Music360

A 360 DEGREES PERSPECTIVE ON THE VALUE OF MUSIC

Deliverable 2.1
MUSIC360 Ontology for the Value of Music

Disclaimer

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[1] PU= Public, CO=Confidential, only for members of the consortium (including the Commission Services), CL=Classified, as referred to in Commission Decision 2001/844/EC

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Contents

1. Ontology for The Value of Music - General Description

In the context of measuring the monetary and non-monetary value of music, the Music360 ontology refers to a structured and comprehensive conceptual model that represents the essential elements, relationships, and attributes associated with music's value in both financial and non-financial terms. Thus, the Music360 ontology is the reference artifact to implement a common repository to achieve with following technical facilities:

- Data Integration: The ontology should facilitate the integration of diverse data sources, such as sales data, streaming statistics, cultural assessments, and emotional responses, to provide a holistic view of music's value.

- Interoperability: Ensure that the ontology aligns with existing standards and models in the music industry, facilitating data exchange and collaboration among stakeholders.

- Scalability and Extensibility: Design the ontology to accommodate future changes in the music industry and evolving concepts of value, allowing for easy updates and extensions.

This takes into account various dimensions of music's value, including its cultural, social, therapeutic, and economic aspects. From these dimensions, the cultural and social values are usually confused as the same value, for these reason we provide a detailed description of these two dimensions and their main differences below.

1.1. Music Cultural Value

Refers to the significance, importance, and impact of music within a particular culture, society, or community. It encompasses the ways in which music is embedded in the cultural fabric of a group of people and how it reflects, shapes, and preserves their cultural identity, traditions, and heritage.

Key Characteristics of Music Cultural Value

- Cultural Preservation: Music often plays a crucial role in preserving and transmitting cultural traditions, stories, and rituals from one generation to another.

- Identity and Heritage: Music can serve as a symbol of cultural identity and heritage, helping individuals and communities connect with their roots and express their uniqueness.

- Shared Experience: It fosters a shared cultural experience, bringing people together in celebrations, ceremonies, and communal activities.

- Language and Narrative: Music can convey cultural narratives, history, and values through lyrics, melodies, and musical themes.

- Diversity: Different cultures have their own musical traditions, and music cultural value recognizes and celebrates this diversity.

1.2. Music Social Value

Pertains to the role of music in shaping and influencing social interactions, relationships, and dynamics within a society. It focuses on how music connects individuals, fosters communication, and contributes to social cohesion and change.

Key Characteristics of Music Social Value:

- Community Building: Music often serves as a social glue, bringing people together and promoting a sense of belonging and community.

- Emotional Expression: It provides a platform for individuals to express their emotions, which can lead to empathy and understanding among listeners.

- Social Change: Music has the potential to inspire social change and activism by addressing important social issues or conveying messages of unity and justice.

- Communication: Music transcends language barriers and can facilitate communication between individuals who may not share a common language.

- Shared Experiences: Concerts, music festivals, and other musical events create shared experiences that strengthen social bonds and memories.

It is important to point out that Music's cultural value and social value are two distinct dimensions of the value of music, each with its own unique characteristics and significance. Following, the Key Differences Between Music Cultural Value and Music Social Value are presented:

- Scope: Music cultural value is often deeply rooted in traditions and heritage, encompassing historical and cultural narratives, whereas music social value is more concerned with the immediate impact of music on people dynamics and connections.

- Purpose: Music cultural value is closely tied to the preservation of cultural identity and traditions, whereas music social value is more concerned with the emotional, social, and communicative aspects of music.

Examples of these differences are the music cultural value might involve the preservation of traditional folk songs or religious music, while music social value might manifest in the way music is used at social gatherings, protests, or therapeutic settings.

In summary, music cultural value and music social value represent two facets of the broader value that music brings to individuals and societies. Music cultural value is rooted in cultural identity and preservation, while music social value focuses on how music shapes and enriches social interactions and relationships within a given community or society. Both dimensions highlight the diverse and multifaceted impact of music on human experiences.

1.3. Core Conceptual Elements for the Value of Music

Musical Artifacts. This includes music compositions, recordings, and performances, each with its own unique characteristics.

Stakeholders. Entities such as musicians, composers, producers, consumers, and organizations involved in the music industry.

Value Dimensions. Different dimensions of value, such as economic (monetary), cultural, emotional, therapeutic, and social value.

Hierarchical Structure. The ontology should be organized hierarchically, with broader categories breaking down into more specific subcategories. For instance, under ·Musical Works" you might have "Songs," "Albums," and "Live Performances."

Attributes and Properties. Define the relevant attributes and properties for each element in the ontology. For example, for "Songs," attributes might include tempo, key, lyrics, and genre, while for "Economic Value," attributes could involve revenue, sales, and licensing fees.

Relationships. Specify the relationships between different elements. For instance, how are musicians related to musical artifacts? How does cultural value influence economic value?

Monetary Value Aspect

- Financial Metrics: Represent the monetary value dimension using financial metrics like revenue, sales, royalties, and streaming income.

- Market Dynamics: Incorporate market dynamics, such as supply and demand, pricing strategies, and revenue distribution among stakeholders.

Non-Monetary Value Aspect

- Cultural Significance: Capture the cultural value of music by considering factors like historical importance, cultural heritage, and impact on society.

- Therapeutic Impact: Represents the beneficial aspects of music for health and well-being. One of the therapeutic impacts is the emotional effect of music, which is the ability of music to influence and regulate emotions by including attributes related to mood, emotional resonance, and psychological well-being.

- Social Influence: Account for the social value of music through aspects like community-building, identity formation, and social change driven by music.

- Temporal and Geographical Context: Consider how the value of music can vary over time and across different regions, cultures, and communities. Music's value can change significantly depending on historical context and geographical location.

In summary, the Music360 ontology for measuring the monetary and non-monetary value of music is a structured and flexible conceptual model that encompasses the multifaceted nature of music's worth. It provides a framework for understanding, quantifying, and analysing the diverse dimensions of value associated with music in a comprehensive and coherent manner, ultimately aiding stakeholders in making informed decisions and fostering a deeper appreciation of music's significance.

In the next section the conceptual constructs that comprise the first version of the music360 ontology are presented.

2. Music 360 Ontology - Conceptual Model

The main concepts related to the Music360 ontology can be located in the following four different groups: Music Economic and Non-Economic Value, Music Creation and Use, Music Rights and Licence Management, Music Stakeholders. From these four groups, the concepts related to the Music Economic and Non-Economic Value specification are the core of the Music360 ontology for measuring the value of music. The other three groups are defined to support the data-interoperability among different stakeholders' existing platforms, specially CMOs.

Figure 1 shows the conceptual model defined for the Music360 Ontology. The OMG MOF Standard[2] has been used for the representation of this conceptual model, which is based on the UML Class model notation. The Eclipse Modelling Tools[3] have been used for the specification of the conceptual model and implementation of model editors that support the Music360 conceptual model instances.

2 OMG (2016). Object Management Group Meta Object Facility (MOF) Core Specification Version 2.5.1. Retrieved from https://www.omg.org/spec/MOF

3 Eclipse modeling tools. https://www.eclipse.org/downloads/packages/release/2021-06/r/eclipse-modeling-toolsl.

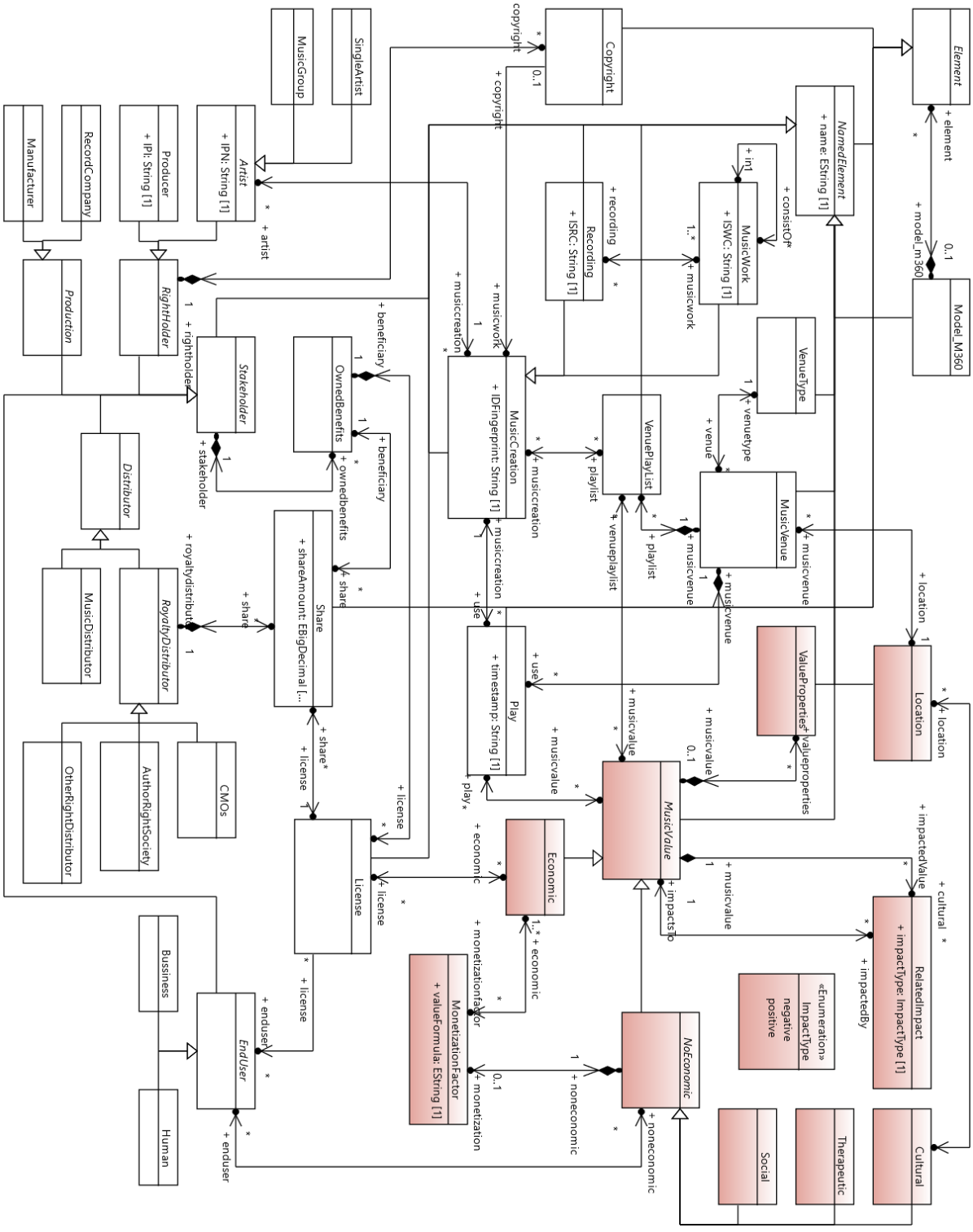

Figure 1. MOF conceptual model related to the Music360 ontology

2.1. Music Economic and Non-Economic Value

In the context of the Music360 Project, the non-economic values are classified into three main value types: Social Value, Cultural Value, and Therapeutic Value.

Moreover, these non-economic values can have an impact on the economic music value (see Figure 2). Is precisely the capturing and measurement of these non-economic values, trying to determine in a quantitative manner the impact that can have over the economic value of music, one of the main objectives of the Music360 platform.

Figure 2 shows the relationship between Economic and Non-Economic Value and thee different instances of music values identified from the literature.

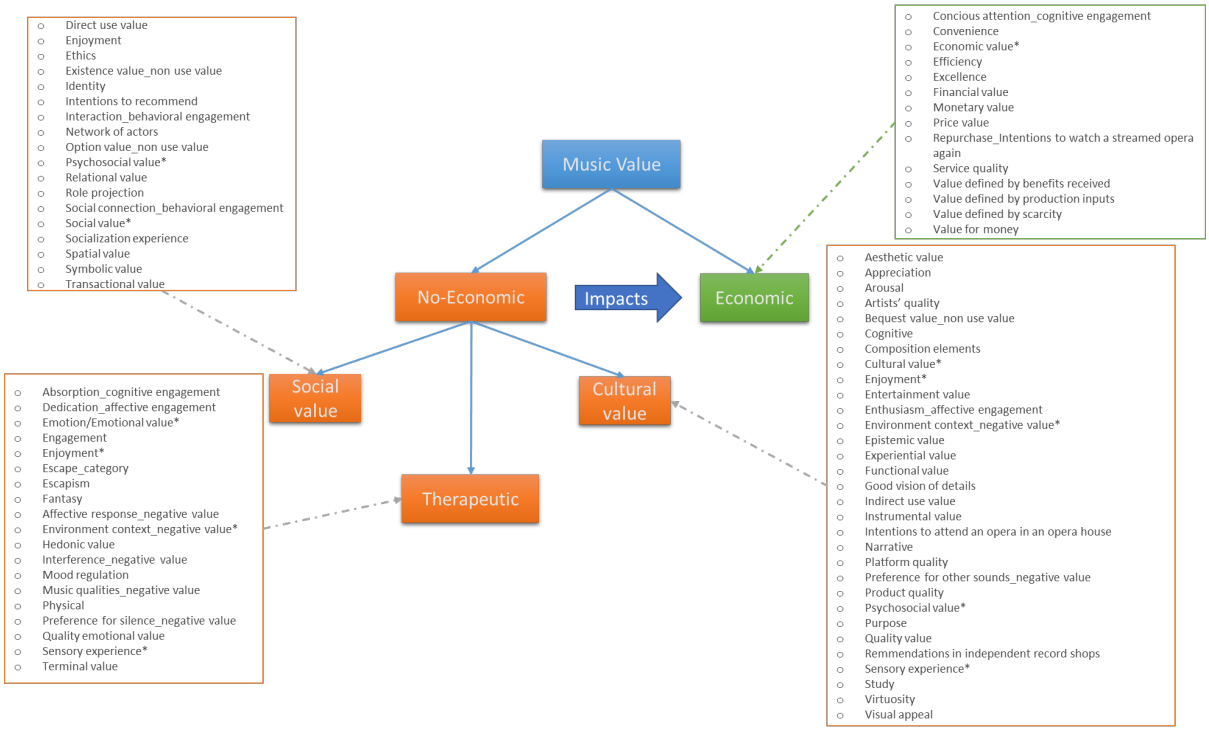

Figure 2. Music360 Economic and Non-Economic Values Classification

The main constructs (Meta-Classes) related to Economic and Non-Economic Music Value related to value are highlighted in red colour in the Music360 conceptual model (see Figure 1) and are described below.

2.1.1. Metaclass Music Value (Specialization of NamedElement)

The Metaclass Music Value represent any kind of value (monetary and non-monetary) related to a music play or to a music playlist used in a venue. This is an abstract metaclass that is specialized in the NonEconomic and Economic Metaclasses.

Properties: **name** (Inherited from superclass NamedElement).

Relationships:

- **play** [0..*]. Indicates the music plays that are related to the corresponding music value.

- **venueplaylist** [0..*]. Indicates the play lists related to different venues that are related to the corresponding music value.
- **impactedValue** [0..*]. Indicate other values that are impacted positively or negatively by a music value. The impact kind is specified by means of the enumeration ImpactType.
- **impactedBy** [0..*]. Indicates the music values that impact the corresponding music value.
- **valueproperties** [0..*] (composite). Indicate specific properties that characterize a music value.
- **musicvenue** [1..1]. indicates de venue where a music is played and the corresponding music value that is generated/obtained.

2.1.2. Metaclass NoEconomic (Specialization of MusicValue).

The Metaclass NoEconomic represent any no-economic music value (non-monetary) related to a Recording. This is an abstract metaclass that is specialized into the Social, Cultural, and Therapeutic Metaclasses.

Properties: **name**. Inherited from superclass NamedElement

Relationships:

- **play** [0..*]; **venueplayist** [0..*]; **impactedValue** [0..*]; **impactedBy** [0..*]; **valueproperties** [0..*]; **musicvenue** [1..1]. Inherited from metaclass Music Value.
- **monetization** (composite) [0..1]. Indicates a valuation formula that can be used to convert the non-economic value into an economic-value.
- **enduser** [0..*]. Indicates the end users (people or businesses) impacted by the corresponding non-economic value.

2.1.3. Metaclass Social (Specialization of NoEconomic).

The Metaclass Social represent any social value related to a Recording. This a concrete metaclass.

Properties: **name** (Inherited from superclass NamedElement).

Relationships: (Inherited from MusicValue)

- **play** [0..*]; **venueplayist** [0..*]; **impactedValue** [0..*]; **impactedBy** [0..*]; **valueproperties** [0..*]; **musicvenue** [1..1]. Inherited from metaclass Music Value.

- **monetization** (composite) [0..1]; **enduser** [0..*]. Inherited from metaclass NoEconomic.

2.1.4. Metaclass Therapeutic (Specialization of NoEconomic).

The Metaclass Therapeutic represent any therapeutical o medical value related to a Recording. This a concrete metaclass.

Properties: **name** (Inherited from superclass NamedElement).

Relationships: (Inherited from MusicValue)

- **play** [0..*]; **venueplayist** [0..*]; **impactedValue** [0..*]; **impactedBy** [0..*]; **valueproperties** [0..*]; **musicvenue** [1..1]. Inherited from metaclass Music Value.
- **Monetization** (composite) [0..1]; **endUser** [0..*]. Inherited from metaclass NoEconomic.

2.1.5. Metaclass Cultural (Specialization of NoEconomic).

The Metaclass Cultural represent any cultural value related to a Recording. This a concrete metaclass.

Properties: **name** (Inherited from superclass NamedElement).

Relationships:

- **play** [0..*]; **venueplayist** [0..*]; **impactedValue** [0..*]; **impactedBy** [0..*]; **valueproperties** [0..*]; **musicvenue** [1..1]. Inherited from metaclass Music Value.
- **monetization** (composite) [0..1]; **enduser** [0..*]. Inherited from metaclass NoEconomic.
- **location** [0..*]. Indicates the geographical locations that can be related to a cultural value.

2.1.6. Metaclass Economic (Specialization of MusicValue).

The Metaclass Economic represent the economic or monetary value related to a music creation. This economic value is directly related to the licensing process related to the use of music. This is a concrete metaclass.

Properties: **name**. Inherited from superclass NamedElement

Relationships:

- **play** [0..*]; **venueplayist** [0..*]; **impactedValue** [0..*]; **impactedBy** [0..*]; **valueproperties** [0..*]; **musicvenue** [1..1]. Inherited from metaclass Music Value.
- **monetizationfactor** [0..*]. Indicates the non-economic values that can have an effect on the economic evaluation of the music used with their corresponding conversion formula to translate the non-economic value in a monetary element.

2.1.7. Metaclass ValueProperties (Specialization of NamedElelment).

The Metaclass ValueProperties represents the properties that can be used to characterize a music value. This a concrete metaclass.

Properties: **name**. Inherited from superclass NamedElement

Relationships:

- **musicvalue** [0..1]. Indicates the music value that owns the corresponding property.

2.1.8. Metaclass Location (Specialization of NamedElelment).

The metaclass Location represents the geographical locations that can be related to a cultural value and/or to a music venue. This a concrete metaclass.

Properties: **name**. Inherited from superclass NamedElement

Relationships:

- **musicvenue** [0..*]. Indicates the music venue related to a corresponding location.
- **cultural** [0..*]. Indicates the cultural music values that are related to a specific location.

2.2. Music Creation and Use

The music conceptual model includes a set of conceptual constructs (metaclasses) related to the characterization of music creations and their use in specific music venues.

2.2.1. Metaclass MusicCreation (Specialization of NamedElelment).

The metaclass MusicCreation represents the main musical artefacts that can be played in musical venues. These musical artefacts can be music works that can be performed by music artists (for instance in live music events), or music recordings that are played using digital or analogical supports. This is an abstract metaclass specialised in metaclasses Recording and MusicWork.

Properties:

- **name**. Inherited from superclass NamedElement
- **IDFingerprint.** Identification code implemented in the context of the MUSIC360 platform to provide a unique identification the different music creations.

Relationships:

- **playlist** [0..*]. Indicates the playlist related to specific venues where the corresponding music creation is involved.
- **use** [0..*]. Indicates the moment and place where the music creation is played.
- **artist** [0..*]. Indicates the artists involved in the music creation.
- **copyright** [0..*]. Indicates the copyrights related to a music creation.

2.2.2. Metaclass MusicWork (Specialization of MusicCreation).

The metaclass MusicWork represents the abstract idea of a composition, including its melody, harmony, and structure. A music work can also be a composition of different music works. This is a concrete metaclass.

Properties:

- **name.** Inherited from superclass NamedElement.
- **IDFingerprint.** Inherited from superclass MusicCreation.
- **ISWC**. International Standard Musical Work Code. Unique identifier for music works.

Relationships:

- **playlist** [0..*]**; use** [0..*]; **artist** [0..*]; **copyright** [0..*] Inherited from superclass MusicCreation.
- **consistOf** [0..*]. Indicates the music works that comprise a composite music work.
- **recording** [0..*]. Indicates the different recordings related to a music work.

2.2.3. Metaclass Recording (Specialization of MusicCreation).

The metaclass Recording represents a specific performance made by one or more artists for a specific music work. This a concrete metaclass.

Properties:

- **name.** Inherited from superclass NamedElement.
- **IDFingerprint.** Inherited from superclass MusicCreation.
- **ISRC**. International Standard Recording Code. Unique identifier for music records.

Relationships:

- **playlist** [0..*]**; use** [0..*]; **artist** [0..*]; **copyright** [0..*] Inherited from superclass MusicCreation.
- **music** [0..*]. Indicates the music works involved in a recording.

2.2.4. Metaclass Play (Specialization of Element).

The metaclass Play represents the moment when a music creation is played by indicating the related music venue and the different music values (monetary and non-monetary) that can be associated to the execution of music creation involved in the play. This a concrete metaclass.

Properties:

- **timestamp**. Indicates the temporal moment when a music creation is played.

Relationships:

- **musicvenue** [1..1]. Indicates the music venue where a play is performed.
- **musiccreation** [1..1]. Indicates the music artifact (recording or music work) played in a specific venue.
- **musicvalue** [0..*]. Indicates the music values (monetary and/or non-monetary) related to a music creation play.

2.2.5. Metaclass MusicVenue (Specialization of NamedElement).

The metaclass MusicVenue represent the specific context where a music creation is played. This a concrete metaclass.

Properties:

- **name**. Inherited from superclass NamedElement.

Relationships:

- **venuetype** [1..1]. Indicates the venue type related to a music venue.
- **use** [0..*]. Indicates the music creations effectively played in a music venue.
- **playlist** [0..*]. Indicates the playlists defined for a music venue.
- **location** [1..1]. Indicates the place where a music venue is performed.

2.2.6. Metaclass VenueType (Specialization of NamedElement).

The metaclass VenueType Indicates the kind of music venues defined in the musci360 platform. This a concrete metaclass.

Properties:

- **name**. Inherited from superclass NamedElement.

Relationships:

- **venue** [0..*]. Indicates the different venues related to a corresponding venue type.

2.2.7. Metaclass VenuePlayList (Specialization of NamedElement).

The metaclass VenuePlayList describes the different playlists related to music venues. This a concrete metaclass.

Properties:

- **name**. Inherited from superclass NamedElement.

Relationships:

- **musicvenue** [1..1] (composite). Indicates the different venues where the corresponding playlist is used.
- **musicvalue** [0..*]. Indicates the music values (monetary and/or non-monetary) related to a venue playlist.
- **Musiccreation** [0..*]. Indicates the music creations related to a playlist.

2.3. Music Rights and Licence Management

The music conceptual model includes a set of conceptual constructs (metaclasses) related to the generic characterization of the licence management and stakeholders rights over the music creations. These conceptual constructs are described below.

2.3.1. Metaclass License (Specialization of NamedElement).

The metaclass License describes the license agreement related to an end-user, which is used to determinate the economic value for a music creation play. The license is related to the economic benefits that must be paid to the stakeholder that owns these benefits rights. This a concrete metaclass.

Properties:

- **name**. Inherited from superclass NamedElement.

Relationships:

- **economic** [0..*]. Indicates the economic values related to the corresponding license.
- **beneficiary** [1..1] (composite). Indicate the benefit right that owns the corresponding license, which are related to a specific stakeholder.
- **share** [0..*]. Indicates the amount of share that must be paid to different stakeholders, which are collected by a Royalty distributor.
- **enduser** [0..*]. Indicates the end users that acquired the licenses for playing music creations.

2.3.2. Metaclass Share (Specialization of NElement).

The metaclass Share describes the amount of money that must be paid to different stakeholders according to the owned benefits and licenses distribution. This a concrete metaclass.

Properties:

- **shareAmount**. Amount of money that must be collected by a royalty distributor for the use of a music creation.

Relationships:

- **royaltyDistributor** [1..1]. Indicates the royalty distributor that is responsible for collecting a share.
- **beneficiary** [1..1]. Indicates the beneficiary that must receive the corresponding share.
- **license** [1..1]. Indicates the license agreement related to a corresponding share.

2.3.3. Metaclass Copyright (Specialization of Element).

The metaclass Copyright describes the author rights owned by a right holder. This a concrete metaclass.

Properties: --

Relationships:

- **musicwork** [1..1]. Indicates the music work related to a copyright.
- **rightholder** [1..1] (composite). Indicates the right holder that owns the corresponding copyright.

2.4. Music Stakeholders

The Music360 conceptual model include a set of metaclasses that provide a general characterization of the stakeholders related to the Music360 ecosystem. These stakeholders can be instantiated into particular actors according to the different music use and the related economic and non-economic values.

2.4.1. Metaclass Stakeholder (Specialization of NamedElement).

The metaclass Share provides the generic characterization of the stakeholders involved in the Music360 platform. This is an abstract metaclass specialized in the metaclasses RightHolder, Production, Distributor, and EndUser.

Properties:

- **name**. Inherited from superclass NamedElement.

Relationships:

- **ownedbenefits** [0...]. Indicates monetary benefits that an stakeholder can obtain from a music creation play.

2.4.2. Metaclass RightHolder (Specialization of Stakeholder).

The metaclass RightHolder describes those stakeholder that have ownership of intellectual property rights of the music creations. This is an abstract metaclass specialized in the metaclasses Artist and Producer.

Properties:

- **name**. Inherited from superclass NamedElement.

Relationships:

- **ownedbenefits** [0...*]. Inherited from superclass Stakeholder.
- **copyright** [0..*]. Indicated the related intellectual property rights.

2.4.3. Metaclass Artist (Specialization of Rightholder).

The metaclass Artist represents the roles and attributes that can be associated with individuals or groups contributing to the music creation. For instance, an artist can be a musician, which encompasses various roles such as instrumentalists and vocalists. Musicians are responsible for performing music compositions, either through playing musical instruments, singing, or a combination of both. Other example is the composer, which is an artist who creates musical works, such as songs, symphonies, or soundtracks. This is an abstract metaclass specialized in the metaclasses SingleArtist and MusicGroup.

Properties:

- **name**. Inherited from superclass NamedElement.
- **IPN**. International Performer Number. is a unique identifier for performers: singers or musicians.

Relationships:

- **ownedbenefits** [0...*]. Inherited from superclass Stakeholder.
- **copyright** [0..*]. Inherited from superclass RightHolder.
- **musiccreation** [0..*]. Indicates the music creations where the corresponding artist is involved.

2.4.4. Metaclass SingleArtist (Specialization of Artist).

The metaclass Artist represents an individual musician or performer who may be involved in various roles within the music creation process. This is a concrete metaclass.

Properties:

- **name**. Inherited from superclass NamedElement.
- **IPN**. Inherited from superclass Artist.

Relationships:

- **ownedbenefits** [0...*]. Inherited from superclass Stakeholder.
- **copyright** [0..*]. Inherited from superclass RightHolder.

- **musiccreation** [0..*]. Inherited from superclass Artist.

2.4.5. Metaclass MusicGroup (Specialization of Artist).

The metaclass MusicGroup represents collective of individual artists or musicians who come together to create music as a unit. These groups can include bands, ensembles, choirs, and other musical collaborations. This is a concrete metaclass.

Properties:

- **name**. Inherited from superclass NamedElement.
- **IPN**. Inherited from superclass Artist.

Relationships:

- **ownedbenefits** [0...*]. Inherited from superclass Stakeholder.
- **copyright** [0..*]. Inherited from superclass RightHolder.
- **musiccreation** [0..*]. Inherited from superclass Artist.

2.4.6. Metaclass Producer (Specialization of Rightholder).

The metaclass Producer represents the stakeholder involved in making creative and technical decisions during the music creation process and production of a musical composition. This is a concrete metaclass.

Properties:

- **name**. Inherited from superclass NamedElement.
- **IPI**. An Interested Party Information (IPI) number is a unique, international identification number.

Relationships:

- **ownedbenefits** [0...*]. Inherited from superclass Stakeholder.
- **copyright** [0..*]. Inherited from superclass RightHolder.

2.4.7. Metaclass Production (Specialization of Stakeholder).

The metaclass Production represents the stakeholders involved in making the music works available through digital or analogic supports and/or providing the necessary musical resources for the correct music performance. This is an abstract metaclass specialized in the metaclasses RecordCompany and Manufacturer.

Properties:

- **name**. Inherited from superclass NamedElement.

Relationships:

- **ownedbenefits** [0...*]. Inherited from superclass Stakeholder.

2.4.8. Metaclass RecordCompany (Specialization of Production).

The metaclass RecordCompany represents the organization (also known as a record label) that specializes in the production, distribution, and promotion of music recordings. This is a concrete metaclass.

Properties:

- **name**. Inherited from superclass NamedElement.

Relationships:

- **ownedbenefits** [0...*]. Inherited from superclass Stakeholder.

2.4.9. Metaclass Manufacturer (Specialization of Production).

The metaclass Manufacturer represents companies or entities involved in the production and manufacturing of musical instruments and equipment used by musicians, bands, and the music industry.

Properties:

- **name**. Inherited from superclass NamedElement.

Relationships:

- **ownedbenefits** [0...*]. Inherited from superclass Stakeholder.

2.4.10. Metaclass Distributor (Specialization of Stakeholder).

The metaclass Distributor represents a company or entity involved making music available to the public. It also represent the stakeholders involved in the distribution of royalties related to the music use. This is an abstract metaclass specialized in the metaclasses MusicDistributor and RoyaltyDistributor.

Properties:

- **name**. Inherited from superclass NamedElement.

Relationships:

- **ownedbenefits** [0...*]. Inherited from superclass Stakeholder

2.4.11. Metaclass MusicDistributor

The metaclass MusicDistributor represents a company or entity involved in the distribution and delivery of music recordings to various platforms, retailers, and digital services. This is a concrete metaclass.

Properties:

- **name**. Inherited from superclass NamedElement.

Relationships:

- **ownedbenefits** [0...*]. Inherited from superclass Stakeholder

2.4.12. Metaclass RoyaltyDistributor (Specialization of Distributor).

The metaclass RoyaltyDistributor represents the organizations or entities that are responsible for collecting and distributing royalties and payments to music rights holders, such as songwriters, composers, and performers. This is a concrete metaclass.

Properties:

- **name**. Inherited from superclass NamedElement.

Relationships:

- **ownedbenefits** [0...*]. Inherited from superclass Stakeholder
- **share** [0..*]. Indicates the shares related to the different royalties managed by the Royalty distributor.

2.4.13. Metaclass CMOs (Specialization of RoyaltyDistributor).

The metaclass CMOs represents the Collective Management Organizations that are entities that manages the rights and royalties of music creators and rights holders. This is a concrete metaclass.

Properties:

- **name**. Inherited from superclass NamedElement.

Relationships:

- **ownedbenefits** [0...*]. Inherited from superclass Stakeholder.
- **share** [0..*]. Inherited from superclass RoyaltyDistributor.

2.4.14. Metaclass AuthorRightSociety(Specialization of RoyaltyDistributor).

The metaclass AuthorRightSociety represents organizations (also known as Authors' Rights Societies or Performing Rights Organizations-PROs) that are responsible for the collective management of copyright and related rights on behalf of music creators, such as songwriters, composers, lyricists, and music publishers. This is a concrete metaclass.

Properties:

- **name**. Inherited from superclass NamedElement.

Relationships:

- **ownedbenefits** [0...*]. Inherited from superclass Stakeholder.
- **share** [0..*]. Inherited from superclass RoyaltyDistributor.

2.4.15. Metaclass OtherRightDistributor(Specialization of RoyaltyDistributor).

The metaclass OtherRightDistributor refers to other entities or organizations that play a crucial role in collecting and distributing royalties on behalf of songwriters, composers, performers, and publishers when their works are used in various ways, including public performances, broadcasts, and digital streaming. This is a concrete metaclass.

Properties:

- **name**. Inherited from superclass NamedElement.

Relationships:

- **ownedbenefits** [0...*]. Inherited from superclass Stakeholder.
- **share** [0..*]. Inherited from superclass RoyaltyDistributor.

2.4.16. Metaclass EndUser (Specialization of Stakeholder).

The metaclass EndUser represents to individuals or entities that consume or interact with music in various ways. These end users can include music listeners, consumers, and other entities that engage with music, such as businesses using music for commercial purposes, or medical centres that use music for therapeutic purposes.

The end users obtain the permission of use music creations through specific licenses that they acquire. This is an abstract metaclass specialized in the metaclasses Business and Human.

Properties:

- **name**. Inherited from superclass NamedElement.

Relationships:

- **ownedbenefits** [0...*]. Inherited from superclass Stakeholder.
- **license** [0..*]. Indicate the licenses that and end user have for playing one or more music creations.

2.4.17. Metaclass Business (Specialization of EndUser).

The metaclass Business represents commercial entities or organizations that use music for various purposes in the course of their operations. These businesses may include retail stores, restaurants, advertising agencies, event organizers, and any other entity that utilizes music for professional, commercial, or promotional activities. This is a concrete metaclass.

Properties:

- **name**. Inherited from superclass NamedElement.

Relationships:

- **ownedbenefits** [0...*]. Inherited from superclass Stakeholder.
- **license** [0..*]. Indicate the licenses that and end user have for playing one or more music creations.

2.4.18. Metaclass Human (Specialization of EndUser).

The metaclass Human represents individuals who interact with music-related services, platforms, and content. These users are music enthusiasts, consumers, and music professionals who engage with music in various ways, such as listening to music, creating playlists, managing their music collections, and exploring music-related content. This is a concrete metaclass.

Properties:

- **name**. Inherited from superclass NamedElement.

Relationships:

- **ownedbenefits** [0...*]. Inherited from superclass Stakeholder.
- **license** [0..*]. Indicate the licenses that and end user have for playing one or more music creations.

Appendix: Application of the ontology

Based on the earlier explained ontology, we derive a data model that will be used for the first living labs, and will be enhanced based on these living labs. In addition to the ontology, the data model is based on a series of workshops with the Dutch Collective Management Organizations (CMOs), namely SENA and BUMA.

The figure below presents the data model as UML class model. We now briefly explain the model.

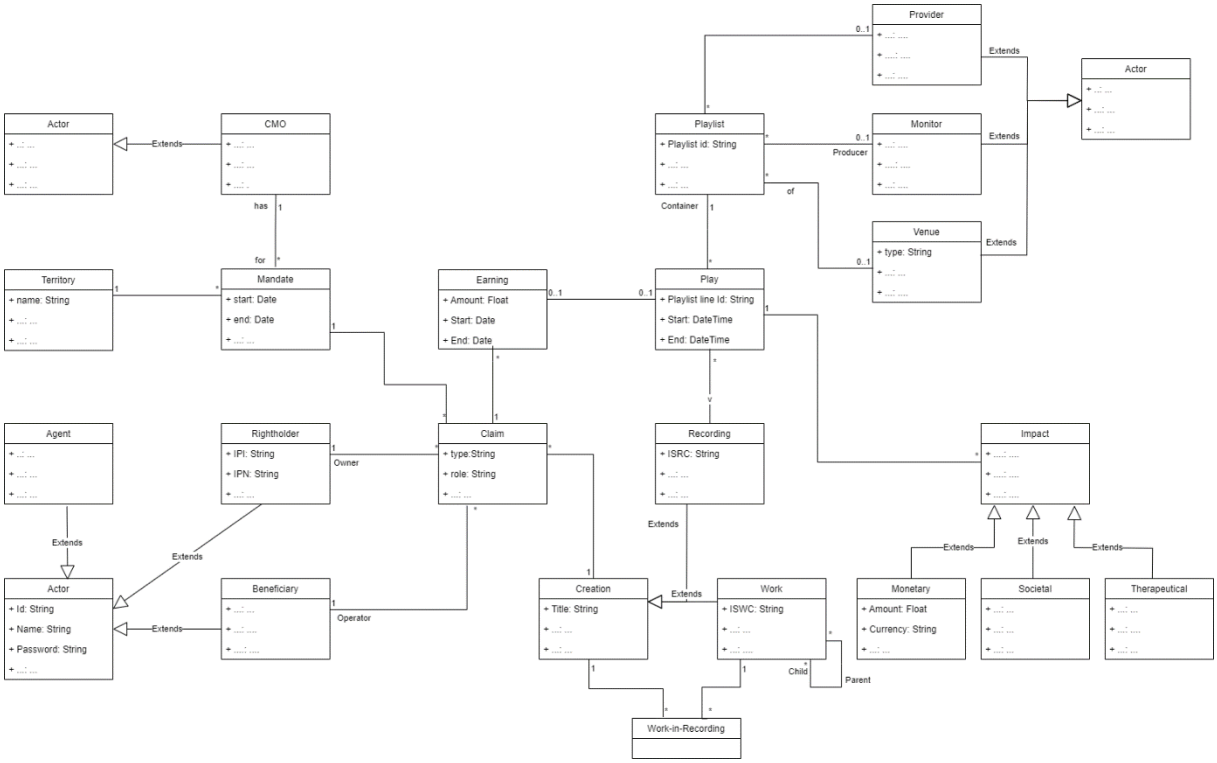

Figure 3. Base data model for the living labs

Actor

Explanation: An actor is an identifiable natural person or legal entity such as an organisation, enterprise, foundation, etc.

Identification: There is no world-wide identification of actors. There are different identification methods for specific kinds of actors. Where appropriate, we will use the scheme for that actor.

Properties: Actors can have many properties, such as their name.

Rightholder

Explanation: A rightholder is any actor who has a claim on creation.

Example: Artist, composer, producer and publisher are all rightholders.

Identification: Rightholders are, depending on their nature, identified differently. Rightholders of neighbouring rights are identified by their International Performer Number (IPN), whereas authors are identified by the Interested Party Information (IPI). A rightholder can have both an IPI and IPN; then such a rightholder is for example both artist and composer. Note that the current metadata of the music industry does not relate the IPI and IPN.

Relations:

- A rightholder can be represented by an agent

Agent

Explanation: An agent is someone, who represents the interests of a rightholder. Typically, famous rightholders do not directly manage their neighbouring- and author rights, but use an agent to do so.

Identification: The identification used by the CMO, plus the identification of that CMO.

CMO

Explanation: A Collective Management Organization (CMO) is an organization that collectively, so on behalf of many right holders, obtains a compensation from right users (restaurants, shops, etc.), and pays the collected fees, minus an administrative fee, to the rightholders.

Benificary

Explanation: A beneficiary is an actor who obtains money that is paid as a result of a neighbouring- or author right.

Identification: The identification used by the CMO, plus the identification of that CMO.

Claim

Explanation: A rightholder has a claim on a work (either a recording or a work).

Properties:

- Type: either a neighbouring or author claim
- Role: the claiming role a rightholder has in relation to the creation (e.g. main artist, studio musician, producer, lyrics author, etc.). CMOs have an exhaustive list of the possible roles.

Identification: A claim is identified by the combination of the rightholder, creation, and role.

Relations:

- A claim has a creation to which the claim applies.
- A claim may have a beneficiary. Default, the right owner is the beneficiary (e.g. the party who receives the payment associated with the claim), but this may be delegated (sold) to a beneficiary.

Creation

Explanation: A creation is either a work or a recording.

Recording

Explanation: A recording is the master, often a digital file, that carries music played by musicians, e.g. in studio but also during a live performance. Recordings are associated with neighbouring rights.

Identification: A recording is identified by the International Standard Recording Code (ISRC). In this project we assume that the ISRC code uniquely identifies a recording.

Work

Explanation: A work is an intellectual creation, in our context often lyrics, scores, and compositions. Works are associated with author rights.

Identification: A work is identified by the International Standard Work Code (ISWC). In this project we assume that the ISWC code uniquely identifies a work.

Relations:

- A work may consist of other works.

Work-in-recording

Explanation: A recording often is based on a work. However, more than one work may be involved, for example in case of a medley. Obviously, a work can have many recordings

Identification: A work-in-recording is identified by the combination of the recording and the work.

Relations:

- A work-in-recording has one recording.
- A work-in-recording has one work.

Mandate

Explanation: A mandate expresses that a CMO is allowed, for a specific claim, to collect fees, and to pay the rightholder.

Properties:

- Start date: When does the mandate start.
- End date: When does the mandate ends.

Relations:

- A mandate is for a CMO.
- A mandate is for territory. Note that a territory can multiple mandates. Often, CMO is the only party who has a mandate for a specific territory, but in case of competition, multiple mandates for the same territory are possible.
- A mandate is for multiple claims.

Identification: A mandate is identified by the combination of the start- and end date, the CMO, and the territory.

Territory

Explanation: A territory is a geographical area.

Example: NL, FI, PT, SP, IE, B, EMEA, USA,…

Earning

Explanation: An earning is a financial result for a claim, which is paid to a rightholder or beneficiary. The earning allows very course grained earnings, e.g. for one year, and for very fine grained earnings, e.g. a play of one recording.

Properties:

- Amount, which reflects the amount of money to be paid.
- Start, the moment the earning periods starts.
- End, the moment the earning periods ends.

Relations:

- An earning is for a claim.
- An earning is based on a mandate.

Identification: An earning is identified by the start- and end data, and on the claim.

Play

Explanation: A play represents that (part of) a recording is played a music user, e.g. a radio station, a restaurant, or a shop.

Properties:

- A play has a start date and time.
- A play has an end date and time.

Relations:

- A play can be associated with an earning. Note that in many cases, a play can not be directly related to a play. Based on an algorithm, collected money by the CMOs are distributed over claims, e.g. based on the playlists of radio stations,

market research, etc. In some cases, where venues are monitored using finger printing technology it is possible to relate the play to an earning.

Identification:

- A play is identified by a playlist line id.

Playlist

Explanation: A playlist is a collection of plays.

Relations:

- A playlist consists of plays.

Identification:

- A playlist is identified by a playlist id.

Provider

Explanation: A playlist is delivered by a provider.

Relations:

- A playlist may be delivered by a provider, such as a background music provider, a radio station. In case someone plays from a local CD/MP3, there is no playlist provider.

Monitor

Explanation: A monitor is the party who listens to music played (e.g. on the radio, or by a shop), and identifies the recording played.

Relations:

- A monitor produces playlists.
- A monitor monitors a music user (e.g. by means of a music finger printing device).

Music user

Explanation: A music user is an entity which makes music public, and as result of that, has to pay for neighbouring and author rights.