WHITE PAPER v1.1

< October 2019 >

MILLENNIUM COIN

iMira

A Blockchain-powered multimedia platform

Table of Contents

Executive Summary

The multimedia industry is undergoing radical changes and will continue to do so. Several decades ago, radio and television were the only sources of multimedia entertainment at homes all over the world, this percentage has now dropped drastically, especially among children and young adults. Within the decades, it is likely that the traditional forms of radio and television will get a very small audience, whereas **online platforms offering digital content are becoming commonplace**.

In fact, we are already experiencing this change. Today, we have many payment platforms such as Spotify, Netflix and HBO; and some free platforms like YouTube or Flooxer, for the dissemination of digital content. All of them are managed by big companies, the main profit-makers. Very few platforms generate **direct benefits for the creators and owners** of the content. This White Paper proposes a **Blockchain-powered multimedia platform** called iMira which enables the sharing of multimedia content. iMira offers a **faster, simpler and more transparent** platform for content sharing. Users who share their content on the platform enjoy **much fairer and more profitable monetization options**, such as direct sales, advertising, donations and more.

Financial transactions will be made using the **MILLENNIUM COIN cryptocurrency**. This currency is also described in this White Paper; it has been created specifically to facilitate the sale and purchase of contents on iMira. Nevertheless, this currency will be available to any user at the currency exchange offices and may be used for other purposes. The value of the coin will be based on the digital content stored on the platform and on market trends.

From the functional point of view, iMira is a "platform of platforms", on which TV channels, as well as professional and amateur video producers can upload their content. They can use their own editing programs or use the platform's video editing tools specifically designed for the editing of educational, music and animated videos, etc.

Countless sectors can benefit from this new platform thanks to its many uses. Thus, iMira enjoys a wide range of potential clients:

- **TV channels**
  Could use iMira as a basis for the implementation of their own online platforms or to promote their content (trailers, new programmes, series). iMira also enables users to create multimedia content using the themes of their own programs, documentaries and series. The platform offers a series of video editing tools which will help attract child and young adult audience to traditional channels.

- **Producers of movies, series, documentaries and short films, etc.**
  They will be able to use this platform to earn money by charging consumers for viewing their content or through advertising.

- **Mentors, teachers, students**
  In general, any creator interested in presenting educational content may use the specific editing tools incorporated in the platform and receive remuneration for such content. The platform will be divided into thematic categories, one of them will be education.

- **Advertising and marketing companies**
  They may sponsor the content of any iMira user, so that consumers do not have to pay to view their videos. In this respect, promotional strategies will be proposed to ensure fair remuneration for both the producer of the content and the consumer. Viewing content will in such cases result in financial gain.

- **Streamers**
  Persons who broadcast themselves in real time playing video games, showing their talents or participating in challenges, etc., and would like to share their live streaming contents on this platform.

- **Any content creator** interested in the development of an intuitive multimedia communication channel that is profitable and easy to manage. In addition, content persons interested in using additional video editing tools that will facilitate the creation of their content.

Both iMira and MILLENNIUM COIN will be managed by the "Air Institute" Foundation which will be in charge of the development of the platform, the integrity of the cryptocurrency and the dissemination of this project.

1 **Motivation**

Nowadays, we can find countless online platforms for the sharing of digital content. However, very few of those platforms imply a financial gain for the content creator and if they do make money, a large part of it is given to the intermediaries.

Current platforms use algorithms that lack transparency, making it possible to hide the content of popular creators from new platform users. It often happens that users do not receive notifications from content creators and in some cases the user is automatically unsubscribed with no prior notice. The monetization policies regarding content creation are not clear and, in some cases, there is a sharp decrease in the number of views from one day to the next.

iMira facilitates the *peer-to-peer* (P2P) dissemination of content, enabling creators to obtain a financial gain from customer views, following the offer and demand laws which state that the Price depends on the quality of the content and the distribution and storage service. The platform will enable the purchase of a digital content for its viewing for an unlimited period of time.

iMira also facilitates the exchange of content directly between individuals or with the help of third parties. The persons who have content sharing servers/platform will be able to directly upload all types of digital content and share it with other iMira users. Those who do not have such tools will be able to use third party services and share the profits with them. The percentage of the income given to third parties will depend on the quality of the service they provide. In this way, iMira will become a platform of other platforms, managing the URLs where the contents are stored. The security of the URLs will be ensured, and it will be possible to access them (to view the content), through a pay-per-use policy backed by the blockchain-driven MILLENNIUM COIN cryptocurrency (token TRC20 on the TRON network).

The users will be able to share and live stream videos using iMira and MILLENNIUM COIN. The owners of digital content will make it available and a pay-per-use system will be implemented. The price paid for viewing content will depend on the quality of the content as well as the quality of the service and the number of views. Users will be able to choose among multiple platforms all offering different video quality. Users can also earn money by watching content and helping disseminate it to third parties.

Content creators will be able to opt for different content monetization modalities:

1. Facilitate the purchase of content for multiple displays.
2. Offer free content sponsored by a third party through advertising.
3. Option enabling consumers to receive a percentage of the sponsor's payment.

The platform will make it possible to choose between using one's own content distribution network or outsourcing the services of a third party. The platform will be in constant development and will add other methods of payment and content management in the future.

The iMira project will continue updating the platform to newer versions, in order to provide it with all the functionalities it needs. The generation of content will be promoted, so that all users who upload content will receive Millennium Coins through a dividend system,

based on established criteria. The first platform users ("pioneer users") will also be rewarded until the funds allocated for this purpose have been exhausted.

The platform will have editing tools for video, educational and any other multimedia content. All this with the aim of making it easier for users to create content.

The value of the MILLENNIUM COIN and its fluctuations in the market will be influenced by the services offered by the platform, the quality of the service, the incorporation of new content and the loyalty of users. For this reason, policies will be established to promote the use of the platform and continuously attract new users. In addition, it will be important to increase the number of partners supporting the project.

The **Millennium Coin Token** incorporation in the existing currency exchange platforms will be negotiated for a later listing.

The iMira platform and the MILLENNIUM COIN cryptocurrency are described below.

1.1 Current Situation

Multimedia platforms continue to grow in content at a very fast pace. New multimedia platforms emerge continually. However, the majority of those platforms have many weaknesses and market models that do not look after the interests of digital content producers. The majority of **today's digital content sharing platforms experience some of the problems described below**:

- The older age group have become the main users of TVs. It is difficult for television channels to **attract young adults and children** because of the growing popularity of multimedia platforms, which are much more versatile and interactive. The audience in those age groups generally prefers to view content on their tablets, mobiles or laptops; and they also prefer multimedia platforms that provide **on-demand content** as opposed to the rigid schedule of TV channels. Although traditional televisions try to adapt to the new times by diversifying and increasing the number of channels, they have many difficulties in attracting young audience.

- On the majority of current multimedia platforms, **monetization** programs are difficult to enter, this discourages new content creators. Fundraising is usually associated with the number of subscribers and/or the number of viewing hours. Content creation is a complex process that often requires scripting, recording, use of complex multimedia equipment, video editing; it is comparable to any other full-time job. Unfortunately, in many cases the profit that content creators are able to gain on these platforms is really low, which has caused many creators to stop investing into more **advanced production tools**. As a result, many truly creative producers began to look for alternatives or to use micro-sponsorship platforms to promote their projects and make a living out of it.

- The **registration of video views** on current platforms is unreliable, is not updated in real time, many of the views are not counted and/or disappear.

- Channel subscriptions and notifications disappear in many cases, impeding the user from viewing the content of their favourite channels.

- The **donations and paid subscriptions policy** is very strict and it is designed to allow platforms to make large amounts of money.

- **Stories** (short videos filmed for display on mobile phones) do not monetize in many cases. This leads story producers to searching for other ways of monetizing their content, either through sponsorship searches, business affiliations, product sales, or brand account mentions.

- The companies that control media platforms **make decisions** about changing monetization policies, advertising, etc. without asking for the opinion of content creators. These companies are only concerned with meeting the needs of advertising and marketing companies rather than users and content creators. Changes in these policies are not very transparent and are communicated to users and content creators once taken.

- In many cases the content lists are manipulated, the most popular contents may be partially hidden from users or do not appear on the top positions.

- The **user communities** of some platforms become toxic because of the anonymity on the Internet, and there are no mechanisms to encourage good behaviour among users.

2 Solution: iMira

iMira is going to be a platform of platforms. Its model is based on **sharing and managing media contents that are distributed across different platforms and servers using different service and video quality models**. The platform will have the following functionalities:

- **Decentralized** content storage and distribution networks.
- Distribution of digital content in **different genres** and from **different providers**.
- Video processing system with **audio and subtitle management**, enabling the playback of videos with **different video resolution qualities**.
- **Different players** for each type of content (videos, films, series and streaming).
- **Transparent payment** system using Blockchain
- Your **own cryptocurrency MILLENNIUM COIN**
- **Advertising** system
- **Wallet management** and block explorer.
- **Indexing and search system** according to content language.
- **Recommendation** system
- Video **editing tools**
- iMira **story applications** for Android and iOS.
- **Reward and dividend system**.
- **Parental control**.
- **Chat** and **private messages**.
- …

This platform will be constantly updated to incorporate new functionalities that will guarantee **security, growth and user satisfaction**.

This platform can present films, series, videos, documentaries, live streaming, etc. It also incorporates a specific section for children (Kids), stories, wallets, emoticons, stickers and gifs, crypto-collectibles, messaging, donations, interaction with other platforms, etc.

2.1 Movies

The platform makes it possible to disseminate both full-length and short movies. The owners of the content will be required to provide a special permit accrediting their rights to manage and share the content. Distributors will have a special account which they will use to upload this type of content, at their own risk and always under the supervision of the Foundation managing the platform.

The Foundation will **evaluate the authenticity** of all uploaded content by means of automated **Artificial Intelligence** algorithms. Moreover, in the case of movies there will always be an **additional manual evaluation**. The platform guarantees that there will be **no movie spoilers** on the platform.

The uploaded movies will be **monetized individually**, making it possible to purchase unlimited access to a movie, so that the user can watch it as many times as they wish.

2.2 **Series**

Series will be treated in the same way as films. This will guarantee the originality and authenticity of the uploaded series. Moreover, it will ensure that the series will meet iMira's quality standards. All the episodes of the same series will be managed by the same user.

The series will have **prices per episode, per season or complete series**.

2.3 **Videos**

Any platform user will be able to upload videos, choose the storage networks, which will be shown in descending order according to the quality of the server. Each storage provider will charge, in Millennium Coins, a percentage of the price of the video. The user has **unlimited access** to the videos once they have subscribed. The **videos may include advertisements or sponsors**, in those cases the advertising company will be responsible for rewarding the storage networks and the content creator for each view.

Once published, the video is automatically listed and indexed on the platform, for purchase or viewing by any user.

Viewers may support content creators by rating the videos, leading to the creation of a system that will facilitate the indexing of content. Moreover, videos may be added to favourites lists and shared on social networks. It will be possible to **comment** and sub-comment videos as well as mention users in the comments. Comments and sub-comments may be rated, and these data will be taken into account to establish the reputation of each platform user.

2.3.1 **Educational Videos**

The platform incorporates a system that allows for the creation of educational videos, **facilitating their editing**. It will be possible to incorporate **slides and presentations that include video**, with, for example, the recording of the speaker (using the webcam and WebRTC) and voice (using the microphone).

2.4 **Documentaries/Documentary Series**

Documentaries and documentary series shall be treated in the same way as other film genres and series.

2.5 **Live Streaming**

The platform also offers live streaming services. There will be two live streaming options:

1. Using **WebRTC2**, recording directly from the camera.

2. Using applications such as OBS, Xplit or other HLS applications that support the **RTMP** protocol (Real-Time Messaging Protocol) and stream in **HLS**.

The videos recorded live can be kept in the storage nodes, and added to the author's channel, making it possible to monetize it as if it were a normal video. These videos will be stored in the storage nodes in mp4 format.

Streamers will be able to **choose a subscription price** in Millennium Coins. Streaming works differently than storing videos and it will be necessary for the foundation to maintain an adequate specific infrastructure. Different payment plans will be defined for the use of this infrastructure, where different income percentages will be assigned to the Foundation. Users will have **different pay-per-use models**. The streamers payment plans will be different in terms of:

- Maximum number of cards.
- Number of images to use in the cards.
- Number of characters per card.
- Number of icons that subscribers can use in the channel chat.
- Number of premium emoticons for the chat that users can monetize in the channel within the platform.

Streamers will never pay for the platform more than they will earn from their activity. In the established business model, the higher the percentage paid to the platform, the more user loyalty options will be available and the more advantages each streamer will enjoy on the platform.

The platform will facilitate the use of **special emoticons, stickers and animated gifs** that can be used in all platform chat rooms, including those where private messages appear.

All streaming channels will contain a **chat room**, designed to allow communication between users and the streamer. To use the chat, it is mandatory to be a registered user, although any guest user can read the chat.

Each chat will include the following features:

- Writing fonts in different formats (bold, italic, underlined, crossed out).
- Emoticons,
- History, all messages that are sent are stored for later reuse, to load a previous message you must use the up and down arrow keys.
- Commands:
  - All users:
    - **/reload:** Reloads the streaming without having to reload the page.
    - **/reconnect:** Allows users to disconnect and connect the chat room.
    - **/ignoreusers (on/off):** Ignores or redisplays messages from users who are not subscribers, moderators nor streamers.
    - **/silenchat(on/off):** Ignores or shows all messages from users except moderators or streamers.
  - Moderators:
    - **/ban [user]:** Blocks a user, so that he cannot write in the chat.
    - **/unban [user]:** Unlocks a banned user.

- ▪ **/om [message]:** Send a message to the other moderators and to the streamer. The rest of the users will not read this message.
  - o Streamers:
    - ▪ **moderator [user]:** Assign a user the role of chat moderator.
    - ▪ **/demote [user]:** Withdraw a user's moderation permissions.
    - ▪ **/slowchat (on/off):** Enable or disable slow chat, forcing users to wait 5 seconds between messages. This restriction does not affect subscribers or moderators.
    - ▪ **Subscribers (on/off):** You activate or deactivate the chat of only subscribers, preventing those users who are not subscribed to the channel from writing.
    - ▪ **/modchat (on/off):** Activate or deactivate the chat of only moderators, preventing users who are not moderators of the chat from writing.

2.6 **Kids**

To target child audience, in this section **the content will be free of charge** and it will be **sponsored by advertising**. The contents will include films, series and videos for children. It will have an **intelligent automatic content evaluation system** to avoid the inclusion of inappropriate content.

In addition, the platform has a **parental control** system so that any unwanted content can be restricted by using a PIN, which will be requested when attempting to play content that does not match specific age classifications.

2.7 **Stories**

The **mobile APP for IOS and Android** includes a features for uploading short and temporary videos. These videos can include special effects such as:

- Music.
- Filters.
- Masks.
- Augmented reality objects.
- Video editing feature allows to combine different videos and change playback speed.
- Etc.

The tool will enable the inclusion of group videos involving 2 or more users.

The inclusion of **advertisements** and **augmented reality** effects will be allowed, either with objects or with face masks. Advertising companies will pay users in Millennium Coins, when they reach a minimum number of views, thereby the objectives are to:

- Attract child and youth audiences.
- Associate the platform with a new entertainment model.

- Create a circular economy model, where users can earn Millennium Coins and spend them on iMira or on any other platform using cryptocurrencies.

2.8 Wallet

Each iMira user account will have an associated wallet. Its use will be very simple, and it will be equipped with **advanced security** measures. To use a wallet, the user will need an e-mail address and a telephone number to which to which the wallet will be linked.

iMira will allow users to manage their wallets in three different ways, seeking **transparency** for **users with no knowledge** of Blockchain. However, there will be other methods for **more advanced users**, increasing the security of wallets. The 3 methods are:

1. Using a KeyStore file along with a password that will be stored by the platform.
2. Using a KeyStore file, where the user has to introduce the password for each transaction and payment, while the platform is in charge of signing the transactions, but without storing the iMira wallet password.
3. Using TronLink, the user manages his/her wallet and signs the transactions locally.

In addition, iMira makes it possible for users to **choose different wallets** for making or receiving payments.

2.9 Transaction and Purchase History

It will be possible to **view all the transactions** made on the platform under the user's account. The available information will be:

- Hash of the transaction (with link to TRON block explorer)
- Its date
- Origin Account (with link to the TRON block explorer)
- Destination Account (with link to the TRON block explorer)
- Indicator Origin / Destination
- Transaction value

In addition, a **downloadable record** of all operations will be created in a more informative format than the block string format. It will indicate:

- Type of purchased/donated content or service
- Name of the purchased content
- User to whom the payment was made
- Other relevant information

2.10 **Price of Millennium Coin**

The value of Millennium Coin is not stable, and its value is going to **fluctuate in the cryptocurrency** markets against fiduciary money or cryptocurrencies such as Bitcoin.

The cost of the products available on iMira will depend on the exchange rate of the Millennium Coin to the dollar, thereby preventing the price of the contents from fluctuating.

2.11 **Messaging**

The platform will have a messaging system for **interaction between users, friends**, etc.

2.12 **Notifications**

If users give their consent, they will receive notifications when:

- They receive a transaction.
- A subscribed content creator uploads a new video on the platform.
- A content creator begins to live stream.
- A new episode is uploaded of a series that the user watches.
- The user receives a new private message.
- There is a response to a user comment or sub-comment.
- The user is mentioned in a comment.
- Etc.

All types of notifications can be activated, although by default they are all disabled. They can be received **on the platform and/or by e-mail**.

2.13 **Emoticons, Stickers and Gifs**

iMira's messaging, comments and live chat systems will include the following elements:

- Emoticons
- Stickers
- Gifs

The platform will offer streamers the option of creating their own emoticons, which can be sold to followers or offered for free. These emoticons can be used on the entire platform.

2.13.1 **CryptoCollectibles**

A **special type of collectible emoticons and stickers** will be created, which can be purchased on the platform, and used in messages and chats.

These collectibles will be unique; they will be capable of interacting with each other but it will not be possible to divide them.

These collectibles can be acquired in the following ways:

- They can be purchased on the platform.
- Interaction between collectibles (with the same or different contract).
- Exchange with other users.
- As rewards for achieving milestones on the platform or reaching a certain level of reputation.

The creation of these crypto-collectibles seeks to encourage good user behaviour and loyalty to the platform. To further build user loyalty, the use of collectibles will be extended beyond iMira by means of games, this will help increase the value of collectibles.

2.14 **Donations**

Donation models shall be provided **to third parties and in particular to non-profit organisations**. To make it easier for NGOs to register on the platform and carry out campaigns, direct contact with the Foundation will be established to prevent fraud.

It will be possible for creators to donate all or a percentage of the profits to NGOs. Whenever a video is associated with a campaign it will be marked to facilitate its identification. The donation will be automatic and will be guaranteed by the platform and by a Smart Contract, indicating the user, the donated amount and the recipient NGO.

It will also be possible to make donations to **content creators and the platform**.

2.15 **Recommendation System**

A recommendation system will be developed. It will actively **recommend the contents for a specific user to watch**.

To this end, intelligent algorithms will be employed to make recommendations on the basis of the user's watch history, existing contents, new contents, trends, etc. Intelligent **neurosymbolic algorithms** will take into account the duration of the video, watching time, date, genre, author, actors, etc. **Machine Learning** algorithms will act in a transparent way and will inform the user about the way they function, so that, if the user wishes, the recommendation system can offer content alternatives that were not initially considered by the algorithms.

2.16 **Payments with Other Cryptocurrencies**

The system will permit payments with other cryptocurrencies. In this case the platform will charge a fee. These fees will not be charged when using Millennium Coin.

The initial fee for using other currencies or tokens will be 3% of the amount paid with Millennium Coins.

To launch the platform, TRON (TRX) and Millennium Coins (MLC) can be used. TRX payments will initially have a commission of 1% of the amount of the transaction.

3 MILLENNIUM COIN

Millennium Coin is a **cryptocurrency (token TRC20)** created for the development of iMira and the commercialization of other services and products. It will be issued natively within **TRON Blockchain**.

The main reason for using TRON and launching the TRC-20 token Millennium Coin are:

a) **high number of transactions per second**, essential for a proper operation of iMira;
b) several **free transactions daily**;
c) **low cost** for the rest of daily transactions;
d) THE **philosophy**: the main objective of the TRON Blockchain is to decentralize the Internet.

The total volume of Millennium Coins is 1,000,000,000 units, initially allocated as follows:

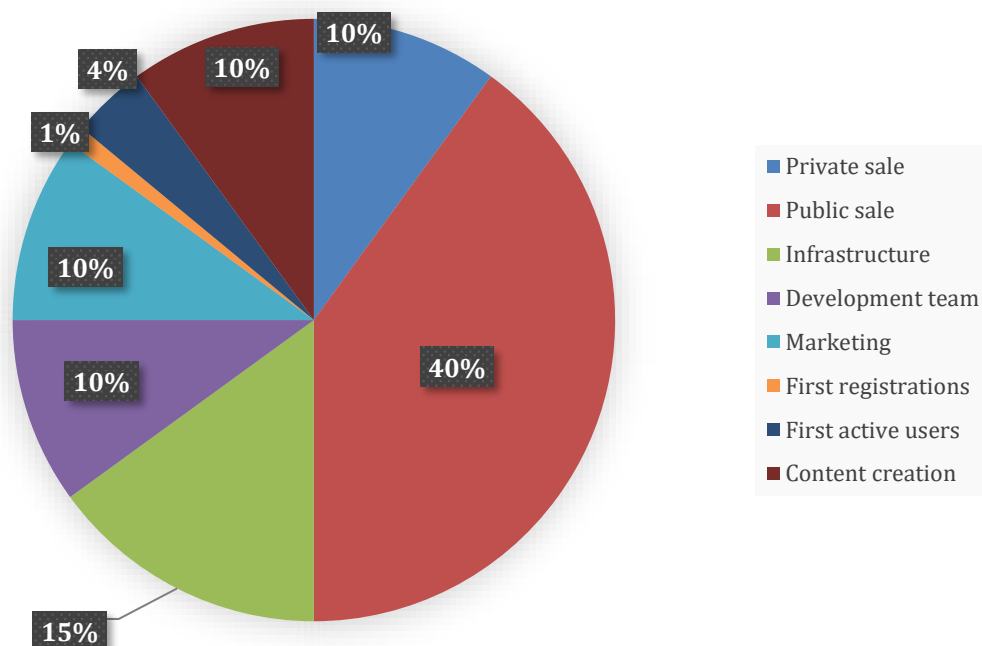| %	Tokens	Usage
15%	150,000,000	Infrastructure
10%	100,000,000	Private Sale
40%	400,000,000	Public Sale (IEO)
10%	100,000,000	Development Team
10%	100,000,000	Marketing
1%	10,000,000	First registrations
4%	40,000,000	Pioneer users
10%	100,000,000	Content creation

FIG. 1 – ASSIGNMENT OF MILLENNIUM COIN TOKENS

Private Sale: 10%

The capital raised from the private sale will be used to expand and maintain work teams for the launching and management of iMira, and to begin the deployment of the Millennium Coin in the TRON network:

- Marketing team and dissemination through social networks and other media
- Web design team
- UI/UX team
- Development Team (JAVA, SCALA, NodeJS, C, C++. Android, iOS)
- QA & Testing team
- System administrators & Cloud architects
- Smart Contracts Audit
- Legal expenses
- Etc.

Public Sale: 40%

The revenues from the public sale will be used to further develop the initial iMira infrastructure with the revenues from private sale:

- Development of iMira infrastructure and deployment of sufficient iMira Delivery Network nodes to provide worldwide coverage with low latency
- Purchase and freezing of TRX in exchange for energy to cover the price of transactions made on the platform
- Negotiation with Exchanges, to facilitate access to currency.
- Etc.

Development team: 10%

Rewarding the initial development team and encouraging new members to join.

Marketing: 10%

Carrying out worldwide marketing campaigns. The objective will be to attract users, cloud hosting companies, services, multimedia producers, etc.

A percentage of this amount will be used to attract referral accounts and airdrops.

iMira first sign-ups: 1%

Rewarding the first 50,000 accounts, with an average reward of 200 Millennium Coins.

iMira Pioneers: 4%

Rewarding the first users who upload content, view content, create playlists, cast votes for content, and get subscribers.

Content creators: 10%

Attracting content creators from other live streaming and multimedia platforms, and incorporation of multimedia production companies (films, series, documentaries, cartoons, etc.).

Infrastructure: 15%

Cloud infrastructure costs for setting up and maintaining the servers and equipment required by iMira (load balancers, storage, content delivery network, streaming services, TRON nodes, big data for user recommendation, etc.).

4 iMira Architecture

iMira architecture is composed of the following components:

- iMira Cloud Platform
- iMira Delivery Network
- TRON Blockchain
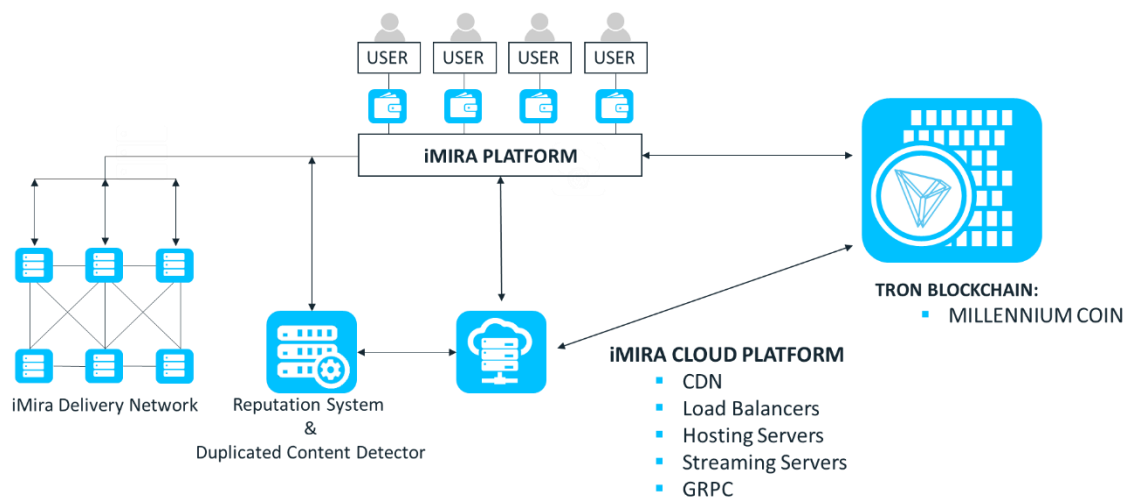- Reputation System
- Duplicate content detection

FIG. 2 – ɪMɪʀᴀ Aʀᴄʜɪᴛᴇᴄᴛᴜʀᴇ

4.1 iMira Cloud Platform

iMira will use cloud services to deliver an optimal user experience, very low response times and high quality of service:

- **Content Delivery Network**: Delivery of all static content, including the images displayed on the platform.
- **Load Balancers**: Load balancing among all iMira nodes.
- The App's **Hosting Servers**.
- **Streaming Servers**: For live streaming, live recording and chat services. The platform uses NodeJS, RTMP (transmission) and HLS (video playback) protocols, live recording in mp4 format and WebSockets for chat on live streaming channels.
- **Nodes with GRPC API**: they increase the performance of iMira mobile app versions (iOS and Android).

In addition to these general services, iMira uses other technologies to achieve maximum performance and usability for its users.

- Own JAVA Library: interaction with TRON from the backend.
- PUB-SUB Redis Server: scalable message sending and multicasting.

- Apache Solr: multilanguage search engine.
- FFMPEG: video and image conversion.

4.2 **iMira Delivery Network**

iMira Delivery Network is based on **P2P** networks, allowing horizontal scaling for the inclusion of new servers in the network. **Kademlia Distributed Hash Tables** (DHT) have been used.

The P2P model provides several advantages:

- Any server can process and store a video.
- Replication increases the system's fault tolerance.
- Any video can be accessed from any server of the network: if the data is not found in a server, it will be searched through the other servers via DHT. Connections among nodes will be much faster than client-server connections. Access is provided to the server closest to the end-user, thus featuring a very high availability.

When a content is uploaded to a network server, it will be processed in parallel (all conversions at once, in the same FFMPEG process), thus improving performance and allowing the user to see an estimate of the remaining time.
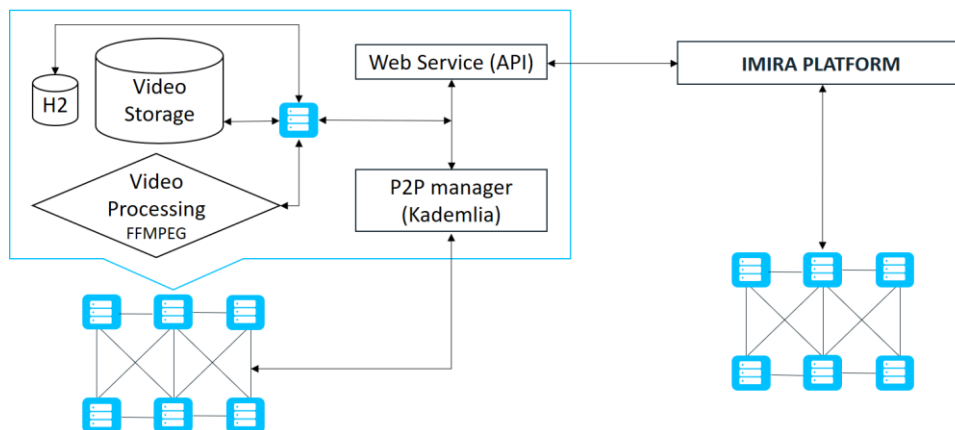

FIG. 3 – ARCHITECTURE OF IMIRA DELIVERY NETWORK

1. Once processed, the content will be divided into blocks of maximum size 1MB that will be distributed among the network nodes, applying a configurable replication factor.
2. In addition, a special index block will be created, storing the addresses of all the blocks that compose each content unit (video).
3. The key (Kademlia ID) of this index block will replace the internal identifier of the video that was previously used. This key will be used to play the video.
4. Each block is stored according to the Kademlia DHT, which makes it possible to find the K nodes closest to a key according to the XOR distance. Each block will be stored in the R nodes closest to its key, where R the replication factor (generally 2 or 3).

When a node receives a request for a block, it checks its cache and local storage. If it's already stored there, it returns it; if not, it will look for the R nodes closest to its key and will request the block from these nodes.

The requested blocks will be stored in a cache of configurable maximum size, following an LRU strategy: when a new item needs to be stored but the cache is full, it will remove the item that has not been used for the longest time.

P2P communications are performed using UDP (node discovery and search messages) and TCP (block sending) sockets. As an additional security mechanism, a configurable common network key is used to encrypt communications and verify messages.

iMira will have a list of nodes for each network, which does not need to be complete. From this list of nodes, the following will be selected:

- The least loaded node: used to upload and process the content.
- The node closest to the user: used to watch the content. If the exact location of the user cannot be known, a random node will be selected.

These storage networks can be deployed publicly (for use by any user) or privately.

In the future, other storage solutions will be implemented as add-ons to iMira Delivery Network.

4.2.1 Communications with Storage Servers

The **process of uploading videos** to the iMira Delivery Network involves the following actions:

1. Once registered, the User requests iMira to upload his/her content, indicating its title, genre, description, etc.
2. iMira creates a new entry in the database and marks the content as "pending", so that it is not displayed in the lists yet.
3. iMira asks the storage server for an upload token, saves it in the database and returns it to the user. This operation is completely transparent to the platform user.
4. Once the permission is obtained, the content is automatically uploaded to the server, and its processing begins.
5. The storage server is in charge of the processing:
    a. It converts the multimedia content to different formats (MP4, HLS) and sizes, and then divides it into small fragments (chunks) using FFMpeg.
    b. It uses Artificial Intelligence techniques [1] to identify duplicate content, inappropriate material, etc.
6. Once the content has been processed, iMira obtains information about the fragments from the storage server. Each fragment is identified by its order 1-N and its hash (SHA-256) is included. The owner of the content will be able to watch it thanks to the upload token stored in the database. This way the user can ensure that the video can be played correctly and maintains its integrity.

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[1] López-Sánchez, D., Corchado, J. M., & Arrieta, A. G. (2017). A CBR System for Image-Based Webpage Classification: Case Representation with Convolutional Neural Networks.

7. Finally, the multimedia content is authorised and published, where the content owner takes full responsibility for the uploaded content.

The **transaction of multimedia content** within the platform is carried out through a security protocol based on RSA:

1. If the user has access to the content, iMira requests a temporary token from the storage node. The public key of the requesting user and its signature, created with the iMira private key, is included in the request message.
2. The storage server validates the signature with the iMira public key and generates a temporary (30 seconds) random token associated with the identifier of the requested video. The server then encrypts it with the public key of the user who initiated the request and sends it back to the platform.
3. iMira decrypts the token with the user's private key, and sends the storage server URL to the user, by redirecting the user (307 Temporary Redirect) or acting as a proxy (in the case of mobile devices).
4. The client player/browser checks the hash of each fragment. If they match, a Blob object is created, modifying the source (src) as time progresses and playing the video from the temporary URL, associated to each time lapse and each chunk.

4.3 TRON Blockchain

A new Java library that uses GRPC for communication between iMira and the TRON node, has been developed. It enables the use of java-tron nodes for communication with TRON blockchain.

4.4 Reputation System

The reputation system will **reward users for their activity and the feedback** from other users. Prizes are awarded in the form of TRC20 tokens (Millennium Points) every 24 hours. The greater the reputation achieved during the previous 24 hours, the greater the number of awarded tokens. To calculate the reputation of each user, a series of relevant factors have been identified, each of which has been given a certain weight within the algorithm. An upper limit has also been set for each factor in order to avoid spam.

The factors, their weight (importance) and the maximum number of points that can be awarded, have been determined by experts in data analysis, mathematics and economics. It is a delicate process, because it determines the result of the user assessment. This mechanism makes it possible to create behaviour patterns. The rewards received for a certain behaviour are calculated as follows:
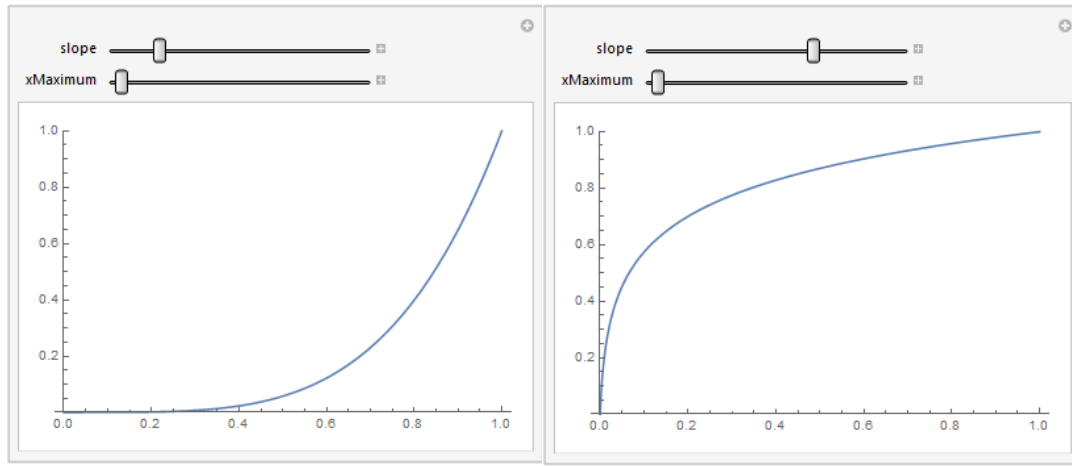

FIG. 4 - EXPONENTIAL AND LOGARITHMIC GROWTH EQUATIONS

The parameters of the equations are adjusted according to each situation. The general equations are as follows:

$$scoreParameter_i = y_{maximum} * \frac{\log(slope * \frac{x}{x_{maximum}} + 1)}{\log(2 + slope)} \qquad (1)$$

$$scoreParameter_j = y_{maximum} * \left(\frac{x}{x_{maximum}}\right)^{slope} \qquad (2)$$

The default growth of the rewards, specifically the identity function, is set as linear. The factors are detailed below, as well as the assigned weight and limit for each of them:

- **Login**: 1 point the first time you access the platform every day.

- **Content consumption**:
  - Videos: Maximum 1 point / day if the user views at least one video.
  - Movies: Maximum 1 point / day if the user views at least one film.
  - Streaming: Maximum 1 point / day if the user views at least one live streamed video.
  - Series: Maximum 1 point / day if the user views at least one episode.
  - Documentaries: Maximum 1 point / day the user views a documentary.
  - Stories: Maximum 1 point / day the user views at least one story.
  - Comments: Maximum 2 points. It will be necessary to receive at least 10 positive ratings, determined on the basis of the received scores. Each negative score cancels a positive one. Exponential growth with gentle slope.
  - Subscriptions: Maximum 5 points. The user will receive points depending on the number of channels to which he/she is subscribed. The reward for

each user will be calculated taking as reference the channel of the user with the largest number of subscribers. In case of being banned from a channel, the user will not be rewarded. Logarithmic growth.

- **Content creation**: It is considered the most important factor as it encourages the use of the platform and its improvement. Quantity is rewarded, but above all quality. This category can add up to 45 points.
    - Uploads: Maximum 30 points. It will be necessary to upload 5 videos (the next video uploads are not considered to prevent creators from fragmenting their videos too much). Logarithmic growth.
    - Videos: Maximum 5 points. The number of views and the positive and negative points received in the previous 24h are considered. Logarithmic growth with gentle slope.
    - Stories: Maximum 2 points / day. It will be necessary to upload 2 stories and that each one receive a minimum of 50 views.
    - Streaming: Maximum 5 points. Determined by the average number of viewers obtained in the previous 24 hours and the number of channel subscribers. The maximum limit is updated taking as a reference the user with the highest average number of viewers and subscribers. Exponential growth.
    - Chatting in streaming channels: Maximum 1 point / day.
    - Comments: Maximum 10 points. It will be necessary to receive 10 comments. The next ones are not considered to avoid favouring sensationalism and controversy. Logarithmic growth with gentle slope.

- **Purchases** made: Maximum 1 point / day. The spending of currency is encouraged.

- **Coindrops** in streaming chats: No limit. The amount of points received will be proportional to the amount of Millennium Coins spent on coindrops.

- **iMira Social Network**: Maximum 4 points / day for the user with most friends on the platform. The rest of the users will get rewards proportional to their number of friends taking as reference the number of friends of the first one.

The storage server is responsible for minting the tokens in proportion to the tokens generated from Millennium Points during that day.

4.5 Detection of Duplicate Content

iMira duplicate content detector implements a complex process to avoid the existence of duplicate videos on the platform. The detector obtains the videos from the storage networks and extracts the frames with a rate of 5 frames/second. Those frames are then converted and stored in hash form[2].

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[2] García-Retuerta, D.; Bartolomé, Á.; Chamoso, P.; Corchado, J.M. Counter-Terrorism Video Analysis Using Hash-Based Algorithms. Algorithms 2019, 12, 110.

To obtain the hash, the detector uses the **pHash algorithm**, which first calculates the average value of the pixels to transform the image into a binary number. The pixels above the mean become 1 and the pixels below the mean become 0.

The algorithm is divided into two sub-algorithms:

1. The input of the first sub-algorithm is the video; the output is a sequence of hashes. It extracts the frames from the video and flips each of them, leaving the darkest half on the left. Then it resizes them to 16×16 pixels and finally converts them to black and white.
2. The input of the second sub-algorithm is the hash database and the hashes of the new video; the output is a list of matching frames. The algorithm decides if the new frames are original or not, by calculating the Hamming distance from each frame of the new video to each frame of the database. If the distance is less than a given threshold, both hashes are considered to be duplicates. Otherwise, they are original.
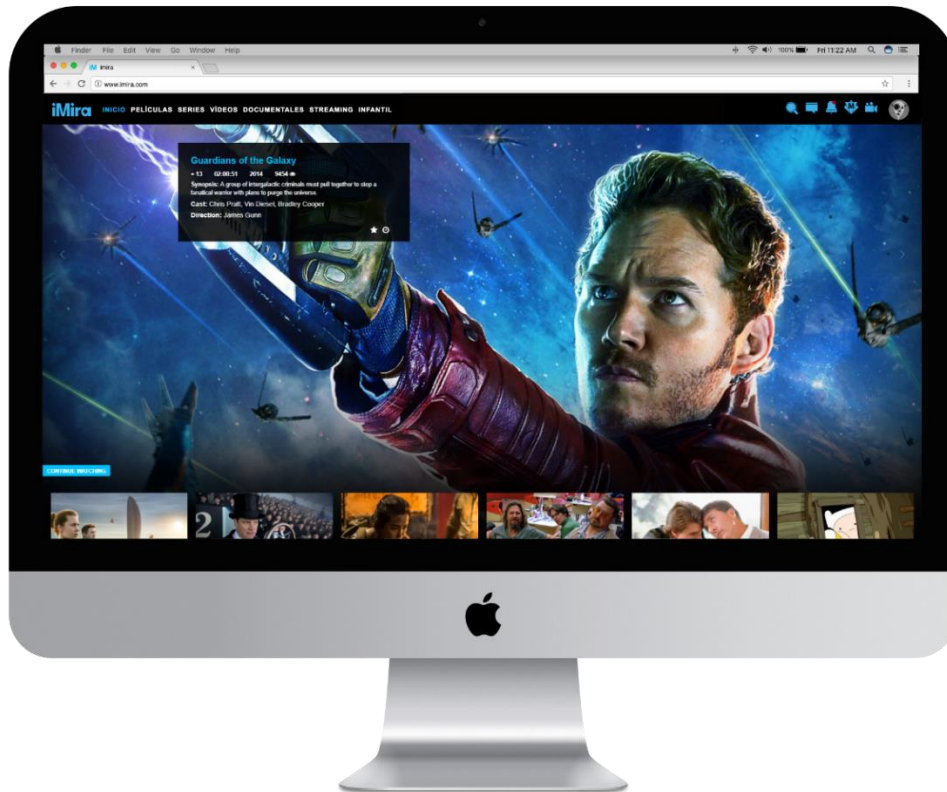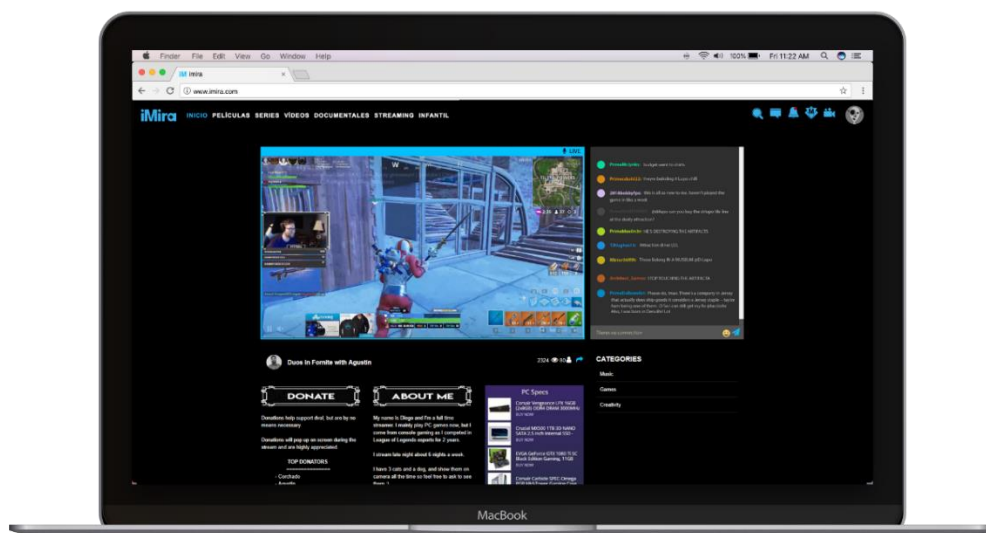
5 Web Interface

FIG. 5 – ɪMɪʀᴀ HOMEPAGE

FIG. 6 – LIVE STREAMING
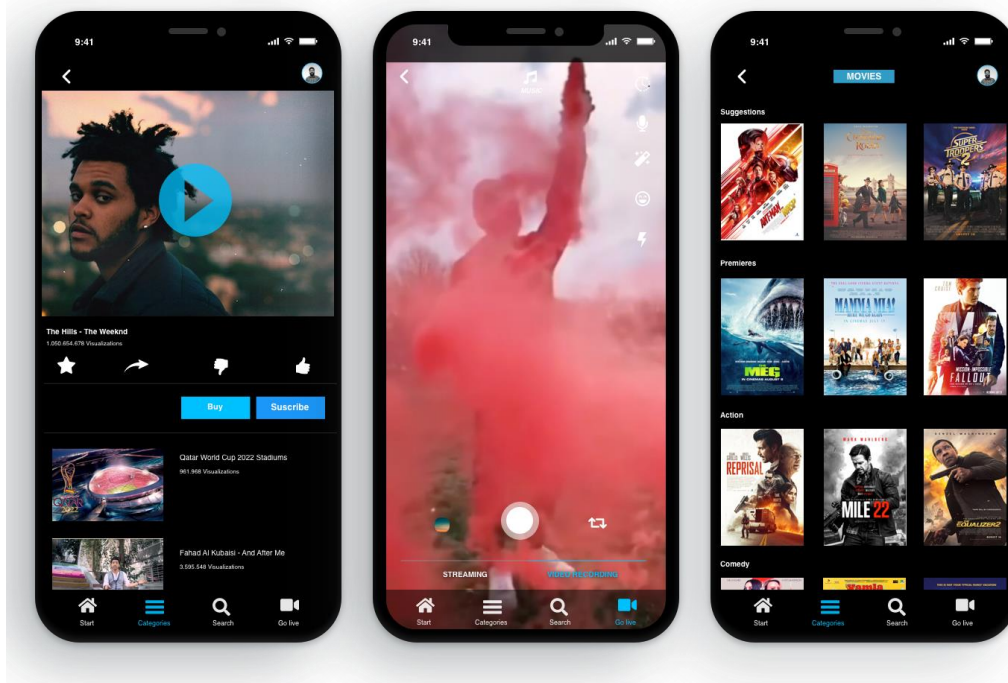
6 iMira APP for iOS & Android

FIG. 7 – IMIRA IOS APP

FIG. 8 – IMIRA ANDROID APP

7 TRON Super Representative

The foundation will deploy fullnode and **will apply for the election as Super Representative** of TRON. If elected, the TRX rates on the platform will be lowered to 0.5%.

A function will be implemented in iMira so that its users can vote for proposals depending on the number of Millennium Coins they possess. iMira is committed to informing its users of the proposal details, and its potential effects on TRON and the platform. This way they will have all the information required to choose what they consider the best for the community. iMira may also initiate proposals to improve the platform operation, where the users will have the power to decide whether the proposed changes will be made.

Before the public sale, 85% of the obtained TRX will be distributed among iMira's voting accounts. The remaining 15% will be used for the development and marketing of the platform and the payment of TRON's fullnode.

The rewards for being elected as a Super Representative, after the public sale, will be distributed as follows:

- 5% will be used to buy Millennium Coins; every 3 months the purchased tokens will be burned.
- 5% will be distributed among the accounts of active iMira users and the number of tokens they own.
- 10% will be used for platform maintenance costs (development, content and infrastructure), as well as for the payment of the fullnode.
- 30% will be returned in the form of Millennium Coins.
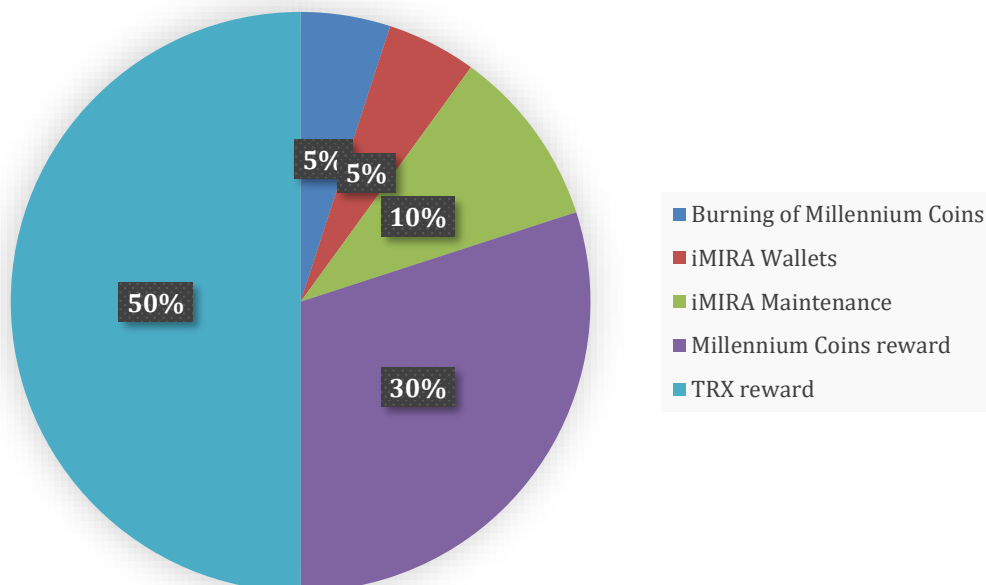- 50% will be returned in the form of TRX.

FIG. 9 - DISTRIBUTION OF THE REWARDS AS SUPER REPRESENTATIVE OF TRON

8 Token Millennium Points & Dividends

A TRC20 token called **Millennium Points (MP)** will be created for the delivery of Millennium Coins to platform users. These MP will be minted for each payment made on the iMira platform; MP minting will be done progressively, so that in the final stages it will be more complex, and a greater expenditure of Millennium Coins will be required for the minting 1 MP.

Frozen MP will be part of daily delivery. If the MP are unfrozen, they will not be part of the next round of dividends, and their transaction will only be allowed from 24 hours after they have been minted.

The platform will offer a monthly number of MP, both for the incurred expenses and for the referral accounts. The latter must have been actively used during that month to qualify for MP. In this way, it is intended that content creators attract their followers to the platform.

The number of tokens created in the last 24 hours will be minted to iMira users according to their loyalty to the platform, activity and behaviour, with the aim of strengthening a troll-free community.

MP may be exchanged for the use of crypto-collectibles on the platform and in the associated games.

9 **Roadmap**

Q1 2018
- Project Startup

Q2 2018
- Initial Commitment
- Initial design
- User and profile management
- Email service
- Wallets in Ethereum and ERC20 token
- Video upload & playback system
- Independent storage servers
- Multi-language support

Q3 2018
- Movie, series and documentary views
- Live streaming
- Implementation of video comments
- Video preview
- Dashboard
- Video Players
- Android initial Commit
- iOS initial Commit

Q4 2018
- Migration to TRON (Library for JAVA and TRC20)
- Smart Contract for storage servers
- Security for storage servers (RSA algorithm)
- Video Processing System
- Playlists
- Educational video upload system
- Notifications
- Stories
- Smart Contract for Coindrops
- Send wallet in PDF format

Q1 2019
- Messaging System
- Multi-language search engine
- Players with additional functionalities according to the genre of the content
- iMira Delivery Network: Content distribution network with distributed Hash Tables

Q2 2019

- URLs Refactoring
- Content Management Panels
- Trailers
- File Caching
- Audio and subtitles for players
- Emoticons
- Docker for iMira Delivery Network
- Parental Control

Q3 2019

- Smart Contract and Ads functionality
- Pictures & screenshots in WEBM format
- HLS Playback
- Migration of images and assets to Amazon S3 and Amazon CloudFront
- Transaction management with TronLink
- iMira Drops

Q4 2019

- Public demo and Whitepaper v1
- Creation of dissemination channels
- Marketing campaign to attract users and content creators
- Beta versions for Android and iOS
- Marketing campaign to attract video production companies
- Integration of solidarity campaigns for videos
- Initial search for exchanges to set a date for an IEO
- Scoring system for users and storage networks

Q1 2020

- API for GRPC
- Streaming scalability
- Payments with TRX
- Design of an interface for content producers
- Amazon S3 integration compatible with iMira Delivery Network

Q2 2020

- Recommendation system
- Integration of Google Cloud Storage with iMira Delivery Network
- Payments with other cryptocurrencies
- Banner ads embedded in videos
- Integration with Sun Network
- Integration with BitTorrent File System (BTFS)

Q3 2020
- Detection system for duplicate videos
- In-stream advertising on Streaming

Q4 2020
- Design and marketing of CryptoCollectibles
- Filters for stories in Android and iOS

10 Conclusions

This White Paper has presented a new P2P model for sharing digital content between multimedia companies and individuals, with the intention of iMira becoming a mainstream multimedia platform.

The Millennium Coin team is committed to pursuing the objectives described in this White Paper, but feedback from users, content creators, and large and small digital content producers will always be our priority. The iMira platform and its functionalities will therefore be continuously adapted to the needs of its users, including the addition of other types of storage systems.

iMira is also committed to monitoring the evolution of digital content and emerging content formats which may be demanded by users. In case of a positive evaluation, new formats and/or protocols will be included in new versions of the platform.

The use of the Millennium Coin will not be limited to iMira, instead the goal is to extend its use to other markets, achieving steady growth in the value of the currency and in its popularity.

One of iMira's most ambitious future goals is to produce its own digital content, in conjunction with the owners of Millennium Coins.

The community will be informed of any updates/changes made in this White Paper by means of social networks. A control version of this document will be kept.

Document History

Version	Date	Comments
1.0	2019/10/11	Initial version
1.1	2019/10/24	Millennium Coin initial allocation. References. Design

MILLENNIUM COIN

iMira

A Blockchain-powered multimedia platform