Integrated Smart Content Archival System

BCCL RFP RESPONSE

Submitted To: Bennett, Coleman and Company Limited [BCCL]

Submitted By: Sify Digital Services Limited

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DOCUMENT DETAILS

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DETAILS OF BUSINESS CONTACTS

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1 Background & Vision

BCCL is looking at implementing an Enterprise DAM with a new modern, extensible, and scalable platform which will provide a feature-rich centralized platform that can integrate with their existing content sources, viz., BCCL Archives, Editorial Works, User Generated and Syndicated assets. Furthermore, BCCL expectations of the Enterprise DAM platform is intended to solve many its challenges currently being faced when using their existing platform for content creation. In addition, BCCL intends to enable a platform with broader DAM capabilities addressing other areas of need around rights management driven through digital forensics and encryption. This intended BCCL goals are to fully optimize their process for story creation, management, and monetization of digital assets in B2B/B2C/B2B2C marketplace and through NFT from other players.

To help address BCCL challenges, we propose a solution that leverages SIFY INFINITDIGITAL PLATFORM as a Software-as-a-Service (SaaS) offering, which will be hosted in a managed SaaS environment. The services identified in this proposal consists of customization, configuration and integration services to ensure the solution comprehensively addresses the business requirements of BCCL.

2 About Sify

2.1 About Sify Technologies (NASDAQ: SIFY)

A Fortune India 500 company, Sify Technologies Limited is India's most comprehensive ICT service & solution provider.

Sify Technologies Limited ("STL") is engaged in, various business undertakings including inter alia

a) Network Centric Services undertaking,

b) Data Centre ("DC") Business undertaking,

c) Digital Service Business Undertaking comprises of Cloud and Managed Services undertaking, Applications Integration Services undertaking, Technology Integration Services undertaking and other related services.

With Cloud at the core of our solutions portfolio, Sify is focussed on the changing ICT requirements of the emerging Digital economy and the resultant demands from large, mid, and small-sized businesses.

Sify offers end-to-end solutions with a comprehensive range of products delivered over a common data network infrastructure. As the builders of India's largest MPLS network with the

largest number of wireless end points, Sify's network today connects 50 Data Centers across India, including its own 11 Concurrently Maintainable Data Centers across the cities of Chennai, Mumbai, Delhi, Bengaluru, Hyderabad, and Kolkata. Over 10000 Enterprise businesses are Sify customers. We also partner with other major network operators to deliver global network solutions.

Sify offers customised services in the realms of Managed IT services and eLearning for clients globally. With the Open Cable Landing Station, partnerships with submarine cable companies globally and enablement of the carrier neutral Internet Exchange, Sify is present in almost all the spheres of the ICT ecosystem.

As the preferred Service Provide Partner for Enterprises, Public Sector & Government, Sify, with its broad spectrum of Data Centers, Cloud, Security, Network and Managed services, is uniquely positioned as the ideal Service Provider and Systems Integration Partner for Indian organizations embarking on their digital transformation journey.

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2.2 About Sify Digital Services Limited

Sify Digital Services Limited (SDSL) is a wholly owned subsidiary of Sify Technologies Limited (NASDAQ: SIFY). It is recognised as a separate legal entity and tasked with offering applications and platform-based services to Enterprises.

Sify Digital Services offers three distinct groups of applications; the first is legacy applications that are now offered off the cloud in a subscription avatar and the company's home grown cloud platform, cloudinfinit. The second set of applications offers incoming MNCs the comfort of application-continuity with applications from industry majors enabled through partnerships. The third set are IP-secured applications, built to exploit the capabilities of AI and VR and are targeted as niche problem solvers for Enterprises. These applications are scalable and adaptable across platforms, geographies and verticals.

Between them, they offer a mix of Cloud based Managed Services, Applications Integration services, Cloud builds and Connects, Compute, Storage, Analytics and Security. For the Network environment, Digital services will offer Network Managed services. SDSL is also tasked with building customized eLearning capsules for clients globally.

Sify's GTM strategy will continue to use the advantage of a cross-functional sales force to sell a converged perspective to CXOs in their pursuit of Digital transformation.

The bedrock of any ICT player is the services that are offered off their infrastructure. Sify is no exception to this. In order to better offer conjoined services, Digital Services was created as a subsidiary and offers Cloud and Managed Services, Applications Integration services, Industry grade applications, Cloud builds and Connects, Analytics, Compute and Storage. From a Network perspective, Digital services offers Network Managed services, including security. Sify also offers customised services in the realms of Managed IT services and eLearning for clients globally.

2.3 Sify Technologies Organization Brief

2.3.1 Sify – A New Age ICT Services Provider

Sify is a leading integrated ICT player in India, helping customers realize value by leveraging its world class assets & services cutting across Data Centre, Cloud & Managed Services, Network Provisioning, Integration and Management Services, Application Services and Technology Integration Services.

Sify Technologies over the past two decades has transformed itself from an Internet Service Provider (ISP) for the consumer segment to an Enterprise Network and Data Centre Services Provider and subsequently to an integrated ICT Solutions and Services Provider for the Digital Age, in alignment with the evolving needs of the Indian businesses. With 5000+ customers across various verticals, we take pride in being one of the largest contributors to the BFSI vertical through our ICT services, to the extent that every inter-banking transaction is carried out on Sify's network.

With 95% of our revenue being contributed from India, we are deeply committed towards the growth of this market and are helping businesses grow exponentially through technology and services led innovation. We see deep alignment of focus and synergy in the mission of both the organizations.

With deep investments in the 3 core elements of Digital Infrastructure – Cloud, Data Centres and next-generation Network infrastructure and capabilities, Sify has been at the forefront of innovation in the country, driving transformation for business excellence.

Our 11 Data Centres, innovative Cloud and consulting services, extensive expertise and partnerships with global technology companies have distinguished Sify in the service provider market. We are focusing on the changing ICT requirements faced by large, mid-sized and small businesses and Governments in the shift to digitization. Sify has a broad portfolio of data center,

enterprise-grade cloud, security, network, application, technology integration and managed services.

Since building India's first Concurrently Maintainable Data Centre in 2000, Sify has pioneered managed hosting and cloud services for the enterprise. We maintain a leadership position in Data Centre services and enterprise connectivity, with extensive experience building and running Data Centres.

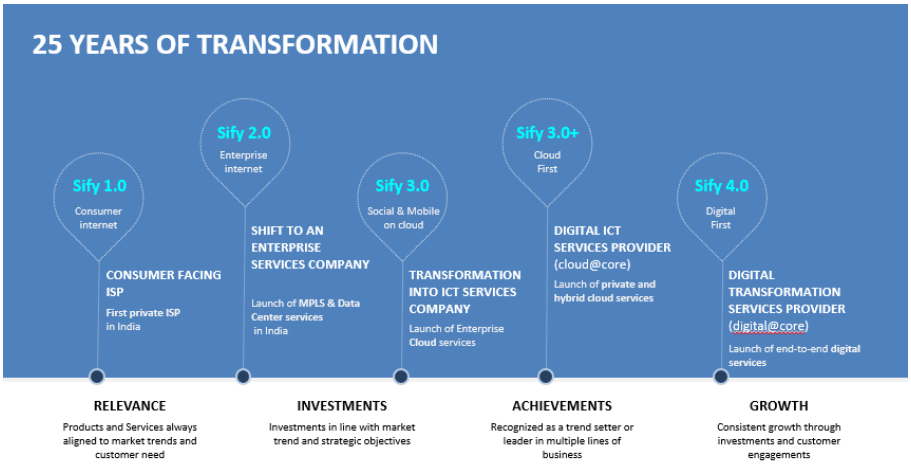
Sify offers public, private, and managed cloud services in different combinations, all based on enterprise-class technology and our Cloudinfinit platform is designed to guarantee high availability, superb performance, massive scalability, and stringent security. These services may be customized and right sized to fit different organization sizes, requirements and market segments and feature easy deployment and use.

Based on our experience in the Data Centre and Cloud space, MeitY has empanelled Sify as a Cloud Service Provider.

In the following sections we have captured the highlights of our organisation which we believe would be of strong relevance to you.

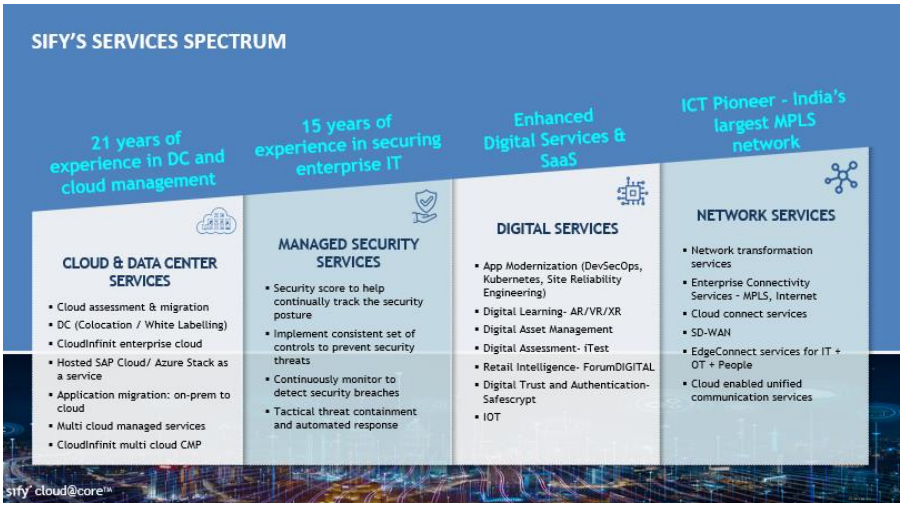
2.3.2 Sify Technologies Transformation Journey

Sify Technologies over the past two & a half decades has transformed itself from an Internet Service Provider (ISP) for the consumer segment to an Enterprise Network and Data Centre Services Provider. Subsequently, Sify transformed to an integrated ICT Solutions & Services Provider and now a Digital Transformation Services provider. The transformation is in alignment with the evolving needs of the Indian businesses. Sify's transformation journey is depicted below.



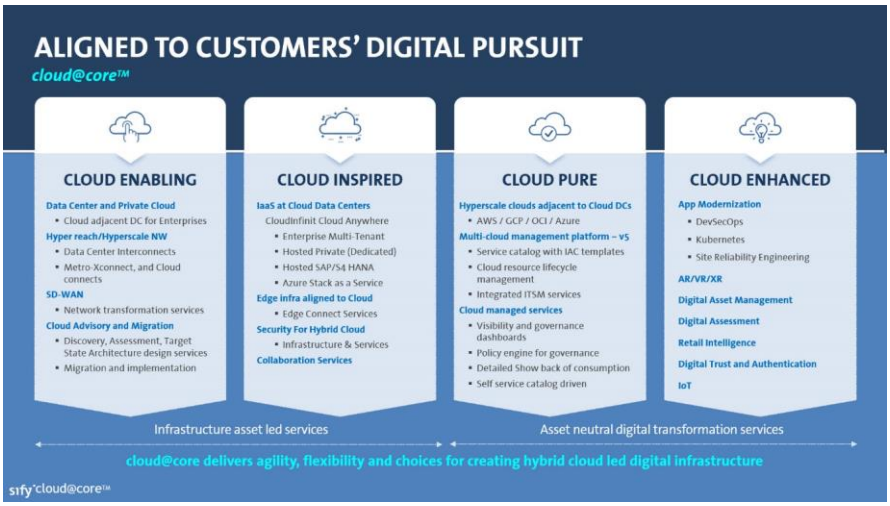
2.3.3 Sify Technologies Services Portfolio

Sify is an integrated ICT Services and solutions organization, and our services portfolio is shown below.



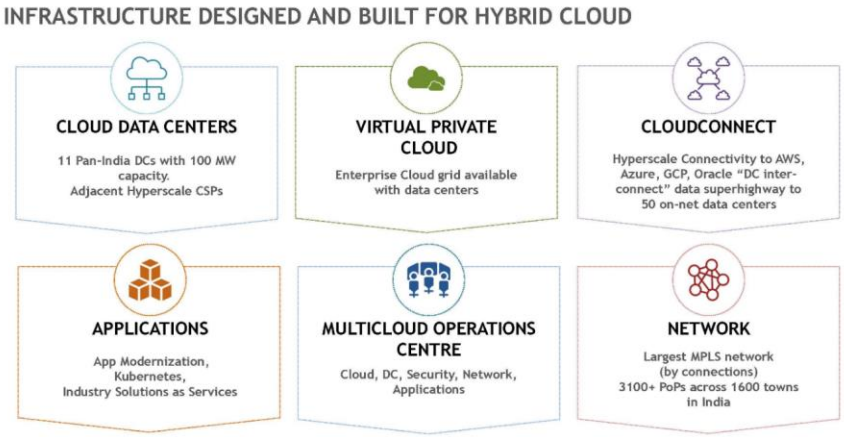
2.3.4 CLOUD@CORE

Cloud is at the core of all our offerings and Cloud@Core is depicted below.



2.3.5 Sify's Investments in Digital Age Technology

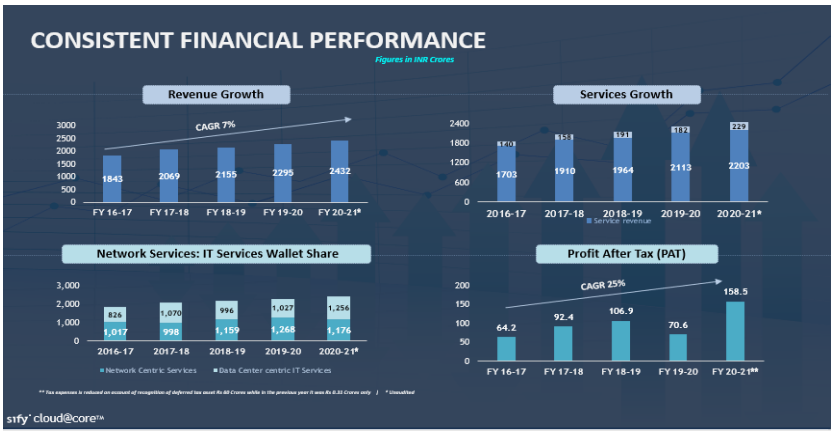
Sify is committed to investing and the bringing the best-in-class technologies to its clients in India. A Brief snapshot of Sify's investments in the new age digital technology is illustrated below.



2.3.6 Sify Financial Snapshots

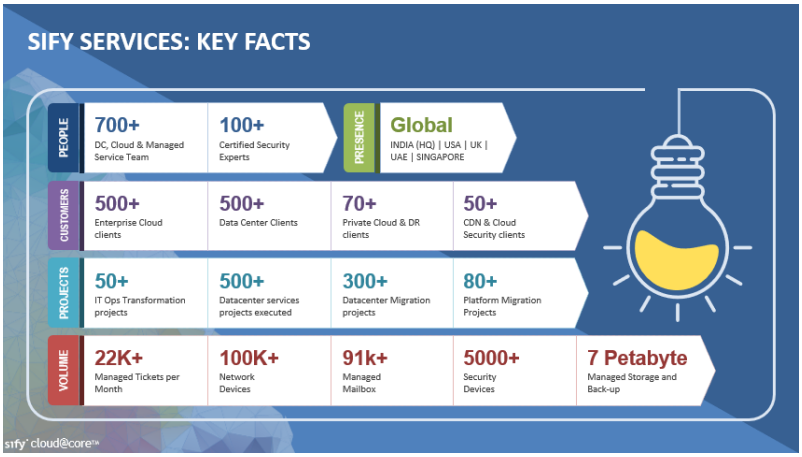
Sify Technologies has consistently grown over the past five years at a CAGR of more then 7%. A brief finanical snapshot is depicted below.

Over the past five years, Sify's revenue split between Telecom Services and IT Services has changed with significant increase in IT services revenue driven by Mananged Data Center Services and Cloud Services, both in Hosted and Customer On-Premise projects.



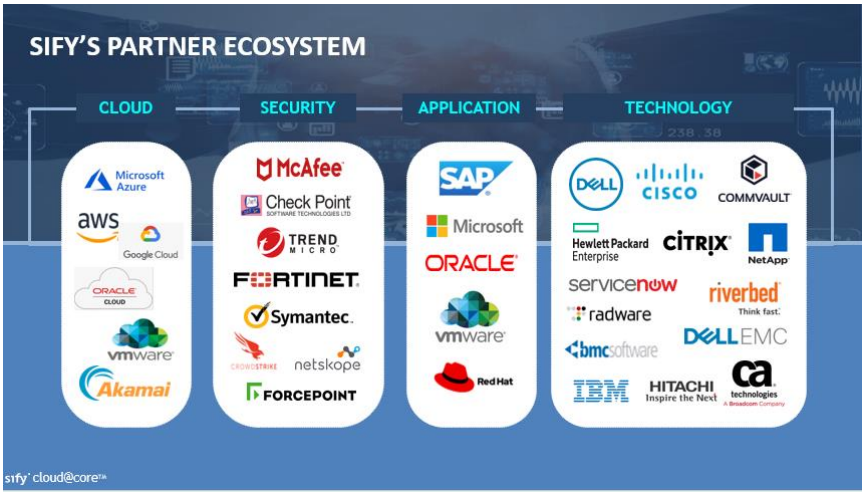
2.3.7 Services: Key Facts

Snapshot of key facts in terms of people, customers, projects & volumes shown below is a reflection of our organizational capability & experience.



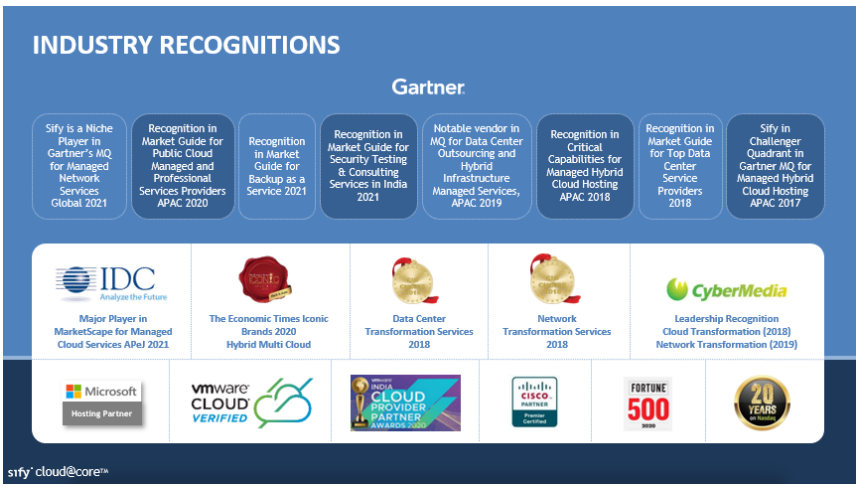
2.3.8 Technology Partnerships

Sify has partnerships across Cloud, Security, Application & Technology providers. Snapshot of the key partnerships is illustrated below.



2.3.9 Industry Recognition

Sify has featured in the Gartner Magic Quadrant for Cloud Enabled Managed Hosting in APAC as a Niche Player in 2013, 2014, 2015 & 2016 and now moved to Challenger Quadrant in 2017.



2.3.10 Accreditations

Over the years Sify has adopted the leading Industry Standards & Frameworks and is continuously improving every aspect of the organization. Following are some of the key certifications which illustrates our commitment to deliver world class quality solutions:

- TL 9000-V for Network Integration
- ISO9001:2015 for Quality Management Services
- ISO/IEC 27001:2013 for Information Security
- ISO/IEC 20000-1:2018 for Service Management
- ISO/IEC 27017:2015
- ISO/IEC 27018:2019
- ISO 14001:2015
- ISO 45001:2018
- PCI DSS
- SOC -1 and SOC - 2
- SEI CMMI Level 5 for Development

3 Executive Summary

The Integrated Smart Content Archival System is a complex system that addresses the key objective of the digital asset monetization through a variety of functional, non-functional, technical, and operational subsystems. All the functional and technical services are architected on cloud native technologies and are delivered as SaaS offerings.

The diagram here shows the top-level organization of the different subsystems comprising the complete scope of work and solution construct.

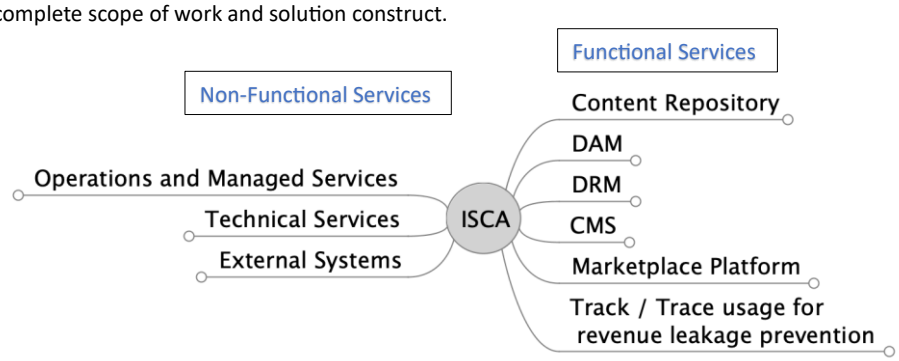


FIGURE 1 - TOP LEVEL SUBSYSTEM ORGANIZATION

Functional requirements

- Content Repository – to manage content acquisition and enrichment
- DAM – the digital asset management system
- DRM – the digital rights management system
- CMS – the content management system
- Marketplace – the monetization of the digital asset over B2B/ B2C/B2B2C channels
- Revenue leakage prevention

Other requirements

- Operations and managed services
- Technical services
- Nonfunctional requirements
- External system integrations

This document describes the detailed solution for all the requirements per the above logical organization. There is a companion compliance matrix in a spreadsheet that gives a quick traceability for the RFP requirements with the section where it is addressed in this document.

4 Loosely Coupled Subsystems – Logical Architecture

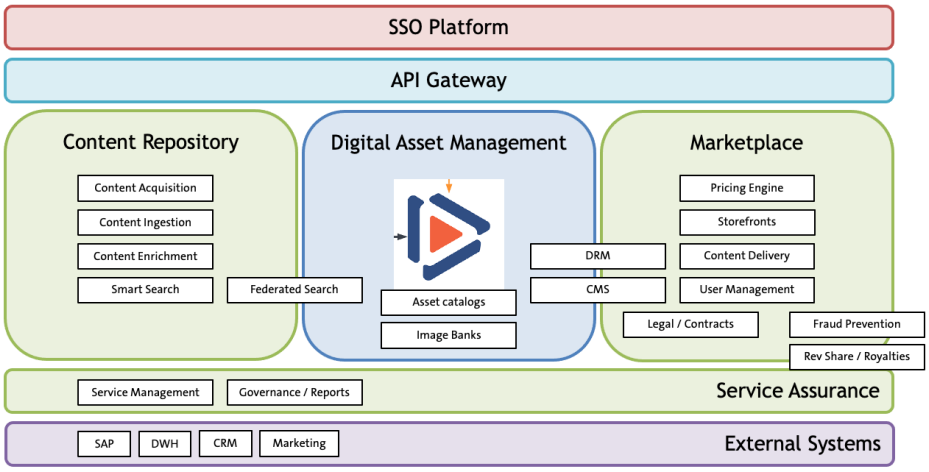


FIGURE 2 THE LOGICAL ARCHITECTURE OF TOP-LEVEL SUBSYSTEMS

The Content Repository subsystem manages the complete lifecycle of content acquisition, content ingestion, content enrichment and instrumenting the smart search capabilities.

Once the content is enriched then it can be searched through for a variety of criteria and the selected content will be handed off to the Digital Asset Management subsystem from where the content will be ingested into the Tenovos DAM for further enhancements and insights generation. The enriched content from the repo is now transformed into digital assets and are available for smart search from downstream CMS systems / Marketplaces. The downstream users of different flavors (B2B/B2C/B2B2C) can also interact with the remote content from the content repository via a hybrid index generated by the Tenovos DAM. The remote content can however be used only for browsing purposes and if there is an interest in consuming that remote content should first be transferred to the Tenovos DAM and transformed into a full-fledged digital asset.

The Market Place subsystem is comprised of pricing engine, storefronts and user management that allow role-based access and entitlements granted based on a variety of parameters. The content delivery process will handle the digital forensics, tracking and tracing the legitimate or fraudulent consumption of the assets and is ready for a variety of downstream consumption platforms.

The Service Assurance system is offered from the Sify Service Now CSM portal. Several key enterprise requirements like invoicing, marketing automation and CRM capabilities are delivered with External System integrations.

5 Functional Requirements

5.1 Content Acquisition and Asset Transformation

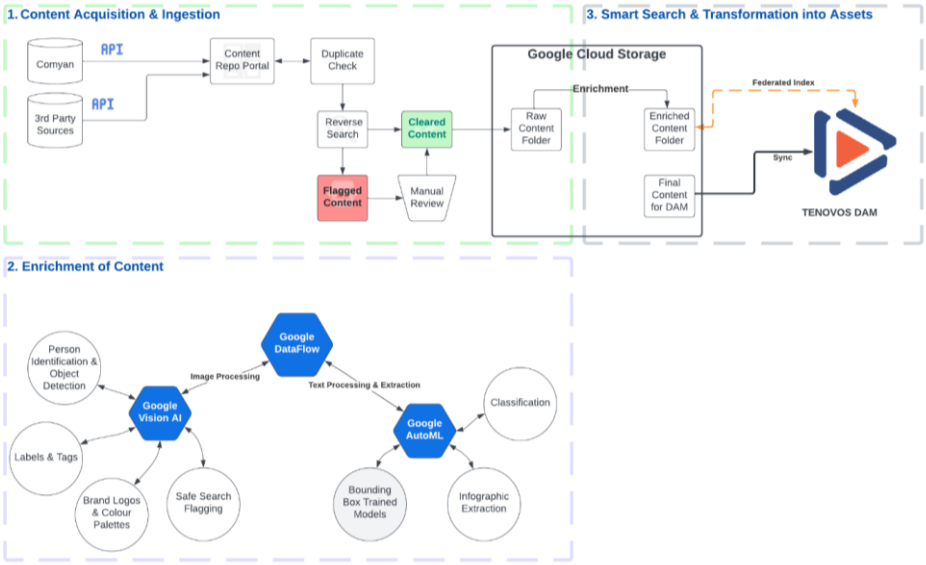


FIGURE 3 - CONTENT SOURCING AND ASSET TRANSFORMATION PROCESS

The key steps of the content acquisition process are:

Pull from COMYAN and third-party sources: Using COMYAN APIs & third-party APIs the content items are imported into the Content Repo.

Duplicate Check: As part of the import workflow, each content item is checked against Tenovos Repo to verify if an exact copy of the content item already exists in the DAM via Tenovos API.

Reverse Search: Reverse search is then performed on image-based content items for veracity and plagiarism. Flagged content from reverse search will undergo a manual review process for approval.

Cleared Content: All the content cleared by reverse search engine is moved to the Google cloud storage for enrichment.

Content Enrichment: The DataFlow pipeline for content enrichment is initiated to process and extract enrichment information through AI driven APIs.

Thumbnail creation: Post enrichment, an automated transformation script will generate thumbnail images of the enriched assets.

Post content enrichment, a curation process allows the business teams to select a catalog of enriched items for ingestion into the DAM. These will be first transferred into an AWS S3
The remaining content items at large will also be available for search from the DAM by way of the hybrid index created within Tenovos for the remote assets.

5.2 Content Repository

5.2.1 Content Acquisition

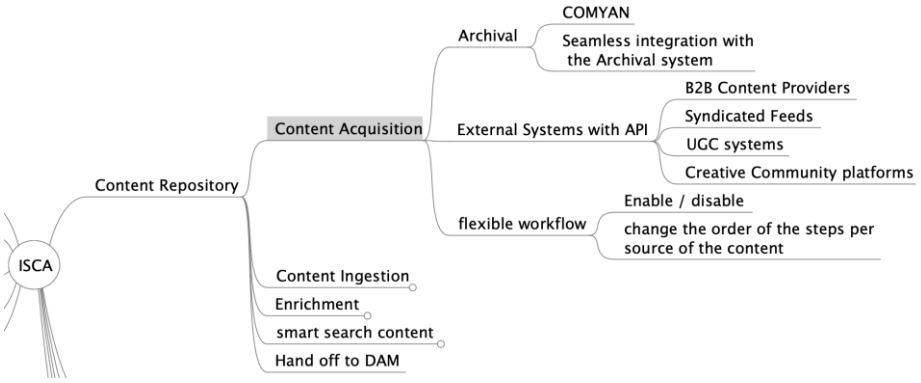


FIGURE 4 - CONTENT ACQUISITION PROCESS AND SYSTEMS

5.2.2 From Archival

BCCL currently uses Comyan as its content assembly and archiving system and BCCL will continue to use the digital content (around 3.1 million items) in the Comyan system as one of its content sources. In addition, the other BCCL content sources include items created through Editorial Workflows, User Generated and Syndicated feeds.

A unified Content Repo portal is developed by Sify, that will work as the primary interface for managing the content acquisition process by all BCCL's privileged users. The unified Content Repo Portal will have a ETL workflow engine for ingestion process and an appropriate User Interface to capture the filter criteria to pull content from Comyan or Third-Party systems API to extract content and dump into Storage buckets for subsequent processing. The system also permits to configure and manage the settings for automated content ingestion.

5.2.3 External Systems with API

A plugin system is built into the Content Repo portal to permit connection to integrate with other external systems (for e.g., B2B content providers, syndicated feeds, UGC systems, Creative community platforms, etc.).

The APIs exposed by these third-party systems will be leveraged to build the plugins. The features available for selection, curation and automation are consequently predicated on the richness of the third-party APIs available.

5.2.4 Flexible Workflow

The ETL Workflow Engine in the Content Repo Portal will be designed in a configurable way, whereby it can query different vendor systems to absorb content as per availability and load into the data pipeline for ingestion process. ETL process is the first step towards picking up the different types of data and connect them between the workflow processes to feed into the ingestion system. BCCL archival repository accumulates large datasets of digital content that are historical, and it gets augmented daily by a variety of sources from entities like editorial, syndicated, photographers and Third-Party services.

Comyan offers APIs to retrieve content from the archival system. The Content Repo portal will offer a Content Viewer along with necessary filters or configurators to control the flow of content into the ETL process. Once the content is chosen for extraction, it will be mapped to the transformation template based on the chosen inventory. The ETL workflow engine will start processing the content based on the transformation template definitions and load the content item into the Cloud Storage service.

When pulling the content from Comyan or Third-Party systems to be eventually fed into the DAM, BCCL will be able to select and move the content that is monetizable into the Tenovos ingestion pipeline through the click of a button in the portal UI. The selection and movement of the content can happen by individual item or in bulk.

5.2.5 Content Ingestion

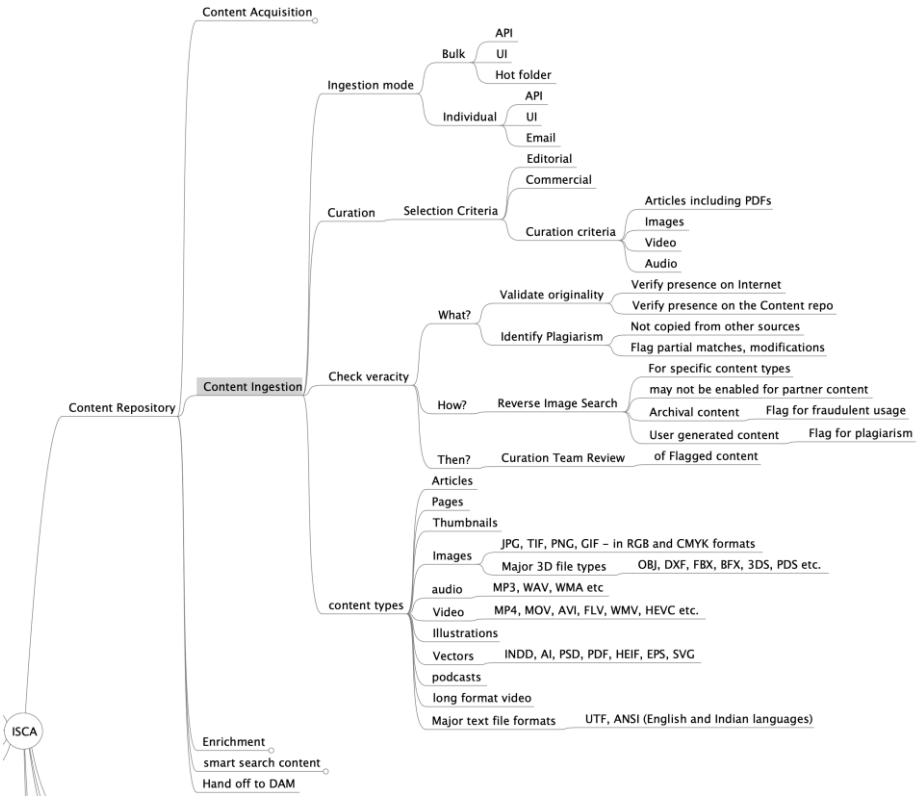


FIGURE 5 - CONTENT INGESTION PROCESS AND SYSTEMS

5.2.5.1 Ingestion Mode

In addition to pulling the content from Comyan or Third-Party systems, BCCL will be able to upload (bulk/individual) content through the unified Content Repo portal UI. Additionally, the content can be uploaded in bulk through FTP or web interface to a hot folder that will be connected to an automated Cronjob that will periodically assimilate the content into the repo from this folder.

5.2.5.2 Curation

It is assumed the selection of content namely editorial or commercial usage will be based on the labels provided in the source system (e.g., Comyan). Source system to provide necessary label information to identify the type of content (Editorial, Commercial and other curation criteria), which will ensure specific treatments or methods to be handled while doing ingestion process.

5.2.5.3 Check Veracity

5.2.5.3.1 Validate Originality and Flag Duplicate Assets

The content items will pass through reverse search APIs to check for duplicates to ensure that the item is not already present in the platform, and on the internet. To check for the pre-existence of an artefact within the Tenovos asset repository, an API from Tenovos will be used, that will compare and verify the checksum of the requested artefact against the entire set of assets in the DAM repo, to return the details of the duplicate found. Upon identification of such a duplicate, the artefact will be moved to the "manual review" area of the content repo portal, and temporarily discarded from the ETL pipeline, until it is manually approved and brought back in by the BCCL reviewer. The flagging of artefacts from reverse search will go through a similar manual review/approval process. Based on whether the content is cleared by reverse search or not, the asset will be processed for manual approval through the unified content repo portal. If the content is flagged, BCCL curation team may now perform a direct search on the cloud repo to filter only flagged items based on the values set in the ''flagged'' attribute.

5.2.5.3.2 Flag Plagiarism

BCCL archival content will pass through reverse search APIs (TinEye or Google Web Entities) to check for unauthorized usage. Based on whether the content is cleared by reverse search or not, the asset will be processed for manual approval through the unified content repo portal. If the content is flagged, BCCL curation team may now perform a direct search on the cloud repo to filter only flagged items based on the values set in the ''flagged'' attribute.

Note: For validating originality of the text-based content such as news clippings, articles etc., extracted from the artefacts, we propose to use any of Third-Party services like Unicheck or Copyleaks. However, during the Analysis phase of the project Sify will qualify the services to use after testing BCCL's sample content. The test evidence will be presented to BCCL's technical team, before finalizing the vendor to go for.

5.2.5.4 Content Types

We understand that BCCL source content types will include articles, pages, thumbnails, images, audio, video, illustrations, vectors, podcasts, long video format and major text file formats and the repo will be able to handle all these listed content types. The formats outlined in the flowchart (refer to Fig 5 on the previous page).

We are awaiting confirmation from GCP on what formats are supported.

5.2.6 Content Enrichment

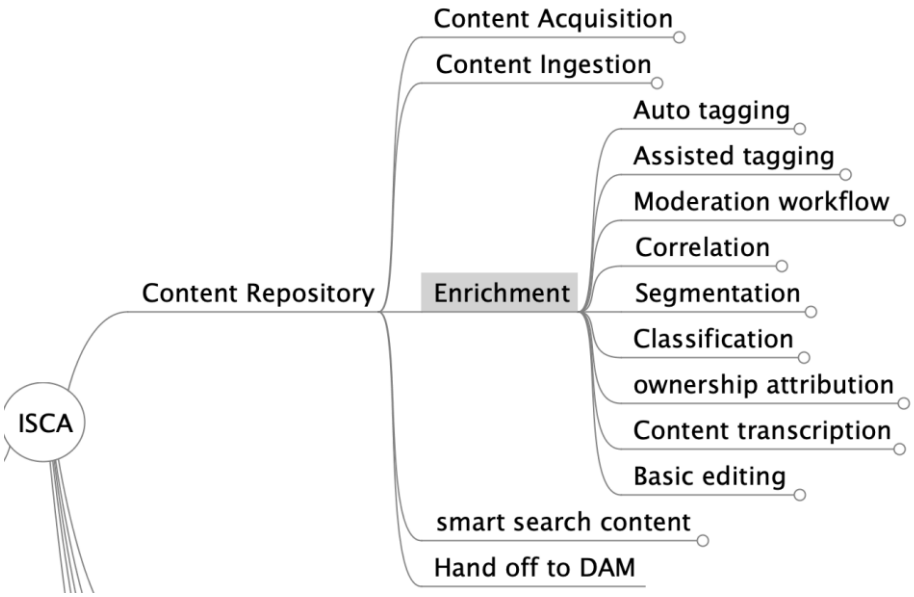


FIGURE 6 - CONTENT ENRICHMENT TOP LEVEL PROCESS AND SYSTEMS

Content enrichment, the process of adding structure, context, or metadata to content, will help support BCCL to achieve its enterprise digital asset management, rights management, and asset monetization goals and provides a better digital search experience for users to quickly find the right content at the right time.

5.2.6.1 Auto Tagging

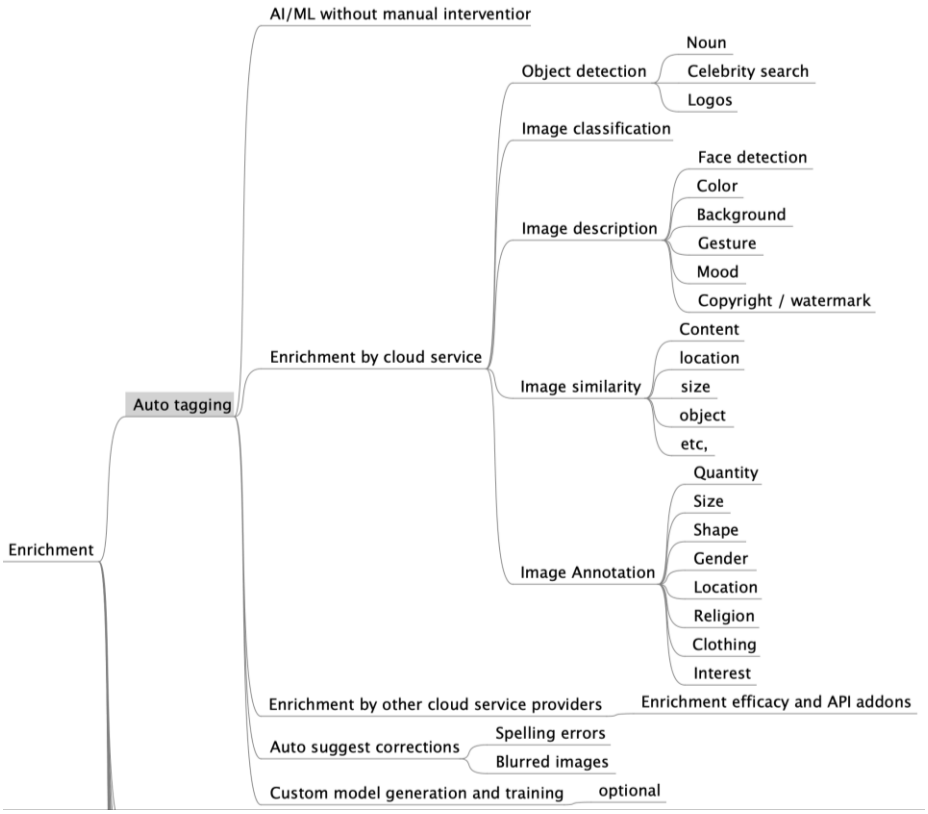


FIGURE 7 - AUTOTAGGING FOR CONTENT ENRICHMENT

The BCCL archival content after being cleared through reverse search is passed through a rule engine that defines rules for the content to be approved without requiring manual intervention and approval and the content that passes the manual approval by BCCL Curation team are moved into the cloud storage.

When the cleared content moves into the Cloud Storage, the content enrichment happens at run time through the Dataflow pipeline that is triggered. The content enrichment is done through AI image tagging using Google services that involves image processing and text processing and extraction.

5.2.6.1.1 Pre-trained AI Models

Image Format*:* Google Vision APIs to use pre-trained/off-the-shelf models available to perform feature detection directly on an image file located in Google Cloud Storage and enriches the image for personality/celebrity identification/object detection, brand Logo recognition, label and tag generation, color/mood, and safe-search inclusion to provide best rich metadata for efficient search.

Video Format: Video Intelligence API has pre-trained machine learning models that automatically recognize a vast number of objects, places, and actions in stored and streaming video. Offering exceptional quality out of the box, it's highly efficient for common use cases and improves over time as new concepts are introduced.

5.2.6.1.2 Custom Trained AI Models

In case, the output of any of the AI services is not as effective as expected, then custom AI models could be generated and trained. Few custom models to be trained to meet the requirements like, AutoML modeling for text extraction from columnar data. An AutoML based model will be trained to extract articles from columns. Metadata and label similarities can be used to flag content similarities, which has to be manually reviewed.

Content formats that are not supported by Google APIs need to be manually converted to a supported format using third party tools within the automation, prior to enrichment.

During the enrichment process, the system will be able to identify and display spelling errors and blurred images, but the system will not be able to fix any of them, which needs a manual intervention to fix.

5.2.6.1.3 Enrichment Efficacy and API Addons

The content enrichment efficacy would be based on the effectiveness of the AI-based tagging services provided by the Google APIs. To enhance the enrichment efficacy further, the additional standard AI-based tagging APIs (tags from Tenovos) are included as part of Tenovos standard asset ingestion process.

5.2.6.2 Assisted Tagging

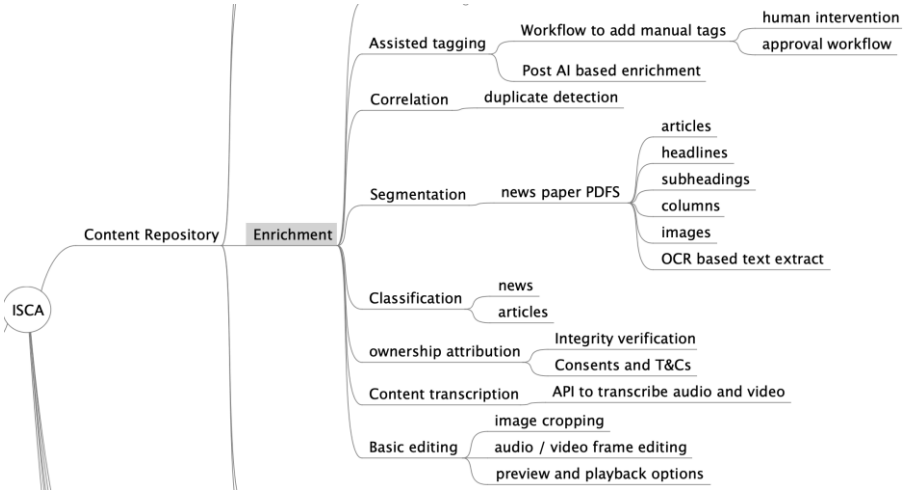


FIGURE 8 - MANUAL TAGGING AND OTHER PROCESSES

Post AI-based auto enrichment, the enriched assets can be further enriched through manual assisted tagging from the Repo portal or Tenovos DAM. Tenovos has workflow to add manual tags and this feature is available as Out-of-the-box. In the Repo Portal, manual tagging option will be provided for further enrichment/modification via user interface, where BCCL curation team can edit tags of the assets, add manual tags, and save tags.

5.2.6.3 Moderation Workflow

The Review Workflow is a system to address the impending manual review required for assets to comply on validity, authenticity, and quality. The review system will have content viewer which will list down the content marked for manual review and on a successful review the content will be pushed further in the pipeline for specific process and completion of the activity. Each review process to carry the users' comments and redressal reasons before submitting back for any eventual process.

5.2.6.4 Correlation

Metadata and label similarities can be used to flag content similarities, which has to be manually reviewed.

Commented [VVR1]: Note to Ravi: Would this be applicable in the upstream application?

5.2.6.5 Segmentation

Content segmentation is done based on labels and tagging, Search will be enhanced based on labels and filters. For example, the OCR Text Detection and Extraction powered by the Google

Vision API, integrates seamlessly to extract all detected text from images, including multi-page documents like TIFFs and PDFs. Using these APIs, the newspaper PDFs will be segmented using AI driven APIs to categorize articles, headlines, subheadings, column, and images.

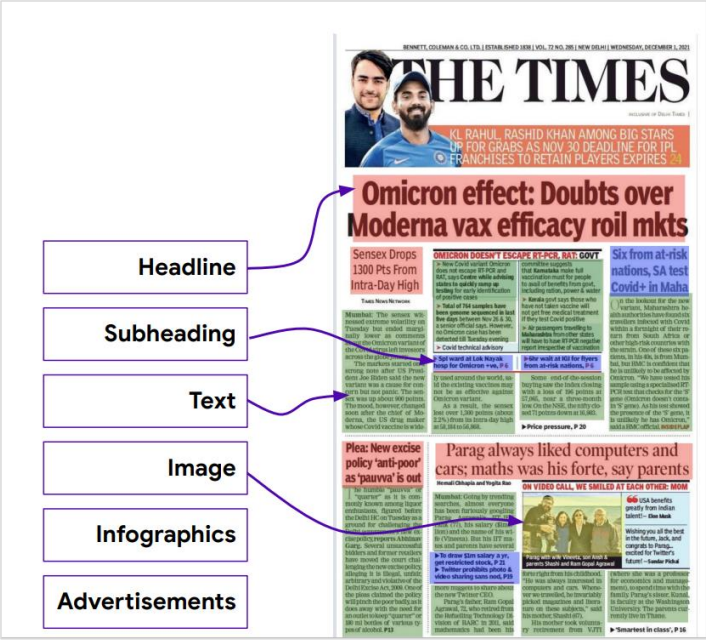


FIGURE 9 - AI-BASED LABELS AND TAGGING FOR CONTENT SEGMENTATION

5.2.6.6 Classification

During the enrichment process, the content will be classified based on the available labels in source system along with the automated text-based content extraction from AutoML APIs (See Content Ingestion Workflow Diagram in Section 2.1).

5.2.6.7 Ownership Attribution

For assets coming into Tenovos, an option will be provided in Tenovos for BCCL Curation Team to input details regarding ownership attribution such as vendors/partners legal contracts/T&C for each asset. This information is retained with the asset as metadata that will transfer with the asset until it reaches the marketplace.

5.2.6.8 Content Transcription

With the Google AI Video Transcription services, you can automatically generate speech-to-text transcripts of video and audio files. The AI Video Transcription services applies powerful neural network models to your videos using Google's Cloud Speech API to get the best possible speech recognition results and this supports to transcribe videos in almost any language.

The contents of the returned transcript file can be displayed making your content more skimmable, accessible, and SEO-friendly. The ingestion process workflow will transcribe and store Audio/Video texts and indexed as part of enrichment process.

5.2.6.9 Basic Editing

As part of enrichment, the image format content can be edited for basic edit functions such as image cropping, rescaling, etc using tools like ImageMagick. For audio and video file formats, when transforming and editing audio/video frames, BCCL would want to trim parts of the video/audio to adjust the length or concatenate different videos together. To achieve these trimming and editing functionalities, we will use an online SaaS service such as Cloudinary service for trimming and concatenating via APIs.

5.2.7 Smart Search Content

Smart Search is available for digital assets in Tenovos repo as well as the larger remote content from the Content Repo with Hybrid Index generated from Tenovos.

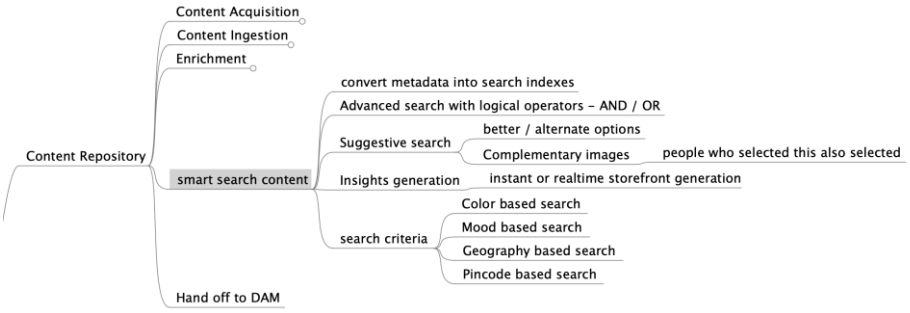


FIGURE 10 - SMART SEARCH CONTENT APPROACH

5.2.7.1 Convert Metadata to Search Indexes

Elasticsearch in built in Tenovos allows you to store, search, and analyze huge volumes of data quickly and in near real-time and give back search results in milliseconds. It's able to achieve fast search responses because instead of searching the text directly, it searches an index. It uses a structure based on documents instead of tables and schemas and comes with extensive REST APIs

Commented [VVR2]: Note to Ravi: Would this be applicable in the upstream application? Tenovos has this inbuilt. Should this be covered under DAM core features?

for storing and searching the data. At its core, Elasticsearch process requests and returns JSON data.

The metadata extracted and refined (such as labels, tags, brand logos, personality identification, object identification, color palettes, textual information) during the enrichment and content transformation is indexed via Elasticsearch adds a searchable reference to the assets.

5.2.7.2 Advance Search with Logical Operators

After the metadata is indexed into Elasticsearch in Tenovos, one will be able to start searching and analyzing it. The simplest query one can do is to fetch a single item. For advanced search, when calling the search API, one can specify the search term and using logical operators like and/or for which you want to search. One can even search on multiple indices and types by separating their search terms with commas.

5.2.7.3 Suggestive Search

A suggestive search provides recommended queries, and this search feature suggests similar looking terms based on labels/tags text already defined. A query suggestion will match deeper on a single field and apply less search logic when compared to a search query. It's a word, phrase, or text fragment which will be used to find good matches and suggestion results are matched against indexed data/tags and based on search history, popular search query and similar views by the users. The goal of a suggestive search is to find a match, then suggest that match to a user who will use it for their own query.

5.2.7.4 Insights Generation

During the syncing and storage into Tenovos DAM, the assets will be automatically AI tagged (if not done already) with rich meta data to power complex searches. Using an end-to-end Analytics and BI engine, the platform provides valuable insights (User based Reporting, Asset Based Reporting, ML /AI Anomaly Detection, Lifecycle Analytics, etc.) throughout the content lifecycle, regardless of where content lives by aggregating product, rights, and other enterprise data into a 360-degree view.

5.2.7.5 Search Criteria

Search criteria is used to retrieve get list response for an asset based on specific conditions that are specified by the user. For instance, the conditions of the search criteria can be set to filter the search results by color, mood, geographic, and pin code.

5.2.8 Handoff – Flow of enriched content into DAM

Post content enrichment from the DataFlow pipeline, the enriched content folder will contain the original asset along with JSON files containing the metadata captured from enrichment. At this point, a copy of this metadata will be synchronized separately along with just the thumbnail

images of the original asset to serve as Federated Asset Indices for the DAM. This folder will be in periodic sync with Tenovos through a cronjob. This will allow users to search assets from Tenovos as well as from the Content Repo through a federated search within Tenovos. The results of the federated search will be a combination of original assets within Tenovos as well as references of assets within the Content Repo thereby enhancing the user experience to view content across applications (Tenovos and Content Repo).

The federated assets within Tenovos are just the references of the original assets still residing in the Content Repo. However, to be able to monetize an asset, BCCL will have to ingest the actual asset into Tenovos.

The Content Repo will have a final assets folder inside which assets (along with all their metadata) will get populated upon BCCL user's manual selection from the Content Repo to move into Tenovos DAM. This selection must be made just for assets that have the potential to be monetized. Through an automated and manual workflow, these final assets will be synced with the DAM staging folder on a periodic basis.

5.3 Digital Asset Management

5.3.1 Core Features

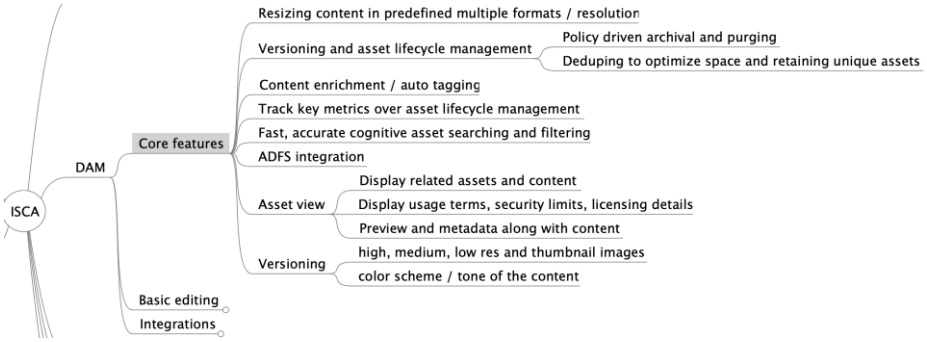


FIGURE 11 - CORE FEATURES OF TENOVOS DAM

5.3.1.1 Resizing Content in Predefined Multiple Formats

In Tenovos, the content transformation is handled through several content extraction and transformation servers that process content after it is imported. These servers are responsible for extracting EXIF data, creating different sizes of the original image, and transcoding videos for example, create multiple versions of the image/video content - high, medium, low resolution and thumbnail images or creating versions of the content for different color scheme and tone of the content.

5.3.1.2 Versioning and Asset Lifecycle Management

In Tenovos, asset lifecycle management features are available to provide organizations to create, review, collaborate, and approve/reject digital assets. Using the Tenovos Workflows module, as part the content import into Tenovos, assets can be approved and moved to the DAM with review and approval cycle with other BCCL stakeholders, which can be started before finalizing them to DAM. Using Proof features in Tenovos, versioning of the assets is managed, and this is only available to the participants of the proof(s). Once a new version of the asset is created, it is available for review and approval wherein email notifications with activity progress information are sent to reviewers and approvers until is published to a marketplace.

Story Boards, an asset collection portal for sharing and campaign management. Within Story Boards, the option to define the expiry date of each asset is available out-of-the-box. Tenovos sends notifications to BCCL users and the associated B2B partners to remind about the expiry of the license and when it needs renewal or retirement.

5.3.1.3 Content Enrichment and Auto Tagging

In Tenovos, the process of asset ingestion includes enrichment and auto tagging by default using AWS AI/ML APIs. Once the content is imported into Tenovos main DAM along with respective tagged metadata, all embedded metadata is automatically extracted and indexed with the asset in Tenovos. Tenovos keeps a record of the original tags so that in the future we can send the updates if desired back to the AI engine for AI training purposes as part of the standard business process (as opposed to a separate activity). Furthermore, this metadata can also be mapped to business fields to enhance lifecycle workflows.

5.3.1.4 Track Key Metrics Over Asset Lifecycle Management

Story Insights in Tenovos is an end-to-end analytics and asset intelligence engine. The engine allows the capture of aggregate data gathered across Story Manager and Story Streams in asset lifecycle so users can generate insights, visualizations, reports, recommendations, and value measurements. BCCL can use these insights to drive content decisions and stakeholders can assess the value of all content.

5.3.1.5 Fast, Accurate, Cognitive Asset Searching and Filtering

The approach is detailed in Smart Content Search section (for details refer 2.2.4).

5.3.1.6 ADFS Integration

The finalized SSO Provider will be integrating all BCCL existing systems along with Content Repo Portal, Tenovos, Content Management System, marketplace, an

d the API management platform. The scope of ADFS integration will be with the SSO service provider and Tenovos as system will have Federated Users managed via the SSO service provider.

5.3.1.7 Asset View

The details of an asset are available in the Asset Details page in Tenovos. The Asset Details page is available when an asset is selected by clicking on a specific asset. The details page provides a larger preview image, the file name of the asset and metadata applied to the asset. The asset metadata available to the user is based on the asset templates, asset permissions and user permissions. Metadata is read only and may be displayed as text, tables, numeric and icons. Using the carousal available in the Asset Details page, the details of other assets can be viewed. The security template of an asset is a predefined template of grouped attributes that is applied to the asset.

5.3.1.8 Versioning for High/Med/Low Resolution/Color Scheme

This is already covered earlier in section 2.3.1.2 titled Basic Editing

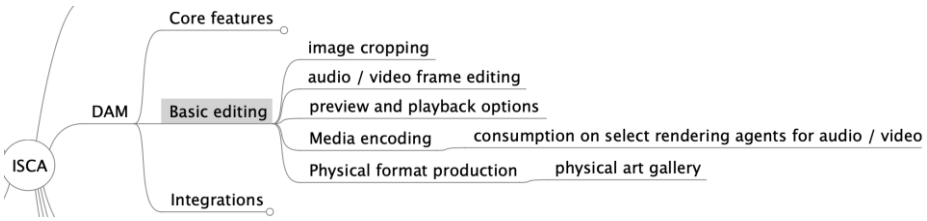


FIGURE 12 - HANDLING BASIC EDITING OF ASSETS IN TENOVOS DAM

5.3.1.9 Image Cropping

Assets in image format can be edited for basic edit functions such as image cropping, rescaling, etc using tools like ImageMagick.

5.3.1.10 Audio/Video Frame Editing

For frame editing video and audio files, we will use an online SaaS service such as Cloudinary service for trimming and concatenating via APIs. Alternatively, we can leverage on Tenovos partners services to facilitate audio and video frame editing functions.

5.3.1.11 Preview and Playback Options

In the SaaS platform/service for audio and video editing will also have the capability for preview and playback of the media files prior to saving the updates.

5.3.1.12 Media Encoding

Media encoding of video and audio files for different formats is handled during content transformation in Tenovos by default, as part of the asset ingestion pipeline.

5.3.1.13 Physical Format Production

The support for physical format productions will be handled through integration of third-party services, tools, and hardware, wherever applicable.

5.3.2 Integrations

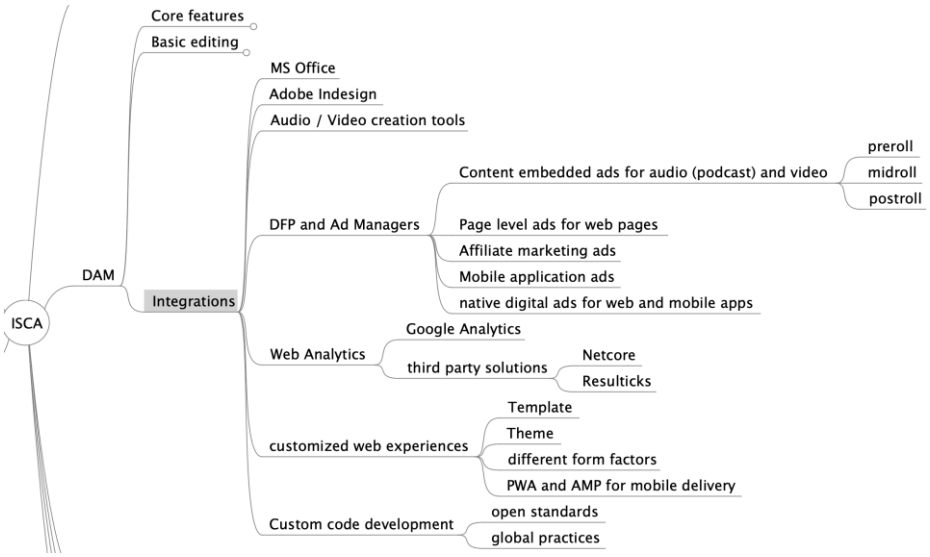


FIGURE 13- INTEGRATIONS OF TENOVOS DAM WITH THIRD PARTY SOLUTIONS/SERVICES

5.3.2.1 Adobe InDesign/Audio/Video Editing Tools

Tenovos has connectors for integrating with Adobe InDesign and other third-party audio and video editing tools. Based on the BCCL's requirements, we will be able to integrate online services such as Adobe Creative Cloud, Cloudinary, etc.

5.3.2.2 Other Integrations – Third Party Solutions

For other integrations such as MS Office, DFP and Ad Managers, Web Analytics, and customized web experiences, which are not readily available in Tenovos, Sify will be able to handle those through custom integrations and third-party APIs based on BCCL's needs and priorities.

5.4 Digital Rights Management

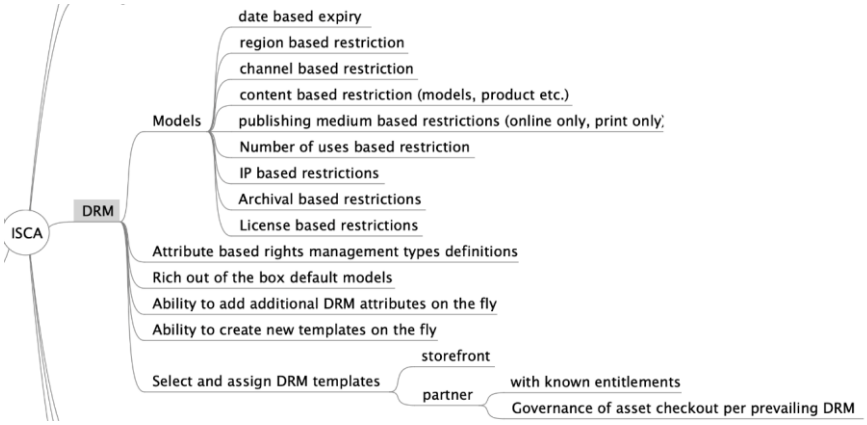


FIGURE 14 - DIGITAL RIGHTS MANAGEMENT APPROACH AND FUNCTIONS

5.4.1 Digital Rights Management

Tenovos has an advanced licensing / compliance framework which is an extensive rights platform. The rights management capability is handled within Tenovos is through Story Rights which will enable BCCL to effectively manage content rights and streamline content sharing with external partners and agencies.

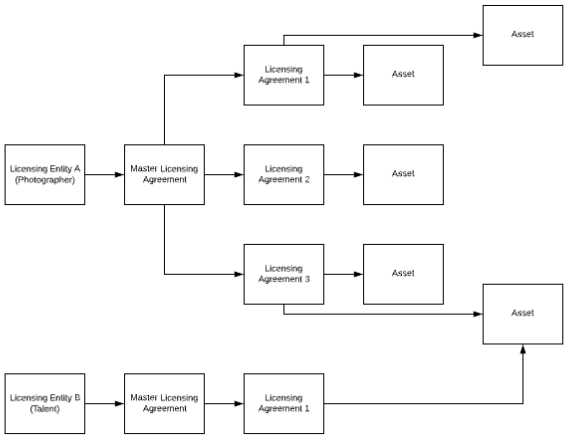


FIGURE 15 - PROCESS FOR DIGITAL ASSETS/LICENSING AGREEMENT ASSOCIATIONS IN TENOVOS

Based on BCCL's Master Licensing Agreement with its partners and agencies, assets can be associated with single or multiple licenses. For example, a BCCL contract with Licensing Entity A (e.g., Photographer) having multiple licensing agreements can be individually associated with single or multiple assets. Similarly, a single asset can be associated with multiple licensing agreements. Refer to the flowchart in Fig 16 for details on the assets to licensing agreements associations. The contract and agreement associated with the assets will centrally reside in Tenovos and feed into the marketplace platform and other external systems that the assets are published to.

5.4.2 DRM Models

Story Rights has easy-to-configure workflow forms that can do anything from simply collecting usage information, to easily create and control rights and usage governance for assets across channels. By pairing critical rights and creation data with assets from the start, Story Rights enables all aspects of rights management and governance, including the tracking of date-based expiry, region-based restriction, channel-based restriction, content-based restrictions, publishing medium based restrictions, archival and license-based restrictions. However, BCCL requirement of rights management for number of uses-based restriction and IP-based restriction needs to be custom developed.

Story Rights connects assets to rights data to create an understanding of content's financial return by aggregating complex agreements, tracking usage, and ultimately measuring performance to inform business on the value of assets when deciding whether to renew rights and licenses.

5.4.3 Define Rights Management Types Based on Various Attributes

- Tenovos allows the management of digital rights of assets using templates that can be defined based on various standard and custom attributes. For example, using Rights Management Permissions Model to create projects, agreements, and entities, and uploading assets to the projects, the following might be applicable:

1. There would be an existing Rights Template that is the "Admin Template" for BCCL. This template will always be assigned to a Rights Object (project, agreement, or entity).
2. There may be an existing "Business Affairs Group" for BCCL that might need full control over rights for all assets.
3. The third party would have some users that should be allowed to create the projects, agreements, and entities, and other users that should be allowed to upload assets to the created projects.

In the above example, the following would be the steps on how the Tenovos Rights Management permissions model would be updated:

1. Create the Group
2. Create the Users
3. Create the Rights Template
4. Update existing Rights Templates
5. Create Security Templates

An example of the steps involved in attribute-based RM Privilege and Permission Model creation could be the ability to distinguish between “unapproved” and “approved” rights objects. In this case, the user access varies depending on whether an object is “unapproved” or “approved”, where the privileges would be defined as:

- **Rights Management**: Approve rights objects, Delete rights objects
- **Rights Maintenance**: Create and Update rights objects
- **Rights User**: Upload assets and assign rights, Read rights object

In this example, the list of permissions applied would be:

- **Write**: Groups with this permission checked on the security template have the ability to modify rights objects that have that security template applied.
- **Apply**: Groups with the permission checked on the security template have the ability to assign that template to rights objects.
- **Auto Apply on Creation**: Groups with the permission checked on the security
- template will apply that template to any right object they create.
- **Auto Apply on Approval**: Groups with the permission checked on the security template will apply that template to any right object that is approved.
- **Associate to Asset**: Groups with the permission checked on the security template have the ability to associate objects that have that security template applied with Assets such as videos and photos.

5.4.4 Rich Out of the Box Default Model

The Story Boards defined for the entities during the onboarding can have digital rights management parameters included based on the contractual agreements between BCCL and their B2B partners. Assets imported into the main DAM can selectively be associated with B2B partner Story Boards to automatically have specific digital rights settings applied to them based on the defined DRM templates associated with the Story Board. The consumption of the assets by the B2B partners through the Story Board will be governed by the digital rights settings prevailing for them.

- Rights Management Permissions Model
- Rights Management Privilege and Permission Model
- Rights Security Model

5.4.5 Ability to add Additional DRM Attributes on the Fly

The DRM attributes in Tenovos are managed using templates and easy-to-configure workflow forms that provides the ability to add or modify DRM attributes at any point of the asset lifecycle.

5.4.6 Create New Templates on the Fly

In Tenovos, a standard set of DRM attributes are already defined that can be used for creating new templates. However, a DRM attribute that is not available in Tenovos by default needs to be custom built. For example, attributes such as management for number of uses-based and IP-based rights are not available and these need to be custom-built.

5.4.7 Select and Assign DRM Templates (Storefront and Partner)

As needed, BCCL users may select and assign DRM templates for each Story Board to ensure that BCCL partners can access the usage rights and licensing details for every asset. With this approach, a single asset could be included within multiple Story Boards containing differently defined rights for consumption of different external entities.

5.4.7.1 Governance (Partners)

The Story Boards defined for the entities during the onboarding can have digital rights management parameters included based on the contractual agreements between BCCL and their B2B partners. Assets imported into the main DAM can selectively be associated with B2B partner Story Boards to automatically have specific digital rights settings applied to them based on the defined DRM templates associated with the Story Board. The consumption of the assets by the B2B partners through the Story Board will be governed by the digital rights settings prevailing for them.

To provide Story Board access to BCCL external entities (B2B partners), the partners need to be onboarded into the platform. The B2B partner onboarding can be done through integrations with their ERP/CRM systems containing user information along with invoicing/collections and other business process information.

5.5 Content Management System

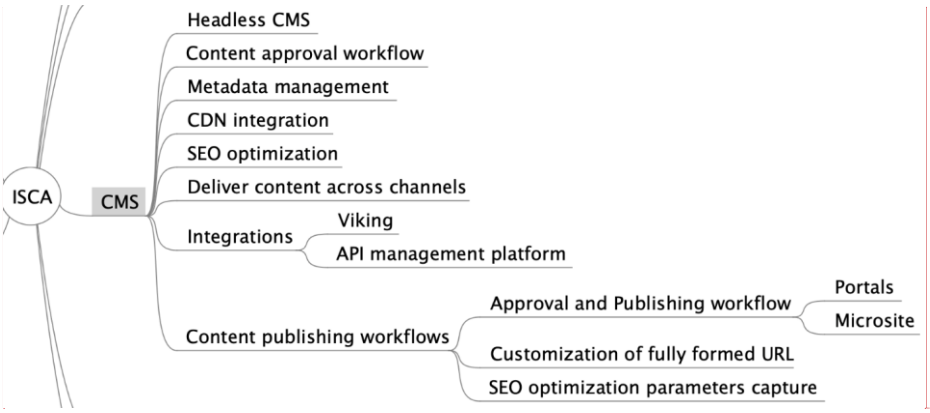


FIGURE 16 - CONTENT MANAGEMENT SYSTEM

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5.6 Marketplace Platform

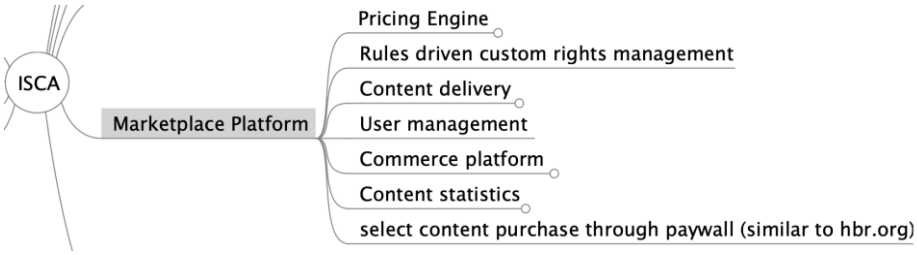

FIGURE 17 - MARKETPLACE PLATFORM FEATURES

BCCL's content has been curated, enriched, and stored in the Digital Asset Management platform in the form of Digital assets. These Digital Assets will be monetized by selling/licensing them on the Marketplace that is custom-built by Sify on top of a Headless CMS, which has the salient features like Storefront, Commerce platform, Pricing Engine, in addition to many other capabilities. For details on Storefront, Pricing Engine, Rights Management, Content Delivery, User Management, Commerce Platform, Content Statistics, Image Banks, Newsletter curation and Paywall functions, refer to the sections in the pages that follows.

5.6.1 Pricing Engine

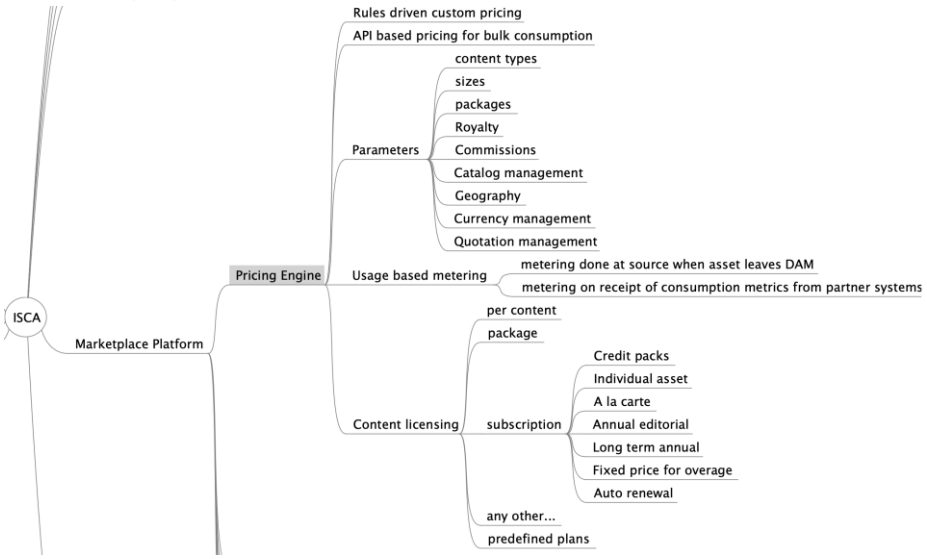

FIGURE 18 - PRICING ENGINE FEATURES

A pricing engine primarily is used to set the prices for the assets being sold/licensed. A pricing catalogue will be used to drive this, and it can also connect to external systems for additional pricing information when required. Considering the different categories of BCCLs content and the variants available in each content type, it's a very complex process to manage the pricing for these products. Sify will custom build the pricing engine, that helps us to manage this complexity in a better way. It also allows us to dynamically calculate the prices based on manual price inputs, customer analysis, etc. to help increase the revenues.

5.6.1.1 Rules Driven Custom Pricing

The pricing of a product is set not just based on the nature of the asset but is also determined based on the usage by the end customer. For example, if an image asset is going to be used in the front page of magazine, then that might cost more compared to the same image asset being used in a blog. Such custom pricing rules shall be determined and defined in the application to maximize revenues. These rules will be finalized by BCCL before configuring the pricing engine and the system will also allow BCCL privileged users to configure these rules.

5.6.1.2 API based Pricing for Bulk Consumption

For users/businesses that are looking to consume the assets in bulk, APIs are provided for them to connect to their systems and consume the content. For instance, the pricing parameters can

be finalized by BCCL such as pricing determined based on the number of API calls, and the same can be defined in the pricing engine and billed accordingly.

5.6.1.3 Parameters

Pricing parameters are variables that can defined and added to customize the pricing. The variables such as periodicity, validity, values, price, cost, etc. can be modified and applied.

5.6.1.4 Usage based Metering

The usage-based metering or pay-as-you-go pricing will allow the end user to only pay for the resources they have used. The criteria for the metering can be defined in the engine and bills are generated accordingly. The metering can be done either at source when the asset leaves the DAM, or on receipt of consumption metrics from partner systems.

5.6.1.5 Content Licensing

Licensing gives the end users permission to use the purchased assets for a particular time period, for an agreed upon fee. Given below are some of the license types that can be made available in the system, and the end user can choose from the same while purchasing the content.

- Per content – License for each piece of content
- Package – License for a group of assets
- Subscription – Following are some subscriptions that can be defined:
    - Credit Packs,
    - Individual subscriptions,
    - Ala carte,
    - Annual editorial subscriptions,
    - long term annual subscriptions,
    - Fixed price for overages,
    - Quota based usage,
    - Auto renewal, etc.
- Other predefined plans

5.6.2 Content Delivery

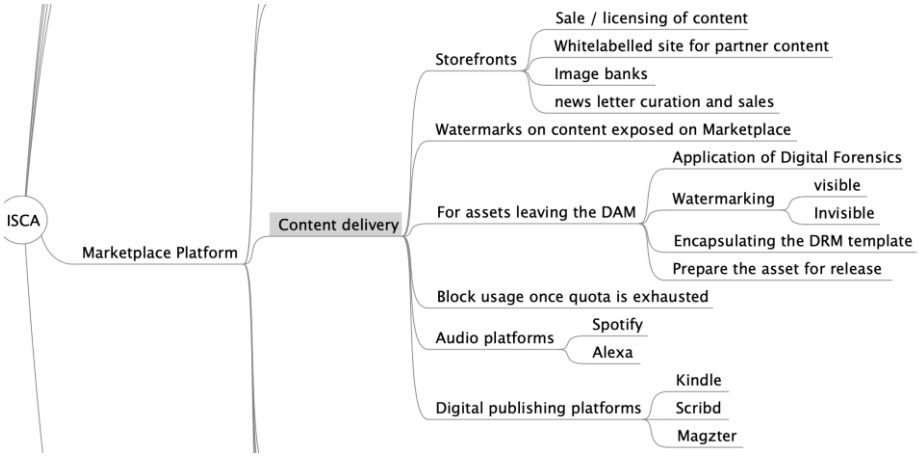

FIGURE 19 - CONTENT DELIVERY PROCESS AND FEATURES

The select assets that customers choose will be delivered dynamically through the Marketplace platform. The content is also secured before being delivered and can also be serviced in different ways depending on the platform that it is being requested from. The content delivery system is custom built by Sify.

5.6.2.1 Storefronts

The storefront allows us to display BCCL and its partners' Digital assets that are available for Sale / Licensing and the end-user can come here to buy them either through direct Sale or through licensing. Multiple storefronts can be created in the Marketplace, like BCCLs own B2C site, and multiple partner sites which can be customized accordingly through a white labelled site. The Tenovos DAM has options for creating collections of assets to publish into multiple storefronts through a custom connector build into the headless CMS.

5.6.2.2 Watermarking / Digital Forensics

Watermarking the assets as they leave the Tenovos DAM before distribution allows to identify the source in case of a leak. In this approach, digital watermarking will be realized from the integration with 3rd party services (such as IMATAG) in conjunction with the rights management module and the security templates applicable with Tenovos. The digital watermark applied to the assets remain invisible to the human eye and helps BCCL track copies of the assets to detect unauthorized usage.

5.6.2.3 Watermarking on Content Exposed in Marketplace

The encryption and digital watermarking of the assets helps detect and prevent fraud and unauthorized use of BCCL assets – Archived/User Generated/Syndicated assets. Assets leaving the system will be encrypted thereby making it unreadable to an unauthorized user. The decryption keys will be owned by BCCL via the platform and access to the assets will authorized/enabled through a custom-developed component to allow the intended B2B partner to consume the assets.

5.6.2.4 For Assets Leaving DAM

As the assets move out Tenovos and get stored in the target platforms of the BCCL marketplace for the monetization of digital assets such as storefronts B2B/B2C/B2B2C marketplace, the assets will be encrypted and watermarked. Also, the assets leaving the platform are subjected to a periodic reverse search applied to them to constantly monitor and flag their usage in external systems. To publish assets for the marketplace, we will use Collections feature in Tenovos to group assets into a large set, which will be then moved into the Marketplace platform via APIs/connectors. The proposed marketplace will be driven by a headless CMS framework with e-Commerce capabilities and ability to integrate with third-party APIs and systems.

Any asset that has been purchased will move from the DAM to the customer via the marketplace. For security, traceability, tracking expiry, etc. watermarking will be applied on the asset before being delivered to the customer. For image-based assets, the watermarking can be applied in 2 ways:

5.6.2.4.1 Option 1: 1-Pass Approach

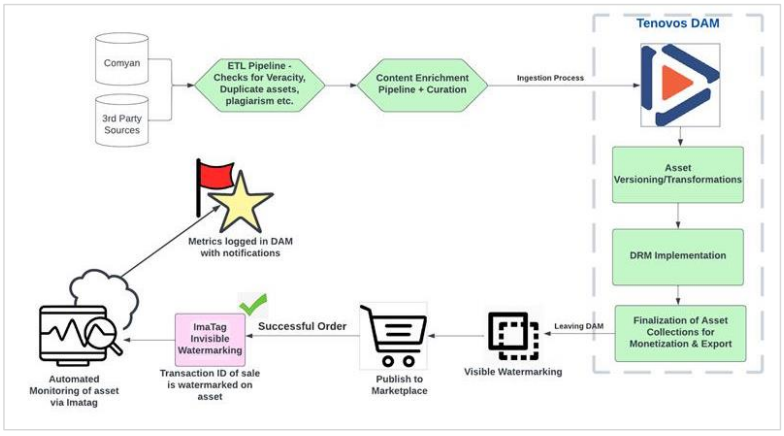

FIGURE 20 - WATERMARKING USING 1-PASS APPROACH

In this approach, the curated content is ingested directly into the DAM system without any watermarking. When an asset is processed for sale, a visible watermark is applied just before the content moves from the DAM system to the marketplace. Once the sale is successful, the transaction ID is watermarked by Imatag onto the asset as an invisible tag. The asset can be monitored via Imatag using this invisible watermark.

5.6.2.4.2 Option 2: 2- Pass Approach

In this approach, the curated content is passed through Imatag application to attach an initial invisible tag, and then ingested it to the DAM system. When an asset is processed for sale, the asset with the initial invisible watermark moves from the DAM system to the marketplace. Once the sale is successful, the transaction ID is again watermarked by Imatag onto the asset as an invisible tag. The asset can be monitored via Imatag using the invisible watermark. The advantage of the 2-Pass approach is that the base invisible watermark is imprinted on all assets as they flow into the DAM with all its transformed asset versions also containing the same watermark. This way the asset is already protected when it hits the marketplace by de-risking the possibility of the usage any tool for the removal of visible watermark.

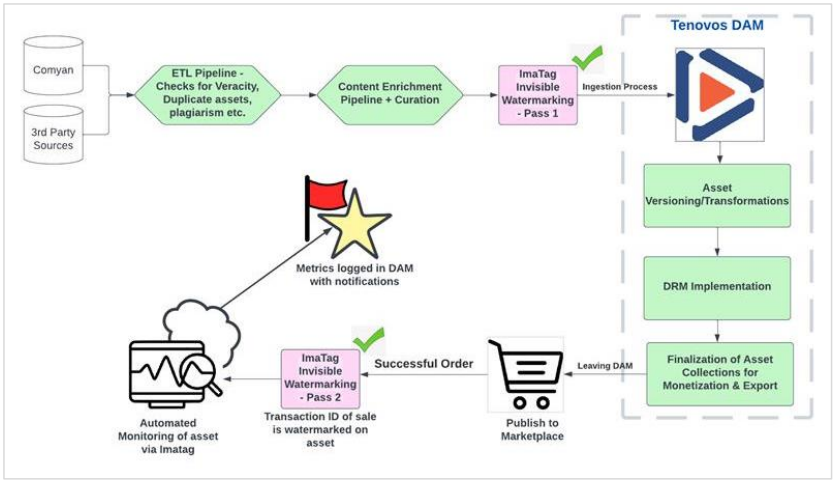

FIGURE 21 - WATERMARKING USING 2-PASS APPROACH

5.6.2.5 Encapsulating the DRM Template

During the encryption of the assets, the respective DRM templates associated with the assets are also encrypted along with the assets themselves. This allows our custom-developed decryption component to identify, and act based on the rights information associated with the assets. For

example, the component could immediately deny access to the assets if their expiry date has passed.

5.6.2.6 Prepare Asset for Release

As the assets are planned for release the following measures are taken to ensure their traceability and security while outside of the Tenovos platform:

- Applying digital watermarks to the assets
- Encryption of the assets
- Creation of asset identifiers in ServiceNow to allow support tickets to have asset association information.
- Tagging the asset for periodic reverse search to constantly track and identify external usage.

5.6.2.7 Quota based Blocking

To limit or restrict the usage of resources, quotas can be defined in the system. These quotas are dependent on the product / license purchased by the end user. Once the quota is exhausted the resources will be blocked and no longer be available to the customer until further necessary action is taken. Such quotas can be defined in the application to impose restrictions. Also, the end customer will be notified upfront in advance when either the limit of the quota usage is nearing or about to expire.

5.6.2.8 Platforms

Commented [VVR4]: To cross-check with Sunita to finalize the approach and update this section accordingly.

The content will be served to various Technology and Distribution platforms based on the requirements of the end-user. The marketplace platform supports this and below are some of the platforms that BCCL has requested for and are supported by the application:

- Audio
  - Spotify
  - Alexa
- Digital publishing
  - Kindle
  - Scribd
  - MAgzter

5.6.2.9 Others – Image Banks/Newsletter Curation and Sales/ Paywall

The content delivery platform driven via headless CMS will have the ability to integrate image banks and handle newsletter curation and sales. Regarding the paywall features, the headless CMS will have option to show a free preview of the premium content for a few lines/sections

beyond which, the full-content access will be tied with the payment terms for the user to access the content. User management

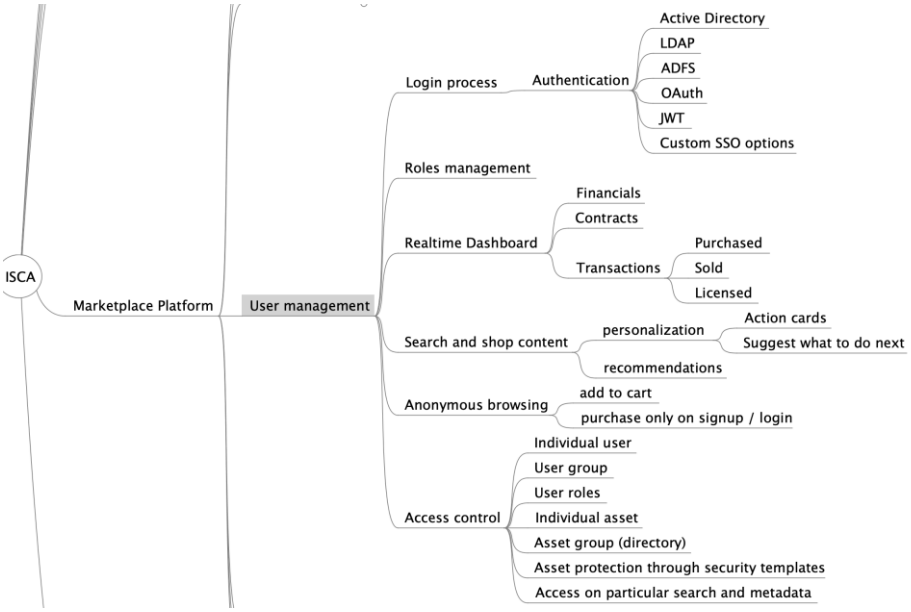

FIGURE 22 - USER MANAGEMENT IN MARKETPLACE PLATFORM

The Marketplace is where all the end users come to browse and purchase content. Below are the types of users that would need access to the system for either managing the marketplace or for consuming content from the marketplace:

- B2B Users
- B2B2C Users
- B2C Users
- BCCL AD Users
- 3rd Party AD/LDAP Users
- 3rd Party Individual users

5.6.2.10 Login Process

The site provides the user with a login interface that is integrated with the enterprise SSO provider. The SSO can integrate with various authentication modules such as Active Directory, LDAP, ADFS, OAuth, JWT and other SSOs. It can also provide federated access from 3rd party Identity providers such as Google, Facebook, etc. and lastly can also create new users into its own

user database. Depending on where the user is coming from and the type of authentication they are already using, the SSO will be integrated accordingly and allow the user to login.

5.6.2.11 Roles Management

A single user would need to have varying levels of access across various applications in the system. Similarly, the various types of users mentioned above would need different type of access on the Marketplace. Such restrictions and control of access to the site can be done using Roles management.

Specific Roles can be defined and assigned to the user. While signing-up during User onboarding, the user even has the option to choose between multiple roles e.g., creator, business user, consumer, etc. Based on these roles and other custom roles assigned to the user, their access on the system changes. Below are some of the roles that the different user types would require in the marketplace.

- BCCL AD Users:
  - Select BCCL AD users would require Administrator access to the Marketplace and its sub applications like the Storefront, Pricing Engine, API Management platform, etc.
  - Other BCCL AD users should have normal / consumer access.
- B2B Users:
  Usually, B2B customers would consume bulk content and hence would need Consumer access to the site, as well as to the APIs provided to them.
- B2B2C Users:
  Depending on the method of their content consumption, these users would also need Consumer access to the site and the APIs exposed to them.
- B2C Users:
  These users usually consume individual assets, hence Consumer access to the site should be enough.
- 3rd Party AD/LDAP Users:
  These could be BCCL partner organizations that have their own AD/LDAP authentication setup. These users would need Consumer access to the e-commerce site as well as the APIs exposed to them.
- 3rd party Individual Users:
  These are again BCCL individual partners like artists, journalists, etc. who might like to look at their content displayed on the site. Consumer access to the site should be enough to these users.

5.6.2.12 Realtime Dashboard

The Realtime Dashboard that provides information about all the Financials, Contract and Transactions data for each respective user. Depending on the type of user, the different areas of this dashboard will be restricted.

- Financials
  Financial data is the information such as payment histories, financial statements, subscription costs, payment methods, etc. Based on the user privileges assigned by BCCL, the user will be able to access either their own financials or all financials relevant to individuals or businesses.

- Contracts
  Usually, contracts can be awarded by BCCL to its Syndicate partners, 3rd party vendors, Artists, Partners, B2B/B2B2C/B2C users. Based on the user privileges assigned by BCCL, the user will be able to access either their own contracts or all contracts relevant to individuals or businesses.

- Transactions
  Transactional data is the information that is captured during the process of buying and selling content on the site. It can provide us details about how many assets have been Purchased, Sold, Licensed, etc. Based on the user privileges assigned by BCCL, the user will be able to access either their own transactions or all transactions relevant to individuals or businesses.

5.6.2.13 Access Control

Depending on the user type, asset type, etc. access to the marketplace should be controlled to ensure security and also protect the assets from unauthorized usage. Given below are some the user / asset types and the access controls that would be implemented against them.

- Individual User

  Individual access control policies can be attached to the user, depending on the role, resources that can be accessed, etc.

- User Group

  A group of individuals from a single 3rd party entity or those individuals who would need to perform similar actions on the system can be grouped into a single user group and access control policies shall be applied on the group itself. This helps with easier management of users and their policies. A single user can be assigned to multiple user groups.

- User Role

  All the users on the platform fall into atleast one of the role types such as administrator, creator, business user, consumer, etc. Depending on these roles, access to the resources will be determined. Multiple roles can be attached to a single user or group.

- Individual Asset

  Access control can be set at the individual asset level as well. This allows us to fine tune restrictions on the asset irrespective of the users accessing them. For example, an asset cannot be downloaded more than x number of times, etc.

- Asset Group

  All assets that are of similar type or would need similar access controls defined can be grouped into an asset group and policies shall be applied to the group.

- Asset Protection through Security Templates

  Assets are associated with the respective DRM templates and are encrypted by the DAM system before transferring them to the end user through a sale. This allows our custom-developed decryption component to identify, and act based on the rights information associated with the assets. For example, the component could immediately deny access to the assets if their expiry date has passed. For more details refer to the DRM section 2.4.

- Access on Particular Search and Metadata

  Access to particular search results or allowing search for particular content can be restricted based on a predefined criteria such as user type, geographical location, etc. The access to the particular metadata on the assets can also be restricted similarly. For more details refer to the Smart Search section 2.2.4.

- Security Restrictions

  In addition to the security restrictions described above for the users and assets, we can define and apply additional restrictions on the site, applications, etc.

5.6.2.14 Search and Shop

Users would be able to search for specific content on the site for shopping. Depending on the role and profile of the user, the search for these users can also be restricted. For e.g., age-based restrictions, region-based restrictions, etc. on content can be imposed.

5.6.2.14.1 Personalization / Recommendations

The first time the user logs in and sets the user profile, preferences, etc. personalization of the portal starts there. As the user browses through specific content, the system remembers those searches, purchases, etc. and provides recommendations on similar content. The subsequent logins would be more and more personalized based on the user's previous activity.

5.6.2.14.2 Action Cards

The site will handle the transaction and payments related to a sale / licensing. As the user adds the asset to the cart, it provides step-by-step process in the form of action cards to complete the sale and improving the buying experience.

5.6.2.15 Anonymous Browsing

The user can anonymously browse and search through the content to find any relevant assets that they would like to consume. The user is allowed to add the asset to the cart also anonymously, but the final purchase itself will happen only after sign-up/login to the marketplace.

5.6.3 Commerce platform

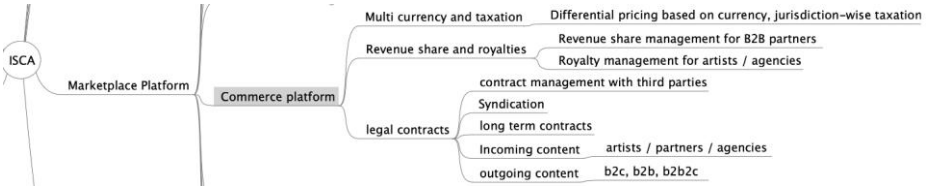

FIGURE 23 - COMMERCE PLATFORM FEATURES

The Headless CMS software that Sify uses to custom build the marketplace also has the capability of an inbuilt commerce platform that enables the transaction of content across various channels. This can be leveraged and customized according to the BCCLs marketplace requirement.

5.6.3.1 Multi-Currency and Taxation

The BCCL Marketplace and its assets are available for purchase worldwide, unless there are specific geographical restrictions imposed explicitly due to local governing laws, treaties, etc. Hence, the users that come on to the platform for purchasing content will also be from various countries which deal in vast variety of currencies and taxation laws. The platform enables us to handle:

- Differential Pricing- based on Currency

  The value of an asset changes from currency to currency not just from the point of a pure exchange rate conversion, but also depending on the market value, income standards, etc. in that country. Such differential pricing can be defined and handled in the platform.

- Jurisdiction-wise Taxation

  Taxation laws change not only from country to country, but also between jurisdictions within a country. The taxation on the assets can be applied depending on the jurisdiction of the buyer through this platform.

5.6.3.2 Revenue Share and Royalties

BCCL has partnerships / contracts with Artists, journalists, agencies, other B2B partners, etc. who contribute content to the system. Depending on the partnership type revenue share and royalties need to be calculated for payout.

- Revenue Share Management for B2B Partners

  B2B partners have partnership agreements in place that would determine the revenue share to be paid out as per the agreement. The platform can handle these payouts.

- Royalty Management for Artists / Agencies

  Artists / agencies contribute content to BCCL on a regular basis and this content can be part of the assets that BCCL sells through the marketplace. Royalty agreements are put in place based on which the artists / agencies will be paid an amount dependent on their content being sold. The platform can track and calculate the payouts for the same.

5.6.3.3 Legal Contracts

In addition to its inhouse content creation, BCCL acquires content from various other sources including syndication, 3rd party contractors, artists, agencies, partners, etc. It also sells content to end users such as B2C/B2B2C/B2B users. BCCL setups legal contracts with each one of these parties which define and govern the rights and obligations of all parties involved in that contract. The contract and agreement associated with the assets will centrally reside in Tenovos and feed into the marketplace platform and other external systems that the assets are published to.

5.6.3.3.1 Contract Management with 3rd Parties

3rd party vendors / consultants contribute content to BCCL, which is either used as part of their editorial content and/or sold / licensed to end buyers. Contracts are put in place with all the terms and conditions applicable.

5.6.3.3.2 Syndication

BCCL gets syndicated content from agencies such as PTI, ANI, etc. The rules for resale of such content will be governed by BCCL-Agencies Contract agreements, which will be handled through the DAM platform.

5.6.3.3.3 Long Term Contracts

Long term contracts are often financially viable to the parties involved. Depending on the partner or buyers request, long term contracts will also be setup by BCCL and the same can be managed through the commerce platform.

a. Incoming Content (Artists, Partners, Agencies)

Artists, agencies, and partners contribute content to the platform and / or help to increase the revenues for BCCL. Royalty agreements and revenue sharing agreements are used to determine the payouts for these parties. The same can be managed on this platform.

b. Outgoing Content (B2B, B2B2C, B2C)

All outgoing content that has been purchased / licensed by B2B, B2B2C, B2C users will accompanied with a legal contract or usage terms and conditions, depending on the content type and the purchase made by the end user. These could be contracts defining the quotas for a business, expiry of an asset usage, purpose of usage of an asset by a user, etc. All such contracts / usage terms, etc. can be handled by the platform.

5.6.4 Content statistics

Statistics will help determine the areas of performance and areas that need improvement to drive more sales and revenue. The platform can utilize various methods such as analytics, database counters, API management platform stats, etc. to determine the content statistics. Given below is a sample list of the stats that can be collected from the platform:

- Number of times viewed
- Number of times liked
- Number of times sold
- Number of purchases made from a particular geographic location
- Average sale price of an asset
- Average cart value
- Number of API calls made by a B2B / B2B2C user, etc.

5.7 Revenue Leak Prevention with Track and Trace

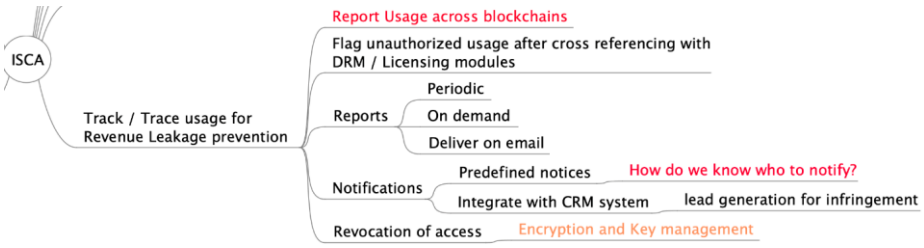

FIGURE 24 - REVENUE LEAK PREVENTION APPROACHES

Unauthorized use of BCCL content is a major area of revenue leakage. To handle such revenue leakage and ensure more revenue is generated, we can track and trace the assets using reverse search capabilities of Google Web Entities / TineEye, Tenovos Digital Rights Management templates, Imatag watermarking, etc. to identify users / businesses that are possibly using the assets illegally, which will be sent to legal team for further review and action.

5.7.1 Flag Unauthorized Usage

Unauthorized usage of assets can happen in two ways.

- Content that has not been purchased from BCCL and is being used without permission by the end user or business.
- Content that has been purchased from BCCL, but is continued to be used beyond its expiry, or used for a different purpose not defined in the original agreement, etc.

BCCLs assets can be passed through the Reverse Search tool to find out exact and partial matches of the image being used on the internet. All these matches are cross referenced manually against the various security measures put in place:

- Ensure that partner sites are excluded from the list
- Verify if the user has a legal contract for Sale / licensing in place with BCCL
- Verify Watermarks and DRM templates to ensure correct ownership
- Verify watermarks and DRM templates to ensure that the asset is not past expiry

Once the asset has been passed cross referenced against the above criteria, the rest of the results will be forwarded to the legal team for further manual review and legal action as necessary.

5.7.2 Reports

Once areas of revenue leakage have been identified, reports can be generated through the reporting interface to keep track of the revenues and any potential leakages.

- Periodic
  Periodic reports such as daily/weekly/monthly revenue reports, new user onboarding reports, periodic sale reports, assets nearing expiry, contracts validity reports, etc. can be generated to establish trends over a period, identify any significant changes and the reason for change, etc. which help in identifying areas of performance and revenue loss.
- On Demand
  All the above reports should also be available on demand for estimating the current status and to help drive decisions.
- Deliver on Email
  Either periodic or on-demand delivery of reports over email is a very useful feature. For example, end users can be reminded of a renewal of subscription, expiry of assets, quotation of assets, etc., through email notifications. This helps to reach out to the customer in a timely and efficient fashion.

5.7.3 Notifications

When unauthorized usage has been flagged and the users have been shortlisted, BCCL legal team or other stakeholder will be able to send notifications through the platform to the responsible teams for further action.

- Predefined Notices
  Once the possible offenders have been shortlisted by the legal team, notices would be sent to them. A predefined set of notices can be saved as templates on the system ready for use.
- Integrate with CRM system
  The notification system is integrated with the CRM system so that any unauthorized usage that has been flagged and notified can act as potential lead for digital rights infringement.

5.7.4 Revocation of Access

The rules for revocation of access for assets will be handled through Tenovos DAM. As the validity of assets has expired, the access to those assets should be revoked until further corrective action has been taken by the user. This can be done by encryption and key management through the platform.

The assets are encrypted, and invisible watermarking is applied before being consumed by the end user. The decryption keys will be owned by BCCL via the platform and access to the assets

will be authorized/enabled using this. Our custom-developed decryption component identifies, and acts based on the rights information associated with the assets. For example, the component could immediately deny access to the assets if their expiry date has passed.

6 Technical Services

6.1 API Management Platform

Enterprise Digital Asset Management (DAM) is a service-oriented architecture encompassing a hue of technologies integrated in unison to deliver unified services for users. The platform is built on top of numerous APIs developed for internal application consumption as well as Third-Party API services connected to deliver enrichment to the automation processes. The APIs developed internally are at times exposed for consumers and partners for consumption as a service on a subscription model, whereby the consumption could be monetized by the organization.

The BCCLs requirement on monetizing the digital assets primarily focuses on consumers like B2B, B2C and B2B2C. These consumers have multiple licensing agreements and usage terms. Marketplace houses the wide variety of media assets curated from the BCCLs archival repository for monetization purposes. These assets are consumed on a daily basis by B2B consumers, where they repurpose the assets for their customers. The partners and B2B consumers who would like to use BCCL APIs on their white labeled platform to bring their customers into their ambit, may use the proposed platform. In such a scenario, the marketplace APIs should be hosted for consumption by B2B consumers.

Sify will build the marketplace APIs for internal storefront consumption and create another distribution layer for its potential customers to leverage the assets to be monetized in multiple channels. The entire operation of API Management takes a different level, where the RESTful APIs must be built, managed, secured, tracked, and monetized. Along with it, it is assumed that BCCL Digital properties like subscription engine, marketing campaigns, gold platform, e-paper, SMS gateway, paywalls and omni channel communications are available as RESTful services for consumption by external users.

A comprehensive interface will be created to list APIs and track metrics recorded by API Management system to evaluate volumetric consumption and monetize accordingly on the agreed pricing methods. Additionally, the API management system will have the ability to retire an API consumption or Re-deploy an upgraded API with minimal downtime. The API Management System will mirror the operation of a cloud-based API management service provider with help of its very own APIs.

6.2 Single Sign on Platform

The below diagram outlines the SSO integrations for all the platforms that are part of the proposed solution.

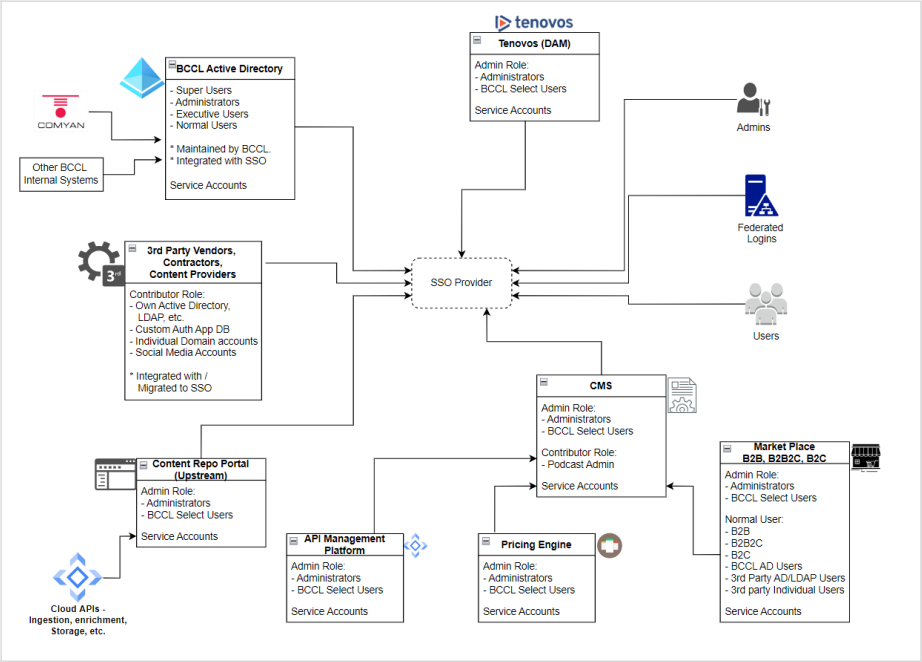

FIGURE 25 - SSO INTEGRATIONS OF ALL PLATFORMS

We understand that currently BCCL has a non-unified sign-on to their existing properties from various user bases to contribute/consume assets to/from the system, depending on the type of user. Given below are primarily the user types:

- BCCL Workforce (Employees/Contractors)
- BCCL Partners/Vendors
- End Users
    - B2B,
    - B2B2C,
    - B2C

In addition to the existing BCCL systems, as part of this overall solution a new set of applications will be added to the BCCL properties which in-turn would add more Users requiring additional Roles, Groups, policies, etc. These new systems include:

- DAM system,
- DRM system,
- Content Repo Portal
- Content Management System
- Market place,
- Pricing Engine,
- API Management Platform

The "**SSO PROVIDER"** solution to be implemented would provide a Secure Single point of Sign-on to access all the BCCL's properties and provide a Unified View to both its internal and external customers.

This platform allows for integrating existing Authentication modules like Active Directory, LDAP, etc.; Federating to Externa IDPs (Google, Facebook, Twitter, etc.); and even new User creations directly on the SSO Providers database.

We can create separate Tenants, Groups, Roles, Policies, etc. and attach them to existing and new users to allow or restrict users as necessary. As part of the User onboarding process, the user will have the option to choose between multiple roles like creator, business user, consumer, etc. while signing up. These features of the SSO help manage the Non-unified Login systems through a Single Admin Interface and maintain a Customized User Experience based on the user type, application, etc. The SSO platform scales automatically as the user base grows and also provides Security through MFA, Captcha, DDoS protection, etc.

6.2.1 BCCL Workforce (Employees/Contractors)

A typical organization has the below types of users (but not limited to):

- Super Users – Super privileges on all the resources including AD.
- System Admin Users – Admin privileges to select resources
- Executive Users – Additional privileges to Dashboards, Reports, etc.
- Normal Users – Regular usage, content providers,

Since BCCL already has its own Active Directory, these roles would have been already defined there. BCCL manages their user base via this AD and controls access to the existing resources. The same can be integrated to the SSO and provide the AD users access to the new systems via the SSO. Any new user additions and deletions will also be propagated to the SSO.

Depending on the Role in their Organization, select BCCL employees would need access to some, or all the applications being deployed as part of this solution. Application specific roles, tenants, etc. can be defined to restrict user access across various applications.

6.2.2 BCCL Partners/Vendors

These are 3rd parties (individual/corporate) who contribute content such as Photos, Videos, Audio, Text to the organization.

Content providers would need "Contributor" access to systems like Content Repo Portal, Content Management System, Content Storage, etc. For these users, the SSO can:

- Create new accounts in the SSO database
- If already present in BCCL AD, manage privileges like BCCL employees/users above.
- Integrate to SSO, if they have their own AD/LDAP already in place.
- Migrate users from Custom Auth app to SSO DB
- Federated access from external IDPs (Google, Facebook, etc.).

6.2.3 End Users

End users would primarily login to the Market Place (and possibly other applications in future) to browse and purchase content. Below are the types of end users and possible methods they could be using to login. The SSO helps simplify their registration and login process to the platform. It also provides a personalized / customized view of their content.

- B2B
    - Active Directory, etc. if available in that enterprise
    - Custom Authentication Tool/Database
    - New Sign-in via email
    - Sign-in via External IDPs (Facebook, Twitter, etc.)
- B2B2C
    - New Sign-in via email
    - Sign-in via external IDPs
-
- B2C
    - New Sign-in via email
    - Sign-in via external IDPs

6.2.4 Applications, Users, Roles

Given below are the various applications / sub-systems that form the Integrated Smart Content Archival System, and the users that would need role-based access on these respective systems:

Tenovos DAM Application (including DRM)

This Digital Asset Management system is where all finalized digital assets reside. The ingress and egress applications are integrated with the DAM, and transfer of content would primarily happen through APIs. The DRM is also handled as part of this system. Below are the users that would need access to this system.

- Admin Role:
  - DAM Administrators
  - DRM Administrators
  - BCCL Select Users
- Service Accounts

Content Repo Portal:

The Content Repository portal allows us to manage the content acquisition, content ingestion, content enrichment and instrumenting the smart search capabilities. Below are the users that would need access to this system.

- Admin Role:
  - Administrators
  - BCCL Select Users
  - Select 3rd party vendors
- Service Accounts

Content Management System (includes Viking CMS, API Management Platform)

This is a headless CMS that delivers content across various channels, provides Content approval workflows, metadata management, etc. It also integrates with the existing Viking system and API Management Platforms. Below are the users that would need access to this system:

- Admin Role:
  - CMS Administrators
  - Viking Administrators
  - API Management Platform Administrators
  - BCCL Select Users
- Contributor Role:
  - Podcast Administrator
- Service Accounts

Market Place (includes Storefront, Pricing Engine, Commerce platform)

The Market Place is where the end users come to browse and purchase content. This subsystem is comprised of pricing engine, storefronts, commerce platform, content delivery, etc. Below are the users that would need access to the system:

- Admin Role:
  - Administrators
  - BCCL Select Users
- Normal Users / Consumer Role:
  - B2B Users
  - B2B2C Users
  - B2C Users
  - BCCL AD Users
  - 3rd Party AD/LDAP Users
  - 3rd Party Individual users
- Service Accounts

7 Operations and Managed Services

Commented [VVR5]: We did not work on this section as we aren't sure on BCCL expectations as well as what we want to propose.

7.1 BCCL SLA requirements

BCCL's requirements for SLA based support for the SaaS based solution are as below:

- On the floor support for product/application
- Be available as per BCCL operating hours
- Should be ready to provide round the clock support on 24x7 and 365 days basis
- 24x7 SLA based L1/L2/L3 support.

7.2 SLA based support for L1/L2/L3

7.2.1 Skill Profiles for L1/L2/L3 Support:

Based on the analysis of the current requirement from BCCL, skillsets for the resources shall be defined and a resource allocation schedule shall be proposed.

7.2.2 On the floor support:

Sify proposes to deploy 2 onsite resources at BCCL for a period of 6 months after the final implementation and deployment of the solution. This would help BCCL with:

- Training of the ISCA system to BCCL team
    - Training for a period of 5 days for a batch of 10 IT Team members – this would cover system administration functionalities and existing workflows.
    - Training for a period of 2 days for Business team for a batch of 15 business team members – this would cover the details of user interface and knowhow of the system.
- Handholding of the ISCA system to BCCL team – BCCL to appoint a SPOC and a team of IT and business representatives who can be trained and handhold the system.
- BCCL can repeat the above set for a maximum of 50 IT Team members and 120 Business team members.

Requirement from BCCL:

- BCCL to appoint a SPOC and a team of IT and business representatives for the training.
- BCCL to provide the necessary office infrastructure for the on-site team – dedicated sitting space, internet connectivity, necessary access to common resources.
- The resources would be available from 9.30 am – 6.00 pm from Monday – Friday

7.2.3 Round the clock support on 24x7x365

Remote support will be available via email/phone support as per the SLA definitions defined in section 4.2.4. The process for availing the support is defined in section 4.4 - Customer Service and Assurance.

7.2.4 SLA Definitions

Following sample table includes the typical details around the SLA and is applicable to Production for unplanned activities only.

The response and resolution times mentioned below are only indicative and they will be refined based on finer integrations.

Call Priority	Description	Response Time (Business Hours)	Resolution Time (Business Hours)
Severity 1	Stops business operations, No workaround	15 mins	1 hours
Severity 2	Severely impacts business operations with workarounds	60 mins	4 hours
Severity 3	Impacts business operations, workarounds available	60 mins	2 Business days
Severity 4	Does not impact business operations	60 mins	5 Business days

The problem codes and To-be-severity need to be defined and agreed upon at the time of contract. An example of the same has been shown below.

S.No	SR_Type	Problem Code	To be SEVERITY
1.	BCCL-SSOAuth	SSO not working for anyone	Severity 1
2.	BCCL-SSOAuth	SSO not working for select individuals	Severity 2

7.2.5 Penalty clause for non-compliance of SLA:

The penalty charges will be limited to 5% of the Managed Services charges for the quarter.

7.3 Scope change inclusion up to 20% every year

The scope change related to Managed Services model with enhancements and changes will be factored to 20% annually. Sify team will evaluate the change requirements and will determine the effort estimates. The same shall be discussed with BCCL before the final execution. Any

additional effort beyond 20% of the initial product/solution development would be charged additionally at the prevailing price.

7.3.1 Change Management

Change Management is the formal control of all levels of making changes, from changing the project requirements at the highest level, to the details of changing the individual modules. Change Management avoids dispute, promotes agreement and provides ability to trace changes by:

- ensuring that the impact is properly analyzed,
- ensuring that risk is properly assessed, and that security and control measures have not been compromised.
- allowing informed decisions to be made,
- ensuring consensus agreement is reached,
- documenting the decision / agreement,
- ensuring that the resulting change is properly documented, at any level of required detail,
- ensuring that any increases in cost or timescale can be justified.

Any changes to the work as agreed in the project scope shall be formally communicated by BCCL to Sify and such work shall be carried out subject to the mutually agreed terms between BCCL and Sify. Scope changes in Design, Implementation, Testing or Managed services will be mutually understood and agreed. In any given scenario, for changes proposed by BCCL apart from the scope defined in this agreement will be charged additionally at the prevailing rates.

7.3.1.1 Change Management Procedure

If during implementation of the BCCL ISCA platform, there is a need for change/modification to system interfaces, inputs, outputs, functionality or to the way the system is implemented, such changes shall be initiated through:

- an amendment to the Contract (contractual change), or an amendment to the specification within the terms of the Contract (technical change). These changes shall be summarized into a Change Request Form and uploaded against the project / Task ID in Project management Tool

- a Change Request Form (CRF) filled up and uploaded in Project management Tool against the project

Where the changes are minor and have minimal or no impact on schedule, and cost, changes can also be posted as comments in Project management Tool against the respective Project / Task ID. Any additional information or explanations or clarification or remarks on the requirements received from BCCL shall be posted as comments against respective Task Id's in the PM tool.

- Initial Planning

At the outset of the project, BCCL and Sify, must document and agree a set of objectives for the project. These may be in form of a contract, proposal, terms of reference, statement of requirement or a deliverable from some previous area of work.

During the Project Initiation phase, BCCL and Sify shall nominate individuals or groups of individuals, on either side, who shall have the authority to approve any technical and/or contractual changes. The agreed deviations from the initial requirements shall also be mutually agreed.

- Implementation

On getting the CRF, the impact of the change shall be applied by the Project Manager / Project Lead, as appropriate, to the Project Plan, WBD and estimation sheet

In particular, the planning documents shall be updated to include provision for any necessary amendments to:

- user requirements specification
- required system specification
- high level (logical) design documentation (HLD)
- detailed (physical) design documentation (LLD)
- software modules
- support documentation
- user documentation

- Escalation

All change requests will receive a formal response from the Project Manager. Depending on the size and financial impact of the change, the changes have to go through the stakeholders / Change Approval Board for necessary approvals.

7.4 Customer Service and Assurance

7.4.1 Data Governance

7.4.1.1 Helpdesk Support Services

Sify has full-fledged helpdesk to support BCCL where they can contact through a Toll-Free number or Ticketing tool. BCCL users would also be able to raise the ticket for any issues/complaints via the ticketing portal.

The proposed service desk model would provide a central support structure for BCCL. Calls are handled based on severity levels and are tracked till the ticket closure.

L1 Support Responsibilities

- Providing Technical support of BCCL application related queries to the end users.
- Ensure that activities within a process are being performed at a high level of quality and that it meets its associated Service Level Agreements.
- Record and classify the received tickets through call/mail/ticketing tool and undertake an immediate effort in order to restore a failed Service, as quickly as possible.
- Log all tickets in the ticketing tool with proper Service Request detail, as per the agreed process.
- Assign unresolved tickets to appropriate Level 2/3 Support Group with detailed analysis.
- Keep Users informed about their ticket status through ticketing tool updates and emails.
- Associate tickets with other records (i.e. Incidents, Changes, Problems, Knowledge Articles, Known Errors, etc.)
- Verify resolution with users and resolve ticket in the ticketing tool.
- Escalate Critical tickets to the Project Manager and the Level 3 to deploy the fix.
- Determining if a ticket needs to be escalated according to priority and severity of the issue.
- Ensure that tickets are assigned to their Support Groups, are resolved and that service is restored.
- Participate in reviews following major Incidents.
- Identify potential problems and/or increasing trend of repetitive Incidents and share it with the Project manager and Level 3 support to provide permanent fix.
- Create knowledge with repeatable procedures to achieve the goal of reducing the number of Incidents.
- Escalate all process issues to the Project Manager.

- Own all Incidents and Service Requests throughout the lifecycle.
- Share Daily/Weekly/Monthly reports on service performance.
- Responsible for SLA Tracking and Adherence.

7.4.1.2 Ticket Management

The contact email and telephone number for raising support tickets with Sify will be provided to BCCL at the time of contract.

Ticket Logging Process

- Customer Success Team is available at Sify.
- Issue Logging can be done by through the following mediums:
    - Calling Customer Success Team.
    - Emails communications send to support emails., automatically opens a ticket in ticketing system
    - Sify Online Ticketing tool
- Customer Success Team is responsible to provide communication to stakeholders through the ticketing system.
- Customer Success Team provides first level troubleshooting for all incidents logged.
- Customer Success Team will ensure the resolution of the tickets & all Internal / External communication until resolution of issues.
- For Critical/ Major Incidents, teams are usually kept updated by calling the BCCL identified SPOC as well.
- Customer Success Team will ensure self-involvement or required internal escalation for all incidents & ticket resolution.

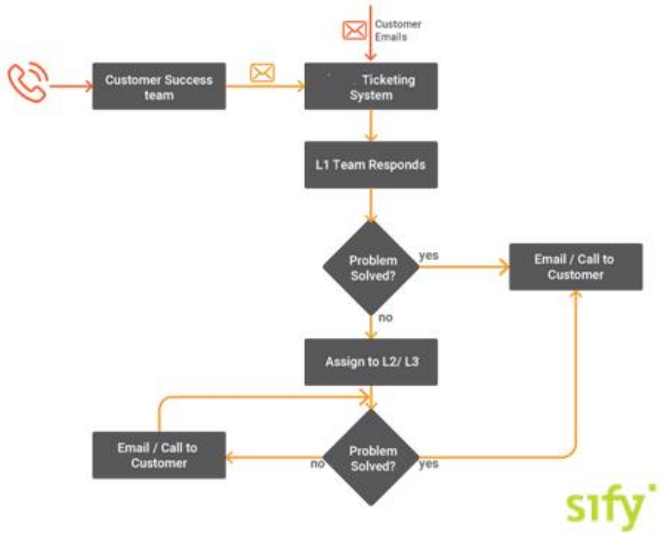

FIGURE 266 – TICKETING PROCESS

7.4.1.3 SLA Reports

- The Customer Success team is responsible for SLA Tracking and Adherence.
- SLA reports can be generated per the agreed timelines and provided to BCCL.

7.4.2 Governance and Reporting

7.4.2.1 Governance Model

We propose the below governance model for the support. The respective stakeholders can meet on the defined timelines to discuss on - operations related issues, any changes expected to the system, any changes or improvements in process and procedures as expected, feedback on the support, future plans, etc. and also ensure that the services are running as expected.

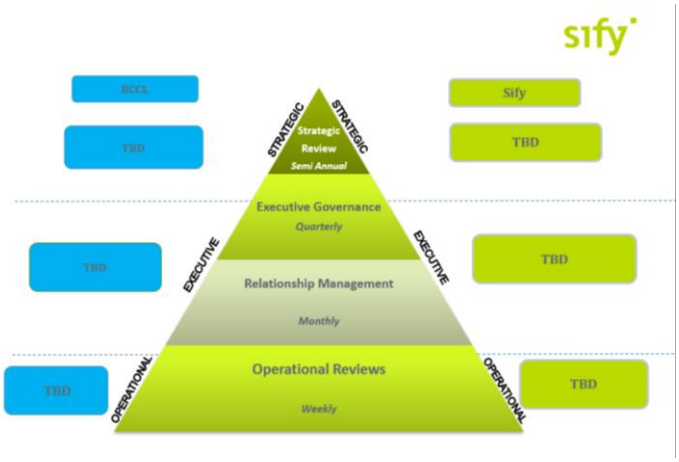

FIGURE 27 – GOVERNANCE MODEL

7.4.2.2 Customer Success Team Structure

Following is the team structure for a typical Sify Cloud support team. The applicable part of the team will work with BCCL to provide the support on the agreed SLA's and for activities defined during the implementation of the project.

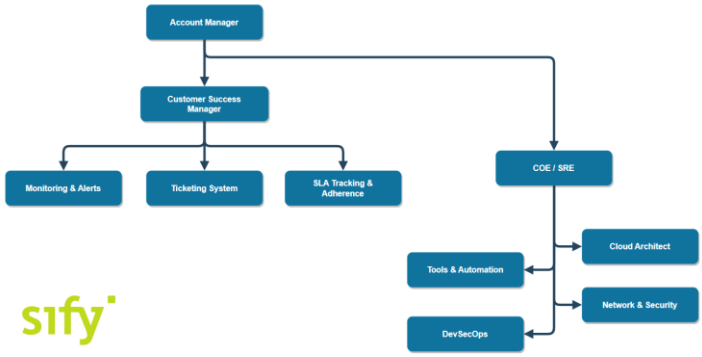

FIGURE 28 – CLOUD SUPPORT TEAM STRUCTURE

7.4.2.2.1 DevSecOps:

Commented [ABr6]: Check with Ravi.

At Sify the DevSecOps is a development practice that integrates security initiatives at every stage of the software development lifecycle to deliver robust and secure applications.

DevSecOps infuses security into the continuous integration and continuous delivery (CI/CD) pipeline, allowing development teams to address some of today's most pressing security challenges at DevOps speed.

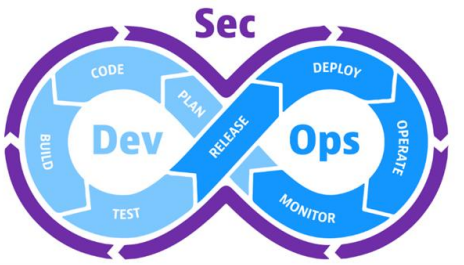

FIGURE 29 – DEV SECOPS

7.4.2.2.2 Training, Standard Operational Procedures, and FAQs:

Training helps in getting a better understanding on the working of the overall system, what are the various applications available for the team to use, the skillset required for handling the activities, etc. As we implement the various pieces of the new system for BCCL, training should also be provided to the Stakeholders to ensure that they understand the working of the system. As we progress through the plan and implement key functionalities, periodic training sessions can be setup with the BCCL team which allows them to review the system and also get comfortable with it.

Training will be provided to BCCLs Business Team users and IT Team users.

- The **business team** would be trained on the overall functionality of the solution, the various dashboard/portals they could use for getting executive summary data, reports, etc. that could help with the business decisions. They shall also be trained on the tools to avail the managed services support – how to raise a ticket, the escalation matrix, related documentation, etc.

- The **IT team** would be trained on the overall functionality and workflow of the solution, the various applications that form the solution, the process and procedures related to each application, technical details about each application and their relationships, how various users interact with the system, etc. They would also be trained on the managed services support tools and the process to follow for raising issues in the ticketing tool and getting a closure on those tickets.

Standard Operating Procedures (SOPs) will provide the step-by-step instructions on how to perform specific tasks across the system. Any key operations that the BCCL team would need to perform, guidance on how raise support requests, etc. will be documented in the form of SOPs and stored in a document database for the client to access. SOPs will be stored in a repository accessible to the necessary stakeholders.

FAQs will provide answers to frequently questions, and this will allow the users to get their answers to most questions in one place. All possible frequent questions that the end user might have will be documented and published for all the users of the system to refer to. These will be shared on a wiki page where new FAQs will be added as we go.

7.4.2.3 Reporting

Commented [ABr7]: Check with Ravi. Most of the reports mentioned here are application related reports. How to address them and inputs needed.

7.4.2.3.1 Daily, Monthly, Periodic Reports

- Status reports and action items by way of minutes of meeting are recorded and shared with all stakeholders at the end of each meeting.
- Sify will provide Weekly/Monthly status reports for the services included as part of Managed Service.
- Any additional reports that BCCL needs can be agreed upon and built and shared accordingly.

7.4.2.3.2 Platform Usage statistics.

Standard reports from the cloud provider will be available for the BCCL team.

7.4.2.3.3 Analytics – both Google analytics for site usage, and Custom

Data from the Marketplace, Tenovos, Google Analytics, etc. can be used to get the details on site usage, etc.

7.4.2.3.4 Revenue and Cost MIS Reports

Revenue and Cost reports can be generated using data from the API Management platform, Marketplace, etc.

7.4.2.3.5 Analytics- Asset based, Partner based, Performance based

Data from the Marketplace, Tenovos, Google Analytics, etc. can be used to get the analytics for assets, partners, performance, etc.

7.4.2.3.6 Insights and Dashboards for end Customers (B2B/B2C/B2B2B) for their performance / financial management.

The end users (B2B/B2B2C/B2C) can log-in to the marketplace, where they will be able to view their financial data, transactional data, etc.

7.4.2.3.7 AI based content marketing reports

Performance reports can show the assets, partners, etc. that have been performing well and vice-vera. Based on these marketing strategies can be developed to increase revenues.

7.4.2.3.8 Content monetization recommendations based on AI/ML

Reports showing the performance of assets, artists, etc. that have been performing well and vice-vera can be generated. AI/ML can be used to generate recommendations that help to take decisions on pricing, etc.

8 Conclusion

Sify has submitted the most comprehensive response for the engagement. The unique architecture and design of our solution along with the project delivery capability will be an ideal platform for implementing the Integrated Smart Content Archival System which is being envisaged by BCCL.

We eagerly look forward for an opportunity to partner with BCCL in its digital transformational journey for the adoption of new age tools & technologies which would accelerate the monetization of the rich & unique content repository of BCCL.