the music file requires the Universal Product Code (UPC) to start monetization. A UPC barcode consist of 13 number digit is used to represent and track the music as an entire physical or digital product. JOOX registered their music digital to Recording Industry Association of America (RIAA) to acquire a UPC for each single and album. UPC is a unique code that represents each digital music; this code is used to sales tracking and a tool for digital music monetization.

JOOX Indonesia's digital music handled is carried out by the Content Division. The Content Division manages digital files based on standard operating procedures from JOOX Indonesia regarding digital music file processing. JOOX Indonesia uses a content management system (CMS) that is built in house to manage music files and their metadata. JOOX Indonesia processes Digital Music Files through several stages, starting with the acquisition of digital music archives through the creation of music or aggregators. The digital music files are collocated at JOOX Indonesia's warehouse and then auditing, giving lyrics to digital music files. Ready files will be published and taken down following the applicable contract. Their framework for music handled by some processes, as shown as this scheme.
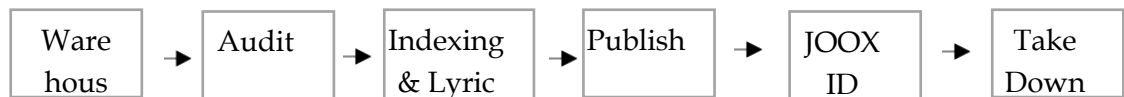
Ware hous → Audit → Indexing & Lyric → Publish → JOOX ID → Take Down

Figure 1. Digital Music File Handling flow in JOOX Indonesia (source: Author, 2019)

JOOX Indonesia's Content Division which has the role of managing digital music files, is divided into several sections, auditing, lyrics, and publishing. Management of digital music archives is carried out, starting from collecting digital files at JOOX Indonesia's warehouse. The auditing section then sorts out the music with several parameters that are considered, such as the authority of the song's creator, and ensures that the artist who sings the song is not confused or incorrect. Make sure the area from which the artist's continent came from. Make sure this column is filled according to the country of origin of the artist. The origin of the artist here does not mean the origin of the artist was born, but where the country of origin of the record label is located. The auditing section then fills the chosen language based on the language used by the singer in singing his music. In the language, a section is not filled based on the country of origin of the singer but is filled in based on the language used by the singer in singing his music this is because in some cases the singer does not use the native language of his country in singing music.

The next process is to determine the type of album. Album types are classifications used to identify albums based on the number of music/album duration. The album type classification by JOOX Indonesia is divided into three types, namely singles consisting of one or a maximum of 2 songs, EP for mini albums consisting of 3-10 songs, and full albums for albums containing more than ten tracks. Another thing done by the auditing section is to ensure the cover of the album. Albums that are allowed to be audited by JOOX Indonesia are album categories based on the regions or countries of origin of the artist. Once sorted, the digital music archive must go through an approval process to be displayed in the JOOX application.

The approval process is the final process of auditing digital music files. Three options that can be selected in this process are three ways that can be done following the conditions of the digital music archive audit results. There are three final choices that determine whether music can be served on the JOOX application or not. Among other things, Approve all auditing, approve and bypass, and reject. Approve all auditing if the audio check meets the criteria. Approve and bypass if the audio check results do not meet the criteria. The reject option is selected if the music file does not meet the criteria, or there is even a missing file. Music that gets the reject option needs to be fixed and added to the CMS used by JOOX. The auditing section then becomes a part that plays a more role because it ensures the music file's metadata and conformity to the agreed contract.

Furthermore, music was announced already available on the JOOX Application. This step is the song release step according to the date stated in the digital music archive's own metadata. JOOX Indonesia application in releasing music so that it can be listened to by listeners will automatically be following the dates listed but often much music that is not released automatically which requires to be released manually by checking using the UPC digital music archive.

After the agreement ends between the music creator and the record label, the record label will ask the aggregator to preach to the JOOX Indonesia digital streaming music application for music takedown from JOOX Indonesia's digital streaming music application library so that the fulfilment of economic rights owned by the music creator is stopped.

Music metadata standards used in JOOX Indonesia
JOOX Indonesia uses metadata standards which are determined by themselves. Music metadata in JOOX consists of field The Name of Artists, Title of the work, Authors, Language, Duration, Genre, The country of the copyright owner, Copy Right, ISRC Code, UPC/EAN Code(s), Company internal code and other filed option included other musicians, Publisher(s),

and Miscellaneous Information. Even the interviewees said JOOX did not refer to any music metadata standard, but in some field that they used in many terms near to music metadata standards by Metadata of Digital Music Files: Summary.

Apart from the fields mentioned in the metadata section above, JOOX embedded the lyrics to each song that is served. This embedding process is carried out through the CMS used by JOOX. This music lyrics become one of the advantages of JOOX Indonesia in its digital music streaming application because the inclusion of these lyrics is not all digital music streaming applications have this advantage. How to work in the stages of giving lyrics is the first choice to see documents from the aggregator whether the digital music archive and lyrics, the second see the song lyrics on the song lyrics website or Google the third listen to music and write it manually. The lyrics will appear on the user screen according to the timing when the music is played on the application. So, users can sing along with the song playing by looking at the lyrics that appear.

However, in practice, the lyrics are not included as a specific field in the metadata but stand as a separate entity that represents the song's lyrics and the timing of the song. Technically, two file entities become a package of song files. So that lyrics and music do not become one entity. That shows metadata play an important roles in many areas and industries, and does not only could be used in library or record management scope.

Lyrics as a Crucial Feature

Lyrics are one of the highlighted features on JOOX. That feature enriches by "sing-along" feature, in that feature JOOX grants users free, 12-hour VIP accounts for each social media share and has other popular features, such as music videos, artist interviews and subtitles so users can sing along to their favourite tracks. When users play music through JOOX, users can sing along without having to memorize the lyrics. This is possible because JOOX includes lyric via running text when music is played.

Based on the trend on streaming music show that 88% of streaming music subscribers look for lyrics. Moreover, 81% of lyrics users look for lyrics because they want to know the words as 72% of them said lyrics for a sing-along(Mulligan, 2017). Based on the results of the focus group of JOOX users, JOOX users like this feature because they can feel more involved and engaged with music. They can sing along and karaoke with their relatives on a friend, music creates a relation between those. This argument is reinforced that 56% of users want the streaming service to play lyrics according to time with music played(Mulligan, 2017). Lyrics features will become an increasingly important differentiation point for streaming services.

As lyric is a core component of a song, music creator using lyrics as a medium to deliver the message to the audience. Somehow, lyric could be an integral part and indivisible from music. Lyric could be an access point when someone is looking and searching for a song. Someone when hearing a song will search for what song is through the lyrics he got because of no search engine searches based on audio. Even though there has been an algorithmic rhythm music method, or searching for music based on sound. However, searching for songs through lyrics is often more practical and more simplistic than music rhythm algorithm.

JOOX users could initiate a search for songs based on music titles, artists, albums, playlists, videos and users, but videos and users do not affect the digital music archive managed by JOOX through apps. JOOX users when they want to search for songs based on lyrics, still use text-based search engines like Google. As we were looking to music relation metadata standard such as AACR2(Anglo American Cataloguing Rules), Dublin Core, MEI(Music Encoding Initiative) we found there is no metadata standard defined information about lyrics.

Closes things we found on metadata music about lyric are define lyrics language and lyric publisher (Landr, 2019), Lyricist,-a person who create lyric(Finnish Music Publisher Association, 2017; Music Business Association, 2014; MEI). So, we propose lyric could be a part of the metadata field on music metadata standard. By making the lyrics as one of the fields in the metadata, users can retrieve certain songs by entering keywords in the lyrics as access points. As in past research, Dubuc(2006) found out lyric could be part of metadata using a new file format designed to lyric named LML (Lyrics Markup Language).

Another benefit that could be extracted by using lyric is it has a capability to do some data mining based on user participation, and they could do a content exploration because it benefitted from user input(Cahyani, 2018). Problems that may arise in the application are, among others, the metadata becomes much more extensive in terms of its size if a song has long lyrics and consists of thousands of characters. However, this should not be too much of a problem because storage costs are getting cheaper. If we consider the possibility, inserting lyrics as one of the fields in the music metadata standard can be a useful additional feature for many music streaming services, which will improve the user experience while using any music streaming services.

Conclusion

It is undeniable that music is a form of culture that continues to exist and be enjoyed, such as what form and media. Changes in the way we listen to music more or less also change how we manage music. Music has now become one of the commodities, as a reason to start caring about its management. Music streaming services have become a new business model for the music business. Proper digital file handled, and management could improve the value of music based services, from the results of case studies, JOOX uses the standard operating standards they make to manage them. While metadata, as the core of their music business, they have not used specific standards, they still adapt existing music standards for their own needs and needs. JOOX who makes lyrics as a superior feature requires a way so that the lyrics can not only be played when the music is running, but also can be an access point when the music returns to the service while improving the experience for users as the way us to listen to the music.

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