MediaVerse

A universe of media assets
and co-creation opportunities

D4.1

Copyright and Procedures for IPR Definition

Project Title	MediaVerse
Contract No.	957252
Instrument	Innovation Action
Thematic Priority	ICT-44-2020 Next Generation Media
Start of Project	1 October 2020
Duration	36 months

Deliverable title	Copyright and Procedures for IPR Definition
Deliverable number	D4.1
Deliverable version	V1.0
Previous version(s)	N/A
Contractual Date of delivery	30.09.2021
Actual Date of delivery	30.09.2021
Nature of deliverable	Report
Dissemination level	Public
Partner Responsible	TLX
Author(s)	Dorien Surinx, Lynn Pype, Pieter Gryffroy (TLX), Domenico Rotondi, Marco Giovanelli, Marco Saltarella (FIN), Giacomo Corrias (LINKS), Haris Bouchlis (ATC), Manos Schinas (CERTH)
Reviewer(s)	Robin Nachtrab-Ribback (STXT), Nicolas Patz (DW)
EC Project Officer	Alberto Rabbachin

Abstract	This deliverable provides the legal framework for copyrights and their management within MediaVerse and presents the planned legal and technical implementation of the copyright and licensing approach within the project.
Keywords	Intellectual property rights, copyrights, digital rights management, copyright licence, blockchain, smart (legal) contracts.

Revision History

Version	Date	Modified By	Comments
V0.1	25/06/2021	Dorien Surinx, Lynn Pype, Domenico Rotondi	First Draft Table of Content
V0.2	30/06/2021	Dorien Surinx, Marco Giovanelli, Giacomo Corrias	Final Table of Content
V0.3	16/07/2021	Dorien Surinx, Lynn Pype, Domenico Rotondi, Marco Giovanelli, Marco Saltarella, Giacomo Corrias, Haris Bouchlis	First Draft
V0.4	05/08/2021	Dorien Surinx, Pieter Gryffroy, Lyn Pype, Domenico Rotondi, Marco Giovanelli, Giacomo Corrias, Haris Bouchlis	Second Draft
V0.5	27/08/2021	Dorien Surinx, Domenico Rotondi, Marco Saltarella, Giacomo Corrias, Haris Bouchlis	Final Second Draft
V0.6	15/09/2021	Dorien Surinx, Pieter Gryffroy, Domenico Rotondi, Marco Giovanelli, Manos Schinas	Final Second Draft Review
V0.7	17/09/2021	Dorien Surinx, Lynn Pype, Pieter Gryffroy	Version ready for review
V0.8	24/09/2021	Robin Nachtrab-Ribback	Review
V0.9	28/09/2021	Nicolas Patz	Review
V1.0	28/09/2021	Pieter Gryffroy, Dorien Surinx, Lynn Pype	Final version

Glossary

Abbreviation	Meaning
AD	Administrative Domain
AI	Artificial Intelligence
API	Application Programming Interface
BIS	Bank for International Settlements
CBDC	Central Bank Digital Currency
CC	Creative Commons
DAM	Digital Asset Manager
DApps	Decentralised Apps
DLT	Distributed Ledger Technology
EC	European Commission
ECB	European Central Bank

ECJ	European Court of Justice
ERC	Ethereum Request for Comments
ETH	Ethereum
EU	European Union
GBBC	Global Blockchain Business Council
GSMI	Global Standards Mapping Initiative
GSN	Gas Station Network
IPR	Intellectual Property Rights
ID	Identifier
IWA	Inter Work Alliance
MV	MediaVerse
MVCoin	MediaVerse Coin
MVDigA	MediaVerse Digital Asset
NFT	Non-Fungible Token
OD	Ownership Deed
PBOC	People's Bank of China
PSD2	Payments Services Directive 2
RBA	Reserve Bank of Australia
SC	Smart Contract
SLC	Smart Legal Contract
TRIPS	WTO Agreement on Trade-Related Aspects of Intellectual Property Rights
TTF	Token Taxonomy Framework
UI	User Interface
UNESCO	United Nations Educational, Scientific and Cultural Organisation
US OCC	US Office of the Comptroller of the Currency
VR	Virtual Reality
WIPO	World Intellectual Property office
WP	Work Package
WTO	World Trade Organisation
XR	Extended Reality

Table of Contents

Index of Figures

Index of Tables

Executive Summary

This deliverable provides the legal framework for copyrights and their management within MediaVerse and presents the planned legal and technical implementation of the copyright and licensing approach within the project. MediaVerse will be a platform on which users will be able to create, share, license and monetise content. Inevitably, copyrights will be engaged in such activities. Keeping in mind the challenges of copyright management in a digital context, MediaVerse will implement a technical solution based on Distributed Ledger Technology (DLT), using on the one hand a blockchain solution and Smart Contracts (SC) for notarising and executing transactions and on the other hand licences as Smart Legal Contracts (SLC) to meet the legal requirements.

As copyrights will be a cornerstone for the MediaVerse project, this deliverable provides an introduction to European copyright law and neighbouring rights, including the conditions for application of those rights, in Section 2. Within the areas of authorship, the protectable works and exceptions, the deliverable identifies the main considerations within copyright law in a digital environment with relevance to the platform in Section 2.4. The identified challenges mainly point at the fragmentation of national law, which result in difficulties when operating a cross-border service. Nevertheless, we identified that the technical implementation proposed by MediaVerse can be of great value, as users can determine themselves, and the platform can register, what works they want to make available, how ownership should be shared and how the work should be distributed and monetised. MediaVerse will not function as a registry for copyrights nor a collective management organisation, as it registers ownership and not copyrights as such. Since content can be licensed through SLCs regardless of the nature of the work, it provides an easy way for owners and creators to exploit their content. This way, legal certainty for the owners can be provided and contracts can be enforced outside of the digital environment. Also new exceptions, such as the text and data mining exception can be implemented though technical tools developed for online rights management.

Section 3 builds on section 2 by explaining how copyright can be managed on the blockchain through the use of licences executed as SLCs. Section 3 explain the legal conditions for licensing and the state of play in terms of existing open-source licences. The legal implementation of copyright management through cross-border licences is looked at in detail, which resulted in drafting a template licence that covers the main legal obligations following from national law and covers all kinds of options and standard licence templates such as the Creative Commons licences. Section 3 also explains how, by making use of SLCs, licences can be adjusted to the needs of the user and can be automatically executed which will provide the user with control and certainty on remuneration.

Section 4 covers the implementation of copyright management within the MediaVerse platform and lays the foundation for the technical implementation, which will be done through a blockchain-based rights management solution, running on the Ethereum blockchain. This will handle the deployment and the management of the SCs that will be used to notarise the SLCs counterpart, supporting not only the possibility to acquire and transfer rights, but also provide auditability and revenue payment splitting. The technical approach relies on a root triplet: the asset (MVDigA), the owner and the Ownership Deed. This root triplet can then be further supplemented with leaf triplets (MVDigA, right owner, right) stemming from licences or transfers of ownership. For implementing the Ownership Deed or such licences, MediaVerse will make use of SLC (off-chain logic) combined with an Ethereum-based SCs implementation (on-chain logic) to notarise and automate the execution of the legal agreements. This way, any authorisation to use the work gets registered, and the execution of the contract, including remuneration according to ownership rights, is automated. The ownership rights will be registered in an interchangeable fungible token, while the specific copyrights will be identified by a non-fungible token, which cannot be shared. This section also includes the functional requirements and workflows per process.

1   Introduction

MediaVerse aims to enable all sorts of content creators, from traditional publishers and freelance creators or artists to anyone who wants to share their ideas, to create and share their media, while keeping control of their Intellectual Property Rights (IPR).

In order to do this, tools for content (co-)creation will be provided and the users will be able to share, license and monetise the content as desired. MediaVerse will implement a blockchain-based rights management solution, which will deploy licences in the form of SLCs, combining legally binding contracts with automated execution on the blockchain through SCs.

The platform will be tested in several use cases, for example, through Use Case 1 on citizen journalism, which will enable prosumers to deliver content, to be used and further adjusted by professional broadcasters. Another example is Use Case 2, which provides users with a possibility to use co-creation tools to work together on certain projects together and publish them on the platform. After creating content on the platform or uploading it, users will be able to select a licence on the platform, by making use of pre-set examples or building their own making use of the provided building blocks.

Providing internet users with a possibility to create, co-create, share, license and monetise media in an online environment inevitably engages copyright law and its particularities and raises particular legal and digital challenges. Besides the challenges, the use of digital copyright management solutions also has great value as it can give back control to rightsholders, maximise the revenue streams and provide safeguards against online misuse of content.

As the legal challenges are tackled by technical solutions and implementations, this deliverable will commence in Section 2 by setting out the legal framework and the particularities, to then continue with the legal and technical implementation within the platform.

An introduction will be given to copyright law in the European Union, the conditions for copyright protection and the content of the copyrights and neighbouring rights themselves.

The deliverable will then focus on the particularities within copyright law with relevance for MediaVerse, within the distinctive domains of authorship, protected works, exceptions, and platform liability.

Next, Section 3 of this deliverable will build on the theory provided in Section 2 by explaining how copyright can be managed on the blockchain, making the distinction between copyright transfers and licensing, and explaining how licences can be executed as SLCs to have a highly automated and secure management of copyright. This section investigates the legal conditions and elements of valid copyright contracts in detail and a solution is sought for the fragmentation of national law in the copyright domain. Based on the analysis a MediaVerse template licence is defined.

Last, Section 4 of the deliverable is dedicated to the actual implementation of copyright management within the platform. The technical implementation of ownership transactions and licensing on the platform will take place through the use of blockchain SCs, crypto-assets and SLCs, as explained in detail in this section.

2   Intellectual Property Rights in a Digital Environment

2.1   Overview

As MediaVerse will allow users to upload content and share, license and monetise such content. An important part of the project revolves around copyrights.

This deliverable will set out the important concepts regarding copyright law, such as the conditions for protection and the content of the rights, and will analyse some topics of relevance to the MediaVerse platform.

2.2   Copyrights

2.2.1   Legal Framework

Copyright law is one of the fields of intellectual property law where the harmonisation efforts of the European Union have only covered a small area of the domain. In comparison to trademark law and design law, many subjects remain a national matter.

When this deliverable refers to European copyright law, it shall refer to copyright law, which stems from legislative documents and case-law of the European Union, but also international treaties and conventions concluded with countries of the European Union.

The most important international treaties in the area of copyright law, which are also reflected in the obligations of the Member States under the European Union's Directives are the Berne Convention and the Rome Convention, as well as the TRIPS Agreement of the World Trade Organisation (WTO), the Paris Convention of the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and the WIPO treaties of 1996, the WIPO copyright treaty and the WIPO Performances and Phonograms Treaty. In 2012 and 2013, two additional WIPO treaties were signed by the EU: The Beijing Treaty on Audio-visual Performances and the Marrakesh Treaty to Facilitate Access to Published Works for Persons who are Blind, Visually Impaired, or otherwise Print Disabled.

Within the European Union's legislative framework, the main legal instrument in the copyright domain is the Copyright Directive of 2001 (InfoSoc Directive), which aims to harmonise copyright rules within the Union and to adapt copyright legislation to new technological developments. The document is a Directive, having as its effect that the Member States had to transpose the provisions into their national law. There are obligatory provisions, but also optional provisions, such as on certain exceptions to the economic rights of rightsholders.

The relevant European Union instruments in the copyright domain are:

- Council Directive 93/83/EEC of 27 September 1993 on the coordination of certain rules concerning copyright and rights related to copyright applicable to satellite broadcasting and cable retransmission ("Satellite and Cable Directive");
- Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases ("Database Directive");
- Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market ("Directive on electronic commerce");

- Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society ("InfoSoc Directive");
- Directive 2001/84/EC of the European Parliament and of the Council of 27 September 2001 on the resale right for the benefit of the author of an original work of art ("Resale Right Directive");
- Directive 2004/48/EC of the European Parliament and of the Council of 29 April 2004 on the enforcement of intellectual property rights;
- Directive 2006/115/EC of the European Parliament and of the Council of 12 December 2006 on rental right and lending right and on certain rights related to copyright in the field of intellectual property ("Rental and Lending Directive");
- Directive 2006/116/EC of the European Parliament and of the Council of 12 December 2006 on the term of protection of copyright and certain related rights ("Term Directive");
- Directive 2009/24/EC of the European Parliament and of the Council of 23 April 2009 on the legal protection of computer programs (Codified version);
- Directive 2011/77/EU of the European Parliament and of the Council of 27 September 2011 amending Directive 2006/116/EC on the term of protection of copyright and certain related rights;
- Directive 2012/28/EU of the European Parliament and of the Council of 25 October 2012 on certain permitted uses of orphan works ("Orphan Works Directive");
- Directive 2013/37/EU of the European Parliament and of the Council of 26 June 2013 amending Directive 2003/98/EC on the re-use of public sector information;
- Directive 2014/26/EU of the European Parliament and of the Council of 26 February 2014 on collective management of copyright and related rights and multi-territorial licensing of rights in musical works for online use in the internal market;
- Directive (EU) 2019/790 Of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC ("Digital Single Market Directive").

2.2.2 Conditions for Protection

Expression

The expression of a work is the first requirement to enjoy copyright protection. More specifically, copyright protection is conveyed to *"literary and artistic works".* This implies that in order to benefit from copyright protection, something has to be expressed in an actual work. In other words, the author or the creator has to give a certain shape to an idea or a thought. This means that copyrights and neighbouring rights only protect the form of expression of an idea, but not the idea itself.

The Berne Convention defines literary and artistic works as (Article 2, Berne Convention):

> *"every production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression, such as books, pamphlets and other writings; lecturers, addresses, sermons and other works of the same nature; dramatic or dramatico-musical works to which are assimilated works expressed by a process analogous to cinematography works to which are assimilated works expressed by a process analogous to cinematography; works of drawing, painting, architecture, sculpture, engraving and lithography; photographic works to which are assimilated works expressed by a process*

analogous to photography; works of applied art; illustrations, maps, plans, sketches and three-dimensional works relative to geography, topography, architecture, or science."

This definition is extensive and comprises all kind of (original) works, whether tangible or intangible. This definition targets every kind of original work of authorship and is thus not exhaustive (WIPO Publications, 2016, 7). The work has to be expressed in a certain shape, regardless of what that shape is. Computer programs, for instance, are not included in the list set forth by the Berne Convention, but this does not mean that it does not enjoy copyright protection. A computer program can qualify as a "*production in the literary, scientific and artistic domain".* Although specific legislation has in the meantime been put in to place to cover the exploitation of copyrights on computer programs[1], the Berne Convention still serves as the basis for copyright protection.

Original

Originality is the second requirement to establish copyright protection. Copyright protection requires that the work that expresses an idea must be original. In this regard, originality is not a synonym for novelty (Stanmatoudi, 2017, 57). Novelty is more difficult to achieve, because it entails that something is not yet known in a field of work worldwide. Novelty relates to prior art and is connected to industrial intellectual property rights such as models and patents.

The threshold for originality is lower than the one for novelty and relates to a certain expression instead of the idea behind that expression (Stanmatoudi, 2017, 57). For example, different persons can paint the same landscape, whereby each individual painting can enjoy copyright protection provided that it is the author's own interpretation of the landscape. It would however not be allowed to copy a painting of that landscape from another author.

However, there has been quite some discussion on how to apply the originality criterion since different countries can have a different interpretation. Although originality is an essential requirement for copyright protection, there is no legal definition of the originality concept (Margoni, 2016, 3). Civil law systems would generally apply it in a stricter way, with an emphasis on the author's own imprint on the work. This means that the works should reflect that author's personal input, which is not always easy to establish. Common law traditions use a more relaxed approach and require for the work to be original that it is not a copy of another work (Margoni, 2016, 3).

Until today, there is not full harmonisation of copyright protection and of the originality concept. As a result, different approaches remain to exist. However, this has not withheld the ECJ to interpret the provisions in various copyright directives that relate to originality in order to provide a more harmonised view of the concept.

With its Infopaq decision, the ECJ has established the basis of the originality concept (ECJ, Infopaq):

"37 In those circumstances, copyright within the meaning of Article 2(a) of Directive 2001/29 is liable to apply only in relation to a subject-matter which is original in the sense that it is its author's own intellectual creation.

38 As regards the parts of a work, it should be borne in mind that there is nothing in Directive 2001/29 or nay other relevant directive indicating that those parts are to be treated any differently from the work as a whole. It follows that they are protected by copyright since, as such, they share the originality of the whole work.

---

[1] See Directive 2009/24/EC of the European Parliament and of the Council of 23 April 2009 on the legal protection of computer programs.

> *39 In the light of the considerations referred to in paragraph 37 of this judgment, the various parts of a work thus enjoy protection under Article 2(a) of Directive 2001/29, provided that they contain elements which are the expression of the intellectual creation of the author of the work."*

In other words, the ECJ sets forth that the originality criterion is fulfilled when the work is the author's own creation. In later judgments, the ECJ added that the author's intellectual creation is present when the author can freely make creative choices and can put his or her personal imprint on the work (ECJ, Panier). Furthermore, when a work or expression is solely determined by technical or functional requirements, that leave no room for creative choices, the work in question will not show originality (ECJ, Football Dataco v. Yahoo!). This means that pure technical documents will not be copyright protected. As soon as the author can make personal choices in the creation or development of a work, the originality criterion would be met and copyright protection can be invoked.

If there were a discussion on the (existence of) originality of an expression, it will be up to the courts to determine whether or not that expression is in fact original. When doing so, the courts apply the originality principles laid down by the ECJ, but since there is no full harmonisation of the concept, each Member State remains to use their own approach.

2.2.3   Rights

Copyright is usually divided between economic or patrimonial rights and moral rights. The economic rights are the rights that allow the author to use the work in the way of their choice. The moral rights on the other hand allow the author to protect his reputation.

The duration of the validity of the copyrights is usually 70 years after the author's death but there are differences between Member States. For example, in France and Poland, the moral rights are perpetual while in other Member States, they have the same duration as the economic rights.

Economic Rights

The economic rights are the rights that can be exploited and commercialised. These rights have an economic value and can, contrary to moral rights, be transferred to third parties, both to national persons as to companies. There are a number of economic rights and they mainly entail the right to Authorise or prohibit a third party to use the copyright protected works in a certain way. Copyright owners can generally Authorise or prohibit third parties (WIPO Publications, 2016, 11):

- to distribute copies of the work;
- to reproduce the work in different forms;
- to adapt the work;
- to translate the work into other languages;
- the public performance of the work;
- to broadcast the work or communicate it any other way to the public.

This shows that there are two kinds of economic rights. The economic rights comprise, on the one hand, the rights of reproduction, distribution, rental, and importation. These rights relate to the (use of) physical copies of the works. On the other hand, there are the rights of communication to the public. Those rights relate to the non-physical exploitation of the works (for example in an online environment).

1. The rights relating to the reproduction and distribution of the works

Copyright owners have the right to prevent others from making copies of their works without their permission. This right is standard in copyright legislation and other rights, such as the right to distribute copies of a protected work ensure that the right of reproduction can be enforced. It would not make sense that a third party would need the permission of the copyright owner to reproduce a copyright protected work but could otherwise freely distribute copies thereof. Hence, different rights exist in order to ensure that the copyright owners can control the exploitation of their works.

However, it should be noted that the right to distribute is usually exhausted after the sale of a certain copy. For example, a copyright owner can sell a copy of their book or CD, but can afterwards not prevent that copy from being resold to another buyer. In other words, a customer can purchase a copyright protected work and then resell it but cannot make other copies of that work in order to resell those. In this regard, discussions came to light whether this concept could be applied to digital works. The answer is not as easy, and this will be further addressed in the section below.

2. The rights relating to the communication to the public of the works

The rights relating to the communication of the works to the public concern the exploitation of the non-physical form of a copyright protected work, such as the commercialisation of a work online or via broadcasting. What activities can be considered as a 'communication to the public' has been the subject of discussion during the past decade.

Article 3(1) of the InfoSoc Directive provides the right of communication to the public and stipulates that:

> "*Member States shall provide authors with the exclusive right to authorise or prohibit any communication to the public of their works, by wire of wireless means, including the making available to the public of their works in such a way that members of the public may access them from a place and a time individually chosen by them.*"

The act of communicating a work to the public entails two constitutive parts. First, there must be a transmission of protected works, irrespective of the technical means or the process. Second that transmission must be a transmission to a public. The ECJ developed criteria on how to determine whether a certain intervention or transmission can be considered as a communication to the public for which the right owner's permission is required. First and foremost, a communication requires that the one who communicates is fully aware of the consequences of their actions. He must willingly give others access to protected works. For example, the radio playing in a doctor's waiting room will be considered as a communication to the public (ECJ, SFC v. Marco Del Corso). In this regard, the transmission of the work must go further than the mere provision of physical (technical) facilities. For example, a car rental company that leases vehicles with radios does not communicate protected works to the public. This is a mere provision of technical equipment and there is no intervention of the rental company in the broadcast of the works through the car's radio (ECJ, STIM and SAMI v. Fleetmanager Sweden).

Furthermore, the works must be communicated to a 'public'. This has led to the most notable addition of the ECJ, who decided that in order to speak of a communication to the public, the work has to be communicated to a 'new public' (ECJ, SGAE v. Rafale Hoteles; Hugenholtz & van Velze, 2016, 5). What's a "new public"? By 'new public', the Court refers to the public that has not been considered by the relevant copyright owner when he Authorised the initial communication (ECJ, SGAE v. Rafale Hoteles).

It must be said that it is a case-by-case analysis whether a transmission can be considered as a communication to a new public. For instance, making work available via a hyperlink will generally not constitute an act of communication to the public (ECJ, Svensson v. Retriever Sverige AB). According to the ECJ, hyperlinks do not meet the 'new public' test since all Internet users are able to access works freely available online. In other words, the copyright owner should be aware of the fact that when they put their work online without any restriction, it is accessible for potentially all Internet users. However, if the hyperlink would circumvent restrictions put into place to protect the work, in order to restrict public access, then they would be considered as a communication to the public (ECJ, Svensson v. Retriever Sverige AB).

The ECJ decided that the sale of second-hand e-books through a website can constitute a communication to the public, which is subject to the authorisation by the author (ECJ, Nederlandse Uitgeversbond and Groep Algemene Uitgevers). In this case, the Court found that the supply by downloading an e-book for permanent use is not covered by the right of distribution to the public, but instead by the right of communication to the public.

As long as new technologies and ways of transmitting content will see the daylight, it will be up to the courts to determine whether their use would constitute a communication to the public.

Moral Rights

Next to economic rights, the authors also enjoy moral rights. The characteristics of the moral rights is that they are attached to the author as a natural person. Contrary to the economic rights, the moral rights cannot be transferred to third parties.

The moral rights set forth in the Berne Convention are the right of paternity, or the right to claim authorship of a work, and the right of integrity, which entails that the author has the right to oppose to any distortion or modification of the work that would be prejudicial to the author's reputation (article 6bis, Berne Convention).

Certain copyright legislations also recognise the divulgation right as a moral right. This is the author's right to decide whether or how to make work available to the public. This gives the author control over when their work can be disclosed to the public.

2.3   Neighbouring Rights

Besides copyrights, there is the regime of the neighbouring rights, rights which are linked to copyrights, which are given to performances that do not enjoy copyrights. Classical, such rights are given to performers, to protect the performances, and to producers and broadcasters, to protect their financial investment. More recently, also (press)publishers were granted neighbouring rights.

To all the neighbouring rights, exceptions can apply. We refer however to the exceptions described in relation to copyrights further on in this deliverable, as these would take us beyond the scope of this deliverable.

2.3.1   Performing Artists

Regardless of whether a work of art is (still) protected under copyright, a performer is granted a neighbouring right on her or his interpretation, "performance", of a work. A performer communicates a work to the public or performs the work in an artistic way, subsequently it covers singers, musicians, actors, dancers, or acrobats, etc., as well as directors and conductors. The performer must use their personal attributes to communicate the work,

such as their voice, mimic, body, virtuosity, etc. This does not entail that he needs to comply with the originality criterion under copyright law.

Not included are sound- and light technicians, camera people, athletes, etc.

Note that artists that also made the underlying work, for example musicians, also hold the copyrights on the work itself, the composition, and the lyrics.

Performers have the broadest rights of all neighbouring rights holders. They have economical rights, including the full range of reproduction rights and communication to the public rights, interpreted identical as for copyrights' holders. For audio-visual works, it is important to note, as will be touched upon below as well, that neighbouring rights of performers, such as actors, are presumed to be transferred to the producer. Furthermore, they enjoy several moral rights, although less broad than those of authors.

2.3.2   Producers

Another important neighbouring right, is that of producers of phonograms (recordings of sounds, including music) and films. The right is limited to the first fixation of the recording on a medium. This right protects the financial investment of recording sounds or a film.

Producers are only granted economical rights in relation to the fixation, including the rights to authorise:

- reproductions;
- rent or lend;
- distribute;
- communicate the recording to the public.

2.3.3   Broadcasters

Thirdly, there is the right for broadcasters, which have an exclusive neighbouring right on their broadcasts. Broadcasts are defined by the Rome Convention as: "the transmission by wireless means for public reception of sounds or of images and sounds" (Article 3(f), Rome Convention).

In comparison to performers and producers, the broadcasters have less broad rights:

- An exclusive reproduction right, including the distribution right;
- Exclusive right of communication to the public, limited to communication to the public in a public place in exchange for entrance money, retransmissions and making broadcasts available on-demand to the public.

2.3.4   (Press) publishers

Recently, also (press) publishers were granted neighbouring rights, under the Digital Single Market Directive, which will be touched upon further below. Such protection was deemed necessary to respond to the practices of linking and showing snippets from articles (e.g., Google news), which caused publishers to loose revenues.

Such publishers enjoy an exclusive right to reproduction, but only for the online use by Information Society Service providers, defined by Directive 2015/1535 as *"any service normally provided for remuneration, at a distance, by electronic means and at the individual request of a recipient of services. For the purposes of this*

definition: (i) 'at a distance' means that the service is provided without the parties being simultaneously present; (ii) 'by electronic means' means that the service is sent initially and received at its destination by means of electronic equipment for the processing (including digital compression) and storage of data, and entirely transmitted, conveyed and received by wire, by radio, by optical means or by other electromagnetic means; (iii) 'at the individual request of a recipient of services' means that the service is provided through the transmission of data on individual request." (article 1(1)(b), Directive 2015/1535)

A press publication is defined as: *"a collection composed mainly of literary works of a journalistic nature, but which can also include other works or other subject matter, and which: (a) constitutes an individual item within a periodical or regularly updated publication under a single title, such as a newspaper or a general or special interest magazine; (b) has the purpose of providing the general public with information related to news or other topics; and (c) is published in any media under the initiative, editorial responsibility and control of a service provider."* Explicitly excluded are *"Periodicals that are published for scientific or academic purposes, such as scientific journals, are not press publications for the purposes of this Directive"* (Article 2(4), Digital Single Market Directive).

The right is limited to two years from the publishing date and is subject to a lot of exclusions including for hyperlinking and non-commercial use.

2.4.   Copyrights and Neighbouring Rights in MediaVerse - Particularities

As MediaVerse will operate as a digital platform for content creation and sharing, many particular aspects of copyright law are triggered. This section of the deliverable will give an introduction to these particularities and will provide a legal analysis in the framework of European copyright law.

2.4.1. Authorship

Under European copyright law, copyrights are given to the physical person who creates the work. This implies that the initial copyright is only granted to a physical person, not an organisation or a business. Such actors can nevertheless obtain the copyright through a transfer or as a result of a legal construct.

Difficulties can arise when a work is created by more than one person, or when it is not created by a person at all. As these topics are of specific interest to MediaVerse, they will be touched upon below.

Co-authorship

MediaVerse will offer powerful co-creation tools, which will allow several persons to work together on the creation of a work. Within MediaVerse, use case 2 will use the MediaVerse platform to allow for co-creation in small groups as a method of enhancing awareness and training through cooperation, and to stimulate the creation of training materials through cooperation. In this use case, the users will be able to create the content together through the co-creation and editing tools MediaVerse will provide, and they will be able to assign roles in relation to the work. The work will be made available on MediaVerse through one of the available licences.

Inevitably, this raises the question on co-authorship of works. In general, the individuals that created a work together will be the co-authors of the work and they will all own the copyright on the work together. Regardless of the share that each author has in the work, as long as they provided an original input to the work, every single one will be a co-author. Individuals who help with the creation of the work, while carrying out instructions or

taking preparatory steps will not be co-authors as such actions do not have a creative impact on the work which carries the stamp of the individual itself.

A distinction needs to be made between works which are inseparable (joint authorship) on the one hand, and works which are separable (collective works), on the other hand.

Inseparable works are works in which the individual inputs on the authors cannot be individualized, such as two artists working together on an art installation or two musicians composing a song together. In general, such works cannot be exploited separately as the individual inputs of the co-authors are inseparably linked to one another, the parts are in other words "merged" together. The co-authors will have to exploit the work together, meaning they all have to agree on how a work is used, licensed, etc. Hence, before one of the co-authors can turn to exploitation, they will have to ask the consent of the other authors.

Separable works, such as a theatre play with accompanying music or a book with contributions of several writers, have clearly identifiable original inputs of different authors. Such co-authors can exploit their work individually, as long as they do not harm the work as a whole.

Both for separable and inseparable works, the exploitation is often arranged contractually to avoid future conflicts between the co-authors. For inseparable works for example, it is also possible to deviate from the prior consent requirement.

Some specific rules need to be taken into account for audio-visual works. Given the number of individuals involved in the creation of such works, they are subject to assumptions of authorship and assumed assignment in many European countries. All European countries recognise that the director will in any case be the author of the work (Council Directive 92/100/EEC). The Member States of the EU were free to designate other co-authors. *In Belgium*, for the script- and screenwriter, the editor and the graphic designer (in case of animated movies) there is a rebuttable assumption of authorship, meaning they will be considered as co-authors of the audio-visual work through original inputs, unless proven otherwise. Furthermore, film adaptations of a book will always have as a co-author the author of the book. Other individuals can also be recognised as authors, when proof is provided that they contributed an original element to the audio-visual work as a whole. *In France*, the director and authors of the script, the adaptation, the dialogue, and musical compositions made for the audio-visual work are co-authors. *Portugal and Italy* designate as co-authors the director, the authors of the underlying works, such as script, scenario, dialogue and adaptation, and the authors of the music in the audio-visual work.

In Belgium, the (economic) exploitation rights of all co-authors in relation to the audio-visual work are subject to a rebuttable assumption of assignment to the producer. Exempted from this are the copyrights of the author of music used in the audio-visual work and the copyrights on a book used for a film. In return for the attribution of exploitation rights, remuneration obligations are imposed. In *France and Germany*, the main exploitation rights are also presumably transferred to the producer. Since these national particularities pose difficulties to the film industry, which has international effects, the Berne convention provides for an assumption of assignment of rights for authors who have undertaken a contribution to the audio-visual work. The provision however excludes the authors of scenarios, dialogues and musical works created for the work and the principal director of the work, thereby limiting the applicability of the provision to designers, camerapeople, actors, etc (Article 14bis, Berne Convention) (if such actors would obtain copyrights under national law).

Attention has to be given as well to the particular case of *neighbouring rights*, which are inevitably also apparent in audio-visual works. Under the Rome Convention, performers which agreed to have their performance included in an audio-visual work cannot prevent any further uses (Article 19, Rome Convention). The Beijing Treaty

expands the rights of the performers in audio-visual works, granting them minimum rights and exclusive rights. However, it also offers the possibility for the member states to include in their national law a rebuttable presumption of assignment of the rights of the performers on the performance to the producer (Article 12, Beijing Treaty on Audio-visual Performances). In *Belgium*, there is such a presumption regarding the assignment of the exploitation rights on the performance to the producer.

Within MediaVerse, the co-authors will have the possibility to agree on their respective roles towards the work in the Ownership Deed, which will be touched upon below. They will be able to determine their identity as co-author or holder of a neighbouring right. MediaVerse will have no say in this process, nor will it check the attributed roles, putting power and contractual freedom in the hands of the MediaVerse users. As appears from the above, national law often works with rebuttable presumptions of assignment. As MediaVerse will be available across European borders, the users will benefit from this definition of their roles and rights in respect to the work as the uncertainty of the application of diverging national laws in this regard will be excluded. Furthermore, the authors and holders of neighbouring rights will be able to decide on their respective revenue shares in the MediaVerse Licences. It is important to note that the user who uploads a collective or collaborative work in MediaVerse, will have the responsibility and warrant that they have acquired the correct authorisations from the other rightsholders involved. Such obligation will be stipulated in MediaVerse's terms and conditions.

Works Created by/through AI

In today's time and age, an emerging practice is that works of art are created using technological solutions or are even solely created by them. In 2018, Christies auctioned an AI-generated work called "Portrait of Edmond Bellamy" for a stunning 432.500 US dollars. The work was made by an algorithm, formed by feeding a system with 15.000 portraits dated between the 14th and 20th century and adding a system to recognise works made by a human, as to "purify" and optimise the results.[2] Two years before that, an AI algorithm was already used to create a "new" Rembrandt, a computer-made portrait in the style of Rembrandt made by feeding the system with works of the master himself.[3]

As MediaVerse focusses on new innovative ways to create and share media, works created by or through AI are a topic of interest to the project. An important question from a copyright perspective, is whether such works could be protected by copyright and, if yes, who would be the holder of such copyrights. This boils down to the question of authorship of copyrightable works.

The Berne Convention offers little guidance on who is to be understood as the author of the work. However, several common and civil law jurisdictions identify the natural person who created the work as the author (Goldstein & Hugenholtz, 2019, 229).

When we look at the conditions for copyright protection, the condition of originality and its harmonised interpretation under European Copyright law poses a direct problem for works created by AI, as a copyrightable work must be an expression of a personal and intellectual creation of the author. An original work shows intellectual effort and shows a link to the author, as if the author left their personal "stamp". A work which is solely created by a computer, does not in itself provide a link to its creator, which is the computer, and it cannot be an intellectual creation. One could argue that the author of the AI algorithm should be the author of the work created by the algorithm, however, it is one thing recognising that he or she is the creator of the algorithm but is goes too far to also recognise him/her as the author of the specific work as the direct link between him/her

---

[2] https://www.christies.com/features/A-collaboration-between-two-artists-one-human-one-a-machine-9332-1.aspx

[3] https://www.bbc.com/news/technology-35977315

and the work is absent. Moreover, it can be argued that there is no real act of creation, or conception, of a work, as this is merely the effect of a mathematical process. This said, a work created through AI, meaning with human interaction and a human link to the work, can be copyrighted if the work fulfils the conditions. The holders of the copyrights in the work can be diverse, including both the developer of the system and the individual that interacted with the system to create the work.

In the *UK,* the situation of computer-generated works is taken into account in its national law as the Copyrights, Designs and Patents Act provides: *"In the case of a literary, dramatic, musical or artistic work which is computer-generated, the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken"* (Paragraph 9(3), UK Copyrights, designs and patents act 1988). A similar provision was included in the Irish copyright act (Section 21(f), Irish Copyright and Related Rights Act 2000). Such a provision broadens the concept of authorship to individuals who did not create the work itself. By including the necessity of a human intervention, applying this provision will still require human intervention and thus originality of that human to protect the work under copyright law (Ramalho, 2017, 18). Difficulties are still apparent in determining who the individual is that made the necessary arrangements, as in some modern video games, the users themselves also interact with the system and have an impact on the game itself (Bonadio & McDonagh, 2020). It is also Important to note that the rights granted to such authors are limited to economic rights, and that moral rights are still reserved for the authors of classical literary works.

Nevertheless, the current originality condition under European Copyright law does not leave room for qualifying an AI system as the author of a work. Within national copyright law, there are several exceptions, where copyrights can be held by legal persons, mainly prompted by the need to protect substantial investments, a problem which is also dealt with through the creation of neighbouring rights. In *Belgium and France,* for example, the economic copyrights on software created in an employment context will be held by the employer unless agreed otherwise between the parties (Article L.113-9, French Intellectual Property Code; Article XI.296, Belgian Economical Law Code). In *the Netherlands,* employers are seen as authors of works which are made by employees in the context of an employment contract, in contrast with *France and Belgium* where assignment, "ownership", is implied but not authorship. The argument to use such constructs to also grant authorship to computer systems is not convincing. In most instances, an assignment of economic rights is presumed which is in essence a transfer of ownership and not of authorship. The author, who holds the moral rights, will still be the initial flesh-and-blood author. Moreover, organisations have legal personality, a construct which has not yet been put into place for AI systems and computers. Doing so would raise serious questions of liability, a discussion which would take us too far for the purposes of this deliverable, and also raises questions on the exercise and enforcement of copyrights when granted (Devarapalli, 2018, 722; Dorotheu, 2015, 92). Another proposal in this regard is considering an AI-system as an employee, and then assigning the copyrights on the work to the company who owns the AI-system or the creator thereof (Lim, 2020). Also here, drawing this similarity to employment situations ignores the lack of initial creativity in the work.

Whether an AI-created work could be considered a derivative work, with the creator(s) of the AI-system then also being the author of the derivative work, is questionable. The AI-generated work is indeed generated through the AI system; however, it is not based on the AI-system as such to speak of a derivative work. Furthermore, a derivative work does not automatically have as its author the author of the initial work, having as its effect that qualifying an AI-generated work as a derivative work does not in any way solve the problem with authorship of the work. In a way the AI-generated work could be based upon works inputted in the AI-system, but also here this does not solve the authorship issue as there is still a lack of human creativity in the derived work (Lim, 2020).

Stepping away from the idea of granting the AI-system itself or the creator of the AI-system copyrights on the work, other solutions could be a new neighbouring right or a *"droit de suite"*, or search for solace in the rules on the protection of software.

First of all, similarities could be drawn from neighbouring rights of producers and broadcasters, which, under EU copyright law, are granted neighbouring rights in order to protect substantial investments. Such a neighbouring right, however, needs broad support on a European level and will provide less rights than copyrights.

Furthermore, it has been argued in legal literature that AI-generated works could be subject to a right similar to the *"droit de suite"* or the resale right (Cedillo-Lazcano, 2020). Such a right is granted to artists of graphical works and provides them with a fixed share in the revenue every time their work is sold by a professional art dealer. This way, the creator of the AI-system could claim a fee every time the AI-generated work is sold further. From a digitally focused perspective, this could be implemented through blockchain and SCs.

Finally, we must not disregard the protection of the developer of the AI-system which already exists, namely the protection of software under copyright law. This protection is harmonised in the European Union and covers the object- and source code of software and the preparatory material. The conditions are the same as those under general copyright law, the software programme will have to be an original expression. The authorship rights will belong to the developer, as the creator of the software programme.

Within MediaVerse, a user will have the possibility to upload an AI-generated work, claim ownership on it and license the work. As stipulated above, MediaVerse will not function as a platform for copyright registration, nor will it check whether the conditions for copyright protection are fulfilled. MediaVerse will thus allow the owner of an AI-system and a work generated by that system to share, sell and/or license such work without the question of copyright protection posing itself. As the licence is a contract, it is enforceable also outside of MediaVerse regardless of the lack of copyright of the work. The only implication here is that the owner will not have the specific enforcement possibilities which would be given to the author of a work under copyright law.

2.4.2. Works

MediaVerse will stimulate the creation of new works, especially works in the non-traditional sense such as Virtual Reality ("VR") projects and videos which integrate works and which allow users to interact with it. As VR and 360° works will play an important role, the next subsection (Virtual Reality, 360° Videos and Other 3D Works) will look into the protectability of such works. Furthermore, as MediaVerse's focus lies strongly on accessibility, also the copyrightability of subtitles as works will be analysed.

There is no strict list of works which can be protected under copyright law. Article 2, §1 of the Berner Convention stipulates: *"The expression "literary and artistic works" shall include every production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression, such as books, pamphlets and other writings; lectures, addresses, sermons and other works of the same nature; dramatic or dramatico-musical works; choreographic works and entertainments in dumb show; musical compositions with or without words; cinematographic works to which are assimilated works expressed by a process analogous to cinematography; works of drawing, painting, architecture, sculpture, engraving and lithography; photographic works to which are assimilated works expressed by a process analogous to photography; works of applied art; illustrations, maps, plans, sketches and three-dimensional works relative to geography, topography, architecture or science."* The provision attempts to sum up some of the possible works which could claim copyrights, but as is suggested by the inclusion of "such as" this list is not exhaustive and can be further defined on a national level. In most civil

law countries such a list is left open and new works can also qualify if they meet the other conditions (Hugenholtz & van Velze, 2019, 183). Furthermore, as follows from the *sui generis* protection of databases and the rules on the copyrights on software, also databases and software can be seen as works under copyright law.

Referring back to the introductory part, the most important factor in deciding whether something is a literary or artistic work, is whether it is an expression and whether such expression is original.

It is important to note that a work that is copyrightable, can also be subject to neighbouring rights such as a recording of a musical work or the rights of a press-publisher on an article.

Virtual Reality, 360° Videos and Other 3D Works

Works of virtual reality can come in many forms and formats, but in general they can be described as a computer-generated 3D depictions of a space, which the user can explore. Such spaces can be realistic or not and can be optimally accessed through a headset which allows the user to "walk in the space". The complexity of protecting VR under copyright law lies in the fact that several types of works are combined. A VR work can combine elements of illustrations, sculptures, music, photography and visuals. Furthermore, such work will also run as software. In general, there will be three main groups of work: audio, video and computer code. In addition to that, plots and architectural works can be protected.

As touched upon above, in civil law countries, there is no limit as to which works can be protected under copyright law and there is room for new works to be protected under copyright law. Nevertheless, there are no examples (yet) of countries protecting such works as a whole under copyright law.

Similarities need to be drawn to the *protectability of computer games* under copyright law, as these are similar in format. There is a dichotomy between countries that put emphasis on the qualification of the elements of the game under the different types of works, and those that predominantly qualify the work as a computer program. Some non-EU countries also put the emphasis on protection as an audio-visual work (Ramos, 2013, 11).

For a video game to be protected as software there must be an expression, which implies that only source- and object code and the preparatory documents will be protectable. As the Court of Justice of the EU has stipulated, graphical user interfaces will not fall under such software protection (ECJ, BSA). The other elements of the videogame can be protected under general copyright law when the originality criterion is fulfilled.

The relevance of the qualification of video games, and by analogy VR works, as software programs, as works under general copyright law or as both, lies at the ability to determine the applicability of the protective regime and the accompanying rules. Firstly, it can be argued that such works fall under the software protection as a whole. This approach is not to be favoured, as there will be many people involved in the creation of a VR work which are not developers, such as illustrators, graphic designers, musicians, voice-actors, etc. Such a qualification would also run counter to the jurisprudence of the Court of Justice, which determined that general copyright protection can be granted to elements of the software program as well as to the work as a whole (ECJ, Tom Kabinet; ECJ, Nintendo v. PC Box).

Secondly, another practical solution is protecting the work under general copyright law as a whole. The work is then protected as an audio-visual work, without recognising the protectability under the software protection. Such qualification has been applied by some member states, including *Belgium and the Netherlands*. As was argued in a Belgian court, the software protection has to be interpreted restrictively, and can therefore not be applied to a video game as a whole in case of infringement. It was held that applying both protective regimes is not a solution as it will enable conflicting legal effects (Keustermans & Blomme, 2021, 130). This view is also held

by the court of Justice of the EU, which in recent cases has judged in favour of a unified protection under general copyright law, in which the non-software elements of the video game outweigh the software elements. Nevertheless, in case of infringement, it proves interesting to assess on which elements of the video game an infringement takes place. If there is a reproduction of source and object code specifically, it might still be necessary to look at the software protection.

A third and last option for the qualification of video games, and by analogy VR works, is a distributive qualification under both general copyright law and software protection. Such a method is already used in *France* and starts from choosing the most appropriate protection. The Court of Justice of the EU also held such a view before turning to favouring protection under general copyright law touched upon above. Difficulties of such an approach situate at the level of the copyright exemptions, which are not entirely the same under both regimes. A possible solution here would be to apply the most restrictive provision. This could however lead to some legal uncertainty.

As a final note, for these types of works, also the rules on collaborative and collective works set out above prove very relevant, as such works will often be made by several authors. For such rules, the qualification as a software programme or a work under general copyright is also very important, as different rules can apply, for example regarding works made in an employment context.

Within MediaVerse, the biggest challenge will be to determine whether for the purposes of MediaVerse a VR work will be seen as one work as a whole or several smaller works combined or connected to one another. As we will touch upon below, the way works are registered in MediaVerse is through a triplet – Asset, Owner, Right – implying that the biggest question here is whether one or more assets are apparent in a VR work. For the determination of roles, rights and remuneration possibilities, the creators will have immense freedom in arranging their respective contractual relationships through an Ownership Deed and the licence modalities. Another interesting development which MediaVerse could help shape is granting users that interact with the work rights on the derivative work that they created by their interaction.

Subtitles and Audio Description (for Accessibility)

For media content to be made accessible, one of the most important measures will be captioning the content, i.e., providing subtitles. Such subtitles can be a translation of the content, or can rather be a descriptive measure, captioning the dialogues in the work. Another form of supporting accessibility will be audio-description, where text is read, or events are described to assist visually-impaired persons. From a legal perspective, two questions arise: whether such translations, captions or audio versions of an existing work can be made freely and whether the subtitles or audio-descriptive works themselves can be protected under copyright law.

Inevitably, when creating subtitles, the original work is "used". The question on the *legality of such use* relates to the field of tension between copyrights on the one hand and law on accessibility on the other hand. When creating captions and audio-descriptions, several of the economical copyrights will be engaged, namely the reproduction rights and possibly the right to make adaptations and the right to make available or distribute the work. These rights are also relevant for translations, which will additionally engage the right to make translations. Also moral rights can be infringed, if the translation or adaptation negatively influences the original work. Hence, the question will not be whether captions or translations are actions which are relevant to copyright law, because of the nature of accessibility measures that take over original parts of the copyrighted work, but rather whether such actions are infringing. To analyse this, we will need to look at the exceptions to copyright infringements.

Especially relevant is European Directive 2017/1564 on certain permitted uses of certain works and other subject matter protected by copyright and related rights for the benefit of persons who are blind, visually impaired, or

otherwise print-disabled. As the legal instrument is a directive, it is directly implemented into the national legislation of the member states of the European Union. Following these rules, Member States need to implement in their copyright legislation an exception to the copyrights on a work for the benefit of creating an accessible version of the work and distributing and making such versions available. This has as an effect that no authorisation needs to be asked from the rights holders for actions which entail their right to reproduce, distribute, communicate and make available. The Directive is limited to the benefit of people who are blind or visually impaired, thereby excluding people with hearing disabilities and also excluding the possibility for the accessibility measures taken to be made broadly available for other purposes while still enjoying this exception. Important to note is also that the applicability is limited to those people to whose benefit the Directive was drafted and authorised entities, which are defined as *"an entity that is authorised or recognised by a Member State to provide education, instructional training, adaptive reading or information access to beneficiary persons on a non-profit basis. It also includes a public institution or non-profit organisation that provides the same services to beneficiary persons as one of its primary activities, institutional obligations or as part of its public-interest missions."* (Article 2(4) Directive 2017/1564). The applicability of the exception is thus rather limited, in terms of the people which can benefit from the exception and the purposes for which it can be used. Social media, for example, that want to offer accessibility features, will not be able to call upon this exception. Furthermore, the works are limited to literary works and sheet music, in any media or format. This implies that works which are original audio-visual works are excluded, which is of negative effect to audio description where the events in an audio-visual work are described for someone who cannot see the visual elements. Finally, these rules are not applicable to the benefit of people with limited hearing capabilities or those who are deaf, thereby excluding subtitles and captions on the sounds.

Nevertheless, there are some Member States of the EU that also implemented a similar exception for the benefit of people with hearing disabilities or disabilities in general (European Parliament, 2018).

Generally speaking, when captioning, modifying or transforming copyrighted works for the purposes of providing accessible material for people with disabilities, chances are high that there will be a national exception applicable upon fulfilling some conditions such as non-commercial use and adherence to the strict purpose. As translations will not fall under such purposes, they infringe the copyrights of the rights holder of the original work when the latter has not consented to the translation.

As to *copyright protection of accessibility measures* a division needs to be made between on the one hand translations, descriptions, and performances, which add to the original work, and literal captions, which take over the original existing work. Translations and adaptations are in many European legislations recognised as derivative works, which can be copyrightable works in their own right when they meet the originality criterion. For a translation, the translator has the possibility to choose from several alternatives to translate a text to another language. They will, in other words, make creative choices necessary for copyright protection. For descriptions, which describe the events on screen this will be more difficult, as the creativity is largely limited by the events and story line at hand. Nevertheless, an audio version of a text or a version of an audio-visual work which adds a descriptive layer on top of the existing spoken elements could qualify as a performance with accompanying neighbouring rights. As touched upon above translations require the authorisation of the rights holder, which implies that such translations will not be freely exploitable after they are drafted. Furthermore, subtitles will be seen as a contribution to an audio-visual work, under article 14b of the Berne Convention, having as its effect that even if such subtitles could be copyrightable, they cannot be exploited separately from the main audio-visual work.

For literal captions, which transcribe the dialogues in an audio-visual work, the situation will be less favourable. Such works will literally copy the existing work, albeit in a different format but without any creative addition. Therefore, it will be nearly impossible to protect such captions under copyright law. Nevertheless, there will still be a (financial) effort on the part of the person providing the captions, which can in any case be exploited. The only implication here is that the owner will not have the specific enforcement possibilities which would be given to the author of a work under copyright law.

Within MediaVerse, the creator of the subtitles (whether a translation or transcription) or of an adaptation (audio version or descriptive audio version) can register such a work as an Asset on which he can claim ownership. As MediaVerse will not function as a platform for copyright registration, and it will not check whether the conditions for copyright protection are fulfilled, any accessibility measures can be uploaded and exploited. It will be the users who are responsible for making sure that they obtained the required permissions. As the licence is a contract, it is enforceable also outside of MediaVerse regardless of the lack of copyright of the work.

2.4.3. Exceptions

Overview

The requirement to obtain authorisation of the rights holder to use a work, for example through a licence, can be impractical and would in some cases run counter to other fundamental rights such as the freedom of expression. Therefore, several exceptions to copyright have been introduced, for example for educational purposes or for people with disabilities, as explained above. Some of these exceptions are linked to obligatory remuneration, while others are free of charge.

Most exceptions stem from national legislation and can differ between the Member States of the EU. This also entails that there can be national rules which prevent waivers from such exceptions in contracts, as is the case in *Belgium*. Nevertheless, the European Union has taken legislative action to harmonize some of the exceptions through Directives 2001/29/EC and 2012/28/EU.

Exceptions which are harmonised on EU level are:

- Temporary acts of reproduction, which are transient or incidental and an integral and essential part of a technological process, with the sole purpose of enabling a transmission in a network or a lawful use, for example for running software on a computer;

Some exceptions which *can* be adopted by Member States are (non-exhaustive):

- Reproductions on paper, through copying, provided there is a fair remuneration;
- Reproductions for private use, provided there is a fair compensation for the rightsholder;
- Specific acts of reproduction made by publicly accessible libraries, educational establishments or museums, or by archives, which are not for direct or indirect economic or commercial advantage;
- Reproductions of broadcasts made by social institutions pursuing non-commercial purposes, such as hospitals or prisons, under the condition that the rights holders receive fair compensation;
- Use for the sole purpose of illustration for teaching or scientific research, as long as the source, including the author's name, is indicated, unless this turns out to be impossible and to the extent justified by the non-commercial purpose to be achieved;
- Reproduction by the press, communication to the public or making available of published articles on current economic, political or religious topics or of broadcast works or other subject-matter of the same

character, in cases where such use is not expressly reserved, and as long as the source, including the author's name, is indicated, or use of works or other subject-matter in connection with the reporting of current events, to the extent justified by the information purpose and as long as the source, including the author's name, is indicated, unless this turns out to be impossible;

- Quotations for purposes such as criticism or review or caricature, parody or pastiche;
- Use of orphan works.

In general, many Member States will have exceptions in their national legislation for the benefit of education, reporting on recent events, use of works that are in a public space, private use, photocopies, parodies and for the benefit of libraries.

Recently, Directive 2019/790 on copyright and related rights in the Digital Single Market ("Digital Single Market Directive") entered into force. This Directive stipulates exceptions to the copyrights of rights holders for the benefit of teaching, the preservation of cultural heritage and text, and data mining. The Directive had to be transposed into national law by the 7th of June 2021. Having regarded the importance for MediaVerse, the text and data mining exception will be looked upon in detail below.

Although MediaVerse will be a cross-border platform, it will not take all the national exceptions into account. The terms and conditions will however mention the EU harmonised exceptions and the user will have the possibility of using the work directly, should this be possible, or contacting the right-holder in the event that the technical modalities of the platform would make direct use impossible. In any case, a lot of the works on MediaVerse are expected to be made available under open-source licences.

Text and Data Mining

Text and data mining is a technological process in which content is "fed" to a computer system in order to train and improve an algorithm or draw conclusions from a data set. Or, as defined by Directive 2019/790 *"any automated analytical technique aimed at analysing text and data in digital form in order to generate information which includes but is not limited to patterns, trends and correlations".* Text and data mining is particularly relevant in the domain of machine learning, where it is used to structure the data and to improve the system itself.

Such processes are used for many purposes, one being the creation of AI made artworks, but also scientific research or behavioural studies and influencing. The data used for text and data mining can be protected under copyright law, for example artworks fed to an algorithm or databases protected under the sui generis copyright. Text and data mining can infringe on the reproduction right of a rights holder, and can, specifically for databases, infringe on the adaptation rights and the extraction rights belonging to the rights holder of a database.

As already touched upon above, Directive 2019/790 provides two text and data mining exceptions, one in the context of scientific research and a broader one.

The exception for scientific research reads as follows:

1. *Member States shall provide for an exception to the rights provided for in Article 5(a) and Article 7(1) of Directive96/9/EC, Article 2 of Directive 2001/29/EC, and Article 15(1) of this Directive for reproductions and extractions made by research organisations and cultural heritage institutions in order to carry out, for the purposes of scientific research, text and data mining of works or other subject matter to which they have lawful access.*

2. *Copies of works or other subject matter made in compliance with paragraph 1 shall be stored with an appropriate level of security and may be retained for the purposes of scientific research, including for the verification of research results.*
3. *Right holders shall be allowed to apply measures to ensure the security and integrity of the networks and databases where the works or other subject matter are hosted. Such measures shall not go beyond what is necessary to achieve that objective.*
4. *Member States shall encourage right holders, research organisations and cultural heritage institutions to define commonly agreed best practices concerning the application of the obligation and of the measures referred to in paragraphs 2 and 3 respectively* (Article 3, Directive 2019/790).

An important prerequisite for the application of this article is the qualification as a research organisation, which is defined by the directive as: *"a university, including its libraries, a research institute or any other entity, the primary goal of which is to conduct scientific research or to carry out educational activities involving also the conduct of scientific research: (a) on a not-for-profit basis or by reinvesting all the profits in its scientific research; or (b) pursuant to a public interest mission recognised by a Member State; in such a way that the access to the results generated by such scientific research cannot be enjoyed on a preferential basis by an undertaking that exercises a decisive influence upon such organisation"* (Article 2(1), Directive 2019/790). This entails that public broadcasters, public-private partnerships, commercial research organisations, etc. are excluded, making the application field of this provision rather limited. Research organisations will enjoy a broad exception for text and data mining purposes, on copyrightable material to which they have lawful access. This means that the works should be freely available, or that they acquired a licence to use these works. Such a licence should not specifically mention that text and data mining is permitted, as this falls under the exception, but must simply provide them with access. A licence to use cannot prevent research organisations from using the works for text and data mining. Furthermore, this exception does not require Member States to provide remuneration for the rights holders.

The Directive anticipated this and also included a mandatory exception for text and data mining by other actors:

1. *Member States shall provide for an exception or limitation to the rights provided for in Article 5(a) and Article 7(1) of Directive 96/9/EC, Article 2 of Directive 2001/29/EC, Article 4(1)(a) and (b) of Directive 2009/24/EC and Article 15(1) of this Directive for reproductions and extractions of lawfully accessible works and other subject matter for the purposes of text and data mining.*
2. *Reproductions and extractions made pursuant to paragraph 1 may be retained for as long as is necessary for the purposes of text and data mining.*
3. *The exception or limitation provided for in paragraph 1 shall apply on condition that the use of works and other subject matter referred to in that paragraph has not been expressly reserved by their right holders in an appropriate manner, such as machine-readable means in the case of content made publicly available online.*
4. *This Article shall not affect the application of Article 3 of this Directive.* (Article 4, Directive 2019/790)

Here as well, a prerequisite to enjoy the exception is lawful access to the works. Important to note is that in comparison to the research exception, the general exception only applies when the use has not been expressly reserved by the rights holders. As is not the case towards research organisations, rights holders can exclude the use for text and data mining purposes. The Directive mentions as appropriate means for limiting the use: *"by the use of machine-readable means, including metadata and terms and conditions of a website or a service. […] In other cases, it can be appropriate to reserve the rights by other means, such as contractual agreements or a unilateral declaration."* (Recital 18, Directive 2019/790)

The date for national transposition has already passed, but many Member States have currently failed to transpose the totality of the provisions of the Directive (Horgan, 2021; Matas, 2021). It remains thus to be seen how Member States will implement the exceptions, and how they will be applied in practice.

As the focus of MediaVerse lies on digital media and enabling new technologies, it will be important to take into account these new exceptions. Determining who is a research organisation and who is not will be a subjective process, which for now seems not yet achievable through technological means. Ideally, the platform would recognise text and data mining activities and qualify the user as a research organisation, thereby allowing the use of works under the exception. For now, in both exceptions, the user first needs to have lawful access to the works. Within MediaVerse, this might require a licence. As stipulated above, such licences might in many cases be open source, thereby providing lawful access. Through MediaVerse's technical implementation, licence conditions such as the allowed use for text and data mining activities can be added in a machine-readable format to the work. Hereby, someone with lawful access that wants to use the work for text and data mining will automatically know if it is allowed or not. In situations where technical measures impede a research organisation from using the work for the purpose of text and data mining, one possible solution is for the organisation to contact the rights holder, in which case an assessment will have to be made on whether the user is a research organisation. This assessment can however also already take place when a user on-boards the platform, thereby creating a harmonised profile of that user for its relations with all rights holders in the platform. The evolution of this exception and its national implementation and application will need to be closely monitored throughout the project and a decision needs to be made on how this will be implemented technically.

2.4.4. Platform Liability

A final point of interest in the copyright domain for MediaVerse, are the rules on platform liability for copyright infringements. As users within MediaVerse can freely upload content, it is not unthinkable that copyright infringing activities can take place.

In legal terms, MediaVerse will be an internet service provider, or an "ISP". Several legal regimes can be applicable to ISPs, however, as MediaVerse will enable the sharing of content rather than share content itself, we will look at the regime for "providers of an online service for sharing content". For MediaVerse to keep this qualification, it is important that it remains neutral and does not moderate the content on the platform. Otherwise, it could be primarily liable for infringement to the exclusive right of communication to the public of the rights holder.

For hosting platforms, two situations need to be distinguished, the situation in which a platform falls under the new rules of the Single Digital Market Directive mentioned above, and the situation where it does not fall under such rules but under the pre-existing safe harbour principles.

Regime under the Single Digital Market Directive

The Single Digital Market Directive introduced a specific liability regime for online content-sharing service providers, which it defines as *"a provider of an information society service of which the main or one of the main purposes is to store and give the public access to a large amount of copyright-protected works or other protected subject matter uploaded by its users, which it organises and promotes for profit-making purposes."* (Article 2(6), Directive 2019/790). Important is the focus on "large amounts" of copyrighted works, which entails that not every service provider will fall under this liability regime. As stipulated above, the provisions of the Directive had to be implemented by the 7th of June 2021, a deadline which the majority of Member States failed to reach.

Article 17 of the said Directive provides that online content-sharing services perform an act of communication to the public or an act of making the work available to the public when they provide the public access to copyright-protected works or other protected subject matter uploaded by its users. In other words, they will be directly liable for content infringements by their users, meaning they will need to obtain the authorisation from the rightsholders. The user who uploaded a work, for which the platform has obtained authorisation, also benefits from this authorisation. For sectors where collective management Organisations are present, the platform will be able to negotiate on a global level. However, in the absence of such organisations, negotiating will be very difficult, maybe even impossible. This direct liability also means that if no authorisation is obtained, the platform will be directly liable for copyright infringements committed by its users.

Nevertheless, the Directive provides an exception to this liability if the online service:

1. *made best efforts to obtain an authorisation, and;*
2. *made, in accordance with high industry standards of professional diligence, best efforts to ensure the unavailability of specific works and other subject matter for which the rightsholders have provided the service providers with the relevant and necessary information; and in any event;*
3. *acted expeditiously, upon receiving a sufficiently substantiated notice from the rightsholders, to disable access to, or to remove from their websites, the notified works or other subject matter, and made best efforts to prevent their future uploads in accordance with point (b).* (Article 17(4), Directive 2019/790).

Hence, it is possible to avoid liability, but it will be difficult as also stipulated above, since obtaining all possible authorisations will be very difficult and providing and maintaining a sufficient monitoring and filter system will be time and cost consuming.

For smaller platforms, the Directive did build in a safeguard: *"In determining whether the service provider has complied with its obligations under paragraph 4, and in light of the principle of proportionality, the following elements, among others, shall be taken into account: (a) the type, the audience and the size of the service and the type of works or other subject matter uploaded by the users of the service; and (b) the availability of suitable and effective means and their cost for service providers."* (Article 17(5), Directive 2019/790). This safeguard is expected to provide relief for smaller platforms with less capital from the strict obligations. The strict obligations, which will in fact require filtering and possibly monitoring, run counter to the prohibition of a general monitoring system as stressed in relation to the safe harbour provisions (see *infra*), and is also questionable as the Directive itself provides that the application of article 17 *"shall not lead to any general monitoring obligation".* (Article 17(8), Directive 2019/790).

For small platforms, which just started – less than 3 years active – and which have a annual turnover of less than 10 million euros and an average of monthly visitors below 5 million, article 17 stipulates that only the obligation to make best efforts to obtain authorisation will be applicable, when they additionally act expeditiously, upon receiving a sufficiently substantiated notice, to disable access to the notified works or other subject matter or to remove those works or other subject matter from their websites. To sum up, the obligation under (a) article 17(4) applies and a watered-down version of the obligation under (b). Important to note is that such small platforms will only be able to enjoy this facilitation for the first three years of their existence.

Platforms should also enable an exception for critique, quotations, reviews, caricatures, parody or pastiche, which means that the use of copyrighted works for these purposes without authorisation does not require the platforms to obtain an authorisation and does not require them to take such content down. Besides being very

difficult to implement, this addition is also interesting as these exceptions were optional for Member States to implement in national law in Directive 2001/29/EG.

Finally, platforms need to provide a complaint and appeal procedure and they should also provide their users with information on the licences they have with rightsholders and the permitted use which stems from such licences (Article 17(8) and (9), Directive 2019/790).

In general, the inclusion of provision 17 in the Digital Single Market Directive was a long-term project which was met with a lot of criticism.

Safe Harbour Exemption

Before the introduction of the Digital Single Market Directive, the liability of ISPs was dealt with through Directive 2000/31 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market (Directive on e-commerce Directive). The rules of the e-commerce Directive will still be applicable for ISPs and activities that do not fall under the new Digital Single Market Directive.

The rules provide limited liability for ISPs which function as intermediaries which provide services with a solely technical, automatic, and passive character. The regime targets three specific services: transmission or "mere conduit", caching and hosting services. For MediaVerse, the situation of the hosting provider or the "safe harbour" provisions are relevant.

A hosting provider cannot be held liable for infringing activities committed through its services when:

- It does not have any actual knowledge of the illegal activity or information meaning he can only have a passive role in relation to the content. This entails not filtering the information or categorizing, indexing, promoting, or organizing it. His role needs to be limited to a technical and automatic processing of its users' data. This mainly refers to cloud services; other hosting platforms will fall under the Digital Single Market Directive stipulated above.
- It acts expeditiously to take down any infringing content once he has been notified of such content.

Application to MediaVerse

For MediaVerse, it will be important to determine whether it can qualify as an online-content sharing service under the Digital Single Market Directive to have assurance on the applicable rules. Looking back at the definition, we can recognise three conditions:

1. the main or one of the main purposes of the service is to store and give the public access to a large amount of copyright-protected works or other protected subject matter uploaded by its users;
2. which it organises and promotes;
3. for profit-making purposes.

As MediaVerse will definitely give access to copyrighted works that it will organise, the first two conditions will likely be fulfilled unless it could be argued that the amount of works made available is not "large". As the platform is not yet live, this cannot yet be assessed, but should be monitored in the future. Nevertheless, with the purpose of success it will be even the goal to increase the users and the use of the platform, which implies we can assume that these conditions will be fulfilled.

The third condition would provide a "way out" for MediaVerse, as it would be a product of a research consortium which does not have as its primary goal making the platform profitable. Examples of services outside of the scope of the Digital Single Market Directive are *"open-source software development and sharing platforms, not-for-profit scientific or educational repositories as well as not-for-profit online encyclopaedias"* (Recital 62, Directive 2019/790). The issue here is that MediaVerse will not only provide open source works and will also provide the possibility for users to get remuneration in return for the use of their works, which could be problematic in the light of this condition. The rationale behind the direct liability of online-content sharing services is the value gap between streaming services such as Netflix and Spotify, which pay the rights holders, and services such as YouTube and Facebook, which in many cases offer the same content to users without paying the rights holders. On the one hand, it could be argued that the idea behind MediaVerse is different as it will serve more as a repository than a platform where material can also be accessed. On the other hand, the factual circumstances will count and users will most likely also look at the material through MediaVerse. Additionally, there is the commercial aspect. As the rules only had to be implemented in the national law of the Member States very recently, it remains to be seen how the rules will be applied and which platforms will fall under the scope. For this reason, it will be very important to monitor the national implementations, the applications and jurisprudence in this field.

Following the initial planning and technical implementation, MediaVerse will have no overview on the source of a work and the legality of it. MediaVerse plans to hold the users responsible for obtaining the right authorisation from a rights holder for the work they are uploading, a method which will not be possible to uphold if MediaVerse falls under these strict rules on liability. Should they be applicable, the main obligation will be one of best efforts to obtain authorisations from rights holders. As said, the application will have to take proportionality into account and look at the size and the resources of the platform. These considerations will possibly enable MediaVerse to stick to a minimum of measures possible to meet the threshold of the Directive during the first three years of its existence. While having agreements with collective management organisations, obtaining authorisation from rights holders outside such organisations will be very difficult if not impossible having regarded the financial and organisational assets. Furthermore, to obtain such authorisations, even though collective management organisations, will be very costly for an initiative such as MediaVerse. For the take-down obligation, MediaVerse will have to immediately take down infringing content, such as content uploaded by a person other than the rights holder without the necessary authorisation. As this person did not have the right to claim any ownership on the content, nor the right to license it, MediaVerse will in addition to taking down the content itself, make the Ownership Deed as well as any licences in Smart Legal Contracts based thereon ineffective. Such powers will be reserved in the terms and conditions. If a licensee sees their licence cancelled as a result of the actions of the licensor, they will have to claim any damages directly from the fraudulent licensor. Taking down the infringing content will also entail taking down any derivative works based thereon, which has as a result that also the author of the derivative work who took a licence to do so can claim any damages directly from the fraudulent licensor. They would have the possibility to regain the right to use their derivative work by obtaining a licence from the rightful rights holder of the work. Should also the general authorisation obligation apply to MediaVerse, it could be that MediaVerse already obtained an authorisation in his or her place. MediaVerse will monitor the developments in this area to get a better view on what is needed.

3   Copyright Management

3.1   Transfer of Copyright

The economical rights of an author, or rights holder, can be transferred to another natural person or legal person. A transfer could be best described as a "sale" of rights, where the rights are permanently transferred. Important to note is that a transfer can be very specific in that the rights holder can choose which rights are transferred and for which exploitation methods, hence, it does not have to mean that all copyrights would be transferred as a whole. A transfer of rights entails that the acquirer of the rights can exercise them in the same way as the initial author or rights holder, which means that she or he can also react to any infringements, which is not always the case for licensees.

The moral rights on a copyrighted work are inalienable, and can consequently not be transferred. Nevertheless, an author can under some national jurisdictions waive the exercise of a specific moral right in relation to a specific work. A general clause to waive its moral rights is thus not possible.

Regarding the transfer of copyrights, there is no legislative action of the European Union. As an effect there is fragmented national legislation, which in many instances put extra contractual conditions on the transfer and license of copyrights. We will look at this in detail with regard to licences below. Besides strict rules, there are also countries, such as *Germany and Austria*, that do not allow the transfer of copyrights (Strowel & Vanbrabant, 2013). As a result, those rights holders will need to find relief in a very broad licence, which can in effect provide a similar effect as a transfer. Even in case of transfer, the initial author will always have a sense of control, through her or his moral rights.

For now, MediaVerse will provide for a licensing model. It cannot be excluded however, that transfer possibilities through the platform will be offered as this could also be possible on the basis of standard contracts. The same contractual considerations will have to be taken into account as stipulated in regard to licences below. From a technical point of view, transfer of copyrights might also require the transfer of the Ownership Deed and the Non-Fungible Token (NFT) connected to the work. MediaVerse needs to take this into account for further developments, as essentially copyrights can be transferred partially, which is not the case for the Ownership Deed and the NFTs. As a solution, MediaVerse can only offer full transfers, or it can implement a technical solution to transfer these elements only partly.

3.2   Copyright Licence

As opposed to a transfer of copyrights, a licence grants a (temporary) right to use a work in a certain way. A licence can be granted for any of the economic rights of the rights holder, and can be limited to a certain exploitation method, to a number of copies, to a period of time, etc. Also, neighbouring rights can be licensed.

To give some examples:

- The author of a book can allow a producer to make a film out of the story of their book. This will engage the reproduction right, the right to make available and most importantly the right to adaptation. The exploitation method will be limited to a movie;

- A photographer can allow an advertiser to use his work in an advertisement. This will engage the reproduction right, the distribution right, the right to make available and possibly the right to make a derivative work. The exploitation method can be limited to a specific pre-approved advertisement.

Licences can be exclusive or non-exclusive, the latter entailing a right to use which can simultaneously also be given to multiple actors. The choice for an exclusive licence can be motivated by practical reasons, but also to protect a major investment. Furthermore, licences can be given in exchange for a royalty, a remuneration, or can be free, such as is the case for Creative Commons licences.

3.2.1   Legal Requirements

Contracting on copyrights is a national subject matter. In this area there is no harmonisation on EU level, opposed to the European Union's legislative action in the area of exceptions and interpretation of certain concepts. The rules applicable to licences come forth from general contract law, which is not unified on a European level, and national copyright law, which – as said above – is only harmonised to a certain degree.

Despite the lack of harmonisation, there is a common practise for the basic building blocks of a copyright licence. Nevertheless, apart from the national divergence, there are also sector specific practice variations (Strowel & Vanbrabant, 2013).

Contract

An important concept regarding copyright contracts is the freedom of contract, which allows parties to define respective obligations and rights. To a certain extent, the legislator has intervened with specific rules to protect weaker parties, such as employees, and to beat contractual imbalances and unfair practices. Provisions on the contractual aspects of copyright are drafted from the point of view that authors and performing artists are a weaker contracting party that should be protected. From this perspective fair remuneration and adequate protection are pursued. On another note, such rules can also facilitate exploitation (collective licencing).

The freedom of contract also led to the development of open source and creative commons licences which is a first development that illustrates that the previous rules on remuneration could be outdated. Secondly, the evolution of the way in which works are made available through digital outlets, also creates an incentive to look at the existing rules with a different view. Rights holders will gain visibility, popularity, and possible advertisement revenues, which are not directly linked to the use of the copyright, but are derived from the broader context.

Mandatory Provisions

Many of the formal requirements regarding copyright contracts are only directed at contracts between the author and another party, but not between actors further down the contractual chain. Nevertheless, they prove useful in any contract, regardless of the qualification of the parties. Within MediaVerse, as there will be no check of authorship or any other role, the main principles will be taken into account in a general way.

Under most jurisdictions, a written contract will be required, if not under copyright law, then under the law of evidence. Having a written contract will enable the rights holder to understand what he consents to better and will provide legal certainty. For this reason, MediaVerse introduces a Smart Legal Contract, which will provide users with a legal contract in writing alongside the mechanisms under blockchain and Smart Contracts.

Besides the format, national rules also oblige in many cases that the rights and the use granted are specified in great detail, referring to the scope, the purpose, the duration and graphical scope of the use. Furthermore, many jurisdictions include that contracts should specify the remuneration to the rights holder. While some specify that remuneration should also be proportional, there are also jurisdictions which just require that remuneration is mentioned or jurisdictions, which are completely silent on the matter (*the Scandinavian countries, Ireland and the United Kingdom*). Another related clause which can be mandatory for certain contracts under some national laws is a best-seller clause, as a result of which an author can claim additional remuneration when the exploitation is particularly successful.

An important limitation to copyright licensing (or transfer) which can be found in most European jurisdiction, is the prohibition to contract over exploitation methods which are not yet known or foreseeable. This does not mean that contracting over future works for an existing or foreseeable future is not allowed. It is however possible, like in *Belgium and Germany*, that the national law provides that such contracts should be limited in time and on the condition that the categories of works are clearly defined.

Specific rules also exist on termination, for example in *Germany* where the author can terminate an exclusive exploitation contract when the beneficiary does not exploit the work causing serious injury to the author's legitimate interests. Other termination rights exist to protect the author in case of bankruptcy of the publisher (Strowel & Vanbrabant, 2013).

Applicable Law

A contract and the validity of its provisions is governed by one set of national legal rules. The applicable law is important in case of a dispute but also at the moment of conclusion of a contract. As illustrated above, the applicable law will determine the clauses which have to be included in the contract.

As a result of the freedom of contract, contracting parties are free to choose the applicable law. For reasons of legal certainty, parties often make a decision on the applicable law in a "choice-of-law" clause. Nevertheless, there can be mandatory national law which is applicable regardless of the choice of law the parties made.

If no choice of law is made in a contract, one needs to look at international private law to assess which law is applicable. These rules are drafted to avoid having several applicable legislations, and appoints the applicable law based on certain criteria.

For copyright licences, we need to look at the conflict-of-law rules applicable to contracts, as licences are as such not contracts for the provision of services. Article 4.2 of the Rome I Regulation provides that the applicable law is that of the country where the party required to effect the characteristic performance of the contract has its habitual residence. Since the characteristic performance is allowing the use of the protected work, the law of the habitual residence of the licensor will be applicable in most cases. In addition to this, mandatory provisions of national law of the other contracting party might have to be taken into account. However, since most copyright laws are targeted at protecting the author, who will in some cases be the licensor, such application will often coincide with the law applicable from the international private law rules. In less standardised cases, also the law of the country of habitual residence of the licensee can be applicable. For example, in the case of an exclusive licence, there might be exploitation obligations for the licensee, making this the characteristic performance. Another example are publishing contracts, where the characteristic performance is the publishing, making the law of the country of habitual residence or establishment of the publisher, licensee, applicable. Finally, the rules on the conflict of laws also stipulate that the law of the country to which the agreement has a closer connection might be applicable. This rule will then overrule the ones on the habitual residence.

In case of a transfer of rights, the characteristic performance will be the transfer itself, making the law of the country of habitual residence of the transferor applicable.

When we look at open source licences, we see several options. The Creative Commons licences and the General Public Licence for software do not include a choice of law clause. In contrast, the Free Art Licence chose French law as its applicable law.

For MediaVerse, we will take into account the contractual obligations that most countries have in common to draft the licences. We also looked at the other open source licences for inspiration. In general, it will be good for legal certainty to have a written contract which specifies the allowed uses, rights and exploitation methods and which defines the scope of the licence in time, geographical and/or numbers, etc. Following the example of the Creative Commons licences, the choice-of-law clause will be left out of the MediaVerse template licences (see infra). In case of a conflict, most likely the law of the country of habitual residence of the licensor will apply. Should the licence have any clauses which are invalid under the law of that country, the parties will be able to make use of a renegotiation clause which will be put in standardly. Such a clause will stipulate that the contract needs to be interpreted under applicable law, and that in case of an invalidity, the clause shall be renegotiated to comply with the applicable law, leaving the validity of the rest of the contract untouched.

3.2.2 Standard Templates – Open-Source Licences

There are many open source and standard template licences available, both for open-source software such as GNU and Apache, and for other copyrightable works.

The most relevant for MediaVerse are the Creative Commons Licences, which are used for works of art: music, photo's, texts, etc. The Creative Commons Licences have in common that they are all royalty free licences. By making use of acronyms and easily recognisable "stamps", licensors can easily choose the most suitable licence for their work and any potential licensees immediately know which uses are permitted. The following licences are available:

- CC BY: *"This license allows reusers to distribute, remix, adapt, and build upon the material in any medium or format, so long as attribution is given to the creator. The license allows for commercial use.";*
- CC BY-SA: *"This license allows reusers to distribute, remix, adapt, and build upon the material in any medium or format, so long as attribution is given to the creator. The license allows for commercial use. If you remix, adapt, or build upon the material, you must license the modified material under identical terms.";*
- CC BY-NC: *"This license allows reusers to distribute, remix, adapt, and build upon the material in any medium or format for noncommercial purposes only, and only so long as attribution is given to the creator.";*
- CC BY-NC-SA: *"This license allows reusers to distribute, remix, adapt, and build upon the material in any medium or format for noncommercial purposes only, and only so long as attribution is given to the creator. If you remix, adapt, or build upon the material, you must license the modified material under identical terms.";*
- CC BY-ND: *"This license allows reusers to copy and distribute the material in any medium or format in unadapted form only, and only so long as attribution is given to the creator. The license allows for commercial use.";*

- **CC-BY-NC-ND**: *"This license allows reusers to copy and distribute the material in any medium or format in unadapted form only, for non-commercial purposes only, and only so long as attribution is given to the creator.";*
- **CC0**: *"(aka CC Zero) is a public dedication tool, which allows creators to give up their copyright and put their works into the worldwide public domain. CC0 allows reusers to distribute, remix, adapt, and build upon the material in any medium or format, with no conditions."[4].*

These licences are particularly relevant for MediaVerse, as it is expected that many MediaVerse users will also make their work available for others free of royalties. All these modalities were thus taken into account while drafting the first version of the MediaVerse licence template which will be discussed below. In addition to this, the MediaVerse users will also have the possibility to obtain remuneration in exchange for the use of their work, hence the proposed licences will have more flexibility and possibilities than those of Creative Commons.

3.3 Copyright Management within MediaVerse

3.3.1 Introduction

One of the key features of MediaVerse will be the possibility to use the platform for copyright management. This feature will offer two main functions: ownership registration to declare ownership of the copyright of a given work and the possibility to then grant different licences on that copyright for various forms of use (e.g., non-commercial/commercial, non-sublicensable/sublicensable, non-exclusive/exclusive, revocable/irrevocable and for reproduction, distribution, derivative works, translation etc.).

MediaVerse will function as a repository for the ownership of works. The users will themselves warrant and be responsible that they are the rightful owner of the works or that they obtained the necessary authorisations. MediaVerse as a repository will not verify whether the user claiming ownership is indeed legally the owner.

Additionally, MediaVerse will offer licence suggestions to the users for works uploaded in the platform. As already expressed above, through a standard template there will be an incentive for cross-border standardisation of some of the contractual features of copyrights.

Furthermore, MediaVerse will implement the licences as Smart Legal Contracts, which will be linked to blockchain technology and Smart Contracts in order to enable smart negotiation and automation of the licensing process.

The part below will touch upon the legal implementation of the ownership claim and licensing and will go into detail on the technical framework.

3.3.2 Ownership Deed

For the technical "back-end" to function, MediaVerse will draft an Ownership Deed in the format of a Smart Legal Contract. This ownership is necessary to link the work to the asset and the rights (the triplet which will be discussed below).

---

[4] https://creativecommons.org/about/cclicences/

The Ownership Deed is in no way a registration of copyrights on the work. In many jurisdictions, copyrights are vested in a work upon creation, when the work fulfils the copyright conditions. There are, however, some countries that provide for a – in many cases voluntary – registration procedure for reasons of evidence.

The Ownership Deed will merely function as a means for the technical implementation, and will only allow users to claim ownership of the work. MediaVerse will not check whether such ownership claims are founded, nor will it in any case check whether the expression and originality criterion are fulfilled. It is the users' sole responsibility to make sure they have the necessary authorisations. Should it come to a dispute, an Ownership Deed could be used by a user to prove the date of creation of the work, however, it will have no official value as it comes from a not-recognised organisation. In any case, the ownership, authorship and validity can be refuted.

The Ownership Deed will be very important for collaborative works, where the users (co-creators) will be able to decide their respective roles in relation to the work. Moreover, for remuneration purposes they will be able to decide on their respective shares in the work.

3.3.3 Licences within MediaVerse

Licence Template

MediaVerse has developed a first draft of a licence template for the platform, which can be found in **Annex I** to this Deliverable. The licence was drafted with the Creative Commons licences in mind, while finding a way to also include more flexibility through specific choices on the licensed rights and exploitation methods and remuneration possibilities. The first draft of the licence is limited to a simple licensing scenario, that of one licensor giving a licence on a work of art such as a photo, a text, or a work of art. Later this template will also be modified to include the situation of several licensees, with several roles relating to the work, and more complex works such as audio-visual works and musical works, which also engage the neighbouring rights.

The draft licence is packed with different options (listed below). In order to help the user, he or she will get suggestions based on easily understandable models – to be developed during the next phases of the project - such as is the case for Creative Commons. Nevertheless, the user will also have the possibility to fully model the licence to his or her needs. Through the system of Smart Legal Contracts, a correct legal contract can be drafted very easily.

The MediaVerse licence includes the following options:

- The licence can be given for commercial uses or for non-commercial use only, or both;
- The licence can be royalty-free or remunerated;
- The licence can be drafted as sublicensable or non-sublicensable;
- The licence can be exclusive or non-exclusive;
- The licence can be revocable or irrevocable;
- The licence can be territorially limited (or not).

With regards to the types of use allowed by the licence, it was decided amongst the consortium members that the licence should always include a reproduction right and the right to make the work available through MediaVerse. This is needed in the light of the intended functioning of the MediaVerse platform. These rights can, however, still be specified and limited, for example to a number of copies (reproduction right) or to a specific medium (make the work available to the public).

In addition, the user has several possibilities to further tailor the licensed rights and allowed uses/exploitation methods:

- The right to distribute can be granted in a specific format, where needed limited to a specific amount of copies;
- The right to make, and possibly distribute, derivative works can be granted;
- The right to make translations of the work can be granted.

Depending on the variables chosen, additional clauses will be added to the licence. For example, for paid licences clauses on payment modalities, taxes, late payment, liability and warranty will be added. Another example is when the licensor allows for derivative works. In this case, the licensor will be able to determine whether such works can be made available and whether the derivative works need to be made available under the same conditions. Furthermore, a clause will be added to make sure that the licensor identifies that the work has been modified.

Every licence will have set clauses on the term, termination and attribution and will contain a salvation clause, to make sure that in the event of a clause non-compliant to the applicable national law, in absence of a choice-of-law clause as explained above, the parties will renegotiate that clause and the rest of the agreement remain valid.

Any user licensing her or his work under MediaVerse will always have a legal contract to enforce and to use as evidence in the event it would come to a conflict.

Smart Legal Contracts

The licences within MediaVerse will take the form of Smart Legal Contracts (SLCs).

The Accord Project defines the concept of a SLC as "a human-readable and machine-readable agreement that is digital, consisting of natural language and computable components. The human-readable nature of the document ensures that signatories, lawyers, contracting parties and others can understand the contract. The machine-readable nature of the document enables it to be interpreted and executed by computers, making the document 'smart'" (Accord Project Web Documentation, accessed July 2021).

"[Blockchain] Smart Contracts only have legal implications when a software is used in contractual settings, to express the content of a contract and operate the execution of the content." [5]. That is logical, given that 'Blockchain Smart Contracts' are just a form of software that can be executed on the blockchain and are defined as "automated software agents hosted on blockchains that are capable of autonomously executing transactions on the triggering of certain conditions" (Jake Goldenfein and Andrea Leiter, 2018). It is their involvement in a contractual setting that makes them SLCs.

From this definition, it can be derived that an SLC is a way to connect and automate the legal and physical aspects of contracting. Some of the natural language in the contract is translated into executable computer code, which communicates with external sources. Depending on the input data from external sources, the clauses can then self-execute. A very simple example would be access which is granted once the agreed upon price shows on the bank account of the licensor.

---

[5] Rephrased from what presented by Maiko Meguro, EU Commission DG Connect F3, 2021

These SLCs will enable MediaVerse to provide tailored contracts within the preselected options. When the user chooses their preferences regarding the variables, the whole contract will change accordingly and necessary clauses will be added. The user will have at their disposal a legal contract in natural language, which can be enforced outside of a digital environment.

Furthermore, SLCs allow to involve 'Blockchain Smart Contracts' only at the end of the process, decoupling preliminary checks from effective execution, and therefore possibly reducing latencies and costs.

Another possible benefit of SLCs is legal certainty, as part of the contract can be registered on the blockchain which ensures immutability of the input data.

Moreover, SLCs can enhance fair remuneration for rights holders when their work is used, as they will be in direct contact with licensees and as transaction costs can be lowered (Vanherpe & Janssens, 2020).

Furthermore, by making use of blockchain, the terms of use – as stipulated in the licence – of a certain work will be registered, thereby making it possible to monitor legitimate and illegitimate use of the work.

Of course, general benefits are also efficiency, velocity and safety.

Nevertheless, there are also some legal concerns making use of blockchain and Smart Contracts for licensing:

- The garbage in, garbage out dilemma: there is no way to verify whether the information which was inputted in the blockchain – ownership, date of creation, qualification as a copyrightable work – was correct, and the data cannot (easily) be changed later;
- The lack of textual flexibility and possibility to adapt to situations which were not foreseen by the contract;
- The difficulty to assess an infringement without human intervention;
- The relation to previously existing "off-line" licences;
- Vulnerability to illegal use and unsuccessful transactions as a result of bugs or hacks.

Different approaches to SLCs were proposed by projects such as Common Accord[6], OpenLaw[7] and Accord Project[8]. For further details about how MediaVerse handles SLCs, please refer to section 4 (in particular section 4.3) below.

---

[6] http://www.commonaccord.org/
[7] https://www.openlaw.io/
[8] https://accordproject.org/

3.4   Blockchain and Digital Assets Right Management

3.4.1   Blockchain and Smart Contracts

Blockchain[9] is an emerging digital technology that combines cryptography, data management, networking, and incentive mechanisms to support the checking, execution, and recording of transactions between parties.

Transactions such as payments, escrow, notarisation, voting, registration, and process coordination are key in the operations of government and industry. Traditionally, these transactions are supported by trusted third parties such as government agencies, banks, legal firms, accounting firms, and service providers in specific industries. Blockchain provides a different way to support these transactions. Instead of trusting third parties, we would trust the collective jointly operating the blockchain and the correctness of their shared technology platform.

Before delving into further details of the technology, we have to highlight what Distributed Ledger Technology (DLT) means. A distributed ledger is an append-only store of transactions that are distributed across many machines. Being append-only imposes that new transactions can be added, but old transactions cannot be deleted or modified. A new transaction might reverse a previous transaction, but both of them remain part of the ledger to allow auditability and ensure long-lasting integrity.

Finally, we can define a blockchain as a distributed ledger that is structured into a linked list ('chain') of groups ('blocks') of an ordered set of cryptographically signed transactions. Typical solutions use cryptographic hashes to secure the link from a block to its predecessor referring to a well-defined consensus protocol shared across nodes in the network. The consensus must be reached among the nodes to guarantee integrity on the shared contents of the blockchain ledger. As new blocks are added, older blocks become more difficult to modify (i.e., creating resistance against tampering). Public key cryptography and digital signatures are normally used to identify accounts and to ensure the integrity and authorisation of transactions initiated on a blockchain.

Blockchain technology was originally used for the Bitcoin digital currency. In fact, for cryptocurrency transactions, the state information is about the transfer of holdings of cryptocurrency between accounts (addresses). These transfers happen from one participant to another by using digital signatures with asymmetric-key pairs. Sometimes additional data can be recorded with a transaction that might have meaning for participants or systems outside of the blockchain. With the advent of the second most popular blockchain platform, Ethereum, transactions can record code, variables, and the results of function calls. These are often called *Smart Contracts* although the programs are typically **not very smart and are often not related to legal contracts.**

Smart contracts are programs deployed as data in the blockchain ledger and executed in transactions on the blockchain. These can hold and transfer digital assets managed by the blockchain and can invoke other Smart Contracts stored on the blockchain. Smart contract code is deterministic and immutable once deployed. Therefore, "the Smart Contracts are executed by nodes within the blockchain network; all nodes must derive the same results for the execution, and the results of execution are recorded on the blockchain." [10]

---

[9] Xu, X., Weber, I., & Staples, M. (2019). Architecture for Blockchain Applications. Springer International Publishing. https://doi.org/10.1007/978-3-030-03035-3

[10] Yaga, D., Mell, P., Roby, N., & Scarfone, K. (2018). Blockchain technology overview. National Institute of Standards and Technology. https://doi.org/10.6028/nist.ir.8202

Smart contracts offer valuable benefits, being less prone to human errors, requiring no intermediaries, providing automation, and enabling new business models [11].

We can summarise that blockchain technology has a lot of fundamental properties which provides fundamental attributes: data integrity through cryptography and data transparency through public access, decentralisation through a consensus protocol shared in an adversarial network environment, immutable transaction history, non-repudiation of stored data, collective maintenance and equal rights, traceability, digital cryptocurrencies and financial incentives mechanisms, and programmable contracts.

3.4.2   Business-related Aspects

When talking about adopting a blockchain component we must consider how its technological decisions, from design to functionalities, may affect the business and service models of the entire ecosystem.

MediaVerse is a **decentralised** network of intelligent, automated, and accessible services, tools, and authoring platforms for digital asset management. An instance of MediaVerse can be deployed as an MV Node in the decentralised MediaVerse network providing to users a blockchain-based rights management solution (in combination with AI-based identification services) guaranteeing automated cross-network rights negotiation and content monetisation through Smart Contracts.

The MediaVerse nodes can interact through a **federated network** that supports distributed content search, exchange and copyright negotiation between users of the same or different MediaVerse nodes (e.g., deployed by different organisations).

In detail, we have:

- Networks of Administrative Domains[12];

- Each Administrative Domain (AD) is **autonomous**, that is it has full freedom to define its own rules for users' registration, services provision, service payments, etc.;

- A user can register to a specific AD in order to use its services, while digital assets are managed in the context of the AD where their owner is registered;

- ADs cooperate according to a set of common rules and standards, providing the same basic services for all users in the MediaVerse ecosystem;

- The blockchain network will be the same across all ADs.

The impact of the federation and blockchain component in MediaVerse, raise the greatest issues in the business related aspects and the design of the licence management functionalities. In particular, we must deal with:

- Service for licensing payment (e.g., buying ownership rights on digital assets);

- Rights registration;

- Rights auditability.

---

[11] Qureshi, A., & Megías Jiménez, D. (2020). Blockchain-Based Multimedia Content Protection: Review and Open Challenges. Applied Sciences, 11(1), 1. https://doi.org/10.3390/app11010001
[12] From an architectural point of view an AD is represented by a MediaVerse Node that cooperates with the other MediaVerse nodes

To this end, before discussing the above elements it is worthwhile to quickly characterize the cryptocurrencies and the fiat currencies scenario.

Crypto-Assets

A first aspect to be analysed and clarified is related to the crypto-assets types and roles. According to Don Tapscott and Alan Majer[13] crypto-assets can be split in eight categories:

1. *cryptocurrencies*: whose objective is to support payments via blockchains (e.g., Bitcoin, Monero, Zcash);

2. *protocol tokens*: also mentioned as *platform tokens* whose objective is to support the distributed applications running on the blockchain. The most relevant examples for this kind of token are: Ether, NEO, ICON;

3. *utility tokens*: are native *DApps* tokens and tied to functionalities provided by a DApp. For example, the *Golem* token[14] used to operate the decentralised Golem computing facilities;

4. *security tokens*: these are the digital versions of securities (stocks or bonds)[15] and usually represent an investment contract where the purchaser expects future profits from the investment[16];

5. *natural asset tokens*: these digital assets actually represent real world assets (e.g., oil barrels, grain) that are managed and traded digitally;

6. *stablecoins*: these crypto-assets aim at providing a less volatile cryptocurrency. *Stablecoins* are pegged by fiat currencies (e.g., US dollars, Euros) or a basket of specific assets (e.g., International Monetary Fund's special drawing right)[17];

7. *crypto fiat currency*: also known as *CBDC* (Central Bank Digital Currency[18]). These crypto-assets are created and controlled by governments or central banks and represent digital versions of fiat currencies or currencies in the digital world having the same characteristics and guarantees of fiat currencies;

8. *non-fungible token* (NFT): they represent unique digital assets or, according to the US NIST NISTIR 8301 document[19] "*a data representation or abstraction that assigns uniquely identified and uniformly formatted qualitative data objects to blockchain addresses with programmable lifecycle management*".

---

[13] Majer, A. (2019). Non-Fungible Tokens: Transforming the Worlds of Assets, Gaming, and Collectibles. Blockchain Research Institute

[14] https://www.golem.network/

[15] Crook, R. (2021, March 16). The rise of digital securities. Nasdaq. https://www.nasdaq.com/articles/the-rise-of-digital-securities-2021-03-16

[16] Hamilton, D. (2021, March 6). What are Digital Securities? Securities.io. https://www.securities.io/what-are-digital-securities/

[17] Lesavre, L., Varin, P., & Yaga, D. (2021). Blockchain Networks: Token Design and Management Overview. National Institute of Standards and Technology. https://doi.org/10.6028/nist.ir.8301

[18] Wikimedia Foundation. (2021, September 6). Central bank digital currency. Wikipedia. https://en.wikipedia.org/wiki/Central_bank_digital_currency

[19] Lesavre, L., Varin, P., & Yaga, D. (2021). Blockchain Networks: Token Design and Management Overview. National Institute of Standards and Technology. https://doi.org/10.6028/nist.ir.8301

The above classification highlights the need to clearly distinguish between crypto-assets required to "pay" services or goods (i.e., *cryptocurrencies*, *CBDC*, *stablecoins*) from the crypto-assets required to support the blockchain based distributed environment (i.e., *protocol tokens*). The *protocol tokens* are indeed required to support the execution of transactions or processing on the blockchain. For example, on Ethereum, to pay for mining blocks and Smart Contract executions. The *protocol tokens* can imply an explicit cost (like on Ethereum or other permissionless blockchains), or an implicit one (like in permissioned blockchains where members of the community providing the infrastructure pay for the processing and communication capabilities required by the infrastructure).

With reference to the crypto-assets required to pay the services or goods deployed on, or provided through, the blockchain, the real alternatives are *stablecoins* or *CBDC*, due to the high volatility of the *cryptocurrencies*.

Stablecoins can be further classified as[20]:

- *Redeemable* or *convertible stablecoins* that are backed by a reserve and give to stablecoin tokens owners the possibility to redeem the tokens with the underlying assets (e.g., USDC[21], USDT[22]);
- *synthetic stablecoins* that are essentially used to track the price of one or more underlying assets, but do not guarantee any redemption value for these assets. *Synthetic stablecoins* may be backed by multiple assets distinct from the tracked ones (e.g., sUSD[23]);
- *algorithmic stablecoins* adopt an algorithmic approach[24] that adjusts the supply of the stablecoin in response to price fluctuations (e.g., AMPL[25], yUSDC[26]).

Stablecoins can be subject to regulations by central banks to reduce risks (e.g., redeemability, financial, money laundering, privacy compliance).

For example, the US Federal Bank has approved "*the use of stablecoins … for the settlement of financial transactions by banks*"[27]. The US OCC issued an interpretive letter[28] that clarifies how national banks and federal savings associations can use certain stablecoins or cryptocurrencies for regular banking transactions. On the EU side the ECB (European Central Bank) is wondering whether[29] to regulate the use of *stablecoins* recognising that, on the one hand, they help in addressing unmet consumer demand, but, on the other hand, they pose challenges

---

[20] Beck, J. (2021, January 29). How Stablecoins are DRIVING Decentralized finance on Ethereum. ConsenSys. https://consensys.net/blog/blockchain-explained/how-stablecoins-are-driving-decentralized-finance-on-ethereum/

[21] https://www.centre.io/usdc

[22] https://tether.to/

[23] https://synthetix.io/

[24] Moin, A., Sirer, E. G., & Sekniqi, K. (2019). A classification framework for stablecoin designs. ArXiv:1910.10098 [Cs, q-Fin]. http://arxiv.org/abs/1910.10098

[25] https://www.ampleforth.org/

[26] https://yearn.finance/

[27] January 2021 Trends Report. (2021, January). EU Blockchain Observatory & Forum. https://www.eublockchainforum.eu/sites/default/files/reports/January%202021_Trends%20Report_0.pdf

[28] Gould, J. V. (2021, January). OCC Chief Counsel's Interpretation on National Bank and Federal Savings Association Authority to Use Independent Node Verification Networks and Stablecoins for Payment Activities. https://www.occ.gov/news-issuances/news-releases/2021/nr-occ-2021-2a.pdf

[29] Adachi, M., Cominetta, M., Kaufmann, C., Van Der Kraaij, A. (2020, October). A regulatory and financial stability perspective on global stablecoins. European Central Bank. https://www.ecb.europa.eu/pub/financial-stability/macroprudential-bulletin/html/ecb.mpbu202005_1~3e9ac10eb1.en.html

and risks. It is therefore plausible that the ECB will issue specific regulation to assure that "*the Eurosystem relies on appropriate regulation, oversight, and supervision to manage the implications of stablecoins (and the risks that stem from them)*"[30].

A possible approach to overcome the envisaged *stablecoins* and *cryptocurrencies* risks is the use of *CBDCs*. Many countries have advanced projects for providing their "digital currency" (see Fig. 1 below). According to the Bank for International Settlements (BIS) recent survey[31], 86% of central banks are actively researching the potential for *CBDCs*, 60% of them are already experimenting with the technology, and 14% are deploying pilot projects. *CBDCs* will be better positioned in terms of trustiness, efficiency, and payment functionality (e.g., wider acceptance, no significant "learning-steps" for citizens, interoperability between digital and physical worlds, no exchange costs, accessibility).

Since the beginning of March 2021, the People's Bank of China (PBOC, i.e. the central bank of China) has started real-world trials[32] in a number of cities (e.g., Shenzhen, Chengdu, Suzhou). The PBOC has provided about 1.5 million\$[33] as digital yuan for the trials. The digital currency distribution for the Chinese trials is based on the so-called two-tier system which implies the PBOC will distribute the digital yuan to commercial banks that will be responsible to provide the digital currency to consumers.

The US is conducting experiments as well, even if they are not as advanced as the Chinese real-world trials. The US Federal Reserve plans to engage the public on its digital dollar in 2021[34].

---

[30] Stablecoins: Implications for monetary policy, financial stability, market infrastructure and payments, and banking supervision in the euro area (No. 247; Occasional Paper Series). (2020, September). European Central Bank. https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op247~fe3df92991.en.pdf

[31] Boar, C., & Wehrli, A. (2021). Ready, steady, go? - Results of the third BIS survey on central bank digital currency. BIS Papers. https://www.bis.org/publ/bppdf/bispap114.htm

[32] Areddy, J. T. (2021, April 5). China creates its own digital currency, a first for major economy. Wall Street Journal. https://www.wsj.com/articles/china-creates-its-own-digital-currency-a-first-for-major-economy-11617634118

[33] Cheng, E. (2021, February 8). China plans to hand out \$1.5 million in a digital currency test during the Lunar New Year. CNBC. https://www.cnbc.com/2021/02/08/china-to-hand-out-1point5-million-in-lunar-new-year-digital-currency-test.html

[34] DiCamillo, N. (2021, February 24). Fed chairman powell: We will engage the public on the digital dollar this year - coindesk. CoinDesk: Bitcoin, Ethereum, Crypto News and Price Data. https://www.coindesk.com/markets/2021/02/24/fed-chairman-powell-we-will-engage-the-public-on-the-digital-dollar-this-year/

United Kingdom
The Bank of England recently issued a Discussion Paper on opportunities, challenges, and design of central bank digital currency.

Sweden
Sweden's central bank is planning to build a pilot platform for a digital currency known as the e-krona.

European Union
On December 19', the European Central Bank has established a proof of concept for a CBDC.

China
On April 20', People's Bank of China (PBOC) launched the pilot about a retail CBDC.

United States
On May 20', a proof of concept related to a CBDC dollar based has been established.

Brazil
Study of a CBDC to improve the efficiency of the monetary function.

South Africa
The South African Reserve Bank has invited bids from private companies to develop the infrastructure necessary for a CBDC.

Australia
The Reserve Bank of Australia has been working on an all-digital version of the Australian dollar.
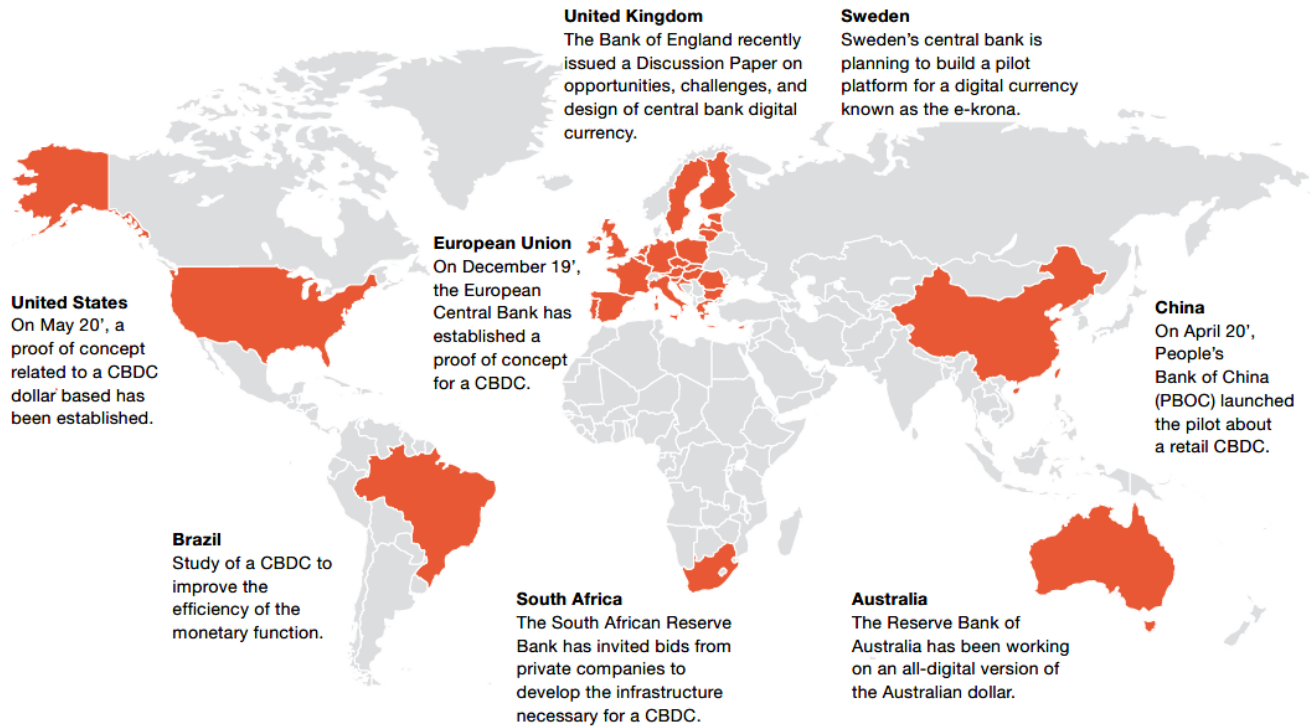
Figure 1: CBDC worldwide status (source: PwC "Central Bank Digital Currency", 2020)

In the same situation are Australia and Japan. Indeed, the RBA (Reserve Bank of Australia) is conducting research[35] on the provision of its own *CBDC* and it has also signed an agreement with ConsenSys[36] to explore the possibility to deploy its *CBDC* on the Ethereum blockchain. Japan plans to start its *CBDC* pilot in 2021[37], and plans to perform a first phase of experiments on *CBDC*[38] basic functions (e.g., issuance, distribution) early in the fiscal year starting in April 2021.

Additionally, in February 2021 several major Asian banks signed an agreement[39] to create a cross-border central bank digital currency. The initiative, named *Multiple Central Bank Digital Currency Bridge* (*m-CBDC*), involves the Hong Kong Monetary Authority (HKMA), the Bank of Thailand (BOT), the Central Bank of the United Arab Emirates (CBUAE), and the People's Bank of China's Digital Currency Institute (PBCDCI). Its objective is to identify new ideas and strategies to mitigate current issues for cross-border fund transfers reducing inefficiencies and costs.

---

[35] Lyanchev, J. (2021, March 15). Reserve bank of Australia looks to tap blockchain for a cbdc. CryptoPotato. https://cryptopotato.com/reserve-bank-of-australia-looks-to-tap-blockchain-for-a-cbdc/

[36] Lyanchev, J. (2020, November 2). Australia's reserve bank partners with consensys over an ethereum-based cbdc. CryptoPotato. https://cryptopotato.com/australias-reserve-bank-partners-with-consensys-over-an-ethereum-based-cbdc/

[37] Osaemezu Ogwu, E. (2021, March 17). Japan's central BANK gearing up for cbdc experimentation. BTCMANAGER. https://btcmanager.com/japans-central-bank-gearing-up-for-cbdc-experimentation/

[38] Kihara, L. (2021, March 16). BOJ must prepare "thoroughly" on digital currency, says Kuroda. Reuters. https://www.reuters.com/article/us-japan-economy-boj-cbdc-idUSKBN2B80CS

[39] Joint statement on multiple central bank digital currency (M-cbdc) bridge project. (2021, February 23). https://www.info.gov.hk/gia/general/202102/23/P2021022300482.htm

On the EU side the ECB has advanced plans to launch a *digital euro*. Indeed, in October 2020 ECB published a report on the *digital euro*[40]. Immediately after, ECB launched a public consultation on the outcomes of this report asking citizens, firms and other subjects for opinions. The consultation was closed in January 2021. Even if the consultation analysis has not yet been published, some initial indications have anyway been provided[41] confirming the great interest for the *digital euro* and an "*increased demand for electronic payments in the euro area that would require a European risk-free digital means of payment, a significant decline in the use of cash as a means of payment in the euro area, the launch of global private means of payment*".

The *digital euro* will be a means of payment that will complement cash, not replace it. Additional objectives of the *digital euro* are to avoid financial instability and dominance on non-EU financial providers for EU payments which could threaten the stability of the EU financial system. The ECB plans to send to the European Parliament[42] the outcomes of the public consultation to acquire its position and, hopefully, in the middle of 2021 to take the decision to move forward with the adoption and experimentation of the *digital euro*. As reported in the Bloomberg interview to the ECB President Christine Lagarde, it is expected that in four years the *digital euro* will become fully operative. Indeed, on July 14th 2021, the ECB announced the launch of the digital euro and the start of a 24 months' investigation phase to identify the technicalities and distribution mechanisms of the digital euro.

Non Fungible Tokens

NFT stands for Non-Fungible Token. Non-fungibility is an economic term that could be used to describe things that are not interchangeable with other items because they have unique properties (e.g., work of arts). Therefore, the NFTs are a tokenised representation of the ownership of unique items.

Historically, the first NFT naive attempt took with Coloured Coins in 2012/2013 on Bitcoin blockchain, but real popularity has had in 2017 with projects like Cryptokitties and Cypherpunks released on Ethereum blockchain. They are a blockchain-based virtual game that allows players to buy and trade, respectively, virtual punks and cats using Ethereum Smart Contracts. Nowadays, the NFTs are taking the scene of the digital art[43,44] and collectibles world, due to the exponential growth of marketplaces and the attention of the media and artists[45]. Those are seeing their lives change thanks to huge sales to a new crypto-audience and celebrities are joining in as they spot a new opportunity to connect with fans. For example, an NFT could represent digital art as GIFs, collectibles, music, videos, or real-world items such as deeds to a car, tickets for events, legal documents, signatures and many more.

---

[40] Report on a digital euro. (2020, October). European Central Bank.
https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro~4d7268b458.en.pdf
[41] ECB digital euro consultation ends with record level of public feedback. European Central Bank. (2021, January 13)
https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210113~ec9929f446.en.html
[42] Neumann, J., & Lacqua, F. (2021, March 31). Lagarde says ECB could have digital currency within four years. Bloomberg News.
https://www.bnnbloomberg.ca/lagarde-says-ecb-could-have-digital-currency-within-four-years-1.1584643
[43] Kastrenakes, J. (2021, March 1). Grimes sold $6 million worth of digital art as NFTs. The Verge.
https://www.theverge.com/2021/3/1/22308075/grimes-nft-6-million-sales-nifty-gateway-warnymph
[44] Reyburn, S. (2021, March 25). Jpg file sells for $69 million, as 'NFT mania' gathers pace. The New York Times.
https://www.nytimes.com/2021/03/11/arts/design/nft-auction-christies-beeple.html
[45] Ohlheiser, A. (2021, March 25). Some artists found a lifeline selling NFTs. Others worry it's a trap. MIT Technology Review. https://www.technologyreview.com/2021/03/25/1021215/nft-artists-scams-profit-environment-blockchain/

As everything becomes more digital and connected, the NFTs can be a unique opportunity for translating on the digital world the properties of physical items like scarcity, uniqueness, and proof of ownership[46].

The owner of an NFT can: easily prove the ownership, have the safety that no one can manipulate it in any way, sell it, and prove that the copy of the digital file is the original. Indeed, the NFT creators can easily prove the creation, determine the scarcity, earn royalties every time it's sold and sell it on any NFT market or peer-to-peer, not locked to platforms or other third parties[47].

The euphoria around NFTs has raised several scepticisms around the technology due to episodes such as the more recent *Rug Pull*[48] and the implications about **IPR** (Intellectual Property Right) management[49]. Several studies and initiatives are currently underway to address and adequately respond to the issues to help creators and collectors.

Most NFTs are built using a consistent standard known as ERC-721[50]. However, there are other more specialised or experimental standards, like the ERC-1155 (for semi-fungible tokens, useful in the realm of gaming) and EIP-2309 (proposed to make minting NFTs a lot more efficient). To this fact, there is also the issue raised by the interoperability between standards in the blockchain landscape.

Blockchain Agnosticism and Interoperability

According to the Oxford English Dictionary interoperability is "*the ability of computer systems or software to exchange and make use of information*". In the case of blockchain, it has the potential to break the silos and to create a network of blockchains. It is a catalyst for broader adoption of blockchain and cryptocurrencies.

We are currently observing the explosion of blockchain based platforms, solutions and cryptocurrencies. The Global Standards Mapping Initiative (GSMI), promoted by the Global Blockchain Business Council (GBBC) and the World Economic Forum, has surveyed 379 industrial groups, more than 30 technical standardisation entities and 185 jurisdictions[51].

This results not only in the difficulty in transferring or migrating virtual assets from one blockchain to another, but also in interpreting, correlating, or converting, information in blockchain transactions on the same blockchain (e.g., converting a cryptocurrency A token into a cryptocurrency B token), as well as forcing users to be active on many different blockchains. Currently, interoperability among different blockchains is usually based on a third party that mediates the transfer of virtual assets. These third parties are usually centralised, hub-and-spoke, asset-exchange entities (i.e., crypto-exchange), which not only have control on the assets transfer, but also diminishes the blockchain autonomy and scalability. Additionally, asset's owners using these asset-exchange

---

[46]The history of NFTs & how they got started. (2021, July 27). Portion Blog. https://blog.portion.io/the-history-of-nfts-how-they-got-started/

[47] Non-fungible tokens. (2021, September). Ethereum.org. https://ethereum.org/en/nft/

[48] Redman, J. (2021, March 11). NFT immutability debate grows as tokenized tweets get deleted and nft images are replaced. Bitcoin News.
https://news.bitcoin.com/nft-immutability-debate-grows-as-tokenized-tweets-get-deleted-and-nft-images-are-replaced

[49] McConaghy, T. (2021, June 3). NFTs & IP 1: Practical connections of erc721 with intellectual property. Medium.
https://blog.oceanprotocol.com/nfts-ip-1-practical-connections-of-erc721-with-intellectual-property-dc216aaf005d

[50] Standard token non fungibile ERC-721. (2021, August 19). Ethereum.org.
https://ethereum.org/it/developers/docs/standards/tokens/erc-721/

[51] https://gbbcouncil.org/gsmi/

facilities must usually have a relationship (e.g., an account) with them and must pay for the provided service, further impacting costs and privacy.

This situation is fostering activities on blockchain interoperability. The InterWork Alliance (IWA), for example, is working on a relevant Token Taxonomy Framework to define and scope the token concept in an agnostic specification with respect to the specific underlying blockchain technology. This framework will help different stakeholders in developing new blockchain-based technologies and business models starting from a common but technology neutral ground.

Finally, Figure 2 reports the number of papers indexed by Google Scholar on "*blockchain interoperability*".
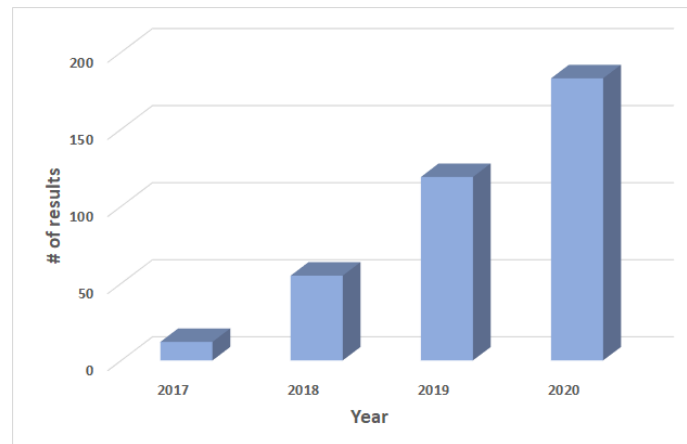

Figure 2: Google Scholar Research trends on blockchain interoperability

MediaVerse Approach

Coming back to the MediaVerse needs, an urgent problem to be solved is how the MediaVerse managed digital assets will be paid. As stated, we must clearly distinguish between paying for digital goods and services, from the *protocol tokens* required to perform transactions or execute Smart Contracts on the blockchain.

Of course, avoiding constraints on end-users for the payment mechanisms would foster the usability and attractivity of the MediaVerse ecosystem. To this end supporting the widest number of paying mechanisms would reduce the burden on end-users to "adapt themselves to MediaVerse" instead to "adapt MediaVerse to the end-users' needs".

In the medium term, supporting CBDCs can also increase the accessibility of the MediaVerse ecosystem because end-users will be able to pay for services without having the hassle of using specific cryptocurrencies, the need to convert currencies, or additional costs.

In the short to medium term, offering the possibility to end-users to use traditional paying mechanisms (e.g., credit cards, PayPal, etc.), as well as the new digital payment services fostered by the PDS2[52] (Payment Services Directive 2) EU directive will both reduce burden on end-users, and, at the same time, be in line with EU strategies for the digital single market and able to catch of future evolution for payment services without constraining MediaVerse to specific payment solutions or restricting the payment service MediaVerse users can use.

---

[52] Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC. (2015, December 23). EUR-Lex. https://eur-lex.europa.eu/eli/dir/2015/2366/oj

Related Solutions

Communication technologies are reshaping the media industry, with profound implications on its value chain and society. The revolution impacts the way the content is produced, transmitted to and enjoyed by people. To keep up with the pace of change, broadcast and media technology businesses have been making significant investments in developing and integrating new technologies into their processes: AI-based recommendation algorithms, enhanced real-time XR streams, blockchain technology for agile management of digital arts with automated royalty payments, and so on. These technologies involve a new way of revenue generation as well as value sharing with prosumers.

MediaVerse combines a federated ecosystem of nodes where three emerging technologies are synergistically applied, i.e., blockchain, AI and XR. MediaVerse leverages these technologies with a federated network design to compete on the *Content Communities* (platform sharing media content with the primary aim to create theme- or geography-based communities of users), *Content Distribution* (platforms that allow distribution of digital content protecting the IP of their creators) and *IP Registration* (blockchain platforms for registration of creative works and remuneration of artworks) market segments. For further details, please refer to D8.2, Section 4.2.

A preliminary comparison must be performed between platforms that act in the Media Industry using at least one of the aforementioned emerging technologies and MediaVerse (NB. only operational platforms that already have a released version (either beta or stable) and an active user base have been considered). Classifying solutions according to their primary technology, results in three different clusters each one matching one of the three technologies used in MediaVerse. You can find more details on the classification process and solutions taken into consideration on tables reported in D8.2, from page 36 to page 41.

The study has shown that despite most of the solutions developed some innovative functionality relying on advanced technologies, none of them has yet implemented an integrated approach to leveraging a mix of technological assets coming from different domains (AI, blockchain and XR), thus placing MediaVerse in a uniquely advantageous position concerning its potential competitors. To learn more about the business rationale and value ecosystem of MediaVerse, you can refer to D8.2, Chapter 4.

4 Implementation of Copyright Management in MediaVerse

Since the massive adoption of the internet, copyrights have had a somewhat interesting relationship with it. The intrinsic characteristics of digital media: ease of replication and transmission, the malleability of the digital medium, equivalence between digital copies, compactness, and non-linearity in use[53], point out how the classic schemes for Copyrights Management cannot be easily shifted into the digital world. The main features of the blockchain place the technology as a potential enabler for tackling the problems in today's media world.

The exploitation of blockchain and Smart Contracts for managing IPR is currently a hot topic. However, there is a general belief that Smart Contracts can be considered legally valid and therefore effectively support IPR both from a technical and a legal point of view which is unfortunately not the case. As Smart Contracts (which are neither smart nor actual contracts) are actually just code, which is run on a blockchain platform, they cannot be considered equivalent to legally enforceable contracts[54].

Thus, to achieve its IPR-related objectives, MediaVerse combines Smart Contracts (SCs) with Smart Legal Contracts (SLCs) to take advantage of the technical automation and the notarisation provided by SCs with the legal validity of traditional contracts.

We have designed a Rights Management component that will be part of each MediaVerse node for providing the IPR management in MediaVerse. As said, the MediaVerse Node is the core element of the MediaVerse network. Users will interact with the Node through its UI[55] that will allow the interaction with all MediaVerse services provided. The Node will manage media assets, i.e., any digital media asset that is copyrightable and/or negotiable (the usage of which must be agreed or must be recognised/paid). Each asset will be identified and referenced within MediaVerse via an ID which will be handled by the DAM (Digital Asset Manager).
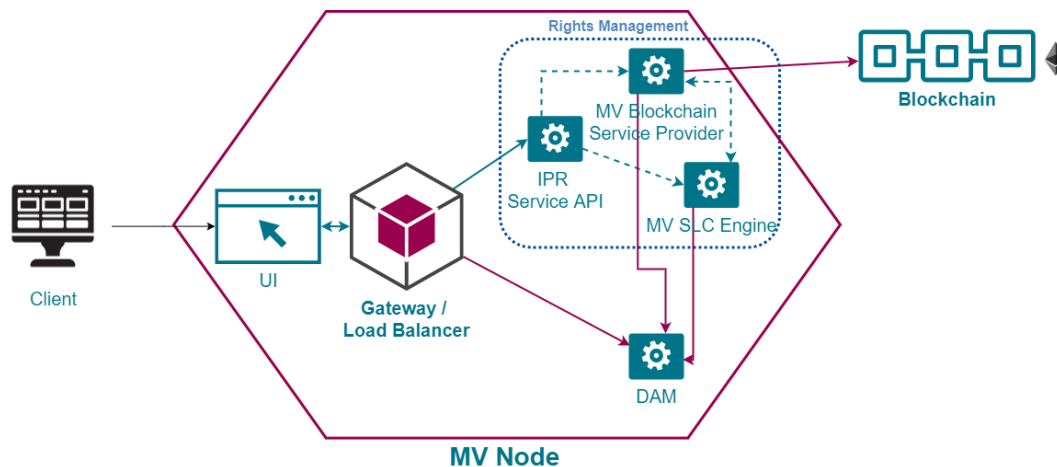

Figure 3: Rights Management Architecture Overview

---

[53] Samuelson, P. (1990). Digital media and the changing face of intellectual property law. Rutgers Computer and Technology Law Journal. https://lawcat.berkeley.edu/record/1113802/files/fulltext.pdf

[54] Mik, D. E. (2020, May 1). From automation to autonomy: Some non-existent problems in contract law (SSRN Scholarly Paper ID 3635346). Journal of Contract Law. https://papers.ssrn.com/abstract=3635346; Mik, E. (2019, December 7). Smart Contracts: A Requiem. Journal of Contract Law. https://doi.org/10.2139/ssrn.3499998 ;Pardolesi, R., Davola, A. (2019, February 21). What Is Wrong in the Debate About Smart Contracts. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3339421

[55] The MV UI communicates with the DAM and the Service API

The Rights Management component, which will make use of the MediaVerse Digital Asset Management (MV DAM) for managing SLCs and user related data to provide its functionalities, is composed of three sub-modules:

- The Service API, which will be the medium for communication to and from the entire component, providing APIs layer to interact with the Blockchain Service Provider and the SLC Engine;
- The Smart Legal Contract (SLC) Engine (based on the Accord Project CICERO Engine), which will handle all the run-time features related to SLCs like for example, the creation of SLC instances, check for the trigger of specific SLC-related events (e.g., contract deadline exceeded);
- The Blockchain Service, which will handle the deployment and the management of the Smart Contracts that will be used to notarise the SLCs counterpart, supporting not only the possibility to acquire and transfer rights, but also provide audibility and revenue payment splitting. The interaction with the blockchain will be completely transparent to the user. Each MediaVerse Administrative Domain will have its own blockchain ID and its own blockchain wallet through which will manage the Smart Contracts related to the MV Digital Assets (MVDigA) registered on it and perform privileged actions. Blockchain activities on behalf of users are paid by MediaVerse Administrative Domain using the Gas Station Network (GSN) approach. However, the blockchain service will operate transparently and end users will not be able to see their blockchain wallet, which will be internally managed by the blockchain service. All the relevant info will be provided as part of the user's balance account which will allow them to manage the value transfer associated with buying, selling, and transferring MVDigA rights, report the owned rights and/or their eventual right share. To this end, MVCoin will not be directly visible to Users which will instead see their balance in their fiat currency.

4.1 MediaVerse Triplets Asset – Owner – Rights

In MediaVerse IPR management follows the concept of "triplets" (subject, right, object) where rights (e.g., ownership, copyrights, neighbouring rights, such as the right to reproduction and the right to make available to the public) are owned by a subject and refer to an object (a digital asset in the MediaVerse ecosystem). A "triplet" can refer to another "triplet" to represent dependencies between "rights". For example, the right to use an audio track by subject Y (which is obtained through a licence), will refer to the ownership right of subject X on the audio track. In this way we will be able to both maintain the dependencies among the rights, as well as the possibility to always check the rights assignment. We, therefore, define the MVDigA as a MediaVerse asset that is available on a MediaVerse node, that is formally registered through an Ownership Deed and thus has the corresponding Smart Legal Contract and Smart Contracts.

Specifically, each time a new digital asset is registered an Ownership Deed, which will be an SLC stating the ownership of the asset, must be created. This will also spur the related elements on the blockchain. To this end, the Ownership Deed will contribute to formalising the "root triplet" stating the ownership right (copyright) by the owner of the digital asset. All other rights regarding the asset at hand will be hierarchically subordinate to this "root triple". This will allow to build a hierarchy of deeds that will keep track of the relationship between the different triplets and thus the different actors. Let's make an example: an author registers its book on MediaVerse formalizing the book MVDigA through the Ownership deed. This will be the root triple (fig 4). The author of the book can then sign an agreement with DistributorA giving them the right to distribute the book in Europe, for example (Left-hand branch in figure 4). DistributorA , in turn, could sub-contract the distribution in some European countries to DistributorA1, thus signing a new contract (Distribution Contract A1), represented by subordinate triple A1. On the other hand, the author can sign another contract with DistributorB for the

distribution in the US. Finally, Leaf nodes of this hierarchy are represented by the rights of use of the content by end-users. Furthermore, in some cases, more root triplets could be linked together when actually a digital asset is composed of multiple ones, e.g., a song, where one asset could be the music and the other the lyrics.

From a technical point of view, rights will be managed by combining SLCs (Smart Legal Contracts) and SCs (Smart Contracts) to cover both the legal aspects (thanks to the SLC) and the operative aspects (thanks to the SC).
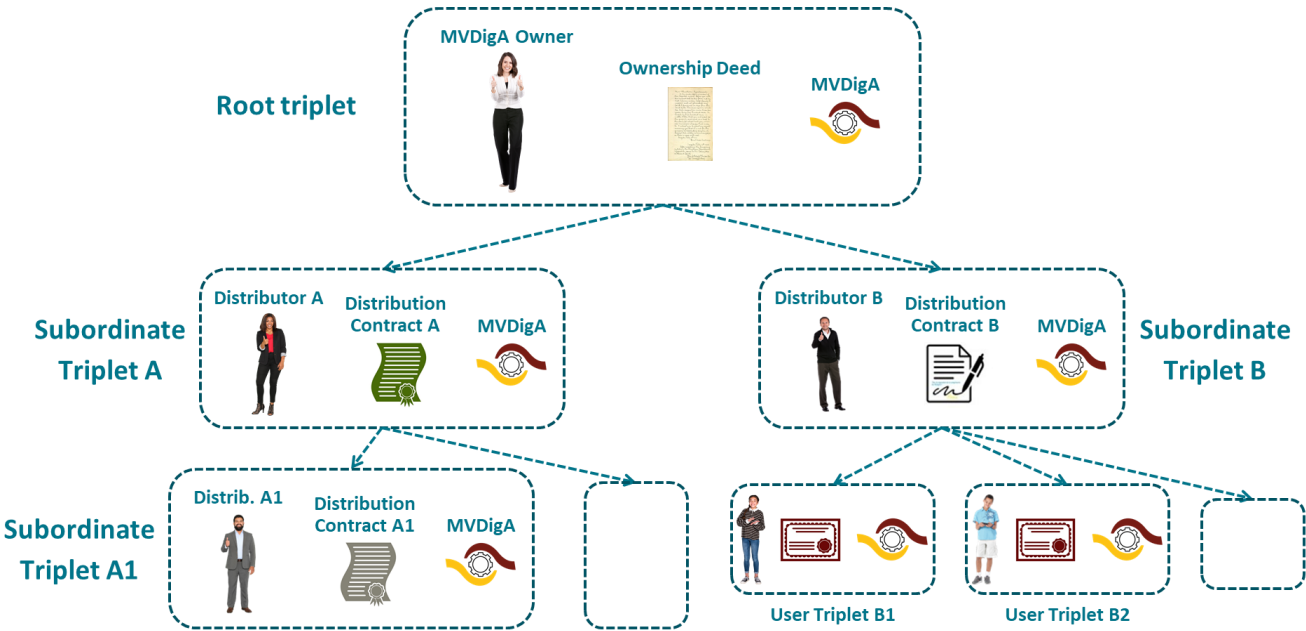

Figure 4: MediaVerse Triplets approach

4.2   Functional Requirements

The following subsections provide an overview of the functionalities that will be used to implement the MediaVerse Rights Management services.

4.2.1   MediaVerse Digital Asset Management

The following table presents the subset of the MediaVerse DAM functionalities envisaged to be used by WP4 to managed data related to IPR and the related supporting SLCs and SCs:

Table 1: MediaVerse Digital Asset Management functionalities

CONTEXT	FUNCTIONALITY[56]	INPUT	OUTPUT (IF NO ERROR)	DESCRIPTION
SLC Mgmt	Store an instance of SLC	- List User ID - Parent SLC ID - SLC Template ID - SLC Template Version - SLC Template Type - SLC Data - SLC File ID - Asset ID - pending approval - pending payment	- SLC ID - Task ID	- Store the SLC (e.g. Ownership Deed or Licence) information and return an identifier for retrieval. N.B. In case of multiple users involved, the task shall be approved by all the users.
	Append SCs addresses to an instance of SLC	- SLC ID - SCs List of address and type	/	- Update the SLC information with the deployed SCs
	Delete an instance of SLC	- SLC ID - pending approval	- Task ID	- Delete an existing instance of a SLC. N.B. In case of multiple users involved, the task shall be approved by all the users.
	Approve a task on an instance of SLC	- SLC ID - User ID	- Approval status	- Update an existing instance of a SLC with the Approval State

---

[56] The functionalities in bold are wrapped by the Rights Management Component and shall not be directly used by other components. For further details see the following section.

CONTEXT	FUNCTIONALITY[56]	INPUT	OUTPUT (IF NO ERROR)	DESCRIPTION
		- Task ID		
	Append payment to an instance of SLC	- SLC ID - User ID - Task ID	- Payment status	- Update an existing instance of a SLC with the Payment State
	Get SLCs of a User	- User ID	- List of SLCs IDs	- Get list of SLCs related to a user
	Get SLCs of an Asset	- Asset ID	- List of SLCs IDs	- Get list of SLCs related to an asset
	Search an instance of SLC	- Query params	- List of SLCs IDs	- Get list of SLCs instances according to the query parameters
	Get an instance of SLC	- SLC ID	- List User ID - Parent SLC ID - SLC Template ID - SLC Template Version - SLC Template Type - SLC Data - SLC File ID - SC Address - SC Type - Asset ID - Approval status - Payment status	- Get an instance of SLC and related metadata
	Set Preferred SLC Template	- SLC Template ID	/	- Set the default SLC Template

CONTEXT	FUNCTIONALITY[56]	INPUT	OUTPUT (IF NO ERROR)	DESCRIPTION
SLC Template Mgmt	Search SLC Template	- Query params (e.g. Type of SLC Template)	- List of SLC Templates IDs and metadata	- Get list of SLC Templates according to the query parameters
	Get SLC Template	- SLC Template ID	- SLC Template File	- Retrieve the SLC Template file
	Create SLC Template	- SLC Template File and metadata	- SLC Template ID	- Store the SLC Template (e.g. Ownership Deed or Licence) information and return an identifier for retrieval.
	Update SLC Template	- SLC Template ID - SLC Template File and metadata	/	- Update an existing SLC Template. The previous version is still valid and it is not deleted.
	Delete SLC Template	- SLC Template ID	/	- Delete SLC Template
User Mgmt	Set Blockchain User ID	- User ID - Blockchain User ID	/	- Set User Blockchain ID
	Get Blockchain User ID	- User ID	- Blockchain User ID	- Get User Blockchain ID
	Remove Blockchain User ID	- User ID	/	- Remove User Blockchain ID
	Set preferred fiat currency	- User ID - fiat currency ID	/	- Set fiat currency ID
	Get preferred fiat currency	- User ID	- Fiat currency ID	- Get fiat currency ID

4.2.2 Rights Management Component

The Rights Management component will be part of each MediaVerse Node and it will be composed by the MV Blockchain service provider, the MV SLC Engine (based on the Accord Project Cicero Engine) and the IPR Service API.

The interactions with the other MediaVerse Node parts will be based on the API exposed by the IPR Service API and the following table lists the main proposed functionalities.

Table 2: MediaVerse Rights Management Component functionalities

CONTEXT	FUNCTIONALITY	INPUT	OUTPUT (IF NO ERROR)	SUB-COMPONENT	DESCRIPTION
SLC Mgmt	Create an instance of SLC	- List User ID - Parent SLC ID - SLC Template ID - SLC Data - Asset ID	- SLC ID - TaskID	- IPR Service API - MV SLC Engine	- Check compatibility (e.g. SLC dependencies, etc.) - Validate SLC from provided data and template (based on TRIGGER/INVOKE command of Accord Project Cicero Engine) - Create SLC from provided data and template (based on DRAFT command of Accord Project Cicero Engine) - Update the DAM (User ID, Asset ID, SLC Template ID, SLC ID, SLC Data ID, pending approval, pending payment...) N.B. In case of multiple users involved, the task shall be approved by all the users.
	Delete an instance of SLC	- SLC ID	- Task ID	- IPR Service API - MV SLC Engine	- Update related SLCs and SCs - Update the DAM (pending approval...) N.B. In case of multiple users involved, the task shall be approved by all the users.
	Approve a task on an instance of SLC	- SLC ID - User ID - Task ID	- Approval Status	- IPR Service API - MV Blockchain service provider	- Check if the action on SLC is approved by all User IDs - Create/Delete SCs instances according to the action to be performed - Update the DAM (User ID, Asset ID, SLC Template ID, SLC ID, SLC Data ID, pending approval...)

Context	Functionality	Input	Output (if no error)	Sub-Component	Description
SLC Templ. Mgmt	Pay for an instance of SLC	- SLC ID - User ID - Task ID	- Payment Status	- IPR Service API - MV Blockchain service provider	- Check pending payment - Check Account's Balance - Create/Update SCs instances according to the action to be performed - Update the DAM
	Query an instance of SLC	- SLC ID - JSON Request	- JSON Response	- IPR Service API - MV SLC Engine	- Send a request to the SLC or a specific clause of the SLC (based on TRIGGER and INVOKE commands of Accord Project Cicero Engine).
	Preview an instance of SLC	- SLC ID	- SLC File	- IPR Service API - MV SLC Engine	- Creates contract text (markdown, no PDF) from data (based on DRAFT command of Accord Project Cicero Engine).
	Create SLC Template	- SLC Template File and metadata	- SLC Template ID	- IPR Service API - MV Blockchain service provider	- Link the SLC Template to the correspondent Blockchain SCs Templates - Update the DAM
	Update SLC Template	- SLC Template ID - SLC Template File and metadata	/	- IPR Service API - MV Blockchain service provider	- Link the SLC Template to the correspondent Blockchain SCs Templates - Update the DAM
	Delete SLC Template	- SLC Template ID	/	- IPR Service API - MV Blockchain service provider	- Update related SLCs and Blockchain SCs - Remove the SLC Template from the DAM
User Mgmt	Create Blockchain User	- User ID	/	- MV Blockchain service provider	- Create User Account's Balance - Set User Blockchain ID in the DAM

CONTEXT	FUNCTIONALITY	INPUT	OUTPUT (IF NO ERROR)	SUB-COMPONENT	DESCRIPTION
	Delete Blockchain User	- User ID	/	- MV Blockchain service provider	- Update related SLCs and SCs - Delete User Account's Balance - Remove User Blockchain ID in the DAM
	Get Account's Balance	- User ID	- Balance in fiat currency	- MV Blockchain service provider	- Retrieve the MV Unit of Account balance transformed in User account's preferred fiat currency
	Top Up Account's Balance	- User ID - Authorized Amount	/	- MV Blockchain service provider	- Increase the Balance of the corresponding amount in MV Unit of Account

4.3   Smart Legal Contract

A Smart Legal Contract (SLC) is a human-readable and machine-readable digital agreement, which in MediaVerse will be used in combination with blockchain Smart Contracts to represent a Subject's Right (e.g., Ownership Deed, etc.) over a "MediaVerse Digital Asset" (MVDigA). In fact, the SLC will represent the legal aspects of the Right, while the blockchain Smart Contracts will be responsible for SLC "notarisation" in the "triplet" (Owner, Right, Asset) and execution (e.g. revenue splits, ownership transfer, etc.). MediaVerse SLC implementation of choice is the Accord Project one because it is open source, it is part of the Linux Foundation[57], blockchain agnostic and it provides a customizable Web UI tool for creating, editing, and testing SLCs Templates.

For further details about SLC and Smart Contracts please see the related introductory chapters.

4.3.1   Concept

MediaVerse will use the Accord Project SLC implementation that defines a SLC as the combination of a SLC Template and its data. This way, the user will be able to select the proper SLC Template from a predefined list and provide the required data. Then, through the MV SLC Engine (based on the Accord Project Cicero Engine), it will be possible to combine the SLC Template and its data to obtain the SLC in human-readable form or to query the SLC about specific requests (e.g., list of authors, etc.).

In detail, a SLC Template is composed of three different parts:

- Text: the natural language of the template;
- Model: the data model that backs the template, acting as a bridge between the text and the logic;
- Logic: the executable business logic for the template.

The following section presents the SLC Template Studio that will support the user to define these parts.

4.3.2   SLC Template Studio

The SLC Template Studio will be aimed at professionals and organisations (e.g., publishers, etc.) that have specific needs that are not covered by the predefined SLC Templates of MediaVerse.

In fact, the SLC Template Studio will be a customised version of the Accord Project Template Studio that provides a Web UI for creating, editing, and testing SLC Templates using its integrated markdown editor and Template Library. It will allow users to create a new SLC Template, or to create a SLC Template based on any SLC Template in the Template Library, without needing to download developer tools or have advanced coding experience. Furthermore, the SLC Template Studio will support the user checking for syntax or logic errors, testing the SLC Template.

The SLC Template Studio will be part of the MediaVerse Node for a fully integrated experience.

---

[57] Linux foundation to host the accord project to develop open-source framework for Smart Legal Contracts. (2019, June 6). https://www.linuxfoundation.org/press-release/linux-foundation-to-host-the-accord-project-to-develop-open-source-framework-for-smart-legal-contracts/
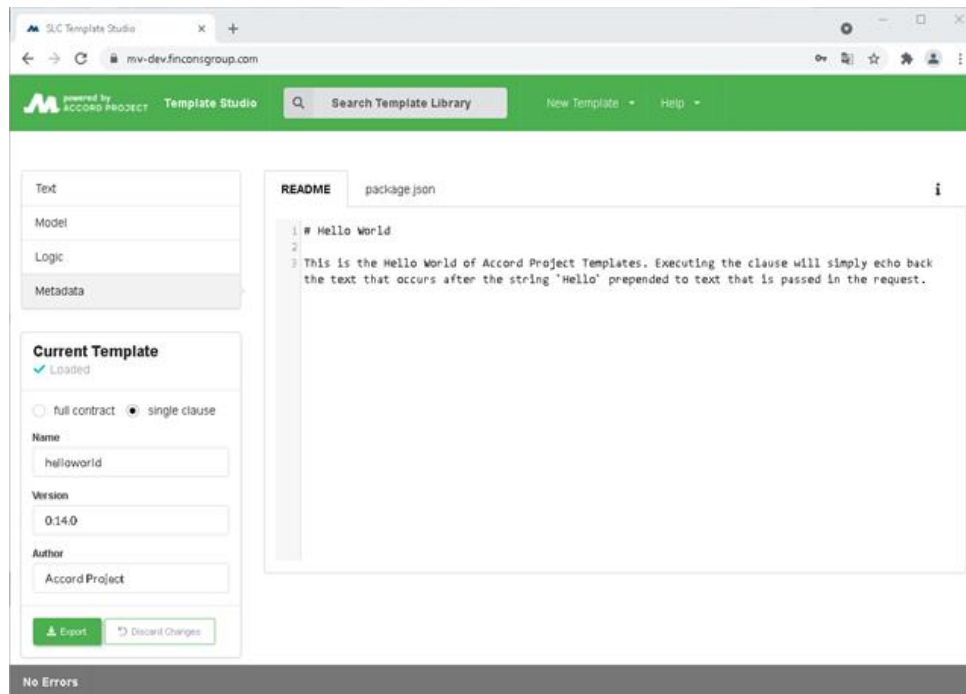
Figure 5: SLC Template Studio Web UI

4.4 Blockchain and Smart Contracts

4.4.1 Concept

Following an in-depth technical analysis based on the following criteria: widely spread, reliability, scalability and availability of supporting libraries and tools; it has been decided to develop MediaVerse solution on top of the Ethereum blockchain. Ethereum is a decentralised platform that, in addition to supporting asset transfer transactions as in Bitcoin, supports Smart Contracts: applications that run exactly as programmed without any possibility of downtime, censorship, fraud or third-party interference[58]. This is possible thanks to its foundational layer: a blockchain with a built-in Turing-complete programming language, allowing anyone to write Smart Contracts and decentralised applications[59]. Ethereum was proposed in late 2013 by Vitalik Buterin, a cryptocurrency researcher and programmer, with the goal of building decentralised applications. Its development was funded by a crowd sale that took place between July and August 2014. The system went live on 30 July 2015, with a pre-mine of 11.9 million *Ether* (the Ethereum native cryptocurrency).

The main intent of Ethereum is to create an alternative protocol for building decentralised applications. Decentralised applications, also known as Decentralised Apps or DApps in short, are part of a new wave of web applications meant to increase the transparency around commercial transactions, governmental processes, supply-chains and all those systems which currently require mutual trust between customers and suppliers or users and providers. The goal of decentralised applications is the minimisation or elimination of the need of any trust during the interaction of mutually untrusted participants, which is said to bring us the so-called Web 3.0.

---

[58] http://ethereum.org/

[59] Buterin, V. (2014). A Next-Generation Smart Contract and Decentralized Application Platform. Ethereum White Paper.

Being one of the most used blockchain platforms, Ethereum has a number of widely supported tools available for different purposes such as accountability and traceability (e.g., Etherscan[60], NonFungible[61]) but also for libraries for development purposes (e.g., OpenZeppelin[62]).

Moreover, Ethereum is in active development and constantly evolving. Around 2022 Ethereum is expected to reach version 2.0 which is expected to solve its biggest weaknesses (low number of transactions per seconds, high transaction fees, high disk space requirements) making it more performant, scalable and secure. This will be enabled by the switch to a proof-of-stake consensus and the introduction of the shard-chains that are 64 sub-chains to spread the network's load on, allowing to keep hardware requirements for blockchain nodes low, reducing network congestion and increasing the number of transactions processed per second. Until Ethereum 2.0, the scalability issues are addressed using Layer 2 chains (or rollups) that envisage the execution of transactions outside the main chain but store transaction data on the main chain. This allows to secure the layer 2 chain through the layer 1 chain and, at the same time, increasing transaction throughput and reducing transaction fees for users.

Fostered by the evolution toward version 2.0, another limitation to overcome relates to transaction fees as well as the need for paying for gas and affects users' on-boarding experience. To start interacting with a blockchain-based system, users need to own some cryptocurrency to pay for transaction fees. This requires users to acquire the cryptocurrency in the first place which can be a tedious procedure, especially for inexperienced users. The Ethereum Gas Station Network (GSN) aims at solving this problem by allowing users to interact with Ethereum contracts even without owning any ETH. By using the GSN, users can sign meta-transactions that are sent to a relay server in charge of sending the actual blockchain transactions on their behalf, and thus pay for the fees.

4.4.2 Standards

MediaVerse envisages the use of different standards including Ethereum ERCs (Ethereum Request for Comments) and EIP (Ethereum Improvement Proposals), like ERC-20, ERC-721 EIP-1167:

- ERC-20 (Fungible Token standard) defines an interface for transferring tokens, to get the current token balance of an account as well as the total supply of the token. It also offers the possibility to approve a third party account to spend a certain number of tokens from another account. As detailed in section 4.4.3 and section 4.5 this standard will be used to implement the MediaVerse Unit of Account (MVCoin) and the MVDigA's related tokens that handles the share splitting of rights;
- ERC-721 (Non-Fungible Token) defines an interface for transferring NFTs, to get the current balance (in terms of number of NFTs) of an account, to get the owner of a specific NFT and the total available supply. As in ERC-20 it also provides functionalities to approve the transfer of an NFT by a third party account. In MediaVerse, as detailed in section 4.5, this standard will be used to implement those kinds of rights (e.g., right of use) that cannot be shared by multiple parties;
- EIP-1167 (Minimal Proxy Contract): defines a simple and cheap clone-contract functionality in an immutable way, this standard specifies a minimal bytecode implementation that delegates all calls to a known, fixed address. This will be useful to reduce gas usage during the deployment of the different Smart Contracts envisaged in MediaVerse.

---

[60] https://etherscan.io/
[61] https://nonfungible.com/
[62] https://openzeppelin.com/contracts/

Furthermore, MediaVerse will consider other standards such as EIP-2981 (NFT Royalty Standard), which extends the ERC-721 specification to enable setting a royalty amount paid to the NFT creator or rights holder every time an NFT is sold and re-sold and EIP-1155 (Multi Token Standard) to manage multiple tokens within a single Smart Contract.

To describe and document the MediaVerse MVCoin token, we will refer to the InterWork Alliance Token Taxonomy Framework[63]. The taxonomy is composed of three parts:

- Token Template: describes a token based on its type and what capabilities or restrictions a token created from the template has. The template has two parts:
  - Template Formula: used to classify and describe how to work with a token;
  - Template Definition: derived from the formula, that contains the instructions and details for defining a token.
- Token Class: a deployed token from a Template. (i.e., Bitcoin created from the crypto-currency template). A token class can have one or more token instances;
- Token Instance: a single token in a particular Token Class. (i.e., satoshi).

The framework classifies tokens using the following characteristics:

- Token Type: Fungible or Non-Fungible;
- Token Unit: Fractional, Whole or Singleton indicates if a token can be divided into smaller fractions, usually represented as decimals, or if there can be a quantity greater than 1. For example, €1 can be divided into five €0.20 coins and thus is Fractional. Whole means no subdivision allowed, just whole numbers of quantities. Singleton has a quantity of 1, is indivisible and is the only token in the class;
- Value Type: Intrinsic or Reference indicates if the token itself is a value, like a crypto currency, or if it references a value elsewhere, like a property title;
- Representation Type: Common or Unique. Common tokens share a single set of properties and cannot be distinguished one from one another. These tokens are simply represented as a balance or quantity attributed to an owner's address. A unique token has its own identity, can have unique properties, and be individually traced;
- Supply: Fixed, Capped-Variable, Gated, or Infinite; indicates how many token instances, usually counted as whole instances, a token class can have during its lifetime. A token class that is fixed may issue an initial quantity upon creation, tokens cannot be removed or added to the supply. A capped-variable supply will allow for a maximum number of tokens to exist at any given time, with quantities added and removed within the quantity cap. A gated supply is common in crypto-currencies, where tranches of tokens are issued at certain points in time or events. A gated supply indicates up front the quantities in each tranche and when the tranche is issued that will increase the total quantity for the class. Infinite supply indicates that tokens in the class can be minted and removed with no cap;
- Template Type: Single or Hybrid, indicates any parent/child relationships or dependencies between tokens.

Following this taxonomy, a definition of the envisaged MVCoin has been defined and reported in **Annex II.**

---

[63] Token taxonomy Framework. (2021, September). InterWork Alliance. https://interwork.org/frameworks/token-taxonomy-framework/

4.4.3 MediaVerse Unit of Account

The DLT world is undergoing a wave of emerging platforms that take advantage of some peculiar technological features of the blockchain. As evidenced by the trend, MediaVerse needs a medium to give control of the content created back to authors themselves providing transparency and auditability in the history of the economic value transactions in the platform.

For this purpose, MediaVerse will have a "coin", named MVCoin (like an ERC20 token), that will constitute the mechanism to manage economic value transfer between the different entities of the MediaVerse ecosystem. This design is not linked to any specific implementation choice as it is an intrinsic feature of the blockchain. For more information, please have a look at the D8.2, Section 4.2, Table 9.

The MVCoin will be totally transparent to MediaVerse users, who will only see their balance in their respective fiat currency. Specifically, the MVCoin value will be stable across the whole MediaVerse federation and converted using an agreed fixed rate (e.g., 1 MVCoin = 0.01€). This implies that users will be able to use their preferred payment methods on MediaVerse (e.g., PayPal, Credit Cards, etc.) but money transfer between MediaVerse (e.g., revenue splitting) will be handled through MVCoin transfers, taking advantage of the blockchain traceability and auditability.

4.5 Tangible use of Smart Contracts to Manage Copyright within MediaVerse

Following what was described above, in MediaVerse, rights will be managed by combining SLCs (Smart Legal Contracts) and SCs (Smart Contracts) to cover both the legal aspects (thanks to the SLC) and the operative aspects (thanks to the SC). Different kinds of Smart Contracts will be used to represent rights. "Main" rights, such as *Ownership Deed*, *Publishing Right* will be implemented starting from the fungible token ERC20 SC standard. This will allow us to model the rights' ownership shares and owners. A right can be divided in shares (e.g. 100 shares) each represented by a single token instance. The number of coins of that specific token represent the right's shares of the owners (e.g., Alice 65%, 65 coins - Bob 35%, 35 coins) . This mechanism will allow to transfer the ownership, even partially, via a blockchain transaction (e.g., Alice transfers 20% percent of her shares to Carol, resulting in Alice having 45 coins, Bob 35, Carol 20).

Leaf rights will instead be implemented following the NFT ERC721 standard. This is because this kind of rights (e.g., right of use) can be transferred but cannot be divided and shared between multiple parties. Additional Smart Contracts (light blue SCs in figure 6) will manage the revenue splitting. The usage of the event mechanism will allow monitoring the status of the different Smart Contracts through off-chain tools.
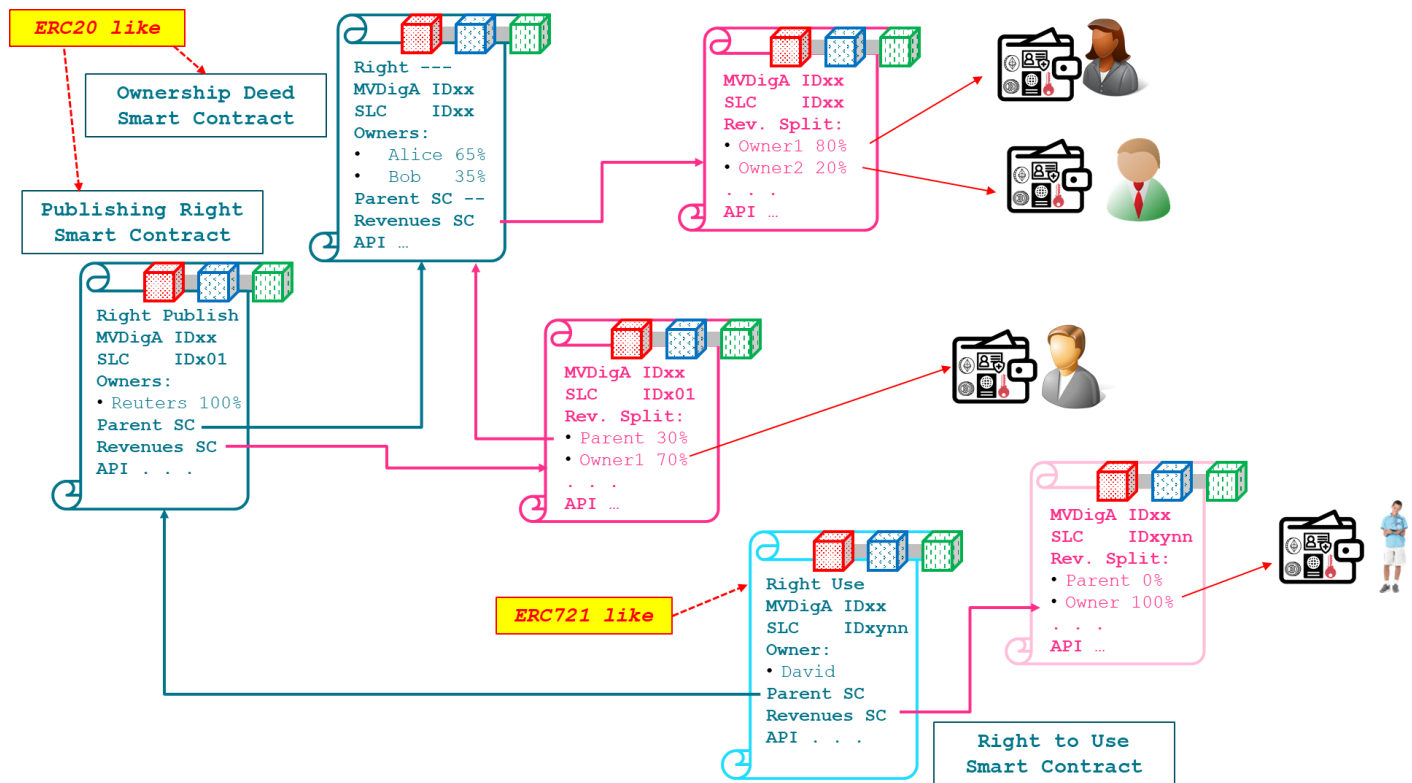
Figure 6: Smart Contracts Hierarchy for rights management

4.6   Copyright Management Workflows

This section shows a preliminary and non-exhaustive list of some relevant workflows that involve the features developed for the Copyright Management.

4.6.1   Ownership Registration

The following figure shows the foreseen steps to create an MVDigA of an uploaded file.

As previously mentioned, the MVDigA consists in a "triplet" of:

- ASSET: the digital asset;
- OD (Ownership Deed): the "Ownership Right" of the OWNER over the ASSET;
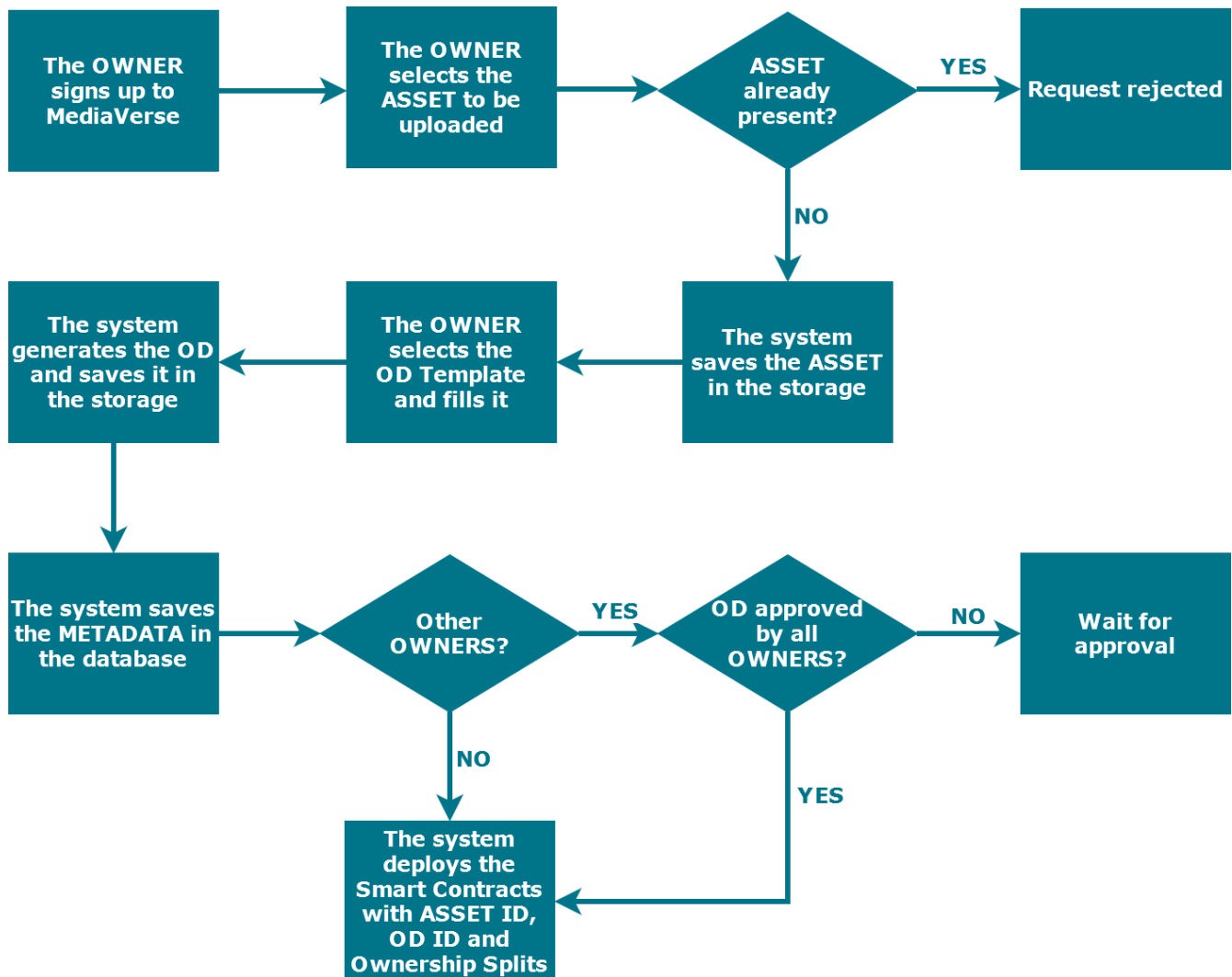- OWNER/S: the Owner/s of the rights over the ASSET.

Figure 7: Workflow of "Ownership Deed" creation

This workflow is composed of different steps:

1. the Owner signs up to MediaVerse;
2. the Owner selects the Asset to be uploaded;
3. the system checks if the Asset is already present (N.B. this will be achieved by another MV Node Component: The Near Duplicate Detection Service);
4. if the Asset is not already present, the system saves it to the storage (N.B. the Asset is only loaded on the system, but until an MVDigA is created, it cannot be published);
5. the Owner selects the Ownership Deed SLC Template from a list and fills it with the required fields;
6. the system verifies the correctness of the provided data and creates the Ownership Deed SLC;
7. the system saves the Metadata in the Database (e.g., link of the Owner with the created Ownership Deed, link of the Ownership Deed with the used Template and inserted data, etc.);
8. if other Owners are specified, the system will ask them for the approval of the created Ownership Deed;
9. the system deploys on the Blockchain the Smart Contracts related to the approved Ownership Deed SLC, with the links to the Asset, to the Ownership Deed SLC and to the specified Ownership Splits.

After correct execution of the above workflow, the MVDigA is correctly created, and the Owner can publish it.

4.6.2   Intermediary Designation

The following figure shows the foreseen steps to design an intermediary (e.g., publisher, etc.).

In this case, the final MVDigA, will consist of a "triplet" of:

- ASSET: the digital asset;
- CR (Copyright): the right of the INTERMEDIARY over the ASSET;
- INTERMEDIARY/IES: the intermediary/ies of the rights over the ASSET.
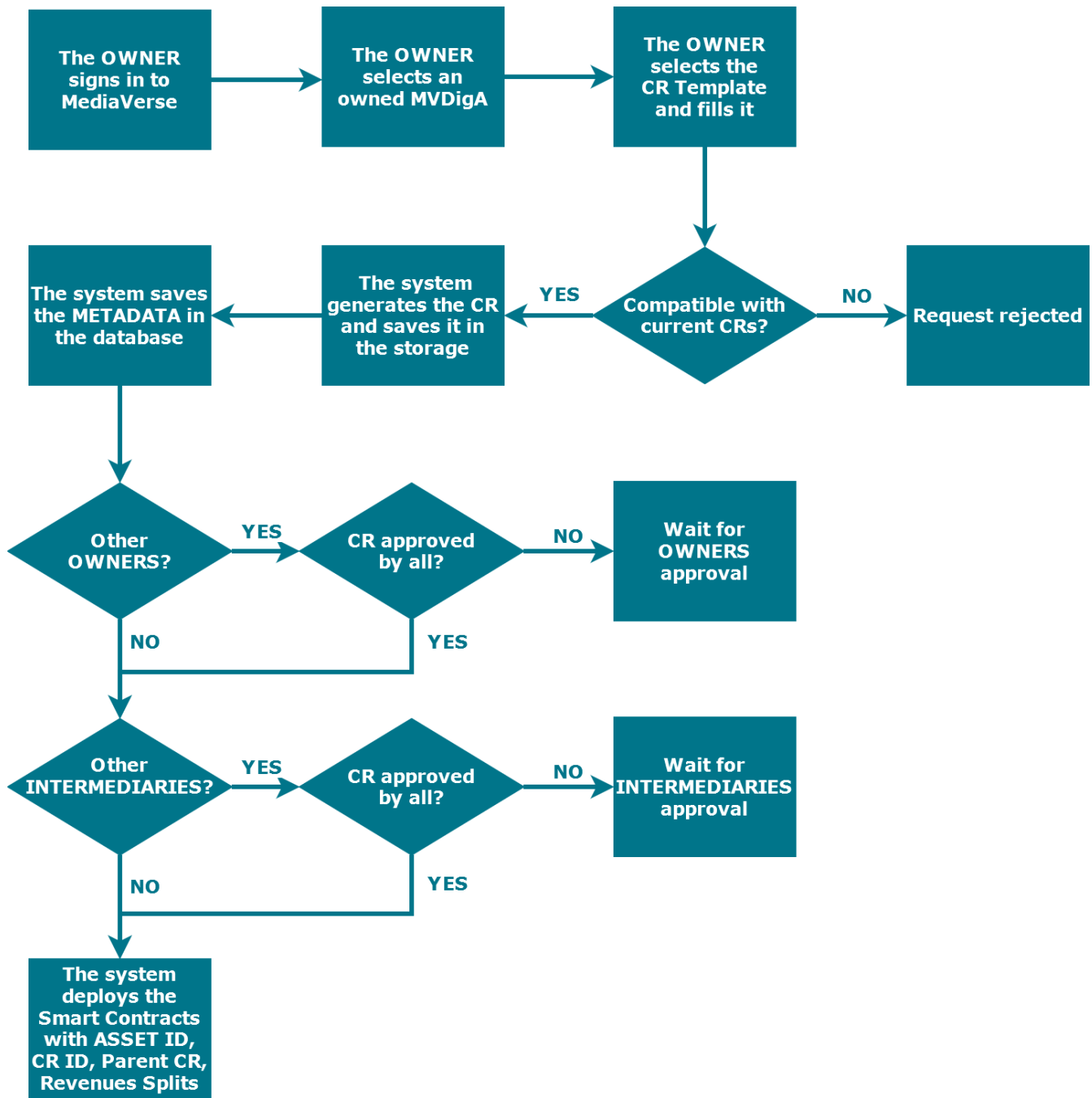

Figure 8: Workflow of "Intermediary's Copyright" creation

This workflow is composed of different steps:

1. the Owner signs in to MediaVerse;
2. the Owner selects an owned MVDigA;
3. the Owner selects the Copyright SLC Template from a list and fills it with the required fields;
4. the system checks if the Copyright SLC is compatible with the other subsistent Copyrights SLCs;
5. if the check is successful, the system creates the Copyright SLC and saves it to the storage;
6. the system saves the Metadata in the Database (e.g., link of the Intermediary with the created Copyright, link of the Copyright with the used Template and inserted data, etc.);
7. if other Owners are specified, the system will ask them for the approval of the created Copyright SLC;
8. if other Intermediaries are present, the system will ask them for the approval of the created Copyright SLC;
9. the system deploys on the Blockchain the Smart Contracts related to the approved Copyright SLC, with the links to the Asset, to the Ownership Deed SLC and to the specified Ownership Splits.

After the correct execution of the presented workflow the MVDigA is correctly created and the intermediary can publish it.

5 Conclusion

This Deliverable gives a first insight into copyrights and copyright management within the MediaVerse platform. Since users will be able to create, share, license and monetise content, the deliverable gives an overview of the legal challenges such a platform would come across in the areas of authorship, copyrightable works, exceptions and platform liability on the one hand, and the technical architecture for copyright management on the other.

The identified challenges mainly point at the fragmentation of national law on for example ownership and exceptions, which result in difficulties when operating a cross-border service. Nevertheless, it was identified that for co-creation, where national rules on exercise of the rights and assignment diverge, the technical implementation proposed by MediaVerse can be of great value, as users can determine themselves, and the platform can register, what percentages they own and how they should be remunerated. This way, legal certainty for the owners can be provided. For the specific issue of exceptions, the terms and conditions will mention the EU harmonised exceptions and the user will have the possibility of using the work directly, should this be possible, or contacting the right-holder in the event that the technical modalities of the platform would make direct use impossible. The new text and data mining exception could be implemented by adding a machine-readable rejection to use the work for such purposes as an option in the licence and by having a distinction in the registration process, which enables registering as a research institution.

Furthermore, a lack of clarity still exists on the copyright protection of AI-generated works, VR works and accessibility content. While we did look into their protectability, these issues do not pose a direct problem for MediaVerse, which will not function as a registry for copyrights nor a collective management organisation. MediaVerse will provide an easy way for owners and creators to exploit their content, as MediaVerse registers ownership – and not copyrights as such – and content can be licensed through SLCs. As a result, also owners of works which could possibly not fall under copyright protection, can limit the use of their work and exploit it. As the licence is a contract, it is enforceable also outside of MediaVerse regardless of the lack of copyright of the work. The only implication here is that the owner will not have the specific enforcement possibilities which would be given to the author of a work under copyright law. For VR works specifically, users that interact with the work can also be granted a derivative work on their intervention.

An important point for MediaVerse to monitor during the project implementation will be platform liability for copyright infringements. This will be relevant for the future operation of the platform. Where previously MediaVerse would have fallen under the safe harbour provisions, the European Directive on the Single Digital Market introduces direct liability for content sharing platforms. While it is still to be seen whether MediaVerse will effectively fall under such rules and while it could enjoy the exceptions to the rules for small platforms, the rules and the application in practice definitely needs to be followed up closely as it might require sector wide agreements with right-holders and uploading filters. In any case, MediaVerse will oblige users to obtain the necessary authorisations and will make sure that any take-downs are followed by making the Ownership Deed and any licences based thereon ineffective and by taking down any derivative works. In addition, the project will monitor the developments in this area and, if necessary, take additional action to comply with the Directive.

From a technical point of view, a main outcome is that copyright management will be implemented within MediaVerse through a rights management solution, based on SLCs and the related SCs deployed on the Ethereum blockchain. In fact, the rights management solution will handle the deployment and the management of the SCs that will be used to notarise the SLC's counterpart, supporting not only the possibility to acquire and transfer

rights, but also to provide auditability and revenue payment splitting. The technical implementation relies on a root triplet: the asset (MVDigA), the owner and the right, which is used for the registration of the content on the blockchain through an Ownership Deed right. This root triplet can then be further supplemented with leaf triplets (MVDigA, right owner, right) which stem from licences or transfers of ownership. For the implementation of the Ownership Deed or such licences, MediaVerse will make use of SLC (off-chain logic) combined with an Ethereum-based SCs implementation (on-chain logic) to notarise and automate the execution of the legal agreements. This way, any authorisation to use the work gets registered, and the execution of the contract, including remuneration according to ownership rights, is automated. The ownership rights will be registered in a fungible token, which is interchangeable, while the specific copyrights will be identified by a non-fungible token, which cannot be shared.

Finally, to draft a template licence, a study was conducted on the mandatory provisions and the applicable law. MediaVerse opted to include a substantive amount of the mandatory provisions that could be found in the national legislations, as these can protect the owner better and provide for more legal certainty in any way. Besides this, the features of the Creative Commons licences were integrated. Furthermore, no choice of law will be made in the licence, as the licences aim to be applicable across several jurisdictions and provide for most of the mandatory provisions. Should the latter not be the case, parties will still be able to renegotiate the specific clause or contract. In case of a conflict the flexibility of the applicable law and court will prove valuable as the conflict of law rules will provide for a logical solution, considering the nationality of the parties and the territorial link of the agreement.

References

Legislative documents

a. International

Berne Convention, of 9 September 1886, for the Protection of Literary and Artistic Works, amended on 28 September 1979 (administered by the WIPO).

Rome Convention, of 18 May 1964, for the Protection of Performers, Producers of Phonograms and Broadcasting Organisations (administered by the WIPO).

Agreement on trade-related aspects of intellectual property rights (Annex 1C of the Marrakesh Agreement Establishing the World Trade Organisation, signed in Marrakesh, Morocco on 15 April 1994).

WIPO Copyright Treaty adopted in Geneva on 20 December 1996.

WIPO Performances and Phonograms Treaty adopted in Geneva on 20 December 1996.

Convention on the Protection and Promotion of the Diversity of Cultural Expressions adopted by the General Conference of the UNESCO in Paris on 20 October 2005.

Beijing Treaty on Audiovisual Performances, adopted by the Diplomatic Conference on the Protection of Audiovisual Performances in Beijing, on 24 June 2012 (administered by the WIPO).

Marrakesh Treaty to Facilitate Access to Published Works for Persons who are Blind, Visually Impaired or otherwise Print Disabled, adopted in Marrakesh on 27 June 2013 (administered by the WIPO).

b. European Union

Council Directive 93/83/EEC of 27 September 1993 on the coordination of certain rules concerning copyright and rights related to copyright applicable to satellite broadcasting and cable retransmission ("Satellite and Cable Directive").

Council Directive 92/100/EEC of 29 October 1993 harmonising the term of protection of copyright and certain related rights (codified by Directive 2006/116/EC of the European Parliament and of the Council on 12 December 2006).

Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases ("Database Directive").

Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market ('Directive on electronic commerce').

Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society ("InfoSoc Directive").

Directive 2001/84/EC of the European Parliament and of the Council of 27 September 2001 on the resale right for the benefit of the author of an original work of art ("Resale Right Directive").

Directive 2004/48/EC of the European Parliament and of the Council of 29 April 2004 on the enforcement of intellectual property rights.

Directive 2006/115/EC of the European Parliament and of the Council of 12 December 2006 on rental right and lending right and on certain rights related to copyright in the field of intellectual property ("Rental and Lending Directive").

Directive 2006/116/EC of the European Parliament and of the Council of 12 December 2006 on the term of protection of copyright and certain related rights ("Term Directive").

Directive 2009/24/EC of the European Parliament and of the Council of 23 April 2009 on the legal protection of computer programs (Codified version).

Directive 2011/77/EU of the European Parliament and of the Council of 27 September 2011 amending Directive 2006/116/EC on the term of protection of copyright and certain related rights.

Directive 2012/28/EU of the European Parliament and of the Council of 25 October 2012 on certain permitted uses of orphan works ("Orphan Works Directive").

Directive 2013/37/EU of the European Parliament and of the Council of 26 June 2013 amending Directive 2003/98/EC on the re-use of public sector information.

Directive 2014/26/EU of the European Parliament and of the Council of 26 February 2014 on collective management of copyright and related rights and multi-territorial licensing of rights in musical works for online use in the internal market.

Directive (EU) 2015/1535 of the European Parliament and of The Council of 9 September 2015 laying down a procedure for the provision of information in the field of technical regulations and of rules on Information Society services (codification).

Directive (EU) 2017/1564 of the European Parliament and of the Council of 13 September 2017 on certain permitted uses of certain works and other subject matter protected by copyright and related rights for the benefit of persons who are blind, visually impaired, or otherwise print-disabled and amending Directive 2001/29/EC on the harmonisation of certain aspects of copyright and related rights in the information society.

Directive (EU) 2019/790 Of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC ("Digital Single Market Directive").

c.   National

UK Copyrights, designs and patents act 1988.

Irish Copyright and Related Rights Act 2000.

French Intellectual Property Code.

Belgian Economical Law Code.

Jurisprudence

ECJ 7 December 2006, SGAE v. Rafale Hoteles, C-306/05.

ECJ 16 July 2009, Infopaq vs. Danske Dagblades Forening, C-5/08.

ECJ 22 December 2010, BSA, C-393/09.

ECJ 15 March 2012, SFC v. Marco Del Corso, C-135/10.

ECJ 7 March 2013, Panier, C-145/10.

ECJ 23 January 2014, Nintendo v. PC Box, C-355/12.

ECJ 13 February 2014, Svensson v. Retriever Sverige AB, C-466/12.

ECJ 19 December 2019, Nederlandse Uitgeversbond and Groep Algemene Uitgevers (C-263/18), C-263/18.

ECJ 19 December 2019, Tom Kabinet, C-263/18.

ECJ 2 April 2020, STIM and SAMI v. Fleetmanager Sweden, C-753/18.

Scientific publications

Bonadio, A. & McDonagh, L. (2020). Artificial intelligence as producer and consumer of copyright works: evaluating the consequences of algorithmic creativity. I.P.Q. 2, 112-137.

Cedillo-Lazcano, I. (2020). AI©R., International Review of Law 2020, Computers & Technology, 34:2, 201-213.

Devarapalli, P., (2018). Machine learning to machine owning: redefining the copyright ownership from the perspective of Australian, US, UK and EU law. E.I.P.R., 40(11), 722).

Dorotheou, E. (2015) Reap the benefits and avoid the legal uncertainty: who owns the creations of artificial intelligence. C.T.L.R. 21(4), 85.

European Parliament (2018). Copyright Law in the EU, Salient features of copyright law across the EU Member States,
https://www.europarl.europa.eu/RegData/etudes/STUD/2018/625126/EPRS_STU(2018)625126_EN.pdf.

Goldstein, P., Hugenholtz, P.B. (2019) International copyright, principles, law and practice, Oxford University Press.

Horgan, C. (2021). Member States make slow progress on DSM Directive as deadline looms. Lexology, https://www.lexology.com/library/detail.aspx?g=88aa5381-11e8-4433-9e76-08532b4340e5.

Hugenholtz, P.B. & van Velze, S.C. (2016). Communication to a New Public? Three reasons why EU copyright law can do without a 'new public'. IVIR publications.

Keustermans, J., Blomme, P. (2021). Auteursrecht Capita Selecta, Intersentia.

Lim, E.C. (2020). Meet my artificially-intelligent virtual self: creative avatars, machine learning, Smart Contracts and the copyright conundrum. J. I. P. L. P., 2020 0 (0), 1-11.

Margoni, T. (2016). The Harmonisation of EU Copyright Law: The Originality Standard. SSRN Papers.

Matas, A. (2021). A missed deadline: the state of play of the Copyright Directive. Pro.europeana, https://pro.europeana.eu/post/a-missed-deadline-the-state-of-play-of-the-copyright-directive.

Ramalho, A. (2017). Will Robots Rule the (Artistic) World: A Proposed Model for the Legal Status of Creations by Artificial Intelligence Systems. J. Internet L. 21(1), 12.

Ramos, A. (2013). The Legal Status of Video Games: Comparative Analysis in National Approaches. WIPO.

Stanmatoudi, I.A. (2017). Research Handbook on Copyright Law (Torremans, Ed.) (Second Edition) Edward Elgar.

Strowel, A. & Vanbrabant, B. (2013). Research Handbook on IP Licensing (de Werra, J.,Ed.). Edward Elgar, 29-53.

Vanherpe, J. & Janssens, M-C. (2020). Smart Contracts, Een overzicht vanuit juridisch perspectief (Aerts et al., Eds.). Intersentia, 331-370.

WIPO Publications (2016). Understanding Copyright and Related Rights.
https://www.wipo.int/edocs/pubdocs/en/wipo_pub_909_2016.pdf.

Annex I: Licence Template

Copyright Licence

This Copyright License (the "Agreement") is concluded between:
1. [XX] (the "Licensor"), with registered address at [Address]

And

2. [YY] (the "Licensee"), with registered address at [Address]

1. **Definitions**
    1. **Derivative Works**: works which are derived from or based upon the Work, such as translations, alterations, combinations, adaptations, arrangements, transformations or other modifications to and/or of the Work, which require permission of the rightsholder, and which in itself are also protected under copyright.
    2. [**Commercial Purposes**: intended for or directed towards commercial advantage or monetary compensation.]
    3. **Exceptions and Limitations**: the exceptions and limitations to the copyrights on the Work, as recognised by national law.
    4. **MediaVerse**: the MediaVerse media platform.
    5. [**Non-Commercial Purposes**: not intended for or directed towards commercial advantage or monetary compensation.]
    6. **Rights**: the copyrights on the Work licensed under this Licence, excluding any moral rights on the Work.
    7. **Work**: the work on which the Licensor has the lawful copyrights, whether as an author or after transfer of such rights, in accordance with Ownership Deed [XX], or of which the Licensor can sub-license the Rights in accordance with licence [XX].
2. **Scope**
    1. Subject to this Agreement, the Licensor grants the Licensee a worldwide/Europe/Country, [royalty-free], non-sublicensable/sublicensable, non-exclusive/exclusive, revocable/irrevocable licence on the Rights in the Work to:
        1. Reproduce [, all or part of,] the Work [in any form/as a e.g. poster, etc.], [limited to x copies]]
        2. [Distribute any physical copies made of the Work in accordance with clause 2.1.1., [in format X], [limited to x copies]]
        3. Make the Work available to the public via MediaVerse/any medium/other]
        4. [Make and reproduce [and make available/but not make available] Derivative Works]
        5. [Make translations of the Work]
    for Commercial/Non-Commercial Purposes.
    2. This Licence shall not apply when Exceptions and Limitations apply to a certain use.
3. **Term**
    1. The Licence stipulated in article 2 of this Agreement shall be granted for the period for which the Work is protected under copyright law / for x yrs /up until the exhaustion of the amount of reproductions which could be made and distributed.

2. [in case of remuneration: The Agreement shall be terminated when the Licensee does not pay the Licence fees in accordance with article 4 of this Agreement for two consecutive months.]

3. The Licensor shall have the right to terminate the Agreement when the Licensee materially breaches this Agreement, which will include any use with regard to the Work which is not licensed to the Licensee under article 2 of this Agreement or the breach of any obligations relating to [Attribution/Assignment].

4. In case of termination in accordance with this article 3, all rights licensed will terminate effective immediately and the Licensee will immediately cease using the Work.

4. **Remuneration**
    1. [The Licence fees are expressed in Euro and are VAT exclusive. Licensee will pay …]
    2. [Parties will each be responsible for their own taxes, other duties, tax penalties and interest, or amounts in lieu thereof however designated, now or hereafter, payable as a result of this Agreement.]
    3. [Payment will be effected through …]
    4. [In the event of royalty-free: To the extent possible and to the extent the Licensee uses the work in accordance with the permitted use stipulated under article 2 of this Agreement, the Licensor will waive its rights to collect royalties for the Licensee's use of the Work in accordance with this Agreement.]

5. **Assignment [and sub-licence]**
    1. The Licensee shall [not] be allowed to transfer its rights under this Agreement.
    2. [in case of royalty-free licence: In case the Licensed work is made available to recipients, the Licensee cannot restrict access to and use of the Work by the recipients, as they will have the possibility of concluding an identical licence with the Licensor as stipulated in this Agreement.]
    3. [In the event of sub-licensing, the Licensee shall in its turn license the Work under the same conditions as stipulated in this Agreement]

6. **Warranty and indemnification**
    1. [In case of remuneration: The Licensor warrants that it has all necessary rights and permissions to license the Rights and Works, and that the transferred Rights do not infringe the rights of any third party.]
    2. [In case of remuneration: The Licensor shall indemnify the Licensee against any claims brought by third parties in relation to the copyrights on the Work.]
    3. [in case of royalty-free: The Licensor provides the Work to the Licensee as-is and, to the extent permitted by law, makes no warranties of any kind as to the title, fitness for a particular purpose, absence of defects or merchantability of the Work.]
    4. To the extent permitted by law [in case of remuneration: and notwithstanding article 6.2 of this Agreement], The Licensor shall not be liable for any indirect or indirect damages in relation to this Agreement, the Licence included therein, and the Work.

7. **Attribution**
    1. The Licensee is obliged to name the author(s) when exploiting the Work in accordance with article 2 of this Agreement. the Licensee shall name the author(s) in a prominent way on or in connection to the Work of copies thereof, taking into account the exploitation methods, context and the format.
    2. The Licensee shall not remove any identification or copyright notice added to the Work, as well as any notice referring to this Licence.
    3. [In case of Derivative Works, The Licensee shall indicate that he modified the Work]

8. **Modifications**
    1. The Licensee is [not] allowed to create any Derivative Works. [The Licensee will make sure however, that any modifications do not cause any damages to the reputation of the Licensor or the author of the Work]
    2. [in case Derivative work is allowed (not obliged – possibility): The Licensee will make the Derivative Work available under the same conditions as stipulated in this Agreement]
    3. The Licensor will however in any case allow modifications which are necessary in order to exercise the rights licensed under article 2 of this Agreement, such as editorial or graphical changes necessary for editing or layout and/or technical modifications. Such modifications will not qualify as a derivative work.

9. **Miscellaneous**
    1. This agreement shall replace and supersede all previous agreements, negotiations, undertakings and correspondence between parties.
    2. The Licensor shall not be bound by any terms and conditions of the Licensee.
    3. Whenever possible, the provisions of this Agreement shall be interpreted in such a manner as to be valid and enforceable under the applicable law. However, if one or more provisions of this Agreement are found to be invalid, illegal or unenforceable, in whole or in part, the remainder of that provision and of these Terms shall remain in full force and effect as if such invalid, illegal or unenforceable provision had never been contained herein. Moreover, in such an event, Provider shall amend the invalid, illegal or unenforceable provision(s) or any part thereof and/or agree on a new provision, in such a way as to reflect insofar as possible the purpose of the invalid, illegal or unenforceable provision(s).

Annex II: MVCoin TTF Compliant Definition

This annex reports a practical example of IWA Token Taxonomy Framework used for a possible representation of the MVCoin.

MVCoin

tF{d,t,g,SC}

MVCoin is a Token with Variable Supply Fungible where an initial supply can set at creation and then supply can be added and removed from the total based on need. It is fractional by setting the Decimals property on the dividable behaviour. A token instance can be burned or minted.

Formula reference: tF{d,t,g,SC}

Token base:
Fractional Fungible tF{d}

Aliases: Liquid, Virtual Money, Balance Money

Fractional Fungible tokens have interchangeable value with each other, where any owned sum of them from a class has the same value as another owned sum from the same class. Similar to physical cash money, a crypto currency is an example of a fungible token that is divisible.

For example: *fiat currency is the most widely understood example of a fractional fungible item. A fractional fungible is divisible, so you can 'make change'.*

Analogies:

- Physical Money or Cash: Cash, or fiat money, is freely accepted between parties and can have varying denominations. Money has a face value, on a coin or bill, and can be summed together to represent higher value. It can be divided, making change, and consolidated from many smaller denominations to larger ones and still have the same value.
- General Admission Movie Ticket: Purchasing a general admission ticket to a movie only allows for you to have a seat, but the seat that you actually get depends on factors like when you arrive.

Dependencies:

- Transferable (Base Token Definition)

Incompatible with:

- Indivisible

Token type:

- Fungible

Token unit:

- Fractional

Value type:

- Intrinsic

Behaviour #1:
Divisible (d)

Referenced behaviour:

Aliases: Subdividable, Dividable

An ability for the token to be divided from a single whole token into fractions, which are represented as decimal places. Any value greater than 0 will indicate how many fractions are possible where the smallest fraction is also the smallest ownable unit of the token.

For example: *Divisible is common for crypto-currencies or tokens of fiat currency. For example, the US Dollar is divisible to 2 decimal places, where a value like .42 is possible. Bitcoin, is divisible up to 8 decimal places.*

Incompatible with:

- Indivisible

Properties:

- Decimals**:** 2 (Set to a number greater than Zero, allowing subdivision)

Invocations:

- **GetDecimals:** Return the value of decimals

GETDECIMALSREQUEST:	GETDECIMALSRESPONSE:
	Return number of decimal places
	Decimals *integer*

Behaviour #2:
Transferable (t)

Every token instance has an owner. The Transferable behaviour provides the owner the ability to transfer the ownership to another party or account. This behaviour is often inferred by other behaviours that might exist like Redeem, Sell, etc. This behaviour is Delegable. If the token definition is Delegable, TransferFrom will be available.

Influenced by:

- **Delegable (g)**: If the token is Delegable, TransferFrom should be enabled.
- **Compliant**: If Compliance is present, a CheckTransferAllowed request has to be made and verified before a Transfer request or a TransferFrom request.
- **Issuable**: If issuable is present, an AcceptTokenRequest from the token issuer, in response to a RequestTokens, has to be made and verified before a Transfer request.
- **Offsetable:** If offsetable is present, a check on if the token has been offset must be made and if it has, transfer should be denied.

Incompatible with:

- Non-transferable

Invocations:

- **Transfer**: A transfer request will invoke a transfer from the owner of the token to the party or account provided in the To field of the request. For fungible or dividable non-fungible tokens, this request may also include value in the Amount field of the request to transfer more than one token of the class in a single request.

TRANSFERREQUEST:	TRANSFERRESPONSE:
The request	*The response*
To *AccountId to transfer ownership to.* **Quantity** *Number of tokens to transfer.*	**Confirmation** *A confirmation receipt or error may be returned to the owner based on the outcome of the transfer request.*

- **TransferFrom**: A transfer request will invoke a transfer from the owner of the token to the party or account provided in to the field of the request. For fungible or dividable non-fungible tokens, this request may also include value in the Amount field of the request to transfer more than one token of the class in a single request.

TRANSFERFROMREQUEST:	TRANSFERFROMRESPONSE:
The request	*The response*
From *AccountId to transfer ownership from.* **To** *AccountId to transfer ownership to.* **Quantity** *Number of tokens to transfer.*	**Confirmation** *A confirmation receipt or error may be returned to the owner based on the outcome of the transfer from request.*

<div align="center">

Behaviour #3:
Delegable (g)

</div>

Aliases: Allow

A token class that implements this behaviour will support the delegation of certain behaviours to another party or account to invoke them on the behalf of the owner. When applied to a token, behaviours that are Delegable will enable delegated request invocations. This is useful to provide another party to automatically be able to perform the behaviours that can be delegated without seeking permission up to a certain allowance.

Note: Applied to behaviours that are Delegable.

Analogies:

- Broker: You may allow a broker to transfer your tokens as a part of an investment strategy. Setting an allowance can cap the total number of tokens the broker is allowed to perform delegated behaviours, when exceeded a new allowance request will need to be granted.

Invocations:

- **Allowance**: A Request by a party or account to the owner of a token(s) to have the right to perform a delegated behaviour on their behalf.

ALLOWANCEREQUEST:	ALLOWANCERESPONSE:
The request	*The response*
Quantity *Number of Tokens to be allowed.*	**Confirmation** *A confirmation receipt or denial be returned to the allowance requestor.*

- **Approve Allowance**: Same control message as the AllowanceRequest. This could allow for an AllowanceRequest to be forwarded to multiple parties needed to Approve and shield this from the requestor. When all Approvals are obtained, an AllowanceResponse could be sent.

ALLOWANCEREQUEST:	APPROVERESPONSE:
The request	*The response*
Quantity *Number of Tokens to be allowed.*	**Confirmation** *A confirmation response from the owner approving the an allowance request, indicating a allowance quantity the requestor has the option to invoke the Delegable behaviours on the token(s).*

Behaviour group #1:

Supply Control (SC)

Aliases: Central Bank

A token class that implements this behaviour will provide controls to increase and decrease supply of tokens within the class. Additionally, it will include the ability to support a role, like Minters, that will be allowed to invoke the Mintable behaviour. The owner can add accounts to the role and any account that is a member of the role will be able to mint tokens in the class.

Note: Define a Minters role and apply the role to the mintable behaviour.

Analogies:

- Central Bank: Implementing monetary policy for this token.

Influenced by:

- **Roles:** Create a Minters Role and apply it to the Mintable behaviour to provide authorisation checks for invoking the behaviour.

Incompatible with:

- Singleton

Behaviour #1:

Mintable (m)

Note: Mintable in SupplyControl will be bound to the Roles behaviour to determine if the requesting minter is allowed to invoke the behaviour.

Referenced behaviour:

Aliases: Create

A token class that implements this behaviour will support the minting or issuing of new token instances in the class. These new tokens can be minted and belong to the owner or minted to another account. This behaviour may be invalidated by a restrictive behaviour like Singleton, where only a single instance of the token can exist. Mintable is technically delegable, but it's delegation should be controlled by a behaviour like Roles.

For example: *A consortium of oil producers needs to create tokens for each barrel of oil they are putting on the market to trade. There are separate classes of tokens for each grade of oil. Producers of barrels will need be have the ability to mint new tokens in order to facilitate the trading of them in the supply chain.*

Analogies:

- SKU: A token class can represent a particular item SKU, where the manufacturer of the item has the ability to mint or issue new inventory of the SKU into the supply chain.

Influenced by:

- **Roles (r)**: Roles is common to implement to provide authorisation checks for invoking the behaviour. Highly Recommended that Role restrictions be applied to MintTo invocations.
- **Compliant:** If Compliance is present, a CheckMintAllowed request has to be made and verified before a Mint request or a MintTo request.

Invocations:

- **Mint**: A request to create new token instances in the class by the owner or a party or account in a role that is granted this permission. Minted tokens using this invocation will be owned by the owner or token pool account. Requires a Quantity field in the request.

MINTREQUEST:	MINTRESPONSE:
The request	*The response*
Quantity *Number of new tokens to create.*	**Confirmation** *A confirmation receipt or error may be returned to the invoker based on the outcome of the mint request.*

- **MintTo**: A request to create new token instances in the class by the owner or a party or account in a role that is granted this permission to another party or account. Requires a To and Quantity fields in the request.

MINTTOREQUEST:	MINTTORESPONSE:
The request	*The response*
ToAccount *Account Id to mint the tokens to.* **Quantity** *Number of new tokens to create.*	**Confirmation** *A confirmation receipt or error may be returned to the invoker based on the outcome of the MintTo request.*

Behaviour #2:

Burnable (b)

Note: Burnable is not modified from the referenced behaviour.

Aliases: Redeem, Retire

A token class that implements this behaviour will support the burning or decommissioning of token instances of the class. This does not delete a token, but rather places it in a permanent non-use state. Burning is a one-way operation and cannot be reversed. This behaviour is Delegable. If the token definition is Delegable, BurnFrom will be available.

For example: *When a token is used in a certain way, you may want to remove it from circulation or from being used again. Since the ledger doesn't allow for deletions, burning a token essentially 'deletes' the token from being used, but not from history.*

Analogies:
- Oil Barrels: If you mint a new token for each barrel of oil created, you may transfer ownership several times until the barrel is refined. The refining process should burn the barrel of oil to remove it from circulation.
- Redeem: A token that is a coupon or single use ticket, should be burned when it is redeemed.

Influenced by:

- **Delegable**: Delegable or not, will determine if the BurnFrom Control will be available in the implementation.
- **Compliant**: If Compliance is present, a CheckBurnAllowed request has to be made and verified before a Burn request or a BurnFrom request.

Invocations:

- **Burn**: A request to burn a token instance(s) in the class by the owner of the token instance(s). Optional Quantity field in the request.

BURNREQUEST:	BURNRESPONSE:
The request to Burn or Retire tokens.	*The response from the request to burn.*
Quantity *The number of tokens to burn, might not apply to the implementation.*	**Confirmation** *A confirmation receipt or error may be returned to the invoker based on the outcome of the burn request*

- **BurnFrom**: Requires Delegable. A request to burn token instance(s) in the class by a party or account that has allowance to do so. Requires a From and Quantity fields in the request.

BURNFROMREQUEST:	BURNFROMRESPONSE:
The request to Burn or Retire tokens.	*The response from the request to burn.*
From *AccountId from which tokens are burnt* **Quantity** *The number of tokens to burn, might not apply to the implementation.*	**Confirmation** *A confirmation receipt or error may be returned to the invoker based on the outcome of the burn from request*

Behaviour #3:
Roles

Note: Roles support requires that a role or group called 'Minters' be created that allows for account to be added. These accounts will be allowed to invoke MintTo.

Applies to: Mintable (m)

Intercept invocation MintTo (from Mintable)

- **MintTo:** A request to create new token instances in the class by the owner or a party or account in a role that is granted this permission to another party or account. Requires a To and Quantity fields in the request.

MINTTOREQUEST:	MINTTORESPONSE:
The request	*The response*
ToAccount *Account Id to mint the tokens to.* **Quantity** *Number of new tokens to create.*	**Confirmation** *A confirmation receipt or error may be returned to the invoker based on the outcome of the MintTo request.*

Influence:

- **RoleCheck:** Check to see if the account is in the Role called 'Minters'

ISINROLE:	TRUE/FALSE:
Checking the 'Minters' role.	*Respond true if the account is in the 'Minters' role.*
AccountId *AccountId of the requestor.*	**IsInRole** *True/False*

Referenced behaviour: Role (r)

Aliases: Groups

A token can have behaviours that the class will restrict invocations to a select set of parties or accounts that are members of a role or group. This is a generic behaviour that can apply to a token many times to represent many role definitions within the template. This behaviour will allow you to define what role(s) to create and what behaviour(s) to apply the role to in the TemplateDefinition.

Note: Roles has a constructor control that creates roles and applies them to certain behaviours of the token at creation of the class from the template.

Analogies:
- Minters: A role called 'Minters' for a token can have accounts in the role. The MintTo behaviour invocation will be bound to the role check to ensure only account in the 'Minters' role are allowed to mint new instances in the class.

Constructor:
- **RoleName**

Properties:
- **Role:** Minters
  A group or list an account can be a member or be in.

Invocations:
- **GetMinters:** Request the the list of member accounts in the 'Minters' role.

GETMINTERSREQUEST:	GETMINTERSRESPONSE:
The request	*The response*
	Members *Returning the list of accounts in the 'Minters' role.*

- **AddRoleMember:** Add a member to the group or role property.

ADDROLEMEMBERREQUEST:	ADDROLEMEMBERRESPONSE:
The request	*The response*
RoleName *Value is always set to 'Minters'*	**Added** *True or False.*

AccountAddress *Address, name or identifier of the account to be added to the 'Minters' role.*	

- **RemoveRoleMember:** Remove a member to the group or role property.

REMOVEROLEMEMBERREQUEST:	REMOVEROLEMEMBERRESPONSE:
The request	*The response*
RoleName *Always set to 'Minters'* **AccountAddress** *Address, name or identifier of the account to be removed from the role.*	**Added** *True or False.*

- **IsInRole:** Check to see if an account is in the role.

ISINROLEREQUEST:	ISINROLEREQUESTRESPONSE:
The request may be internal only and not exposed externally.	*The response*
RoleName *Always be bound to 'Minters'* **AccountAddress** *Address, name or identifier of the account to be checked.*	**InRole** *True or False.*

Invocations:

- **RoleCheck**: Internal invocation when the applied behaviour is called to check if the requestor is a member of the role.

ISINROLE:	TRUE/FALSE:
The request	*The response*
AccountId *AccountId of the requestor.*	**IsInRole** *True/False*