

**SPECIFIC TECHNICAL SPECIFICATIONS FOR THE TENDERING OF THE
MANAGEMENT, DESIGN, DEVELOPMENT AND MAINTENANCE SERVICE OF AN
AUDIOVISUAL AND TRANSMEDIA CONTENT PLATFORM FOR THE CATALAN
CORPORATION FOR AUDIOVISUAL MEDIA, S.A.**

- OPEN PROCEDURE -

FILE NO. 2304OB01(MODIFIED)

1. INTRODUCTION

The Catalan Corporation for Audiovisual Media (hereafter CCMA or the Corporation) is the public entity that manages the audiovisual media of the Generalitat de Catalunya, the channels of Televisió de Catalunya and the Catalunya Ràdio broadcasting group, as well as the digital content generated by these media. It does so in order to fulfil its mission of public service and with a firm commitment to quality, independence and the promotion of Catalan culture and language. It also includes TV3's La Marató Foundation, which promotes social awareness and biomedical research.

The Corporation has been a member of FORTA (Federation of Autonomous Radio and Television Organisms) since its establishment in April 1989. This entity associates regional radio and television stations, with the aim of cooperating in the areas of intellectual property rights, transmissions, exchange of programmes and services or participation in international bodies.

It is also part of the UER-EBU (European Radio Broadcasting Union), through Catalunya Música, which participates in the Euroradio musical exchange of this body which brings together all the public bodies and the main private radio and television companies of Europe.

The CCMA is also associated with Regional CIRCOM, which encompasses 376 public television stations from 38 European countries with the aim of promoting and developing cooperation between members, through the co-production and exchange of audiovisual content and in the training of journalists and technicians.

With regard to the services it offers, the Corporation works to ensure that the public can access its contents from any support and from anywhere in the world. For this reason, apart from the audiovisual offering on television (5 channels) and radio (5 stations), it also has a strong deployment in the digital field.

The Corporation's current offering on the internet combines a presence on its own platforms (such as the website, applications for mobile phones and tablets and applications for SmartTV), with its presence on external platforms and social networks.

Website: The ccma.cat website is the CCMA's most universal and accessible service on the internet. The website contains the entirety of the Corporation's audiovisual offering, offered both live and on-demand. It also contains the entire range of news and articles, engagements, games and user-generated content. The website has a responsive design

and adapts to the device from which it is accessed, be it a computer, tablet or mobile phone.

Apps for mobile devices: The content from the CCMA is also available on mobile phones and tablets through various applications, which users can download from the markets of the main operating systems. The Corporation has, at the time of publication of these tender specifications, six applications for iOS and Android: TV3, Catalunya Ràdio, 3/24, Esport3, iCat and SX3.

Apps for connected TVs: Major SmartTV manufacturers and operating systems offer TV3 and SX3 applications in their markets. These applications are also available through various “dongles” (devices that connect to the television to convert it into a “smart” device, also called “streaming sticks”), such as AppleTV or FireTV. On the other hand, TV3 and SX3 also have the respective “red button” services, available on televisions compatible with HbbTV technology.

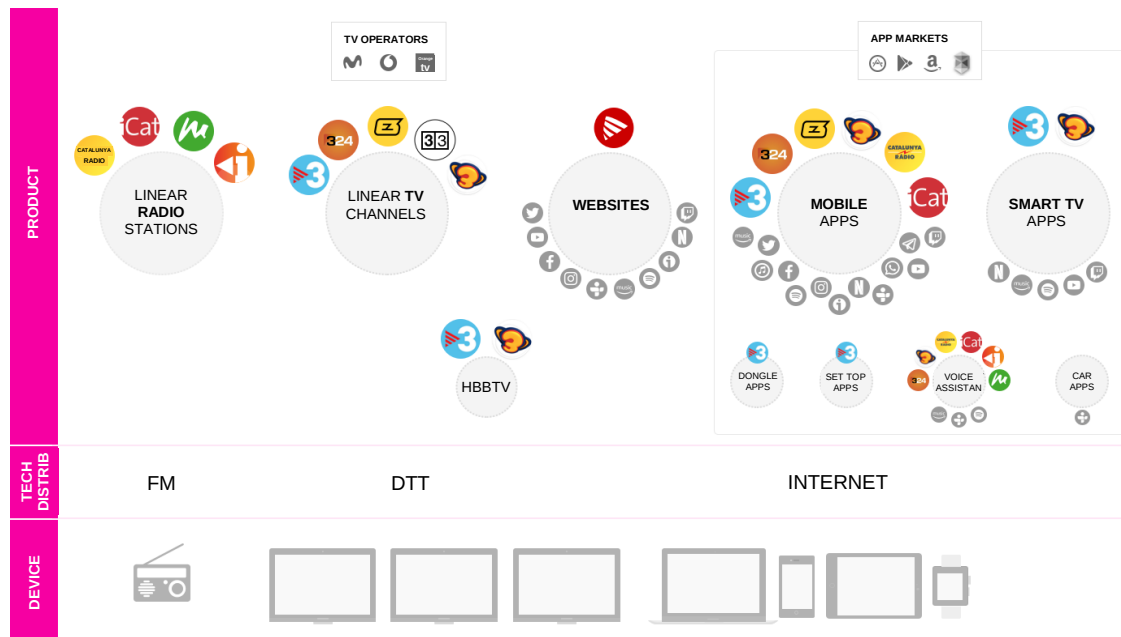
YouTube: The CCMA also has a significant presence on the YouTube video platform. TV3 has several channels, and Catalunya Ràdio has also made a major commitment, with offerings such as “El Búnquer” or “Adolescents iCat”. There are also the children’s channels S3 and X3.

Social networks: The CCMA has an active presence on social media, which are used as community-building and native content distribution channels for networks. The CCMA currently has a presence with various brands and programmes on Facebook, Twitter, Instagram, TikTok and Twitch.

Podcast platforms: Catalunya Ràdio has a wide range of podcasts, available on its own platform but also on the main podcasting platforms (Spotify, Apple Music, iVoox, Google Podcast and Amazon Podcast).

Voice assistants: All Catalunya Ràdio stations are available in these environments, and there is also a range of podcasts. Regarding TV3, the “Telenotícies” summary and the S3 storytelling service are also available.

This is the CCMA’s online distribution ecosystem:



Furthermore, despite this digital deployment, the Corporation is not blind to the reality of the audiovisual sector, which is increasingly oriented towards models based on the personalisation of content and the contribution of value from a perspective that is increasingly ecosystemic and aggregative. For this reason, the aim is to develop the positioning and digital architecture of the Corporation and promote and create a new digital platform for the distribution of audiovisual and transmedia content. This new platform must accommodate audiovisual content in Catalan, both the Corporation's own or that over which it holds rights, as well as content belonging to other cultural, social, sporting entities and institutions or content providers with whom agreements are reached. Along these lines, the Corporation seeks to encourage participation and strategic alliances with other platforms that are already on the market or with new ones that will emerge in the not-too-distant future, especially those in the public sector.

The CCMA faces a key moment in its transformation with the approval of the 2022-2026 Strategic Plan, which defines the organisation's main challenges and sets out the corporation's activity in the coming years, both in terms of the future commitment to have a platform (OTT type) as a point of reference for the definition and launch of various corporate projects involving transformation and adaptation to the audiovisual market.

2. PURPOSE

The purpose of this tender process is the contracting by Corporació Catalana de Mitjans Audiovisuals, S.A. (hereafter CCMA, S.A.) of a design, development and maintenance service for an audiovisual and transmedia content distribution platform which aims to be an agglutinator of the offering of entertainment and information in Catalan, whether its own or that of third parties.

The aim is to offer the public a digital platform that will become an integrating hub for audiovisual content and transmedia in the Catalan language. This hub must promote the consumption and creation of audiovisual products in Catalan and from Catalonia at a global level, while promoting technological innovation.

The benefits for the public that are pursued are:

- Provide access to quality content and information in Catalan in all types of audiovisual formats
- Strengthen the presence of Catalan and its social use in the digital sphere to promote social and territorial cohesion. Promote social integration with an accessible platform
- Offer a personalised experience to the public in accordance with current and future consumption uses (AI)
- Open a window to give access and visibility to content from strategic sectors such as culture, sport or scientific dissemination
- Strengthen public participation and interactivity
- Promote learning through new technological possibilities
- Stimulate growth and strengthen the cultural and digital industries, reinforcing the Catalan business fabric, with a focus on the audiovisual and video game sectors, culture and ICT.
- Stimulate the emerging talent of digital and audiovisual creators

The platform covered by this tender process will be deployed with three major service levels:

- **LEVEL 1: CCMA content distribution**

The platform covered by the contract will offer the end user the following type of CCMA content:

- On-demand streaming of audiovisual content (VOD / AOD)
- Live TV streaming
- Live radio streaming
- Customised vertical streaming
- Streaming for occasional events
- In-app games
- Aggregator/prescriber of games or video games and/or game application launch depending on each case
- Music aggregator

- Multimedia content

- **LEVEL 2: Showcase for third-party content**

The platform covered by the contract will index third-party content in such a way that users will have access to their content in an integrated way, but when they decide to consume it they will be sent on a link to the third-party platform.

It will be necessary to design the strategies for aggregation, visualisation and indexing of this content from third parties, with whom the CCMA will have previously signed agreements and alliances.

The content that will be indexed and added to the platform can be audiovisual (live or delayed video or audio), games or multimedia environments (e.g. learning).

- **LEVEL 3: Distribution of third-party content**

The platform subject to the contract must have an environment for ingesting, managing and monetising content from third parties (companies, institutions, equipment and audiovisual creators). The CCMA will have previously signed agreements and alliances with these third parties. Where appropriate, it will be necessary to integrate monetisation systems for third parties, which must include advertising, subscription and pay-per-view/listen based models.

This service level aims to bolster the community of audiovisual creators in Catalan, as well as the global audiovisual industry in Catalan, while also serving as a platform for cultural and social facilities.

The platform should also be able to integrate third-party applications.

In addition, at all service levels the platform will make interactive and participatory functionalities available to users, as well as various integrations set out in more detail in the platform requirements defined in point 4.

The subject matter of this tender process includes the technological platform (design, development, and corrective and evolutionary maintenance), as well as the associated services in order to carry out the maintenance of this platform as stated in point 3.2, based on the strategic and operational guidelines, supervision, validation and approval of CCMA, S.A.

The technological solution must be based on a commercial product solution already developed, tested and put into production with real customers. This commercial solution will be used to implement all the functionalities required by the CCMA, SA, as well as to design and develop all the client applications.

Regarding the development of the platform, two service scenarios are considered:

- In terms of the mandatory functionalities specified in these specifications, the platform must be based on a commercial product solution that has been developed, tested and put in operation, which is the one that needs to be developed according to the requirements of CCMA, S.A. and the roadmap of the commercial solution.

- With regard to the functionalities arising from specific requests from CCMA, S.A., a development and innovation model will be assessed for those functionalities that do not have a commercial market solution. In this case, the technology will be defined in conjunction with the CCMA.

It is for all the above reasons that an agreement of the services of the nature and extent detailed below is proposed.

3. SCOPE

As already indicated in the previous section, the scope of the service includes conceptualisation, technical and graphic design, development and implementation of the systems and technological infrastructure linked to the OTT platform and all necessary integrations with third parties. Maintenance services for this platform are also required.

The developments made to measure for CCMA, S.A. shall be carried out based on a technological solution previously developed by the successful bidder and tested and used by customers.

The scope of the service shall be divided into two main types of services:

- **Design, implementation and exploitation services of the platform**
 - Implementation of the platform in phases (as specified in section 3.1.1 of these specifications)
 - Licence to operate and use the platform
 - Services and operating costs of the platform:
 - Transcoding.
 - Storage.
 - Content Delivery Network, hereafter CDN
- **Platform maintenance services**
 - Management service and general monitoring of the service
 - Content curation support service
 - Multimedia creativity generation service
 - SEO and ASO strategy and execution support service
 - Promotion and loyalty design support service
 - A/B testing service
 - User experience design service, testing and research with users
 - Digital analytics service
 - End user incident management service
 - Advertising sales maintenance service
 - Linguistic service
 - Activation service
 - Platform technical support service
 - Technical development service
 - Additional services

- Initial and ongoing training

The economic proposal, which will have to be presented according to the template defined in **Appendix 1** “Economic Bid Form” of the : Specific Administrative Bidding Conditions (PCAP), shall be prepared according to this structure and breakdown of services.

3.1. Scope of the design, implementation and operation services of the platform

The successful bidder shall be responsible for the design, implementation, operation and administration of an audiovisual and transmedia content platform, with an interactive and participatory layer and the aggregation and ingestion of third-party content (audiovisuals and games).

The service includes equipping the platform with all the necessary infrastructure, which will be detailed below, for its correct operation, as well as the development and/or integration of as many tools as are necessary for its operation in the terms described.

It also includes the development of all client applications so that end users can access and use the platform.

Therefore, the successful bidder will need to:

- Design, administer and operate the infrastructure of the platform based on the requirements of CCMA, S.A.
- Design, develop, test, publish and maintain all client applications for publishing content, with a consistent and optimised user experience for each device.

3.1.1. Implementation of the platform in phases

In order to be able to publish the platform as quickly as possible, and in order to ensure an agile development and continuous improvement, it is foreseen that the design and development of the platform, as well as its implementation process, will be carried out in phases.

The planned phases and their functional scope are as follows:

- **Phase 1:**
 - **“Distribution of audiovisual content” (video and audio, direct and deferred)**

Based on the technological basis of the OTT commercial product of the successful bidder, custom developments will be carried out and implemented for CCMA, S.A. to have a 100% functional and operational platform with all the functionalities associated with the reproduction of live and deferred video and audio, and all client applications. Specifically:

- Content Management System (CMS), according to the requirements defined in point 4.1 of these specifications.
- Data, analytics and Business Intelligence (BI), according to requirements defined in point 4.2 of these specifications.

- Advertising service, according to the requirements defined in point 4.3 of these specifications.
- Integrations with components of CCMA, S.A., according to the requirements defined in point 4.6 of these specifications.
- Live and on-demand video and audio streaming services, according to the requirements defined in point 4.7 and expanded in detail in Appendix 4 “Technical requirements of systems and infrastructure”.
- Content storage and distribution services, according to the requirements defined in Appendix 4 “Technical requirements for systems and infrastructure” of these specifications.
- Client applications (except for voice applications), according to the requirements defined in point 4.8 of these specifications.
- Player, according to the requirements defined in point 4.11 of these specifications.
- Search engine, according to the requirements defined in point 4.12 of these specifications.
- Personalisation, according to the requirements defined in point 4.13.
- Data protection, according to the requirements defined in point 4.15 of these specifications.
- Accessibility, according to the requirements defined in point 4.16 of these specifications.
- Migration of the videos and audios of CCMA, S.A., and all their metadata, to the new platform.
- Execution of the onboarding strategy and gamification of user data capture.

Phase 2:

- **Integration with the CCMA, S.A. CRM.**

Integration of the platform with the Customer Relationship Management (CRM) and the centralised data repository (or data warehouse) of CCMA, S.A. Communication must be two-way, so that certain actions derived from the CRM can be converted into actions within the platform (for example, sending push notifications or personalising content).

- **Third-party audiovisual aggregation**

Indexing of third-party audiovisual content (based on information provided in data files), so that they can be ordered and displayed from all client application front-ends. When the end user accesses third-party content, it must be possible to be redirected from the platform to the third-party platform (either at the beginning or to a deep link if the information is available).

- **Phase 3:**

- **Implementation of participatory and interactive functionalities**

Incorporation of participatory and interactive functionalities such as chats, comments, votes, ratings and/or surveys in both the CMS and the client applications, according to the requirements defined in point 4.14.

- **Aggregation of third-party games**

Indexing of content related to third-party games (based on information provided in data files), so that they can be sorted and displayed from all front-ends of client applications. When the end user accesses a third-party game, it must be possible to be redirected from the platform to the third-party platform (either at the start or to a deep link if the information is available).

- **Client applications for voice assistants**

Development and publication of voice applications, according to the requirements defined in point 4.8 of these specifications.

- **Phase 4:**

- **Integration with CCMA e-commerce**

Integration of the platform with La Botiga de TV3 and Catalunya Ràdio (<https://botiga.ccma.cat>), in such a way that products from the store can be linked to any video and/or audio content on the platform, and users can purchase the product via the client applications on the same platform.

- **Implementation of DRM**

Integration of a digital rights management system (DRM), which prevents users of certain content on the platform from being able to copy and distribute the content illegally. A certified DRM system must be integrated, in order to facilitate the acquisition of content where distributors require this protection measure. With this system, users who access content will only be able to play it if their rights licence is valid. The integrated DRM will need to be supported by the majority of devices that are going to use the platform's client applications.

- **Phase 5:**

- **Implementation of payment modules (subscription and Pay per View (PPV))**

Implementation of a payment module within the platform that allows business-based models based on advertising, subscription and per view/listen, transaction both for deferred video and audio content and for direct.

- **Implementation of a sub-platform for ingest, management and monetisation of third-party content**

Development of the third-party content sub-platform which must have:

- a module where third parties can register and enter all the necessary data
- a module where they can ingest their content
- a module where it is possible to carry out content curation actions on the content of third parties
- a module where they can see the monetisation of their content and collect the money it has generated, and a module where they can carry out minimal content management of their space on the platform.

At the same time, all such third-party content must be reflected in the platform's global CMS and must be usable for editorial recommendations and must be consumable by the platform's users in all its client applications.

- **Phase 6:**
 - **Integration of native games**

Based on games produced or co-produced by CCMA, S.A., or games for which CCMA, S.A. signs a distribution agreement, the necessary integrations must be made so that the game can:

- Either be consumed from within the platform, if the technology used allows it
- Or link to the relevant market for downloading the game, but in such a way that when the user opens the game it is like another extension of the platform and the user login and all possible social profiles are maintained.

Game usage data must be associated with the user registered on the platform and must be able to be consulted from the Data, Analytics and Business Intelligence Module of the platform.

- **Phase 7:**
 - **Implementation of transmedia environments (e-learning, interactive multimedia, etc.)**

Implement within the CMS and within the client applications of the platform the possibility of creating environments that combine video, audio, participation and interactivity, and textual elements, generating gamified content consumption or learning experiences. These developments must allow the creation of virtual learning environments within the platform, as well as environments that allow the visualisation of content in an interactive and transmedia form (for example, an interactive fiction that combines video, audio and text).

- **Phase 8:**

- **Client applications in immersive environments**

Develop client applications in immersive virtual environments (those with more market penetration at the time of execution of the phase), which allow access to the contents of the platform and, especially, to ad-hoc content generated by CCMA, S.A. for these immersive environments.

- **Phase 9:**

- **Integration of external e-commerce**

Based on commercial alliances of CCMA, S.A., the platform must be able to integrate with external e-commerce and offer end users the possibility of buying products linked to the content of the platform, ensuring a good user experience (that the product proposal adds value to it), and a good positioning of the product (that the product proposal adds value to the e-commerce company).

- **Phase 10:**

- **Future developments**

Given the speed of changes in the technological and audiovisual sector, the platform will have to continue to evolve based on new consumer trends. The specific developments and improvements of this phase will be defined as the previous phases are completed and there is a clearer view of the state of the art in the audiovisual platform sector at that time.

For each of these phases, the successful bidder will be responsible for the following tasks:

- 1. Support in conceptualisation**

- Functional definition
- Platform architecture proposal
- Functional and technical design
- Product analysis
- UX and UI design (including custom and specific graphic design)
- Prototype testing
- Support in the definition of the commercial model with third parties

- 2. Development:**

- Developmental analysis of required changes to the platform's back-end infrastructure or to the CMS
- Development of new functionalities in all client applications.
- Functional tests, unitary tests
- QA control

3. Commissioning

- Production of all changes to the back-end infrastructure or to the CMS
- Publication of all client applications, both on the website and in the different markets and manufacturers' environments. In the case of apps, package, certify and distribute the applications in their corresponding markets, with the metadata and graphic material necessary for publication.
- Respond to and resolve incidents (both internal and those of end users).

Regarding the calendar for each of the phases, the following planning is provided:

- Phase 1: months 1 to 6
- Phase 2: month 7
- Phase 3: months 8 to 10
- Phase 4: months 11 to 12
- Phase 5: months 13 to 18
- Phase 6: months 19 to 24
- Phase 7: months 25 to 26
- Phase 8: months 27 to 30
- Phase 9: months 31 to 32
- Phase 10: months 33 to 60

The calendar schedule for these phases is as follows:

[illegible]

The optimisation of this calendar will be assessed for the execution and implementation of the phases, as long as the publication of components and functionalities progresses.

3.1.2. Licence to operate and use the platform

In parallel with this development and implementation of the platform in phases, it is expected that the bidder will provide a licence to operate and use the platform linked to its evolution.

The operating licence of the platform must bestow the right to use all the services and functionalities of the platform throughout its implementation and evolution, as well as all the necessary evolutions and updates of these services and functionalities, for to the correct operation of the platform based on the technological changes that occur throughout the service (updates operating systems of manufacturers, libraries and SDKs, new consumption and distribution formats, etc.).

The licence provided by the bidder must cover all platform expenses, such as player, servers, adserver, analytical and monitoring tools, technical updates of client

applications, etc., except for custom developments by CCMA, S.A., defined in point 3.1.1 of these specifications, and except for all the costs derived from the services defined in point 3.1.3 of these specifications, which will be invoiced independently based on consumption.

3.1.3. Services and system costs based on platform consumption: transcoding, storage and CDN

The scope of the service also includes the implementation, administration and billing of the platform's consumption-based systems, such as on-demand and direct content transcoding services, storage and CDN.

These services will be the only ones that will be billed individually, outside of the licence to use the platform which should include the cost of using the other systems on the platform.

Billing for these services will be based on consumption and a unit price specified in the economic bid form in Appendix 1 of the : Specific Administrative Bidding Conditions (PCAP).

3.2. Scope of platform maintenance services

The tender object of the contract includes a series of services associated with the maintenance of the platform, which must be provided by the successful bidder.

The scope of these maintenance services, in terms of estimated volume of dedication, is detailed in **Appendix 1**, "Requirement for the maintenance services of the OTT platform".

The details of the services to be provided are as follows:

3.2.1. Maintenance service and general monitoring of the service

Coordination and monitoring of the service, as well as liaison tasks with the CCMA. The management service must also:

- Propose the KPIs of the service and generate the necessary dashboards so that CCMA, S.A. can properly monitor the service in its entirety.
- Monitor service status and be proactive in resolving issues and reporting status to CCMA, S.A. managers to ensure achievement of goals and maximum efficiency and productivity.
- Manage and plan the tasks necessary for the correct execution of the service.

- Provide guidance in those matters that are part of the contracted service, while contributing with solutions to seek quality, stability and innovation in all projects.
- Ensure the level of quality of the products and services resulting from all work teams.
- Prepare regular reports with trends and benchmarking of the OTT sector and audiovisual platforms.

3.2.2. Content curation support service

Based on the strategic prioritisation set by CCMA, S.A., and operational requests, this service will ensure the correct display of the platform's contents in the following environments or lines of action:

- Service landing and sections (series, films, programmes, documentaries etc.)
- Thematic and target verticals (informative, sports, cultural, youth, etc.)
- Live video channels (television, fast channels, pop-up channels, algorithmically personalised channels, occasional events etc.)
- Live audio channels (radio, fast channels, pop-up channels, algorithmically personalised channels, occasional events etc.)
- Implementation of participatory and/or interactive actions on the content
- Integration of commercial actions on the content (e-commerce, branded content, etc.)
- Support in the definition of editorial business rules for personalisation
- Creativity and catalogue metadata (video, audio and/or game): image introductions, video previews, keyframes, titles, descriptions, tags, etc.
- Promotion within the platform of catalogue premieres and future live streams
- For each production, it will be necessary to include the director, actors, presenter(s), genre and related titles, among other metadata, to refine search results (and use discovery via tags).
- Cataloguing of podcasts in third-party aggregator systems

3.2.3. Multimedia creativity generation service

Based on the materials provided by CCMA, S.A., and the strategy set by CCMA, S.A., this service will generate the following creativities:

- Poster type images, and large images of the catalogue productions. If the production is strategic, specific images will also be made for each chapter.
- Videos for previews of strategic productions
- Images for the promotional elements within the platform.
- Images derived from participation and/or interaction within the platform
- Images for A/B testing
- Video clipping for distribution on social platforms

3.2.4. SEO and ASO strategy and execution support service

The successful bidder must help define and execute the SEO and ASO strategy to position the platform's content in search engines, especially Google, and boost downloads of mobile applications and in the different markets.

The service will have to track user searches to detect increasing searches, search trends and optimisation of metadata (title, description, etc.), within the application itself and in external search engines. It will also have to work with the following aspects of technical SEO:

- Clickability
- Ranking
- Rendering/Publishing
- Indexability
- Tracing
- Monitoring of "core web vitals" indicators or other indicators relating to user performance and experience

As for ASO, the service must ensure the optimisation of client applications so that they have the greatest visibility in the stores of the different markets and in the search results of users.

The service will also have to carry out de-indexing in search engines when there are requests from CCMA, S.A. (for example, in cases of de-publication of content resulting from the exercise of the right to be forgotten).

3.2.5. Promotion and loyalty design support service

The service must provide support to CCMA, S.A., in the design and execution of promotion and loyalty strategies, both with regard to the contents of the platform and with regard to all client applications.

It will therefore be necessary to propose actions to improve the entire user conversion funnel, from impact and awareness to capture, retention and loyalty in the form of registration and/or purchase.

3.2.6. A/B testing service

With the aim of offering a better user experience and increasing retention and loyalty, the successful bidder must provide a permanent A/B testing service on the presentation of the contents and on the structures of the pages in all client applications. Therefore, it will be necessary to test different images, titles, descriptors of content groups, ordering of menus or content carousels, buttons and other concepts that help to systematically and continuously improve the product offering and the experience of user to client applications and therefore loyalty.

3.2.7. User experience design service, testing and research with users

This service will carry out the testing with users of the client applications and of the new functionalities that are being incorporated.

It will also carry out the conceptualisation and UX design of the improvement proposals and actions requested by CCMA, S.A. (such as, for example, participation actions derived from coverage or specific content).

The successful bidder would also have to periodically perform accessibility tests within this service, in order to guarantee the maintenance of the double-A (AA) certification on the website and the mobile application, and the maximum level of accessibility to Smart TV applications.

3.2.8. Digital analytics service

This service will be responsible for monitoring all the data collected by the platform. Specifically, it will have to:

- Prepare the platform's KPI reports in accordance with the requirements defined by the Innovation and Knowledge Area of CCMA, S.A.
- Propose and draw up audience monitoring reports for the platform, which allow a global and granular view both in terms of types of content (thematic, vertical, etc.), and in terms of users (registration funnels, retention, loyalty, etc.). Therefore, it will be necessary to have different levels of reporting, global, by consumption type, by thematic verticals, all in accordance with what was agreed with the Innovation and Knowledge Area of CCMA, S.A.
- Prepare reports with application technical performance data, heat maps, conversion panels, and other key data for platform monitoring and improvement.
- Prepare reports with data on user experience in using the platform. The report will have to collect metrics to measure the level of QoE, offering data such as buffering ratio, erroneous plays, content abandonment before playback, content start time, number of interruptions, etc., and all this data can be organised by dimensions of operating system type, device type, geographic area, ISP, user agent, etc.

3.2.9. End user customer service

The platform must provide users with easy and intuitive access so that they can submit queries, complaints or suggestions related to the platform, its contents and its use. In this environment there must be a system of frequently asked questions or some kind of guide (in this regard, the successful bidder needs to make proposals).

This service must respond in less than 24 hours to any users who have sent a query, complaint or suggestion (with the solution or with a proof of receipt stating that we will contact them again shortly). In the event that a satisfactory or conclusive answer could not be given in the first response, it must respond again within a maximum of 72 hours

unless there is an exceptionally complex situation that requires more time. In order to do this, the service will have a directory of key contact people (both for content and technical issues), to be able to resolve the query and send the answer to the user. If the query requires a response from CCMA, S.A., it will be channelled through the Service Manager.

All communications with end users must be saved and identified, with an identifier number, which also serves as proof of receipt.

The Service shall also proactively monitor user feedback in the markets where the client applications are published and respond to feedback.

The service will have to establish coordination with the CCMA's Audience Service once the service has been awarded and send them periodic reports that are established of the incidents and responses offered. On the other hand, this service will need to be integrated into the CRM of the CCMA,SA

3.2.10. Advertising sales maintenance service

The successful bidder will have the responsibility of managing the advertising platform: Adserver/Adservers + SSP (native) + SSA. The adserving licence and variable technological costs for impressions are the responsibility of the successful bidder.

The platform will have to be integrated into the requested demand sources (SSPs, Backfill, etc.), in accordance with CCMA, S.A. Resellers or non-native integrations with demand sources that do not have their own purchasing technology should be avoided.

CCMA, S.A. will be able to market direct and self-promotional campaigns for the platform. In these cases, it will provide creativities and instructions to the successful bidder so that they can plan these campaigns and monitor them , through this commercial advertising management sub-service.

Therefore, apart from the integration with these demand sources, the service will have to provide the traffic management of:

- Direct and self-promotional campaigns of CCMA, S.A.:
 - Trafficker service.
 - Validation of materials and coding if necessary
 - Monitoring and optimisation of active campaigns
 - Solution of technical incidents with creativities
 - Campaign optimisation solution
 - Campaign reports
 - Data analysis for package creation.
- Programmatic campaigns, control of OpenRTB and Backfills
 - Implementation of the diffusion rules agreed with the CCMA
 - Implementation of blacklists and recurring maintenance of blocking
 - Activation of agreements
 - Open/Deal programmatic optimisation
 - Incident resolution and Health (troubleshooting)
 - Data analysis for package creation
 - Open portfolio analysis

The service will also have to ensure, with the agreement of CCMA, S.A., that the development teams of the successful bidder make the necessary developments and integrations for the advertising configuration responding to the protocols, guarantees and market metrics according to IAB. Advertising must maintain technological compatibility with:

- All platforms where the application is distributed.
- CMP, Consent Manager with integration on all platforms where the application is distributed and monitoring/activation of vendors.
- Notice of exit from the protected environment in case of advertisements in the Children's environment that give rise to third-party landings
- Ads.txt/AdsApp.txt/ etc. Maintenance of purchase source declarations with established protocols or those that are being consolidated within the advertising market.
- Advertising regulations and standards to control advertising metrics.
- CDN in the event that the successful bidder opts for this as a repository of advertising creativities. The adserver and SSAI must have access to it.
- Players: The platform's players (video and audio) must be compatible with the Adserver and SSAI, both for the advertising service solution from the server and for the client advertising service solution, always prioritising SSAI.
- Metadata associated with advertising calls
- Internal systems for the payment of settlements, accessible via API or other mechanisms from the CCMA for data import.
- CRM/Audience Modules/Data
- Cookieless
- Compatibility with current CCMA Adserver (Equativ) will be assessed
- Structuring the advertising stack in accordance with CCMA model to guarantee the unification logic of CPM prices and priority management.
 - The stack must ensure that two identical ads cannot be issued consecutively or within the same adbreak for the same brand, it must guarantee the user experience by applying the logic of positions and ad rules defined by the CCMA
 - The stack must allow the defining of content packages by content, data and contextual affinity
- Other systems that can be proposed in terms of their evolution

The commercial advertising management service must also prepare the necessary commercial reports so that CCMA, S.A. can monitor the commercial activity on the platform.

3.2.11. Linguistic service

With the aim of guaranteeing linguistic quality and complying with the principle of promoting and consolidating the standard of the Catalan language that governs the CCMA's media, the bidder shall undertake the linguistic correction and adaptation, as well as orthotypographic, of the public publications of the platform generated by the maintenance team in accordance with the linguistic principles and criteria of the CCMA Style Book, which includes the language portal *ésAdir*.

3.2.12. Activation service

The service must guarantee the activation of the catalogue and the products (client applications) of the platform, through paid media and social ad actions. In this sense, a fixed expenditure of up to €583,000 per year will have to be guaranteed which includes the partial dedication of a senior Social & Paid Media Manager, the development of advertising creativities, the cost of advertising campaigns, the indirect cost and the industrial profit except for the first annual amount which will be €291,500. All actions will be scheduled, supervised and approved by CCMA, S.A. beforehand.

3.2.13. Platform technical support service

The platform provider must offer a 24/7 technical support service for the platform. This service must:

- Be the single point of contact and support for users of the platform systems. (not end users)
- Respond quickly to the End User Support Service in the event of technical service incidents.
- Propose actions and execute them for continuous improvement in processes.
- Establish procedures between the various technical teams (development and operations) to reduce incident resolution and response time.
- Carry out the control of Service Level Agreements (SLAs), submit incident life cycle reports to propose improvements and reduce the number of recurring incidents.

3.2.14. Technical development service

Apart from the phased developments of the platform contemplated in point 3.1.1., the bidder must provide services to develop functionalities required by CCMA, S.A. derived from editorial, marketing or sales coverage or actions. These developments will have to be performed on the CMS and on all client applications that require it. These can also be new integrations required by CCMA, S.A. In this regard, the tasks to be performed shall be:

- Technological developments of the different products and technological stack according to the functional requirements defined by the CCMA,SA

- Configuration, parameterisation and monitoring of the different systems whether in the cloud or on-premises (CMS, VOD or Live encoding platform, deployment cycle, etc.)
- Quality Assurance cycle:
 - a. Automatic and/or manual tests of any type (integration, unit, performance, security, functional)
 - b. Periodic tests and verifications of the operation of the different applications (mobile, SmartTV and Web) (exploratory)

3.2.15. Additional services

CCMA, S.A. may request additional services not initially planned. These services may be new orders but they will be related to the subject matter of the contract and will not change the meaning of the award in any case.

3.2.16. Initial and ongoing training

The successful bidder will have to be in charge of the initial and ongoing training, both technical and operational, on the tools made available to the CCMA to be given to the staff appointed by the latter, in the processes that correspond to them as a service flow. It shall also be responsible of the creation, updating and distribution of the documentation that complements this training, which may be in-person or virtual where applicable to facilitate the logistics of the successful bidder. The training and all documentation shall be in Catalan.

The scope and planning shall be established by the CCMA during the term of the contract, and this service shall be considered included as part of the Platform Maintenance Service for the best possible coordination between the CCMA and the successful bidder in the processes affected.

4. PLATFORM REQUIREMENTS

The service offered by the successful bidder must:

- Design, administer and operate the infrastructure of the platform, to execute all the requirements of CCMA, S.A.
- Design, develop, test, publish and maintain all client applications for content publication, with a user experience optimised for each device but homogeneous in terms of range of content and proposed look.

As already indicated in previous points, the technological solution must be based on a commercial product solution already developed, tested and put into production with real customers, including generation of client applications with user experience interfaces according to state-of-the-art quality standards for OTT solutions.

The bidding company must ensure that its commercial OTT solution, at the time of its bidding on the tender, meets a set of minimum technical requirements, which are defined in **Appendix 2 “Minimum functionalities of the OTT solution of the bidding company”**.

As defined in the procedure of point 9.4.2. of the technical information of the content of Envelope B of the : Specific Administrative Bidding Conditions (PCAP), in the event of non-compliance with these minimum requirements defined in Appendix 2, it shall be considered that the proposal is not valid and it will be excluded from the procedure.

Built upon on the commercial platform that the bidding company already has, throughout the service the platform will be developed through several phases to reach the overall requirements described below:

4.1. Content Management System (CMS)

To ensure the integrity of the platform, the operation of the content management system (hereinafter CMS) will be the responsibility of the successful bidder as part of the service provided.

The CMS must allow for the centralised management of all the content in its different types for its correct administration, as well as its associated metadata, and its orderly publication in the different client applications. It must have the ability to adapt to new specific fields of information that are necessary for integration needs with the processes of CCMA, S.A., or third parties.

To facilitate operational management and coordination with CCMA, S.A., the successful bidder must provide CCMA, S.A., the complementary tools for interaction with the platform, such as partial or total views of the CMS, which allow CCMA, S.A. to contribute value and effectiveness to the overall process.

Some of the necessary functionalities of the CMS are:

- Maintenance of each content asset (including intake, editing and deletion) and administration of the schedule (date/time of activation and date/time of cancellation, scheduled or manual) of its publication. Considering the Asset as an identifier of the different types of content (Audio, Video, Game, DVR and/or elements related to the EPG, Live, etc.).
- Maintenance of content collections (categorisation, playlists, podcast lists, etc.) and administration of the their (activation and cancellation, scheduled or manual) schedule publication.
- Management of editorial workflows, being able to pass the content through different states (editing, work, correction, publication, archived, unpublished, etc.)
- Version management as changes are made to the metadata by the user so that, if necessary, they have a previous version to recover.

- Autosave of content once a metadata tab is entered in edit mode.
- Automatic creation of lists based on certain fields and their values (e.g., movies and genre comedy, fiction series, etc.).
- Preview in different layouts or devices (mobile, desktop, etc.). Possibility of scheduling the publication of layouts.
- Live preview to see how the changes will look in real time.
- Basic online image editing (crop, resize, contrast, brightness, etc.) to be able to touch up covers and/or images that may be of interest within the CMS
- Fields controlled by CMS user roles/permissions.
- Search function for content as well as resources (images)
- Possibility to logically group two or more contents (trailer + video, subtitle files, audio description version, VOR, promotional images, Dolby version)
- Display/Player to play video/audio
- Management of production space and archive space
- Marking and storage of timecodes for intro and credits
- Marking and storage of timecodes for advertising, overlays
- Ability to group collections: collections of collections.
- Configuration of the content to be displayed in client applications through the real-time editing of components and their scheduled or manual activation: headers, sections, highlights, modules, etc.
- Creation and editing of pages and views.
- Administration of geoblocking individually or by groups of Assets.
 - Configuration of included countries where media can be played
 - Configuration of excluded countries where it is not possible to play the media
 - Configuration of geographical restrictions on subtitles by language
- Management of live broadcasts (streaming, shoutcast, fast)
- Protection of viewing content by age group. Marking of the code of ethics.
- Integration of SEO tags and actions (indexing in front-end web search engines).

- Managing the export of podcasts to external podcasting platforms and voice services.
- Managing the export/publishing of videos to YouTube or other online video platforms deemed relevant.
- Managing the sending off push-app and desktop notifications through the platform's client applications.
- Creation and management of thematic or target verticals within the platform.
- Data administration (consumption, content, users). (Integration with the data and analytics module)
- Analytics administration. (Integration with the data and analytics module)
- Advertising administration. (Integration with the commercial management module)
- Complementary operational functionalities of flows:
 - Automatic generation of a meaningful image (meaningful keyframe) of content in the event that it does not exist prior to its publication, with the possibility of changing it afterwards with a friendly tool based on the video itself, or by uploading an image on demand.
 - Automatic generation of meaningful short videos for previewing productions in certain interactions in client applications.

The CMS must also be prepared in case the platform is to evolve into a multilingual service in the future.

The best features of the tools and other functionalities made available to the CCMA for this section will be evaluated.

Additionally, to ensure the integrity of the platform, the administration of user roles for interaction with the CMS shall be the responsibility of the successful bidder as part of the service provided.

The CMS will have to differentiate between different types of users with different roles and profiles, with their displays corresponding to their operation. The minimum roles that the CMS must be able to administer are:

1. **Admin** user: The user with the highest range of permissions and access to CMS functionality, including the ability to extract data and analytics autonomously.
2. **Organiser** user: the user with the capacity to register new users within each group, as well as the roles and permissions of each of its members.
3. **Content Editor** user: the user with the ability to at least upload, review, catalogue and categorise audio and/or video content.

4. **Designer** user: the user with at least the ability to create, modify and place design elements of the fronts, backgrounds and icons.

5. **Advertising** user: the user with at least the ability to activate/deactivate advertising modules and create advertising elements.

6. **Publishing** user: the user with the ability to schedule publications or interact manually in real time with them.

7. **Corrector** user: the user with the ability to linguistically review the publications.

The platform must record the traceability of user actions in order to detect possible operational incidents. It must also offer the possibility of auditing the actions taken by the user.

The content management module must also incorporate functionalities to edit the structures of the service pages (layouts/frontals). In this regard, the following must be provided:

- Layout **template viewer** for their testing and validation prior to publication.
- **Visual builder/editor** (Drag&Drop type) of templates, with a full preview in real time (real WYSIWYG) as it will be seen by the end user, ideally on different type platforms associated with the client applications defined for the brand or brands.
- **Ability to adjust and customise the appearance** (layout) of each element or module and background.

The best features of the tools and other functionalities made available to the CCMA for this section will be evaluated.

In terms of volume, it is estimated that the content manager should be able to manage the following volume of video and audio assets:

- Initial file upload:
 - Videos: 600,000
 - Audios: 850,000
- Generated in the remainder of the first annual period:
 - Videos: 47,000
 - Audios: 62,000
- Generated in the second annual period:
 - Videos: 58,750
 - Audios: 77,500
- Generated in the third annual period:
 - Videos: 73,437
 - Audios: 96,875
- Generated in the fourth annual period:
 - Videos: 91,800
 - Audios: 121,000
- Generated in the fifth annual period:

- Videos: 114,000
- Audios: 151,000

4.2. Data, analytics and Business Intelligence (BI)

The platform shall have a Data, analytics and BI module that ensures the integrity of user data and users' activity on the platform.

This module shall contain the storage of large amounts of data, its debugging and its processing in real time. It will also provide Business Intelligence (BI) tools to analyse and generate relevant metrics, dashboards and reporting for decision-making and supervision by CCMA, S.A. This module and all the tools necessary for its exploitation shall be the responsibility of the successful bidder as part of the service provided.

In terms of data, it must collect the multi-platform data of all the information necessary to analyse the use of the platform (video and audio, users, interactions, etc.). The system will have to collect data from all the client applications of the platform, both the web and mobile apps, SmartTV apps, the HbbTV service and applications for voice assistants.

All the elements related to the "reporting" documents generated to monitor the platform's activity (content, consumption and users/areas) must be agreed upon and validated by CCMA, S.A., and the data and analytical metrics to be reported on a daily, weekly and monthly basis for monitoring the service will be established, as well as the parameters and thresholds that, if achieved, would generate immediate alerts to be communicated to CCMA, S.A.

The platform shall allow analytical data to be obtained, with the ability to filter by any combination of: brand, content categories (and even specific content), playback percentage, country, device (type, operating system, manufacturer, browser type), users, and types of audio or video content; making it possible to know:

- The individual overall performance of the content in a configurable time window, including:
 - The total number of impressions (upload of content ready for playback).
 - The number of total views (start of playback of the content after its impression only after the complete viewing of the advertising/promotional pre-rolls).
- The playback percentage.
- The performance of specific content with detailed information on overall user engagement.
- The total number of minutes consumed.
- The number of unique users who played the content in the time interval defined by the window.
- Service performance, including:
 - The pieces of content that are being consumed the most.
 - Information/Geographic classification with at least country detail.
- Data related to user experience QoE (Quality of Experience)
 - Buffering ratio, erroneous plays, content abandonment before playback, content start time, number of interruptions, etc., and all this data can

organised by dimensions of operating system type, device type, geographic area, ISP, user agent, etc.

- The overall performance of the service in which traffic is referred to in a configurable time window, including:
 - Total bytes served.
 - Bytes served (no DRM protection).
 - Bytes served (with DRM protection).

All information must be able to be consulted and filtered in daily, weekly, monthly and personalised evolutions and be comparable with previous periods.

The platform will allow the data to be exported at least in .csv and .xlsx format, and graphically in .png, .jpg or .pdf format.

In order to facilitate operational management and coordination with CCMA, S.A. the successful bidder must make available to CCMA, S.A. a set of complementary tools for interaction with the platform that allow data to be displayed using its own means and on demand (dashboards) that are accurate for content activity, consumption and users, as well as deferred analysis for reports that require multiple data processing to generate the corresponding reports.

Regarding the advanced data on access to the platform by the users and the consumption of content, the information must be available less than a minute after the event occurs, and must be maintained throughout the entire duration of the service.

With regard to the processing of personal data, the successful bidder must certify compliance with the legal regulations in force in the European Union on the protection of personal data (GDPR), services relating to the Information Society (legal notices, cookie policy), consumer protection and e-commerce, and security. The international transfer of data to a country and international organisation will only be admissible if it complies with the provisions established in the GDPR, so that the level of protection and the rights and freedoms of natural persons guaranteed by the regulation is not undermined.

4.3. Advertising and e-commerce

To ensure the integrity of the platform, the administration and configuration of the advertising service and other marketing options implemented will be the responsibility of the successful bidder as part of the service provided, at all times in accordance with the directives of CCMA, S.A. and following the service requirements mentioned in point 3.2.10

The platform must have one or more advertising servers (adserver+native SSP+SSAI), all of which must guarantee compliance with protocols and Open RTB, measurement standards as per IAB. The Adserver must allow the commercial exploitation of its own and third-party content on the platform, guaranteeing that the advertising stack can operate on a price competitive basis throughout its demand chain for the different video, audio and display formats, with the exception of special positions defined by CCMA or platforms that require other negotiations.

Formats that the platform will have to support when the Phase 1 developments are carried out:

- **Display:**
 - Banners, Overlays
- **Live Video and OnDemand:**
 - VOD, FVOD, BVOD, Ad-Replacement/AdInsertion
- **Live and On-Demand Audio:**
 - AOD, ad-replacement/ad-injection for streaming radio, audio-on-demand and podcasts
- **AdvancedTV**
 - Dynamic product placement, L and advancedTV cross-device solution.

CCMA, S.A. must have access to the successful bidder's adserving tools to follow up, both directly on the platform and through the export of data. The CCMA will also need to be able to access via queries that allow the importing of the variables necessary for the invoicing process and their integration into the internal systems of the administration of CCMA, S.A. itself. The successful bidder must regularly provide the specific reporting files from advertising campaigns that show the metrics/KPIs.

Liaison with agencies/advertisers, negotiation, purchase orders and invoicing shall be the responsibility of CCMA, S.A. The successful bidder must maintain the confidentiality of the portfolio and commercial policy.

It will be necessary to provide for the integration of the subscription model.

It will be necessary to provide for the integration of own or third-party e-commerce. For example, the possibility (contextually or by points) of identifying visual brand elements in the productions and of these signs giving the possibility of linking to a cart on the CCMA online store or third-party stores. The resulting administrative management is not included.

Any financial transaction must have a guarantee of parental control and follow current regulations regarding security and privacy.

4.4. Payment and monetisation

The platform must integrate payment gateways, essential functionality to accommodate possible alliances on the platform with third parties that require pay-per-view or subscription models.

Regarding payment gateways, the ability to integrate with at least Google Pay and Apple Pay will be required.

To ensure platform integrity, the administration of the payment gateways implemented and their transactions shall be the responsibility of the successful bidder as part of the service provided, complying with the regulations in force regarding this provision.

Nevertheless, in order to facilitate operational management and coordination, the successful bidder must provide CCMA, S.A. with access to the manager that allows

monitoring of the access processes to payment content by the end user(s) on the platform.

Furthermore, as a complement to the business functionalities, the platform must have the ability to implement pay per view and/or listen in different modalities depending on the needs of CCMA, S.A. or the third parties with whom it has agreements have been reached, and it shall be the responsibility of the successful bidder to supervise all integration processes for:

- Payment for Subscription
- Payment for content

4.5. Rights Management (DRM)

The platform must have content encryption processes that ensure their non-vulnerability with respect to unauthorised access to the content to be protected. In this sense, there will be a DRM system as a protection mechanism.

These protection measures will apply to a part of CCMA, S.A.'s own catalogue and to third party content integrated into the platform that so require it.

4.6. Integrations

The platform will have to be integrated with various components of the CCMA architecture and with other tools necessary for its correct operation. The tools and platforms to be integrated are the following:

- CCMA user registration.
 - This register allows the registration, deregistration, consultation, modification and login of CCMA users.
 - Technologically, Azure AD B2C is used and the integration will be performed with any of the protocols supported by Azure AD B2C (OAUTH2, OpenID)
- Super3 user registration
- CRM and centralised data warehouse of the CCMA
- Audience dialling servers
 - Adobe Experience Cloud
 - Official audience meter (Comscore, GFK, etc.)
 - User experience quality analysis tools (Youbora, Conviva, Firebase, etc.)
 - Real-time audience analysis tool (Google analytics, Chartbeat, Compass, etc.)
 - CCMA inward dialling in real time (Big Data CCMA). The CCMA shall provide a library to be integrated into the different digital products (web portal, mobile apps, SmartTV and HbbTV apps) that collect this information.

- EPG and AraFem (CCMA) servers
 - o CCMA internal resources
 - There will be an API that will have to be accessed from the back office to upload information to the OTT platform, never directly from the customers. This `api.ccma.cat` offers Now&Next information, programme metadata, videos, etc. in JSON format.
 - o EPG servers of the different direct channels that are to be offered
- Advertising servers:
 - o Adserver+SSPNative+SSAI, compatible with all platforms for direct and programmatic management of video, audio and display advertising depending on the format for price and priority unification. Standard market templates, specific templates on TVDigital environment, new evolutionary products.
- Advertising positions that can be integrated into the client applications described in point 4.3.
- Consent Managers (CMP)
 - o Platform client applications must integrate with an IAB-certified consent management platform. It is also necessary to ensure that user consents are transferred to all integrations that require it (advertising calls, audience dialling, targeting tools, etc.).
- Push notification tools
 - o Client applications that allow this will need to integrate with push notification tools.
- Current CCMA, S.A. services that offer the modelling of Productions and Episodes and their metadata (title, synopsis, capitulation, categories, tags, etc.).
- MAM CCMA to use the physical audiovisual material and its associated metadata.
 - o Technical information of the asset (duration, preset, format, quality, other technical details that may be of interest)
 - o Asset broadcast information (rights, playout broadcast date) if applicable.
 - o Media Source/Origin (XXSS, Agency, Own)
 - o Information about the accessibility of the asset (instructions, summary, labelling among others)
- MAM CCMA Ràdio (DALET Galaxy) which manages all the audio produced by Catalunya Ràdio stations (pills, podcasts, programmes, sections, all hour by hour)
 - o Technical information of the asset (duration, preset, format, quality, other technical details that may be of interest)
 - o Asset broadcast information (rights, playout broadcast date) if applicable.
- Corporate WCM/CMS to be able to exchange information between both systems if necessary.

- Video and Audio export circuits of the CCMA
 - o Physical media
 - o Metadata around the media could be:
 - Miscellaneous titles
 - Synopsis
 - Cataloguing
 - Labels
 - Date of publication and expiry
 - Geoblocking at country/region level
 - Credits
 - Code of ethics/age code
 - Season/Relative episode in the season
 - Internal identifier (OP, UP and version)

- :CCMA Licensing Service:
 - o Changes to the rights of an entire production (geoblocking, publication date, expiry date)
 - o Changes to the rights of 1 or N specific episodes of a production (geoblocking, publication date, expiry date)
 Concurrency control that is set by contract can vary the number of episodes that can be published at the same time of a production or programme.
 - o Last-minute broadcast changes caused by current events (breaking news) or special monographic events that may be relevant that make massive changes to the originally planned video schedule.
 These changes must be guaranteed to be reflected in the new platform (CMS) in the shortest possible time. Real-time response times between the Licensing Service and the CMS should be guaranteed.

For integrations, from the backend part of the media managers (MAM) as well as from the WCM/CMS part, CCMA, S.A. has a REST API based on the Spring/SpringBoot framework that can work with authenticated tokens and the different functionalities are authorised based on the token and the client's roles and permissions at the time of authentication. The optimal solution is for the integrations with these services (and with other CCMA, S.A. services) both via API Rest and, in the case of physical media movement, having a hybrid system in which to:

- Generate the import or export job via API Rest authenticated and authorised by CCMA to the successful bidder or from the successful bidder to the CCMA
- Exchange physical media via hot folder system (watchfolder)
- Make a link between the file in the CMS and physical media and upload it afterwards.

It is also possible to work with queue systems (deferred and cumulative) if the work to be done does not require real time. Queues/topics system (Producer – Issuer) can be used to establish integrations between Central Services and the CMS.

This previously defined circuit, preferably via REST API, must be used so that the CCMA can collect the metadata and assets it deems appropriate from the MAM/CMS of the successful bidder.

4.7. Streaming services

Streaming services are the core functionality of the platform subject to the tender. Through the client applications, users will be able to access live video and audio streams and a large catalogue of videos and audios to consume on demand. A satisfactory experience in this audiovisual consumption is key to the overall experience of the platform service. For this reason, the successful bidder must guarantee that the platform meets at least the requirements detailed in this point.

- **Live streaming**

The platform will be used to provide the live TV channels by CCM, S.A. and the broadcasters of Catalunya Ràdio. In addition, it must allow the user to consume exclusive digital streams to cover occasional events, time-limited pop-up channels, FAST channels and third-party channels/stations.

With regard to live video streams: CCMA, S.A. shall deliver streams of both permanent and occasional source signals encoded using its own media in a single quality at source, and the successful bidder's service must provide for the transcoding the adaptive video delivery/publishing with user experience in mind, with in-band management of source advertising signalling and GEO blocking for operational administration.

With regard to live audio streams: CCMA, S.A. shall deliver streams of both permanent and occasional source signals encoded using its proprietary media in single quality at source, and the successful bidder's service must provide for the delivery/publishing of adaptive audio, taking into account the user experience, with in-band management of source advertising signalling for its operational administration, in such a way that micro-cuts (glitches) in the user experience are not produced and the insertion of advertising is seamless for them.

The service will have a live DVR recording functionality for each live streaming signal. It must also be able to provide users with access to the last 7 days of content from linear channels and broadcasters.

The technical characteristics required for live streaming are detailed in **APPENDIX 3** "Technical requirements for systems and infrastructure, in **section A3.3** of these specifications.

- **VoD and AoD streaming**

Through the platform, a large catalogue of videos and audios will be offered on demand, ordered through content carousels and also in sections, verticals and production sheets.

To ensure the best possible user experience in this on-demand consumption, the platform must have, at least the following requirements:

- Playback of audiovisual/multimedia file content adaptively in different scaled resolutions and respecting as the maximum resolution (source) the one provided by the CCMA or the partners for each type of content, to achieve the best user experience in all supported devices.
- Playback of audio file content (AoD) respecting as a single resolution the one provided for CCMA, S.A. or the partners for each piece of content, which can be modified in parameters during the provision of the service and generating the necessary encapsulates to achieve the best user experience on all supported devices.

In particular, the audio content of the platform catalogued as a “**podcast**” type, must be able to be referred to and accessed from external podcast aggregator systems (global internet systems) so that the content arranged in this way has the maximum possible accessibility, and the task of this cataloguing in the third-party aggregator systems designated by the CCMA will be the scope of the service to ensure the functional operational integrity of the global podcast services.

The technical characteristics required for VoD and AoD streaming are detailed in **APPENDIX 3 section A3.3** of this document.

4.8. Client applications

Globally and to ensure the integrity of the platform (both for a single brand or multi-brand environment, as will be detailed later), the development and evolutionary and corrective maintenance of the different client applications for the environments specified in this contract shall be the responsibility of the successful bidder as part of the service provided.

As indicated in the subject matter of these specifications, the client applications generated by the service must be available for the systems that will be detailed later, but which are at least the following: apps for SmartTV, apps for mobile and tablets, streaming devices (dongles), web, HbbTV and voice applications.

The CCMA's initial approach is a single branded platform with its projection of homogeneous client applications for that brand. However, the architecture of the platform must allow a multi-brand positioning and with several client applications for each of these brands, on the same infrastructure and platform. In all cases, CCMA, S.A. shall establish the criteria for typography, brand logo, colour palette and other brand identification elements for the homogenisation of the visual identity that the successful bidder will integrate into the applications of customer

Related to the above and to ensure the integrity of the platform and a homogeneous user experience on the different devices, the design of the flow and operational navigation on the different front ends will be the responsibility of the successful bidder as part of the service provided, as already indicated in a previous point. The successful bidder will have to take the front ends as a conceptual reference and their navigation according to the state of the art of the global multi-device and multi-system OTT platforms: both the interface and the user experience must meet the de facto market standards for the most advanced state of the art.

The successful bidder will propose interactive prototypes to assess the visual and interaction design, as well as the content and functionality architecture, of all client applications and the new functionalities that are incorporated.

In any case, the validation by CCMA, S.A. of the visual and interaction design proposals shall be a prerequisite for their consolidation in the client applications and a procedure or methodology shall be established for this.

Client applications must provide a great user experience, and must be usable, intuitive, efficient and accessible, as well as visually appealing.

Client Applications shall be available in the following environments (and future environments as the Service evolves:

- **WEBSITE**

The CCMA, S.A. OTT platform must have a web version responsive to desktop computers, mobiles and tablets, on a domain owned by the CCMA. The website must be compatible with all major browsers, including Chrome, Edge, Firefox and Safari, as well as possible future browsers.

The website must be accessible in accordance with Royal Decree 1112/2018, of 7 September, on the accessibility of websites and applications for mobile devices in the public sector, which entails an AA certification.

The website must incorporate the necessary security solutions to guarantee the protection of users and their consent in the management of cookies and personal data.

- **MOBILE APPS**

The CCMA, S.A. OTT platform must have a mobile and tablet version published on the two main app markets in the world: iOS and Android. However, CCMA, S.A. reserves the right to decide which other manufacturers and operating systems need to invest more effort at any given time.

With regard to the backward compatibility of its versions, the last two versions of iOS and the last three versions of Android will be taken into account at the time it is applied.

The scope of this tender covers both the elements of new creation at an evolutionary level (new functionalities, redesigns, etc.) and technical and corrective maintenance. It also includes the integration and update of the libraries and SDKs that contain these apps (commercial, audience, error control, user registration, push notifications, user relationship/CMP, etc.), and especially those specific to the mobility environment, such as the integration of push notifications or webviews for apps.

In addition, among the services and tasks included in this tender, it will be necessary to take into account the specific features associated with this type of product, including but not limited to:

- Packaging, certifying and distributing the applications to their corresponding markets, with the metadata and graphic material necessary for publication.
- Implementing the necessary measures to ensure the accessibility of CCMA. S.A.'s mobile applications, complying with current regulations and good practice recommendations.
- Using security solutions to ensure user protection, and use of consent platforms.

- **HBBTV SERVICE**

The OTT platform of CCMA, S.A. must have an HbbTV service associated with the CCMA's DTT video and audio channels compatible with the standard 2.0 and higher versions of this technology, and also with devices that implement the version 1.5 compatible with HTML5.

The scope of this tender covers both the elements of new creation at an evolutionary level (new functionalities, redesigns, advertising integration, etc.) and technical and corrective maintenance. It also includes the integration and update of the libraries and SDKs of this service (commercial, audience, error control, user registration, user relationship/CMP, etc.), and especially the specific ones in the SmartTV environment, such as the integration of remote control browsing, or the synchronisation of streaming events.

In addition, among the services and tasks included in this tender, it shall be necessary to take into account the specific features associated with this type of product, including but not limited to:

- The production of a LITE version of the service for televisions with less technological capacity and with functionality limited by the standards of the HbbTV versions and its integration in the different devices.
- The management and distribution of a complete or LITE version will have to be done through access and blocking lists (allowlist/blocklist) that can be configured both for the global compatibility of the service or for functionalities, with the certification of compatible devices being essential in each case. The management and updating of these access lists is part of the service offered.
- Implementing the necessary measures to ensure the accessibility of CCMA. S.A.'s HbbTV service, complying with current regulations and good practice recommendations.
- Using security solutions to ensure user protection, and use of consent platforms.

- **SMARTTV APPS**

The CCMA, S.A. OTT platform must have apps for the different brands and operating systems listed below:

- Samsung Tizen (models 2017 and up)
- LG webOS (models 2017 and up)
- Android TV
- FireTV
- Apple TV
- HTML5 (solution compatible with Foxxum, Netrange and Xperi)

However, CCMA, S.A. reserves the right to decide which other manufacturers and operating systems need to invest more effort at any given time.

The scope of this tender covers both the elements of new creation at an evolutionary level (new functionalities, redesigns, etc.) and technical and corrective maintenance. It also includes the integration and update of the libraries and SDKs of this service (commercial, audience, error control, user registration, user relationship/CMP, etc.), and especially the specific ones in the SmartTV environment, such as the integration of remote control and mouse browsing, or the synchronisation of streaming events.

In addition, among the services and tasks included in this tender, it shall be necessary to take into account the specific features associated with this type of product, including but not limited to:

- The production of a LITE version of the service for televisions with less technological capacity and with functionalities limited to their capabilities.
 - The management and distribution of a complete or LITE version will have to be done through whitelists/blacklists that can be configured both for the global compatibility of the service or for functionalities, the certification of compatible devices being essential in each case.
 - Packaging, certifying and distributing the applications to their corresponding markets, with the metadata and graphic material necessary for publication.
 - Implementing the necessary measures to ensure the accessibility of CCMA, S.A.'s SmartTV applications, complying with current regulations and best practice recommendations.
 - Using security solutions to ensure user protection, and use of consent platforms.
- **APPS FOR VOICE ASSISTANTS**

The CCMA's OTT platform must have apps for the voice assistants with the most market penetration. Specifically, for Amazon's Alexa and Google Assistant, as

well as future devices and/or assistants with market penetration in the process of consolidation.

4.9. Platform performance

In order to expedite publications, maintain a good user experience, and track usage metrics, the platform is required to remain within the following performance parameters throughout the duration of the service provision:

- Transcoding time: from the moment the first version of the content is delivered to the CMS, and until all the resolutions and icons necessary for its correct reproduction are generated, and are available for publication, the elapsed time must be less than six times its duration (x6 play).
- Parallel tasks: The number of incoming pieces of content processed in parallel by the CMS must be 4 or higher.
- Refresh time: the maximum time from when the command is given to the CMS until it is reflected in the publication shall not exceed 10 seconds.
- Post cancellation time: The maximum time from the command to the CMS until the post disappears shall not exceed 10 seconds.
- Time to load plans in a web environment: the time required to load the first byte of a response to a request must be less than 1 second, and to load all the components of a new plan must be less than 2 seconds from the moment the request event is generated (click, tap, etc.), with the aim of improving the user experience and positioning in search engines. These times shall be the point of reference at the start of the service, and will have to be validated recurrently with tools like PageSpeed Insights or similar to ensure the correct values for future evolutions.
- In a web environment, page rendering performance should be approximately equal to or greater than 60 fps after loading all components and during all interactions.
- Play time: the time required to play a piece of content shall be less than 4 seconds from the moment the request event (click, tap) is generated.
- Latency of live streaming video: latency time from the first quality coming in until the remaining 3 are generated and published shall be less than 40 seconds.
- DVR Latency: less than 15 seconds from the time the request event (click, tap, etc.) is generated. Also, the maximum time for content to be accessible once the DVR element ends shall be less than 60 seconds.

4.10. Platform security

The platform must guarantee security in accordance with the provisions of Royal Decree 311/2022, of 3 May, which regulates the National Security Scheme in the field of Electronic Administration (hereinafter, ENS), of communications with API services, end user applications, management and monitoring applications, and access to content, through secure protocols: HTTPS, SSL or TLS certificates, and Tokens.

For this purpose, the platform must have protection against DDoS attacks, and configuration of Allowlist and Blocklist that guarantee safe traffic between the CCMA and the platform.

In accordance with the above, the bidders must indicate, as indicated in clause 2 of section 9.5 “Content of the envelopes” of point 9 and clause C of section 11.1 “Assessments of the bids” of point 11 of the Specific Administrative Bidding Specifications (PCAP), their corresponding proposals for the following elements:

- Information security of users.
- Security of the content hosted on the platform.
- Security of the data hosted on the platform.

The successful bidder must therefore take responsibility in the event of an attack or consequences arising from the use of the client applications on the devices of the end users.

The candidates will indicate in this section their proposals for the security audit mechanisms on the platform and its content, which they plan to maintain during the execution of the current contract. The security systems must in any case present an audit frequency of at least six months.

In any event, CCMA, S.A. reserves the right to carry out tests or request the corresponding certifications in security matters in order to verify the security terms indicated.

4.11. Player

The video and audio player(s) of the various client applications are required to have the following functionality:

1. Have the basic video and audio playback options (volume control, play/pause, autostart fullscreen and floating playback, forward or backward in the timeline, go to the previous or next video/audio, skip to the next chapter at the time of the credits within the collection being viewed).
2. Work in a responsive environment, that is to say, on any device with HTML5 technology (mobile, tablet and PC), as well as native iOS and Android applications (availability of an SDK for these environments) and SmartTVs (Tizen, WebOS, AndroidTV, AppleTV, FireTV, HTML5, HbbTV).
3. Playback of live streaming/direct and on-demand/deferred.

- a. Support for current MP4, HLS, MPEG-DASH, CMAF and MP3 formats and future UHD (4K+HDR (HLG, HDR10+, Dolby Vision)+NGA videos)
 - b. Support for 360° video playback
 - c. In the case of live streams, DVR support considering that we will have programmes without rights and we must be able to go back and forward even if we pass through a point without rights and the stream gives an access error (error control, access to programmes from the beginning as per meta information)
4. Adaptation to market aspect ratios: 16:9, 9:16, 1:1, 3:2, 21:9
5. Have functions to change the look&feel (skins) of the Player.
 - a. Allow personalisation of the user experience by showing a warning if a piece of content has an adults-only rating
6. Have the option of incorporating the Player in different domains with its own branding.
7. Have the reproduction of subtitles in different formats (WebVTT, SRT, integrated in manifests and in external files etc.).
8. Integration with analytical tools from Adobe Analytics, Comscore, Google Analytics, Chartbeat Youbora as well as flexibility to integrate third-party analytical tools that the CCMA integrates into the platform.
9. Integration with standard sales and marketing protocol (VAST and VPAID) and with all in-stream formats and overlays. Commercial integration with Adservers and SSAI support.
10. Chromecast and AirPlay support.
11. Must comply with the accessibility level AA guidelines.
12. Ability to play multiple qualities and multiple audios.
13. Visualisation and control features on the seek bar such as cuepoints and tooltip-thumbnails using sprites.
14. Have an API for technical integrations:
 - a. responding to ID3 and SCTE-35 type events contained within multimedia
 - b. offer settings that allow the attachment of playlists to automatically play at the end of the playback of a piece of content from CCMA platform video playlists (integration with playlists from CCMA APIs) and related content playlists, with a configurable visual interface that allows parameterisation of actions to be performed when interacting
 - c. full control of the player via API javascript
15. Support content with DRM

16. Support 360° and VR videos
17. Support 4K HDR videos
18. Incorporate the Start over functionality in live streaming of video and audio, to be able to go to the beginning of a programme in case it has already started.
19. Offer the download of the CCMA's own content and eventually, those uploaded by third parties, with different qualities, to be able to consume them offline (taking into account rights management)
20. If a logged-in user has played part of the content of a video or audio, it must be marked on the playback line, so that the user can continue from where they left off.
21. Allow playback based on a time code.
22. Allow the Picture-in-picture functionality.
23. Allow embedding in a shot in AMP format.
24. Manage the errors that may occur by showing the corresponding information to the user (content not available due to lack of rights, geolocation, etc.) or offering a switch to a compatible quality/codec.

4.12. Search engine

The platform must have a predictive search engine (autosuggest and autofill) that allows the user to search for content in different fields of the catalogue, not only by the name of the programme and/or the title of the episode, but also by other metadata, such as the name of the presenter, actor/actress, director, theme, age code, release year, format (FHD, UHD, Dolby, etc.).

If there is no content that exactly matches the search made by the user, the search engine will have to recommend other content that may be of interest to them based on the search made.

The search engine must provide for both the content in the CCMA catalogue and content by third parties, which will also need to be indexed.

The search engine will need to learn from users' searches, suggesting the most popular searches and remembering the user's search history.

The search engine must recommend content in the event that no result is found matching the search made by the user.

The search engine must embed the voice search function in all client applications.

4.13. Personalisation and user services

The platform must be able to function under user authentication, and must be able to offer the following modes of authenticated access, depending on the requirements set by CCMA, S.A. throughout the implementation of the platform:

- Multiple users: the system shows all users who have logged in, and the user can change and select which one they access the service with (resetting the password if they change user). Each user corresponds to an active user of the database(s) of registered users, and has their username and password. (YouTube Model)
- A single registered user with several associated consumption profiles. There is only one user and password. Associated profiles do not have their own username and password. (Netflix Model)
- A subscription with several users who can log in. Each linked user has their own username and password, but they are linked to an admin user who pays for the subscription. (Spotify Model)

In addition, all client applications on the platform must offer a user management space (for registered users), in which it is possible at any time to view and/or modify data, preferences and settings related to subscriptions to notifications, newsletters, consumption and/or participation history, assignment of content limitation according to age codes and/or other parental control mechanisms, and all the functionalities associated with the registered user.

The audiovisual content platform covered by the tender shall offer a personalised experience to the user, regardless of the device from which they connect.

The platform must offer the following functionalities for authenticated users:

- **Continue watching and listening**
The service will remind the user of the video and audio content they are watching and/or listening to so that they can continue where they left off and will offer them the next episode
- **List of preferred content**
The user can set up a list of favourite programmes, videos and audios. These favourites can be linked with the alert system to announce new content (new episodes, new seasons, etc.)
- **Personalised content recommendation**
The OTT service will offer personalised content recommendations based on the user's multi-device consumption and with content relationships based on metadata to facilitate the discovery of new and archived content related to user preferences.

The recommendations will take into account not only the CCMA catalogue but also that of other content providers, either added to the platform or integrated

into it.

- **Recommendation by territorial location**

The platform must allow the personalisation of all its content based on the user's location. This customisation can be carried out based on an active choice by the user, according to their preferences, or passive systems based on geolocation systems can be proposed, depending on the client application, with the consequent consent by the user. This customisation affects the offering of live video and audio streams and also the entire offering of on-demand content.

- **Personalised notifications**

Based on the user's consumption or based on the explicit selection of topics by the user

- **Scheduled premiere alerts**

The platform must be able to offer alerts (programme premieres or new seasons, for example) to users who have requested them

- **Personalised newsletters**

Personalised newsletters must be able to be sent to users based on their interests

The platform must also allow the creation of subsets of users defined manually or selected based on automatic grouping criteria and be able to offer:

- **Early access to certain features to participate as Beta testers**

Offer the possibility to be able to sign up for a Beta programme to access an environment or advanced functionalities before it reaches everyone.

- **Premium access to certain content not available to most users**

For example, the pilot episode of a new series or format and being able to participate in providing feedback.

The system of recommendations will have to take into account both user preferences and editorial or strategic indications that the CCMA, SA considers appropriate at any given time, including those related to avoiding the creation of filter bubbles and resonance boxes.

4.14. Participation and interaction

The platform will have to provide functionality for participation and interaction by end users, as well as tools to provide a gamified consumer experience.

Actions must be associated with user registration, and may or may not have associated prizes (competitions).

Among the interactive options, the platform must provide various participation formats (from surveys to trivia question type formats). It must also provide a social layer to the consumption of content, where the user can rate and/or comment.

In the environment of live video and audio channels, the platform will need to provide a chat-like environment where users who are simultaneously consuming the content can comment on it and build a community.

Throughout the service, and depending on market changes and the strategic needs of the CCMA, the platform will have to adjust its participatory options.

All information related to participatory and interactive actions must be accessible from analytical environments.

4.15. Data protection

The platform must guarantee compliance with the General Data Protection Regulation. In this regard, it must have the technological guarantees to guarantee the privacy of personal data, and must provide users with information about the sources and recipients of the data, the purpose for which they are processed, information about the countries in which they are stored and the time period. It must also have the necessary mechanisms to comply with users' right of access to obtain a copy of their raw data.

The Data Protection Officer (DPO) of the CCMA shall ensure the platform's compliance with the data protection regulations, although the responsibility for this compliance will fall on the successful bidder, as the party responsible for the development and technological exploitation of the service

All client applications on the platform must also have a consent management platform (CMP), to guarantee transparency with users and their acceptance of the use of cookies and other types of technological components.

4.16. Accessibility

The Catalan Corporation for Audiovisual Media (CCMA) has undertaken to make its websites and apps accessible in accordance with Royal Decree 1112/2018, of 7 September, on the accessibility of websites and applications for mobile devices in the public sector (hereinafter Royal Decree 1112/2018, of 7 September).

The client applications on the platform must all comply with the accessibility requirements for the public sector, according to the regulations in force throughout the duration of the service.

4.17 Onboarding process and design of in-app aids

The platform will have to offer users an attractive and gamified onboarding environment, which allows the user's data to be collected organically and not perceived as intrusive.

The bidding company must offer a strategy proposal for user onboarding, retention and loyalty (Report 5, in the deliverables for the assessment of the subjective criteria, as detailed in the Specific Administrative Bidding Conditions (PCAP).

In addition, all client applications must offer solutions to facilitate user browsing through their interfaces. Therefore, they will propose help elements or features to be discovered.

These help elements should be configurable to display with appropriate frequency and not detract from the experience of using the applications.

5. GOVERNANCE AND MONITORING OF THE SERVICE

5.1. Service methodology and monitoring

Due to the fact that the service includes several types of services, with different natures, the successful bidder shall make a proposal for methodology and monitoring of the service, which shall be used as an element of subjective assessment.

The proposal submitted must provide for the methodology to be used for each sub-service, as well as the control points and how they will be executed. With regard to these control points, it shall be necessary to carry out at least:

- Joint monitoring committee to evaluate and agree on technical and functional aspects of the platform
- In-person and/or telematic weekly follow-up and planning meetings.
- In-person and/or online service evaluation meetings and monitoring of fortnightly indicators.

CCMA, S.A. may also require additional in-person meetings at the facilities of CCMA, S.A., whether periodic or one-off.

5.2. Professional profiles assigned to the service

The number and composition of professional profiles assigned to the service must have the necessary continuity to ensure correct execution of the contract. The volume estimate assigned to each service is defined in **Appendix 1** "Requirements for OTT platform management services.

In order to perform the service with full guarantees, it is essential for the assigned team to have knowledge of the technologies, methodologies and tools that are considered critical for the development of the service.

To carry out all maintenance services, based on previous experiences in similar services and the market analysis carried out, it is considered that the service should have the following specialised profiles:

- Service Manager
- Content Manager
- Content curator
- Multimedia producer
- SEO and ASO specialist

- Digital marketing specialist
- Product Analyst
- UX/UI designer
- Data Analyst
- Customer service technician
- Digital Ad trafficker
- Social&Paid senior media manager
- Operating and systems technicians
- Analysts and Programmers (with knowledge of the technologies necessary to carry out the service)

The successful bidder shall assign these professional profiles to the service covered by this tender. In case of mobility of personnel dedicated to the service within the successful bidder, it will be necessary to provide the same profile and inform the CCMA. Said incorporation shall not have any economic impact for CCMA, S.A. during the adaptation period.

5.3. Infrastructure and equipment to perform the service

The service shall be provided from the premises of the successful bidder, who will also be responsible for guaranteeing the necessary equipment for the provision of the service. The bidder will have to take care of the necessary infrastructure, workplace, hardware and software with its licences to carry out the service properly. In this regard, it must guarantee the necessary computer equipment for the positions in charge of providing the service.

The bidder must guarantee and demonstrate the proper functioning, throughout the service, of all the functionalities and integration services of the various client applications (web environment, mobile applications, TV applications, dongles and voice assistants)

For this reason, the bidder must have continuous access to a fleet of physical devices (not emulators) that at least guarantees coverage in the following environments:

- Web environment from all browsers and operating systems with greater market penetration. Microsoft Edge, Chrome, Firefox and Safari on Windows, iOS and Android
- Mobiles and tablets with the last two versions of iOS and the last three versions of Android with different screen resolutions
- Samsung Tizen (models 2017 and up)
- LG webOS (models 2017 and up)

- Android TV
- FireTV
- Apple TV
- Different TVs with HbbTV service compatible with standard 2.0 and above. Also with devices that implement version 1.5 compatible with HTML5.
- Environments compatible with Foxxum, Netrange, Xperi or Hisense Vidaa
- Models of Alexa Amazon and Google Assistant voice assistants

The bidder must provide a statement of compliance that it will have the laboratory with all the devices listed in this point no later than one month after the start of the service, and CCMA, S.A. may demand to see it in person.

The successful bidder must augment this laboratory with the necessary devices as the platform evolves (for example, it will be necessary to incorporate consoles or other consumer devices).

The successful bidder shall be responsible for the resulting consumption and compliance with the security protocols established by CCMA, S.A.

CCMA, S.A. shall give the bidder remote access, via VPN or alternative system, to the own tools that the bidder needs to carry out the assigned task. Other connection options may be proposed that CCMA, S.A. will evaluate and authorise if it considers them appropriate and safe.

With regard to the technological infrastructure of the platform, the company must have all the necessary equipment to guarantee the technical requirements defined in Appendix 4, "Previous technical requirements".

On the other hand, the costs of dedication and travel to the offices of CCMA, S.A. if necessary for coordination tasks and for the installation and maintenance of computer equipment will be considered included in the price of the tender.

5.4. Service working hours and schedule

The platform must be operational 24 hours a day, every day of the year. Therefore, the service must ensure that it will have the necessary technical equipment to guarantee its correct operation at all times.

In addition, with regard to maintenance services, there are certain services that require dedication every day of the year, except during night hours (for example, the Content Curation service, given that throughout the entire day new content will be added to the platform which will need to be curated at the level of media and images, and also organised within the offering from the platform's catalogue).

In this regard, the bidder shall organise its maintenance teams (except for the technical support service, which is 24/7), in such a way as to guarantee that between 8:00 a.m. and 12:00 midnight every day of the year, it will have a response time of less than 15 minutes at the beginning of the resolution of the request whenever the CCMA makes requests identified as urgent. This response must be an acknowledgement of receipt with confirmation of the initiation of resolution of the request made. On an exceptional

basis, the CCMA, SA may request to modify this timetable from time to time to cover certain needs

With regard to technical incidents, it must guarantee response and resolution times based on the priority codes specified in Table 2 of point 5.8. (Service agreements and penalties), in the Penalties for Incidents section.

In the proposed methodology and monitoring of the service, which will be used as an element of subjective assessment, as defined in point 11, section 11.1 clause C of the PCAP, the bidding company must detail how it will be able to guarantee this response time. The details of the schedules and organisation of each of the services will also be assessed.

The successful bidder undertakes to agree the vacation periods of the team taking into account the needs of the service and, in the event that it is extremely necessary, to provide a substitute for the person during this period.

In the case of sick leave and/or any other leave that causes the absence of the people assigned to the service for a period exceeding 48 hours, the successful bidder undertakes to provide a substitute with the same profile in less than 7 days.

In addition, when there is a change of profile assigned to one of the services, the training of the new profile will be the responsibility of the successful bidder, and in no case shall CCMA, S.A. be invoiced for the hours of training given to the new profiles.

The successful bidder shall assign a permanently operational and exclusive on-call mobile phone number to attend to CCMA, S.A. in the event of incidents of the various services or urgent services and requests. It shall also have an email or request management tool for all other requests depending on the level of urgency.

5.5. Security protocols for access to the CCMA

The bidder is obliged to comply with the requirements that will be provided by CCMA, S.A. regarding people who will access the systems of CCMA, S.A., the assigned users, the software they will be able to access and the effective dates of access to the service.

5.6. Rights and ownership

Without prejudice to the knowledge acquired by the successful bidder, the industrial and intellectual property of the work carried out as a result of the execution of the contract shall be transferred exclusively, without limitation of time or territory, to CCMA, S.A.

Specifically, the successful bidder expressly accepts that all rights corresponding to the client applications generated during the term of the contract, as well as all their updates, shall be the property of CCMA, S.A., including the programme or source code, and in particular, the rights of reproduction, distribution, public communication, making available, transformation, translation, arrangement, adaptation, making successive versions and any others that may be susceptible to economic exploitation. These rights are acquired exclusively, on any mode of exploitation and/or support existing on the date of the signing of the contract, with no time limitation and with a territorial scope of the entire world. The successful bidder shall provide CCMA, S.A. with the source code of

both the client applications and the developments made within the framework of the contract of this tender and on behalf of CCMA, S.A.

CCMA, S.A. shall receive the final client applications in each creation or update process. It shall be the responsibility of CCMA, S.A. to load the client applications in its corporate scope in each case and in each application market of each system/manufacturer (app market/store). The successful bidder must assist CCMA, S.A. in the dialogue with the manufacturers in the event that it is necessary for the publication of the applications. However, CCMA, S.A. may fully or partially delegate to the successful bidder as part of the service. For the purposes of both this paragraph and the previous ones, CCMA, S.A. will access the programme or source code.

Likewise, CCMA, S.A. shall be the sole and exclusive owner of the domains, the brand or brands and the distinctive signs of the OTT platform that is covered by the contract.

5.7. Continuity of the service

In the event that the contract is not extended or needs to be terminated early for any reason, the successful bidder must provide service for a maximum period of 6 months counted from the end of the mandatory initial or extended period, or from the date of early termination of the contract.

The price of the service shall be that stipulated in the award contract in accordance with the services actually provided during the validity of this period.

CCMA, S.A. reserves the right to end at any time the continuity of the services described in section 3.2 “*Scope of Management services*” with 90 days’ prior notice. The price of the affected service will be in accordance with the percentage on the annual price of the management services stipulated by the successful bidder according to the table in Appendix 8 of the Specific Administrative Bidding Specifications (PCAP).

The services that may be continued are:

3.2.2 Content curation service.

3.2.3 Multimedia creativity generation service

3.2.4 SEO and ASO strategy and execution support service

3.2.5 Design support service and promotion and loyalty strategies

3.2.6 Service of A/B tests

3.2.7 Experience service and user testing and research

3.2.8 Digital analytics service

3.2.9 User incident management service

3.2.10 Advertising sales maintenance service

3.2.11 Linguistic service

5.8. Service agreements and penalties

PENALTIES FOR INCIDENTS

- To guarantee the operation of the platform, penalties may be applied in the case of technical incidents resulting from development and/or operation errors by the successful bidder.

Service errors will be counted as per Table 1, in the following manner:

- 5 points for priority 1 incidents, high.
- 3 points for priority 2 incidents, average.
- 3 points for priority 3 incidents, low.

Table 1: Priority Levels of Incidents

Priority	Error
1. High: Incidents which affect the entire service	a) Total stoppage of a system, component or client application of the platform, with serious impact on the publication of content and the functionality of the platform.
2. Medium: Incidents which do not affect the entirety of client applications	a) Degradation or partial loss of a system, component or client application of the platform, with moderate impact on the publication of content and the functionality of the platform.
3. Low	Incidents not contemplated in previous points

In addition, the Bidder shall comply with Table 2, which shows the response times associated with events identified with or by the service. The priority assigned to the case by CCMA, S.A. dictates these response time targets.

Table 2: Priority Codes and Response Time Scale and Resolution Time:

Priority	Response time	Resolution time
1	5 minutes maximum	1 hour

2	10 minutes maximum	4 hours
3	30 minutes maximum	12 hours

These times do not in any case include the validation periods of the Markets.

In the case of non-compliance with these resolution times, 1 penalty point will be applied for each hour of delay in resolving the incident. The time counts from when the incident becomes known and the penalty is applied based on the excess time over the maximum resolution time marked in Table 2.

Example: Priority 1 incident

- From 0 to 1 hour: no penalty
- From 1 hour and a minute to 2 hours until resolution: 1 penalty point
- From 2 hours and one minute to 3 hours until resolution: 2 penalty points
- Etc.

There must be a “ticketing” type of tool for tracking incidents

The person in charge of the service on behalf of the successful bidder shall monitor all incidents and response times and resolution times, and in the monthly follow-up with the CCMA shall present the incident report, with all incidents ordered by priority 1, 2 and 3, response time and resolution time, as well as all associated penalty points. This report (which the CCMA will also be able to supervise on its own behalf), will be used to calculate the monthly penalties for the service.

If in the same month the company accumulates more than 10 penalty points in total for incidents, including incidents and for delays in their resolution, the CCMA shall be entitled to apply financial penalties on the invoice corresponding to the licence to use the platform for that month, as follows:

- 11 to 15 points: - 1%
- 16 to 20 points: - 2%
- 21 to 24 points: - 4%
- 25 to 29 points: - 8%
- 30 to 34 points: - 16%
- And so consecutively (for every 4 points, the previous penalty would be doubled).

At the end of each year of service, a global report will be drafted and if the company accumulates 60 points or more (both for incidents and for delays in response time and/or resolution), CCMA, S.A. reserves the right to terminate the contract

PENALTIES FOR UNAVAILABILITY OF EMPLOYEES ASSIGNED TO THE SERVICE

As detailed in point 5.4. of this document (Service working hours and schedule), the successful bidder undertakes to plan the employees assigned to the service that guarantees the service adequately during vacation periods and/or public holidays, as well as to cover absences.

In addition, in point 9.5. of the Specific Administrative Bidding Specifications (PCAP) (Content of the Envelopes), in the documentation relating to the subjective assessment criteria (Envelope B), the bidding company must present a report explaining the “General plan of management services”.

In this report, it must detail, among other aspects, the methodology, description and organisation of the teams (of all the sub-services), and it must define how it will plan the employees assigned to the service to guarantee the necessary coverage. It must also be possible to detail the proposed key indicators for monitoring the service.

In the proposal of indicators, it must include those related to staff rotation and days with staff unexpectedly not providing service, as well as the partial unavailability of a sub-service (in the event that an assigned employee misses work for 8 days or more). For each of these indicators, the bidding company must propose the level of service committed to each one, as well as the proposed penalty for non-compliance. The submitted proposal shall be binding at service agreement level, as well as the associated penalties.

Penalties due to the unavailability of employees assigned to the service shall be applied to the invoice for the item “Management costs” for the month(s) where there is non-compliance with the agreed levels.

PENALTIES FOR BREACH OF AGREED SCHEDULE

In the implementation of the platform by phases, fixed schedules are established for each of the phases. At the beginning of each phase there is a task of conceptual definition and scope, and in this task a realistic and acceptable definition must be made within the schedule of that phase. Once this scope has been agreed with the CCMA, the successful bidder has the responsibility to comply with the agreed scope and deadline without incurring any additional costs not included in the overall service budget.

In the event that there are delays in deliveries, and such delays (i) are not caused by a change in scope at the request of the CCMA, (ii) a delay in a task of the CCMA dependent on the development of the platform, or (iii) are beyond the control of the successful bidder, the CCMA shall be entitled to apply financial penalties to the invoice for the item “Platform development” for the month(s) with arrears.

The penalties will be applied to the monthly invoice for the month in which the delays occurred, calculated in working days and will be applied as follows:

- 1 to 5 days: - 5%
- 6 to 11 days: - 10%
- 12 to 16 days: - 20%
- 17 to 21 days: - 40%

- 22 to 26 days: - 80%
- 26 to 31 days: - 100%

If a delivery is delayed by more than one month, 100% of the penalty shall be applied in the first month and in the second month the penalty will be applied as a percentage from the 1st day of the second month.

In the "General plan of management services" report, defined in **point 9.5.** of the Specific Administrative Bidding Specifications (PCAP), the necessary indicators to monitor delays with respect to the committed schedule must be included.

PENALTIES FOR DEFICIENCIES IN OF QUALITY CONTROL

Any deployment/production of a new functionality, both in client applications and in management tools, must have been sufficiently tested and passed all necessary quality controls. In order to do this, the successful bidder must have the necessary trial, testing and pre-production environments to detect bugs and functional problems and solve them before uploading to production. In these environments, it will be necessary to perform the extensive trials and automated tests necessary to ensure a smooth deployment.

In the event that incidents deriving from an increase in production are detected, the CCMA shall have the right to apply financial penalties to the invoice for the "Platform development" item. These penalties shall be applied to the monthly invoice originally planned for the item.

The criteria for applying penalties will be: within a calendar month, number of incidents, bugs or functional errors resulting from an increase in production:

- 2 to 5 errors: - 5%
- 6 to 10 errors: - 10%
- 11 to 15 errors: - 20%
- + 15 errors: - 40%

The penalties for quality control deficits are complementary and are added to the penalties for incidents.

In the "General plan of management services" report, defined in **point 9.5.** of the Specific Administrative Bidding Specifications (PCAP), it will be necessary to include the necessary indicators to track errors arising from production uploads.

PENALTIES FOR ORTHOTYPOGRAPHIC ERRORS

As defined in point 3.2.12. of these specifications, the bidder shall undertake the correction and linguistic adaptation of the public publications of the platform generated

by the maintenance team in accordance with the linguistic principles and criteria of the CCMA Style Book, which includes the language portal *ésAdir*.

To guarantee the linguistic quality of the platform, the CCMA shall have the right to apply penalties in the event that spelling, grammatical or typographical errors are detected in textual content published on the platform drafted by the successful bidder's teams. . These penalties will be financial and will be applied to the invoice for the "Management costs" item, on the monthly invoice originally planned for the item.

Penalties will be applied following the following criteria: within a calendar month, misspellings, grammatical errors or typographical errors published:

- 2 to 5 errors: - 0.25%
- 6 to 11 errors: - 0.5%
- 12 to 16 errors: - 0.75%
- 17 to 21 errors: - 1%
- And so on in order (every 5 mistakes = an additional 0.25% penalty).

In the "General plan of management services" report, defined in point 9.5. of the Specific Administrative Bidding Specifications (PCAP), it will be necessary to include the necessary indicators to monitor these faults and errors.

5.9. Invoice monitoring

The platform must make a tool available to the CCMA that allows the monitoring of the different metrics of services that can be invoiced. The metrics and concepts that are established for the invoicing of the services must include those indicated in **clause 16** of the price payment of the Specific Administrative Bidding Specifications (PCAP) and those that are agreed upon in the development of the services of the platform

The tool provided for monitoring invoices will make it easier to validate the metrics and consumption of the calculation of the information, discriminating both by time periods and by content provided by the CCMA or by third parties.

The invoice monitoring tool must be scalable and conform to CCMA's brand and service architecture throughout the evolution of the service. Within this architecture, it must be able to provide global economic detail and also for each of the brands and/or services.

In all cases, the calculation system must be detailed and documented with the data sources used.

6. INFORMATIVE MEETING

Companies interested in participating in the tender must attend a preparatory informative meeting at the facilities of CCMA, S.A., at the headquarters of the television channel in Sant Joan Despí.

To this end, they must confirm, by email and before **18th of April 2023 at 1:00 p.m.**, their attendance at the address:

administracióniserveiscompres@ccma.cat

indicating in the subject of the email: **CPO 2304OB01 visit to the facilities.**

This email must include the name of the company, the name and ID number of the person or persons who will attend (maximum two), and the name of the contact person, their telephone number and e-mail address. **19th of April 2023 at 9:30 a.m.** at the television facilities of CCMA, S.A. in Sant Joan Despí, at Carrer de Oriol Martorell 1.

The preparatory informative meeting will be held with all interested companies at the same time. Any doubts the bidding companies may have will be answered at the in-person session.

CCMA, S.A. will issue a certificate of attendance at this meeting, and this will be essential to be able to participate in the tender. This certificate must be included in Envelope A of the tender. Failure to provide this certificate shall result in exclusion from the procedure.

7. SERVICE RETURN OR TRANSFER PHASE

The return phase must guarantee the continuity of the service provided to CCMA, S.A. For this phase, the bidder is required to prepare a detailed service return or transfer plan, which describes the obligations and tasks to be carried out by each of the parties in relation to the return and which includes the terms and conditions in which the same will be carried out, which will be at least:

- Return term.
- Quantify the number of resources that are considered necessary to carry out the transfer of knowledge and technology.
- Knowledge transfer methodology of the fundamental aspects of ongoing operations, at least, will describe,
 - Assistance, training and documentation on the operating procedures of CCMA, S.A., to the new provider.
 - Access, information, documentation and any other material used by the provider or CCMA, S.A. for services.
 - Training to be carried out.
- Activities to be carried out, planning the return period and delivery plan,
 - Knowledge, number of sessions and format of the sessions.
 - Documentation, determine the type of technical documentation to deliver, delivery deadlines, planning, type of sessions for explaining the documentation.
 - Service, determine the conditions of the service transfer plan.
 - Transfer of source code and resources that have been carried out ad-hoc within the framework of this tender and by order of the CCMA
 - Transfer of all content (videos, audio, subtitles, metadata, etc.) that has been managed within the framework of this tender

- Plan to define the responsibilities and manage the resolution of problems between the new successful bidder, CCMA, S.A. and other providers.
- Requirements to be asked of the new successful bidder to complete the correct transfer of knowledge and technology transfer.
- In the return period of the service, this return plan must not cause any discontinuity in the service.

Sant Joan Despí, April 2023

APPENDIX 1

Requirements for OTT platform maintenance services

Bidders must provide the service with the appropriate professional profiles to execute it with full guarantees, and in accordance with at least a minimum level of experience required in similar services.

The number and composition of professional profiles assigned to the service must have the necessary continuity to ensure correct execution of the contract.

In the event that the successful bidder should modify the profiles assigned to the initially planned maintenance service, according to the required level, it must provide an equivalent or higher profile with the validation of the CCMA.

To carry out all maintenance services, the service must have specialised professional profiles that, based on previous experience in similar services and market analysis, would be, both in terms of profiles and in terms of volume of hours, that which is detailed below:

Maintenance and general monitoring of the service

Service responsible for the general coordination of all services performed by the contracted company. It will be necessary to solve any administrative or contractual aspect generated by the service. It is responsible for the strategic product proposals and their execution, as well as the dialogue with CCMA, S.A.

It will have to ensure the professionalism and proper functioning of the team assigned to the service and, if necessary, plan and execute any personnel changes.

It will also be necessary to attend service coordination meetings or specific meetings for each project, in addition to guiding CCMA, S.A. in those matters that are part of the contracted service.

If any of the services is assessed as not achieving the expected performance, the successful tenderer must take all appropriate actions to reverse the situation

Estimated annual hours: 1,736

Content curation

Team of Content Manager and Content curators.

Estimated annual hours: 20,832

Generation of multimedia creativities

Team of multimedia graphic producers.

Estimated annual hours: 5,208

A/B testing service

Includes specialist graphic multimedia producer and A/B testing

Estimated annual hours: 1,736

Support in SEO and ASO strategy and execution

Includes SEO and ASO Specialist.

Estimated annual hours: 1,736

Promotion and loyalty design support

Includes Digital Marketing Specialist

Estimated annual hours: 1,736

User experience design, testing and research with users

Includes Specialist User Research, UX and UI.

Estimated annual hours: 1,736

Digital Analytics

Team of digital analysts

Estimated annual hours: 3,472

User incident management

Customer service team

Estimated annual hours: 3,472

Advertising sales management

Team of Digital ad traffickers

Estimated annual hours: 3,472

Linguistic service

Stylistic and typographic correction.

Estimated annual hours: 2,163

Activation service

Partial dedication of Senior Social and Paid Media Manager with budget for advertising campaigns.

Estimated annual hours of SP Media Manager: 868

Net budget of €2,250,000 to be guaranteed by the bidder: €250,000 (1st year) and €500,000 (each remaining year). Estimated maximum all inclusive total budget in EUR: €291,500 (1st year) and the remaining €583,000 annually (up to €2,623,500 in five years).

Platform technical support service

Technical support team.

Estimated annual hours: 17,360

Technical development service

Development team.

Estimated annual hours: 6,944 for corrections and small adaptations, 14,000 for requests for new developments (total 20,944)

Ancillary services

In the event that they are requested, the maximum estimate of the all-inclusive accumulated total is €549,504 between the 2nd and 5th year.

APPENDIX 2

Minimum functionalities of the bidding company's OTT solution

The OTT commercial solution of the bidding company must have, at the time of submission to the tender, at least the following functionalities:

- Client applications
 - App SmartTV (at least one app published either on Samsung Tizen, on LG webOS, on Android TV or in HTML5)
 - Mobile apps
 - Apple (iOS 15 or higher)
 - Google (Android 10 or higher)
 - Website
- Advertising model that the platform supports:
 - Free video on demand (FVOD)
 - Ad-supported video on demand (AVOD)
- User registration and authentication
 - The platform has user registration and a user authentication system in all client applications.
- CMS
 - Management of each content asset (including intake, editing and deletion) and administration of the schedule (date/time of activation and date/time of cancellation, scheduled or manual) of its publication. Considering the Asset as an identifier of the different types of content (Video, Image, etc.).
 - Management of content collections (categorisation, playlists, podcast lists, etc.) and administration of the schedule (activation and cancellation, scheduled or manual) of its publication.
 - Management of editorial workflows, being able to pass the content through different states (editing, work, correction, publication, archiving, unpublication, etc.)
 - Content, fields and actions controlled according to CMS user roles/permissions
 - Search engine for content as well as resources (images). Search by text, filters by dates, sorting, last modifications, last activity by user.
 - Possibility to logically group two or more pieces of content (trailer + video, subtitle files, audio description version, promotional images, Dolby version)
 - Display/Player for playing video/audio

- Options to configure the structure of some client application planes
- Basic management of rights and geoblocking (at country level) of Assets (of the entire programme or specific episodes).
- Management of live broadcasts
- Integration of *SEO* tags and actions (indexing in front-end web search engines). Insertion of tags for SEO positioning, cataloguing, etc.
- Player
 - Basic video and audio playback options (volume control, play/pause, autostart, fullscreen, seek).
 - Work in a responsive environment, that is to say, on any device with HTML5 technology (mobile, tablet and PC), as well as native iOS and Android applications (availability of an SDK for these environments) and minimum in an application with the native operating system of SmartTVs.
 - Playback of live streaming/direct and on-demand/deferred.
 - Support for MP4, HLS, MPEG-DASH, CMAF and MP3 formats
 - DVR support in the case of live shows
 - Includes the reproduction of subtitles.
 - Integration with analytical tools
 - Integration with standard sales and marketing protocol (VAST and VPAID) and with all in-stream formats and overlays. Commercial integration with Adservers.
 - Ability to play multiple qualities.
- Search engine
 - The client applications incorporate a predictive search engine that allows the user to search for content in different fields of the catalogue, not only by the name of the programme and/or the title of the episode, but also using other metadata.
- Personalisation
 - The platform offers, through its client applications, a personalisation service for authenticated users consisting of reminding the user of the video and

audio content they have been watching and/or listening to and at what point they are in the playback, so they can pick up where they left off.

All these minimum functionalities of the OTT commercial solution of the bidding company are mandatory and will be corroborated by CCMA, S.A. with the procedure established in the **Technical Information clause described in point 2 “Content of Envelope B” of section 9.4 “Content of the envelopes” of the SPECIFIC ADMINISTRATIVE BIDDING SPECIFICATIONS (PCAP)**. If the verifications do not meet all the requested functionalities, the company shall be considered excluded from the procedure.

APPENDIX 3

Technical requirements of the systems and the infrastructure

The successful bidder must certify, according to point two "Purpose of the Contract" and point two "Content of Envelope B" of section 9.4 "Content of Envelopes" of the SPECIFIC ADMINISTRATIVE BIDDING SPECIFICATIONS (PCAP), that once the contract has been awarded and the service started, it gathers the systems and infrastructure necessary to, within the defined calendar, respond to the technical requirements described in this Appendix. If the verifications do not meet all the requested functionalities, the company shall be considered excluded from the procedure.

Note: For calculation purposes, the annual periods (years) shall be the period of 12 months from the start of the execution of the contract derived from the tender award.

A3.1 TECHNICAL REQUIREMENTS FOR THE STORAGE SYSTEM

The platform provider must have a storage system to support the content of the platform.

The set of mandatory requirements for the storage system are

[Req. 1.] The estimated volume must provide for the following needs:

- The upload of an initial file with a total volume of 390 TB no later than the third month from the start of the contract.
- A monthly increase during Year 1 of 7.5 TB.
- A monthly increase during Year 2 of 9.3 TB.
- A monthly increase during Year 3 of 11.5 TB.
- A monthly increase during Year 4 of 14 TB.
- A monthly increase during Year 5 of 17.5 TB.

Summary of volumetric estimation in TB by annual periods.

Any 1	Any 2	Any 3	Any 4	Any 5
480	592	730	898	1.108

Volumetrics, in relation to the number of files linked to the content manager (CMS) and supported by the storage system, is estimated to be able to manage the following volume of video and audio assets:

- Initial file upload
 - Videos: 600,000
 - Audios: 850,000
- Generated in remainder of first annual period:
 - Videos: 47,000
 - Audios: 62,000
- Generated in second annual period:
 - Videos: 58,750
 - Audios: 77,500
- Generated in third annual period:
 - Videos: 73,437

- Audios: 96,875
- Generated in fourth annual period:
 - Videos: 91,800
 - Audios: 121,000
- Generated in fifth annual period:
 - Videos: 114,000
 - Audios: 151,000

[Req. 2.] The storage must support the content in the following formats:

- Source format of content for encoding to adaptive format and for progressive download on devices that do not support adaptive format
 - HD content (2 instances):
 - Video 1920x1080 MP4 at 4 Mbits and Audio AAC 128 Kbits 48 kHz
 - Video 1290x720 MP4 at 2.5 Mbits and Audio AAC 128 Kbits 48 kHz
 - UHD/HDR content:
 - Video 3840x2160 H265 at 15 Mbits and 2 audio channels AAC 128 Kbits 48 kHz
- HLS format
 - HD content (3 instances)
 - H.264 1920x1080 at 4 Mbits
 - H.264 1280x720 at 2 Mbits
 - H.264 1024x576 MP4 1.6 Mbit
 - UHD/HLG content (1 instance)
 - H265/HLG 3840x2176 at 15 Mbits and 1 audio channel AAC 128 Kbits 48 kHz
 -
- DASH format
 - HD content (3 instances)
 - 1920x1080 MP4 4 Mbit
 - 1280x720 2 MP4 2 Mbit
 - 1024x576 MP4 1.6 Mbit
 - UHD/HLG content (1 instance)
 - H265/HLG 3840x2160 at 15 Mbits and 2 audio channels AAC 128 Kbits 48 kHz

Note: It is considered that the media/chunks that support the HLS and DASH formats will not be duplicated, because it will be possible to work in the CMAF format that takes advantage of the encoding to generate the two formats

[Req.3.] The storage system must have high availability and redundancy systems to guarantee 24/7 access to the content on the platform

[Req.4.] The storage system must have “disaster recovery” systems and be able to restore it in the event of a loss of content

A3.2 TECHNICAL REQUIREMENTS FOR THE CONTENT DISTRIBUTION SYSTEM (CDN)

The platform provider must have a content distribution system (CDN) that can support:

- Functionality 1: Acceleration and distribution of web traffic with HTTP/S.
- Functionality 2: Media distribution with HTTP/S.

Estimated aggregate traffic, delivered for all services, shall be as follows

- Year 1 (last 6 months of the year)
 - Website: 2.509 TB (6 months)
 - Mean 57,5 PB (6 months)

The successful bidder must consider that the requirements that will subsequently be required each year are:

- Year 2
 - Website: 5.771TB
 - Mean 132,2 PB
- Year 3
 - Website: 6.636 TB
 - Mean 152,1 PB
- Year 4
 - Website: 7.623TB
 - Mean 175 PB
- Year 5
 - Website: 8.777 TB
 - Mean 201 PB

The content manager is expected to be able to manage the following volume of video and audio assets:

- Initial file upload
 - Videos: 600,000
 - Audios: 850,000
- Year 1
 - Videos: 47,000
 - Audios: 62,000

The successful bidder must consider that the requirements that will subsequently be required each year are:

- Year 2
 - Videos: 58,750
 - Audios: 77,500
- Year 3
 - Videos: 73,437
 - Audios: 96,875
- Year 4
 - Videos: 91,800
 - Audios: 121,000
- Year 5

- Videos: 114,000
- Audios: 151,000

Estimated platform consumption

- Unique users/year: 5,000,000
- Unique users/month: 2,000,000
- Concurrent unique users (uu) of the video/audio service: 50,000 uu/minute
- Concurrent unique users in participatory actions (e.g. votes associated with online programmes): 250,000 uu/minute
- Average session length: 1 hour

In any case, these reference dimensions must not represent any operational limit of the final solution proposed by the bidder (neither minimum nor maximum), since as previously indicated, the solution must have unlimited scalability capacity in the face of the uncertainty of the evolution of content and its consumption in this type of market.

The aim of this system is to be able to cache content to:

- Reduce the load on the source servers of the OTT content.
- Improve the user experience and speed up the delivery of content to the greatest number of geographical areas possible.
- Reduction of outgoing traffic costs of OTT content source points
- Absorption of load peaks.
- Transfer of specific processes to CDN servers in justified cases.

Both for the web cache functionality 1 and the media cache functionality 2, it is expected that the CDN system implemented/contracted by the OTT provider meets the following mandatory requirements:

[Req. 1.] Ability to absorb twice the indicated load for each year, with appropriately sized resources and supported by high availability systems. Relevant presence in the main geographical areas with internet coverage.

[Req. 2.] It must comply with the HTTP 1.1 and HTTP 2 protocol, respecting the expected behaviour in the different headers.

[Req. 3.] HTTPS support between client and CDN and CDN and source. Optionally supporting HTTPS configuration between client and CDN combined with HTTP between CDN and source (Protocol downgrade).

[Req. 4.] Support for HTTPS SNI, between client and CDN and between CDN and source

[Req. 5.] Support for HTTPS certificates with wildcards (For example: *.ott.cat). The OTT provider will provide the HTTPS certificates to install on the CDN.

[Req. 6.] The OTT service provider must have contracted a technical service for user attention with its CDN service, with 24/7 support to resolve incidents. The proposal must indicate the mechanisms defined between the OTT service provider and the contracted CDN and the SLAs for incident management and resolution.

[Req. 7.] Real-time monitoring of the main service performance indicators (volume, cache effectiveness, incidents, maintenance notices etc.)

[Req. 8.] Support for geoblocking content at country level with high accuracy (over 95%). It must support geoblocking of content at country and province level. Geoblocking of content must be performed based on URL or part of URL. So, if a certain string appears in the URL, the delivery of the content can be opened or closed. Support for exceptions to the geolocation of some IPs via the management tool (blacklist, whitelist). Geolocation database update frequency below 15 days.

[Req. 9.] Multi-source support, so that the CDN looks for the content in an alternative source in case it is not available in the main source (no response, 404 or 5xx, configurable)

[Req. 10.] Origin Shield. It must have a system of replication or distribution of the content between the cache servers so as to minimise the number of requests made by these to the source servers for the same content. There can be no more than 2 concurrent servers for the same content.

[Req. 11.] Staging CDN with the same names as in reality. This environment must allow the execution and debugging of code on the end servers under the same conditions as the production environment with a smaller dimension.

[Req. 12.] Ability to deliver cached content beyond the expiry date in the event that the source server does not respond (Stale content).

[Req. 13.] It must respect the HTTP/1.1 content caching rules, including caching different versions of content based on Vary HTTP headers:

[Req. 14.] P2P-based solutions to reduce invoicing or any system that requires client instrumentation to operate are not accepted.

[Req. 15.] Have a configuration and management application - preferably via the web - that allows the OTT provider to manage the service in a self-sufficient manner, without intervention by the CDN's technical team to carry out the most frequent tasks. The tool must have an API to perform configurations. There should be versioning of configurations and the possibility to commit/roll back the configurations. In particular, the tool must allow configuring of requirements 16 to 19.

[Req. 16.] Flexibility in configuring cache rules. Capabilities to separate cache rules between client and CDN from rules between CDN and source.

[Req. 17.] URL manipulation capabilities in the CDN platform (redirect, rewrite)

[Req. 18.] Compression of content on delivery to the user, regardless of how it was obtained from the source. And other content optimisation options to reduce content size.

[Req. 19.] Ability to configure different sources and define the rules they apply to direct traffic.

[Req. 20.] The management application must trigger the changes directly on the platform without the intervention of CDN technicians. The propagation time of configuration changes must be less than 20 minutes.

[Req. 21.] The management application must allow configurations to be grouped into “services” in order to create reports and statistics. Reports must be extractable: The minimum reports required are:

- Traffic volume/time.
- Hits/Time
- Response type (2xx, 3xx, 4xx, etc.)/time.
- For periods of time defined by the user, grouped by “service”.

Data from reports must be retained for a minimum of six months.

[Req. 22.] It must be possible to deliver logs with detailed traffic, with hourly or daily frequency and grouped by “service”. The format must be W3C or compatible therewith. The delivery mechanism will be of the push type to AWS S3 type destinations or similar.

[Req. 23.] Configurable monitoring system that allows the configuration and receipt of alerts in the event of failure of any element or exceeding a previously configured threshold.

[Req. 24.] It must be possible to validate the calculation process for invoicing and managing information.

- The invoicing calculation system and the data sources used must be detailed and documented.
- Invoicing information, reports and logs must be able to be balanced. The procedure to move from one system to the other must be detailed and documented.

[Req. 25.] It must have the ability to execute (light) code upon request to give a response conditioned on the result of the execution.

For the web cache functionality, it is expected that the CDN system implemented/contracted by the OTT provider meets the following mandatory requirements:

[Req. 26.] The service must function as a cache, or reverse proxy, sourced from the servers of the OTT provider. The infrastructure of the CDN service must be sized to cache objects for their lifetime, or in the case of less popular objects, at least for a week. Effectiveness above 90% measured in requests and in bandwidth for common objects between users.

[Req. 27.] The configuration must allow specifying fixed expiry rules for the content. At least by extension and path and file name. This configuration should be possible on the CDN platform, but it should also be possible to configure a transparent mode that respects the indications in the HTTP headers of the source content.

[Req. 28.] It must be possible to use the query string of the URLs to differentiate content in the cache rules, but also ignore it if this is the desired configuration.

[Req. 29.] There must be tools for forcing a selective purge of caches, both from a management application and via API. The maximum time to purge a content item must be less than 3 seconds.

[Req. 30.] It must have a mechanism of “subrogated keys” or invalidation by labels. The CDN must provide a mechanism via API to invalidate the cache of a set of content identified by these tags.

[Req. 31.] It must have the ability to generate synthetic responses based on request parameters. Specifically, to locate the client’s geographic area, the response will be a text string in the body or header indicating the geolocation of the IP of the request without having accessed source resources.

[Req. 32.] Management of access with tokens. OTT content is not always open to the public, and therefore the CDN must be able to handle conditional access to the content, based on authentication tokens. This must allow us, at least:

- To determine where the request is authorised.
- To limit viewing time, both by start time and duration.
- It must allow the inclusion of management data by the OTT provider, which guarantees the integrity of the information.
- It must support country-level content geoblocking by comparing the token information with the location of the requested IP.

For the media cache functionality, the CDN must support the video and audio distribution service, live and deferred to the end user over the Internet, which must include adaptive streaming capabilities over HTTP, progressive download and downloading files.

The set of mandatory requirements for this functionality are:

[Req. 33.] Live operation mode. The OTT provider will generate the source stream of the directs that the CDN provider must collect, acting as a reverse proxy, in the appropriate format. The CDN service is responsible for delivering the stream to end users. Effectiveness greater than 90% measured in bandwidth.

[Req. 34.] Deferred operation mode. The OTT provider stores the video files in its infrastructure. The CDN provider acts as a reverse proxy, collecting the video at the user’s request, storing it in its cache, and distributing it through the appropriate mechanism to the end user. Effectiveness greater than 90% measured in bandwidth.

[Req. 35.] Formats to support

- Apple HTTP Live Streaming, both live and deferred, with DVR support.
- DASH adaptive streaming, both live and deferred, with DVR support.

This means that if a user has consumed a certain live channel, any other user viewing content from the previous 5 hours will be served from the CDN. If no user

has consumed that channel, the CDN will obtain the chunks from the OTT provider's source servers

- Download and progressive download of deferred content.

It must support the following:

- Control of the download speed (rate limiting) of the content
- Range request (at path, file name and extension level)

[Req 36.] There must be tools for forcing a selective purge of caches, both from a management application and via API. The maximum time to purge a content item must be less than 15 seconds.

[Req 37.] High Availability and Dual Source: The CDN shall have a high availability mechanism that allows a piece of content to be served from an alternate source in the event of a negative response from the primary source.

A3.3 TECHNICAL REQUIREMENTS FOR THE ENCODING OF LIVE STREAMING AND ON-DEMAND CONTENT

Direct transcoding system

The OTT provider must have a live transcoding system that supports the generation of the live video and audio stream channels of the OTT platform.

The solution proposed by the OTT provider for the live transcoding system must be ensured and can be based on one or two different architectures with the ability to be unique, combined or redundant:

- **Cloud service.** The OTT provider has the capabilities to generate a cloud encoding environment, fully managed by the provider with the ability to scale up and increase the number of live channels, both video and audio, on demand.
- **To guarantee connectivity with CCMA resources, In-House service.**

The provider will host the necessary hardware to provide the service at the CCMA, S.A. facilities located in Sant Joan Despí. CCMA, S.A. undertakes to maintain at all times:

- Electrical supply of 220 V in duplicate
- Air conditioning
- Custodianship
- 1 GB network connectivity on all provider machines required to deliver the service.

The fact of having the machines located at the facilities of CCMA, S.A. does not entail the acquisition of any component or the adoption of any maintenance tasks, improvement or repair of the hardware/software necessary for the service. The provider will have remote access with full control of its machines located at the CCMA facilities in Sant Joan Despí.

NOTE: The In-House Service at the Sant Joan Despí facilities shall involve the CCMA invoicing the bidder for the resulting expenses.

Both for the in-house and the cloud solution, the system must meet the following mandatory requirements.

[Req. 1.] Support as a delivery format the live video signals to the live transcoding service using the “Secure Reliable Transport” (SRT) protocol within which an MPEG-2 TS signal will be packaged according to the ETSI TS 102 technical specification 034.

The signal contribution for HD video content must allow the circulation within the stream of:

- 1 video component in MPEG-4 AVC/H.264 encoded H264, 1920x1080, 25 fps progressive
- 1, 2, 3 or more HE-AAC v2 audio components
- 1, 2, 3 or more subtitle components in DVB Teletext.
- 1 SCTE-35 component for the disconnection of advertising associated with each service or “TV channel”.

This information will travel between CCMA, S.A. and the provider as Transport Stream components distinguishable by their PID.

Total aggregate bandwidth is around 10-12 Mbps per HD video channel.

The signal contribution for UHD video content must allow the circulation within the stream of:

- 1 video component n HEVC / ITU-T H.265 | ISO/IEC 23008-2 (current version) , Main10 Profile @ Level 5.1 for the transmission of signals in UHD at 3840x2160 at 50p in HDR with metadata.
- 1, 2, 3 or more HE-AAC v2 audio components
- 1, 2, 3 or more subtitle components in DVB Teletext.
- 1 SCTE-35 component for the disconnection of advertising associated with each service or “TV channel”. This information will travel between CCMA, S.A. and the provider as Transport Stream components distinguishable by their PID.

Aggregate total bandwidth is around 20 Mbps per UHD video channel.

Both for the in-house solution and in the cloud,

[Req. 2.] Support the delivery format of live audio signals to the live transcoding service using the “Secure Reliable Transport” (SRT) protocol.

Signal contribution for audio content must allow

- 1 AAC encoded audio component 96 Kbps (spoken word-based stations) and 128 Kbps (music-based stations)

Each video channel and each audio channel is sent in duplicate over a decoupled primary and secondary circuit to ensure redundancy in the event of failure of one of the contributing or encoding circuits.

[Req. 3.] The system must be able to deliver video and audio output streams over both the http and https protocols.

[Req. 4.] The system must support the following formats and volumetrics provided by the video and audio streaming system:

- 12 HD video channels, for each one it is necessary to generate the following streams
 - HLS format:
 - H.264 1920x1080 at 4.5 Mbits
 - H.264 1280x720 at 2.3 Mbits
 - H.264 1024x576 at 1.8 Mbits
 - AAC audio 96 Kbps or 128 Kbps depending on channels
 - DASH format
 - H.264 1920x1080 at 4.5 Mbits
 - H.264 1280x720 at 2.3 Mbits
 - H.264 1024x576 at 1.8 Mbits
 - AAC audio 96 Kbps or 128 Kbps depending on channels
- 10 audio channels, for each one it is necessary to generate
 - HLS format
 - AAC 96 Kbps or 128 Kbps depending on channel settings
 - Shoutcast format
 - MP3 96 Kbps or 128 Kbps depending on channel settings

Note: The number and format of these qualities are of reference, the solution must allow these values to be modified based on needs.

The live transcoding system for all video and audio channels must offer the following functionalities:

[Req. 5] DVR: The solution must be able to provide a minimum of two hours of DVR of the encoded live signals to allow the end user to rewind the content. This requirement is mandatory for video and audio channels. DVR functionality must be maintained in case of load balancing between primary circuit and secondary circuit. The cost of storage derived from DVR functionality must be included in the encoding cost

[Req. 6] Direct geolocation: The system must be able to receive API commands from the continuity systems of CCMA, S.A. to modify its behaviour based on Geolocation rights of the content. This requirement is mandatory for video channels.

[Req. 7.] Insertion of own advertising for digital platforms. The direct encoding system must support the SCTE 35 protocol, so that the markers within the contribution signal - which indicate that we are in an advertising block - are respected within the encoding process and reach the player so that they can be treated according to the specific advertising insertion policy of the OTT platform. Likewise, the encoding system must segment the video encoding according to the SCTE-35 standard, so that the switching between the live signal and the own advertising inserted by the Player is done with a minimum precision of the size of the chunk. If the duration of the chunk is 2 seconds, the required switching accuracy is 2 seconds or less. This requirement is mandatory for video channels.

[Req. 8.] Start Over. Start-Over functionality to generate the own manifest from the start of the programme based on the integration of the EGP of the CCMA channels. The direct encoding system must have an integration system that allows generating an output stream of VoD type every time the continuity of the channel generates a programme change. The system will have an API call that allows the initial chunk of each programme to be identified, or that responds with a different URL from the direct one for each programme. The precision of the programme start cut-off must be equal to or less than the length of the chunk. The approximate maximum duration of a programme accessible by StartOver is 10 hours.

[Req. 9.] Multiple audio. Multi-audio for different languages and audio description. The proposed system must offer the ability to segment the “n” audio channels that can reach it through the SRT contribution channel. The output format will be the same as the appropriately segmented input.

[Req. 10.] Multiple subtitles. Multi-subtitles in WebVTT format for HLS and EBUVT for DASH. The encoding system must offer the subtitle format conversion functionality. The input format is DVB Teletext and the output format must be Web VTT. The DVB Teletext input format allows different languages through teletext pagination. The WebVTT converter system must be able to discriminate the planes and label the output languages. The system must support the transformation of the source with DVB TXT to WebVTT accepting all the characters defined in the Teletext specific character table for “Spain and Portugal”.

[Req. 11.] Integration with the CCMA’s EPG system

[Req. 12.] Signal injection in social networks. The live encoding service must allow an additional output to feed external platforms via the RTMP protocol. This output must be generated from the signal input of each channel. There will be no extraordinary contributions for this purpose. A channel can feed “n” social networks and “n” profiles from the same network. The system must have a user interface protected by a user and password that will allow the entry of the security password of the external platform, a title, and a start and stop control. It will be assessed positively if these orders are exposed to the Internet via an HTTP API with authentication. For radio channels, the provider shall generate a video stream based on a static image plus the audio of the channel intended to feed social networks via the RTMP protocol. This output must be generated from the signal input of each channel. There will be no extraordinary contributions for this purpose.

[Req. 13.] Latency of live streaming video: latency time from the first quality coming in until the remaining 3 are generated and published shall be less than 40 seconds.

[Req. 14.] DVR Latency: less than 15 seconds from the time the request event (click, tap, etc.) is generated. Also, the maximum time for content to be accessible once the DVR element ends shall be less than 60 seconds.

[Req. 15.] Support and availability. Given the critical nature of the service, the bidder must guarantee 100% availability. To satisfy this requirement, CCMA, S.A. offers the contribution circuit duplicated and adapted to the architecture that best suits the provider. Chunk numbering discontinuity is accepted in case of a switch from main to secondary. In the case of correct operation of both circuits, the output balancing system must provide the main one. Likewise, the balancing system must allow a protection functionality (IP filter, connection limitation, requests per second etc.) so that the encoders are decoupled

from any external disturbance. Output channels will be served on the CDN under a single URL per channel. The provider must ensure that the URL is supported by the highly available system so that end users do not have to change the URL in case of problems. Service interruption (50 seconds maximum) is accepted to recover signal in the URL and it is accepted that the numbering of segments is not correlative after the change. The high-availability system must also be duplicated to avoid single points of failure.

[Req. 16.] Monitoring: The 24/7 support service must have appropriate monitoring and diagnostic tools to quickly detect the following incidents:

- Unexpected input signal drops
- Sustained degradation of video quality over time (pixellation)
- Sustained degradation over time of audio quality (glitches)
- Signal is black for more than 60 seconds
- Signal is silent for more than 60 seconds

Once the incident has been detected in the monitoring system, it will be necessary to act to correct the problem in a time not exceeding 15 minutes.

The high availability system must allow the primary and secondary circuits to be completely isolated so that maintenance and improvement tasks can be carried out without a service interruption. These tasks will be carried out with prior notice both in case of necessary maintenance on the equipment of CCMA, S.A. and on the equipment of the provider of the OTT.

On-demand transcoding system (VoD, AoD)

In the on-demand streaming system (VoD and AoD), the encoding and distribution of content must be supported within the OTT platform

The set of mandatory requirements of the on-demand transcoding system are as follows:

[Req. 1.] The system must support, as its usual source formats, the following source formats of video content for their encoding to adaptive format and for progressive download on devices that do not support adaptive format

- HD Content (2 instances):
 - Video 1920x1080 MP4 at 4 Mbits and Audio AAC 128 Kbits 48 kHz
 - Video 1290x720 MP4 at 2.5 Mbits and AAC audio 128 Kbits 48 kHz
- UHD/HDR content:
 - Video 3840x2160 H265/HLG at 20 Mbits and 2 audio channels AAC 128 Kbits 48 Khz

These formats will be used as a basis for encoding to adaptive formats, as well as for progressive download in the case of platforms that do not support adaptive formats.

[Req. 2.] The system must support, as sporadic source formats, the following video content source formats for adaptive format encoding

- HD content:

- 1920x1080 video in MOV or AVI AVC-INTRA format at 50 or 100 Mbits and stereo or mono PCM audio in WAV format

[Req. 3.] The system must support the generation of subtitles associated with video content. The source formats of the subtitles are:

- WebVTT. It can be delivered to the encoding system as a file associated with the video content or as a publicly accessible URL
- EBU-TT-D

[Req. 4.] The system must support, as common output formats, the generation by video content of the following formats and qualities

- HLS format
 - HD content (3 instances)
 - H.264 1920x1080 at 4 Mbits
 - H.264 1280x720 at 2 Mbits
 - H.264 1024x576 MP4 1.6 Mbit
 - AAC audio at 128 Kbits 48 kHz
 - UHD/HLG content (1 instance)
 - H265/HLG 3840x2176 at 15 Mbits and 1 audio channel AAC 128 Kbits 48 Khz
- DASH format
 - HD Content (3 instances)
 - 1920x1080 MP4 4 Mbit
 - 1280x720 2 MP4 2 Mbit
 - 1024x576 MP4 1.6 Mbit
 - AAC audio at 128 Kbits 48 kHz
 - UHD/HLG content (1 instance)
 - H265/HLG 3840x2160 at 15 Mbits and 2 audio channels AAC 128 Kbits 48 kHz

Note: It is desirable for the transcoding service to be able to perform encoding in CMAF format of the source file, so that the generation of this format allows the generation with a single encoding of the content in both HLS and DASH format taking advantage of the encoding of the chunks.

Note: Both the source and destination formats specified are the requirement as of 2022, during the execution of the service adaptations to the encoding system it can be requested to add new source or output formats based on the needs arising from the appearance of new consumption formats.

[Req. 5.] The system must support, as sporadic output formats, the generation by the video content of the following encoding formats:

- VP9
- AV1

[Req. 6.] The system must support the following volume of video content in source format to be encoded:

- 156,000 minutes/month of source content in HD format and 7,800 minutes/month in UHD format during Year 1. Assuming that in Year 1 the service will be active in the second half of the year, this makes a total of 936,000 minutes/year in HD format and 46,800 minutes/year in UHD format for Year 1.

The successful bidder must consider that the requirements that will subsequently be required by years are:

- 180,000 minutes/month of source content in HD format and 9,000 minutes/month in UHD format during Year 2. This makes a total of 2,160,000 minutes/year in HD format and 108,000 minutes/year in UHD format for Year 2.
- 207,000 minutes/month of source content in HD format and 10,350 minutes/month in UHD format during Year 3. This makes a total of 2,484,000 minutes/year in HD format and 124,200 minutes/month in UHD format for Year 3.
- 237,500 minutes/month of source content in HD format and 11,900 minutes/month in UHD format during Year 4. This makes a total of 2,850,000 minutes/year in HD format and 142,800 minutes/year in UHD format for the Year 4.
- 273,500 minutes/month of source content in HD format and 13,700 minutes/month in UHD format during Year 5. This makes a total of 3,282,000 minutes/year in HD format and 164,400 minutes/year in UHD format for Year 5.

[Req. 7.] The system must support the following of audio content source formats for encoding to adaptive format and for progressive download on devices that do not support adaptive format

- MP3 at 96 Kbps or 128 Kbps depending on the type of content.

This format will be used as a basis for encoding to adaptive formats, as well as for progressive download in the case of platforms that do not support adaptive formats.

[Req. 8.] The system must support the generation of audio content in the following formats and qualities

The formats and qualities to be generated from the source format must be

- MP3 at 96 Kbps or 128 Kbps for progressive download
- AAC at 96 Kbps or 128 Kbps for progressive download
- HLS in AAC format at 96 Kbps or 128 Kbps for progressive download

The volume of video transcoding expected for the period 2023-2027 is 11,712,000 minutes of source content in HD format and 586,200 minutes/month in UHD format.

[Req. 9.] The system must support the following volumes of audio content in the source format to be encoded

- The volume of the audio transcoding service is estimated at 20,000 hours/year of source content.

[Req. 10.] The system must support the following protocols to contribute or collect the source content to be encoded

- HTTP/HTTPS
- FTP/SFTP

[Req. 11.] The system must support the generation of multiple thumbnails in JPEG format linked to the content, we can define the following parameters: image size, position within the content and output file name format.

[Req. 12.] The system must support the generation of stripes. A strip is a set of thumbnails that allow the preview of a content based on the capture of scenes within the content. These thumbnails are displayed to the platform user on the content browsing bar and allow quick browsing within the content. The encoding system must allow the generation of the necessary files to implement this functionality:

- Thumbnail strips: Set of images, in PNG or JPEG format, representative of the content.
- WebVTT file: Generating the WebVTT file by loading the sprite as specified in the HTML5 format.

The following example shows the structure of a WebVTT file

```
00:00.000 --> 00:05.000
/myasset/mysprite.jpg#xywh=0,0,160,90
00:05.000 --> 00:10.000
/myasset/mysprite.jpg#xywh=160,0,320,90
00:10.000 --> 00:15.000
/myasset/mysprite.jpg#xywh=0,90,160,180
00:15.000 --> 00:20.000
/myasset/mysprite.jpg#xywh=160,90,320,180
```

[Req. 13.] The encoding system must allow adaptation of the input content. Specifically, it must allow:

- Video deinterlacing: Ability to deinterlace content that is interlaced at source
- Add a watermark: Add a logo or watermark to the content in the encoding process
- Video cropping: Perform a cropping process on part of the video to highlight a part, before encoding the part resulting from the cropping process
- Video rotation: Perform a video rotation process before encoding.
- Audio down-mix: Perform a down-mix process of multi-channel audio to generate a mono or stereo before encoding.

[Req. 14.] The encoding system must allow the incorporation of a DRM system into the encoding of the content. Specifically, it must support DRM systems enabled by the MPEG Common Encryption Standard (MPEG-CENC), allowing the encoding and encryption of content once with a single password and associating this password with different DRM systems. Some of the DRM systems that could be used are Google Widevine, Microsoft Playready, Marlin, Adobe PrimeTime and Apple FairPlay.

[Req. 15.] The system must have a well-documented REST API that allows control over all aspects related to the encoding flow, in order to ensure integration between the CCMA systems that will feed the encoding system.

The list of functionalities that should be able to be controlled via the API are:

- Encoding flow control: Using the REST API it should be possible to configure all encoding processes, defining the input content to the system and the protocol used, handling the input content, defining the parameters of the codecs for the encoding process, defining the output formats (protocols, qualities, representations), generation of thumbnails and sprites, generation of manifests and management of the transfer of the generated content.
- Monitoring the encoding process. Using the REST API, the information regarding the status of the encoding requests processed by the system and their status will have to be collected.

[Req. 16.] Reports. The system must have the ability to generate reports on the use of the encoding system. This reporting system must report at least the following data:

- Requests received in the system
- Request completion status
- Encoded input minutes
- Encoded output minutes
- Encoding time versus content length

[Req. 17.] Performance. The encoding system must offer the performance ratio data, this data being the time factor used to encode a piece of content with respect to its duration. This factor is required to be at least 6x real time for HD format content with MP4 H.264 source.

A3.4 TECHNICAL REQUIREMENTS CONNECTIVITY

The set of systems and infrastructure used by the OTT platform provider will need reliable connectivity and with the necessary level of performance, to guarantee that the integration processes between the different systems for exchanges of content, metadata, calls to APIs, etc. work stably and quickly.

In the same way, the service provider must have connectivity capabilities with the CCMA headquarters, to be able to provide the necessary remote support to the users of the platform.

This is why candidates will have to present the technical solution in terms of connectivity to guarantee:

[Req. 1.] High availability. The systems and infrastructure linked to the OTT platform must have connectivity with high availability mechanisms, to guarantee communication between them to execute the integration processes and workflows that support the publication of the content on the platform.

[Req. 2.] Performance. The systems and infrastructure linked to the OTT platform must have a connectivity with a performance level, to guarantee the execution of the workflows that support the publication of the content on the platform according to the requirements defined in the section “4.9 Performance of the platform”.