



PFT

CLEARTM VISION CLOUD

Making AI
Work For You



Challenging The Status Quo

Everything is changing – target audiences, customer behaviors, consumer trends, technologies and the economy. Products, processes and practices which were perfectly acceptable at one point in time are eventually becoming outdated and replaced by more innovative ones. Organizations that stick to the status quo inevitably lose more than just market share, they erode mind share too.

We have many examples of organizations that have missed the ‘future bus’ because they failed to innovate – Blockbuster, Kodak and Nokia, to name a few. And many companies which have successfully embraced change enabling survival and growth. Companies like Apple, Netflix, Amazon and Facebook have time and again done just that.

An organization cannot endure the long term without reinventing itself. This fact has been reinforced by numerous research studies including those published by the Harvard Business Review (HBR). A 2015 report titled Knowing When to Reinvent, published by HBR throws ample light on this subject.

One of the most promising opportunities for organizational transformation in the Media & Entertainment (M&E) industry lies in the area of data. As per a recent global EY survey of senior M&E executives, almost two-thirds of them saw the increasing availability of data for rapid exploitation as an opportunity (62%). Yet, many companies have not perfected the art of collecting, sharing, analyzing and utilizing data.

Data is everywhere; Making sense of it is what matters. But how many companies are resorting to Artificial Intelligence (AI) to solve for it?



Is AI Working For You?

The initial euphoria over AI/ML seems to have died down in the M&E industry. Our research shows that many M&E players have run AI initiatives with different vendors but have not achieved anything substantial enough to solve their business problems. Though the demo was impressive, the project hit a wall at the Proof of Concept (PoC) stage because the AI solution did not work for their content! When the cycle was repeated with multiple vendors, they concluded that AI models are not available or mature enough to solve specific M&E business challenges.

The fact is, no M&E client's business problems in their entirety can be solved effectively by any one AI engine or solution provider in the market. Also, the heavy lifting involving trial and evaluation of multiple vendors rests on the client's overburdened shoulders. But do they have the required data science talent in-house to tweak the AI/ML engine for their enterprise's data model and ensure accuracy and actionability? The lack of adequate expertise also scuttles any in-house project which attempts to build an AI/ML model.



Are Existing AI Solutions Working?

Multiple AI Engines – Expensive trials with little results

- Too many AI/ML engines and accuracy issues across those
- Models are not available to solve unique M&E problems precisely
- Too much data and yet very little usable
- Not mature enough to invest in yet

Expert talent at a premium, generally unavailable – Too little an effort to solve

- Data Scientists with M&E expertise are in acute short supply
- No real expertise in bringing it all together
- Lack of adequate leadership bandwidth in M&E enterprise to focus on solving using AI

M&E leaders rue that business returns have not been great to highly prioritize AI/ML.



Usual Excuses For Not Adopting AI

“Not for my content”

“What looked very promising
in the demo is not”

“How do I make the
machines learn”

“Can’t use the data”



Solving For The Customer

To crack the impasse, what is needed is a media recognition AI/ML platform that brings the best-of-breed AI models (IBM Watson, Google, Microsoft and Amazon Web Services) and home-grown niche models to address the issues of accuracy and actionability. Plus, to tackle the talent gaps, consulting expertise in deep learning AI with computer vision knowledge is critical. For AI/ML to deliver for M&E organizations, no cookie-cutter approach will work; what is required is a tailored, bespoke model that embraces the unique data nuances of the client enterprise.

At PFT, we believe that if AI has to work for M&E players, then it has to deliver accurate and actionable data which can solve unique business challenges. For this to happen, solution providers have to be open and committed to work with any AI/ML engine, have the data science talent pool to interpret the data and its subtle nuances, and tweak it to suit the needs of the enterprise's content.

Hence, we offer a combination of Technology and Consulting to deliver accurate and actionable data that can solve specific M&E challenges seamlessly.

- **Accurate Data** – This is the only expectation from the industry currently
- **Actionable Data** – We have gone beyond the current expectation to create Action Toolkits

We make AI work for you. And that is our promise.



Technology

PFT's CLEAR Vision Cloud is a media recognition AI platform that integrates best-of-breed AI engines like Microsoft, Google, Amazon Web Services & IBM Watson, and home-grown AI models along with a unique Machine Wisdom layer that is focused on harnessing the best quality data.

- Embraces best-of-breed AI models (IBM Watson, Google, Microsoft and Amazon Web Services) for each of the tasks
- Offers PFT's own AI models where efficient and effective solutions currently do not exist
- Has a unique Machine Wisdom layer that is focused on harnessing the best quality data from the vast amounts of data generated

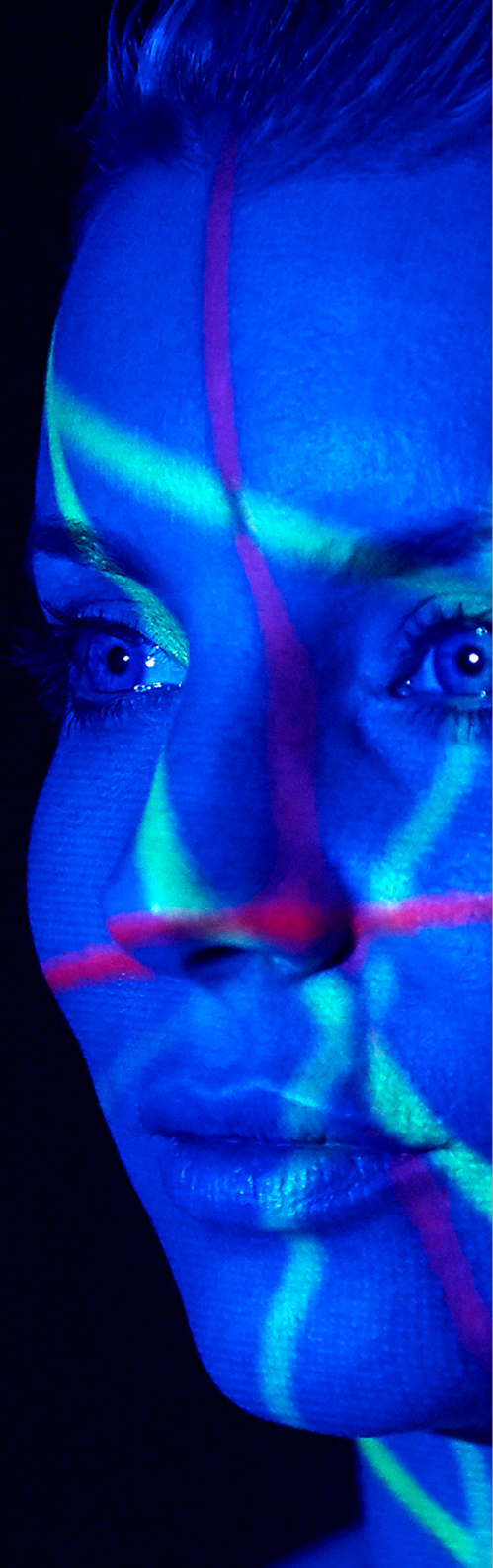


Consulting

Along with Technology, PFT offers bespoke strategic consulting services to ensure AI works for the customer, taking into consideration their specific business challenges and unique content. Our team performs this by

- Providing suitable learning to the AI models for specific content and business needs
- Altering the models to adjust for the specific nuances
- Conducting experiments to measure the quality of data and sharpening the tools to make decisions

CLEAR Vision Cloud AI Platform





PFT's native media recognition AI platform CLEAR Vision Cloud helps solve real world business problems of TV Networks, Studios and OTT platforms because of its perfect combination of both technology and consulting.

CLEAR Vision Cloud comprises of

- Data Packs
- Action Toolkits

Modular Data Packs include those for Basic Metadata, Advanced Metadata, Premium Metadata, Video Comparison, Compliance and Transcripts.

Action Toolkits, as the name suggests, are ready-to-use to address specific M&E use cases. The Action Toolkits include – Discovery, Segmentation, Video Comparator, Content Moderator and Language Tools.

These are enveloped by PFT's unique Machine Wisdom layer that imparts cognitive benefits to CLEAR Vision Cloud. Think of it as an AI platform with a human brain!

CLEAR Vision Cloud does not just produce accurate data but also actionable data.



CLEAR Vision Cloud AI Data Pack

Basic Metadata

CLEAR Vision Cloud AI Data Pack for Basic Metadata helps:

Identify physical video segments:

- Blacks, Color Bars, Slates, Pre-caps, Recaps, Montages
- Essence
- Text & Textless segments
- Specific captioned segments
- Custom segments based on customer need

What does this mean for you?

- 100% accuracy and 100% frame accuracy
- 100% automation of workflows to extract content segments
- Cost and manual effort reduction
- Identification shall be done within a time frame that is about 50% of the content duration

CLEAR Vision Cloud AI Action Toolkit

Segmentation

While the expectation from AI right now is to solve for accuracy alone, PFT has gone a step further and tried to solve for actionability as well. This is how we make AI work for you!

CLEAR Vision Cloud AI Action Toolkit for Segmentation allows M&E companies to:

- Review and QC automatically identified segments
- Filter out content segments and export EDLs
- Generate a video of the custom segment, stripping out the rest of the physical segments

When a segment or its signature is not identified or marked by QC, CLEAR Vision Cloud Action Toolkit – Segmentation enables automatic learning of segment signatures based on QC input.

What does this mean for you?

- Reduction of time and cost of segment marking and content segment extraction
- Automatic learning based on QC input is a novel feature

Key Differentiators

CLEAR Vision Cloud's ability to frame accurately and identify physical segments at a reduced time and cost make it a compelling proposition. Automatic learning based on QC input is an industry first and a key enabler in workflow automation.



Segmentation Use Cases

Broadcast, Direct to Consumer

- Identify physical segments like color bars, blacks, slates, etc. in Ad Spots, extract the Ad Spots and send to playout
- Identify barter segments & Content segments and insert local ads on Barter segments in Long form content
- Identify pre-caps, re-caps, credits, bumpers, custom segments in Long form content and extract content to distribute to OTT
- Identify Ads from an Ad database in the broadcast content and prepare Ad placement reports

E-Sports: Enable marketing to

- Segment content into games and matches
- Identify segments with specific signatures like leaderboards, points table, characters, ammunition, etc. in games





CLEAR Vision Cloud AI Data Pack

Advanced Metadata

CLEAR Vision Cloud AI Data Pack for Advanced Metadata offers all the features and benefits of Data Pack for Basic Metadata and much more:

- Integration of well researched, best-of-breed AI engines: One place to get best quality recognitions – Faces, Keywords, Web Associations, OCR, Transcript, Brands, etc.
- Smart Frame Analysis saving valuable processing time and cost
- Scene Detection and Clip Generation: Provides scenes that can be used for promotion purposes, enables contextual search in clips and identification of logical scene boundaries
- Probabilistic filtering of discovered metadata: Less noisy, eliminates low accuracy keywords & findings and reduces not-so-useful keywords to cut the clutter
- Compilations: Curated playlist themes like clips of action, romance, explosion, comedy, kissing, police, guns, etc. This makes it ready to consume while building a promo and enables you to export playlists for marketing or syndication purposes
- Translate & Transliterate: Auto Translate in the target languages; Search in Natural Languages
- Custom Keywords: “YOUR” recognitions – This helps you tune the models to recognize objects of importance for YOU

What does this mean for you?

- ONE place to get the best quality recognitions across the industry
- Saves time & cost and secures the best results
- Custom Keywords ensure your specific business use cases are solved for

Key Differentiators

- **Machine Wisdom:** CLEAR Vision Cloud offers a unique Machine Wisdom layer that synthesizes discoveries across a wide range of engines and gives data in context. This ensures better quality metadata, better than any ONE third party engine's solution and better than all third party engines' solutions put together because of better discoverability/search-ability
- **Smart Frame Analysis:** Another feature that sets CLEAR Vision Cloud apart is Smart Frame Analysis where its Machine Wisdom enables technology to compare the difference between frames before they are processed by down stream engines that reduces roughly 20% in cost of third party engines and processing time
- **Logical Scene Boundary Identification:** Saves time
- **Smart Playlists:** Playlist clips are pre-cut with metadata suggesting multiple shot boundaries and multiple end-of-sentence boundaries, with audio level classification metadata. This makes it much easier to select and include in manual, semi-automatic & automatic promos, and obtain fine transitions across shots in promos



CLEAR Vision Cloud AI Data Pack

Premium Metadata

CLEAR Vision Cloud AI Data Pack for Premium Metadata offers all the features and benefits of Data Pack for Advanced Metadata and much more.

Key Moments Playlists enabled through Machine Wisdom

- Key Moments are auto-identified based on audio levels, audio level transitions from low to mid to high and then back; Key Moments are ranked based on several parameters including presence of key actors in those moments, overlaps with other key playlists like action, romance, etc.
- Auto identification of Key Moments can be selectively picked for building marketing and promo videos either with manual, semi-automatic or automatic process, saving time
- Enables CLEAR Vision Cloud AI Action Toolkit for Custom Package Builder to produce packages with interesting clips/moments

Key Dialogues Playlists enabled through Machine Wisdom

- Key Dialogues are auto-identified from the transcript, including repetitive/signature dialogues (e.g. *Hasta la vista baby*; *Sometimes things happen for a reason*; *With me, without me*; *My name is Bond, James Bond*), automatically, without being trained for it. It also identifies some powerful dialogues based on the rank of the dialogue in content and various other parameters. The Key Dialogues are ranked based on several parameters that include which actors are involved and how important they are to the movie, overlaps with other Key Moments, other playlists, what genre of keywords are present in them, etc.
- Auto identification of Key Dialogues as part of playlist to help build packages or promos either with manual, semi-automatic or automatic process, saving time
- Enables CLEAR Vision Cloud AI Action Toolkit for Custom Package Builder to produce packages with interesting clips/moments

Thumbnails enabled through Machine Wisdom

- Automatically identifies logical thumbnail candidates from across the content and ranks them on the keywords that match with synopsis, specific genres, etc.
- Automatically smart crops all the images to create ready-to-use thumbnails tailored for the profiles of various social media sites like Facebook, Twitter, YouTube, Instagram, etc.
- Enables a marketing person to use on the go, without depending on the creative agency
- Reduces significant time and effort involved in the process

Image Captions enabled through Machine Wisdom

- Captions every frame in every clip of the content, using the discovered metadata and some additional parameters
- Captions can be integrated to search indices, enabling more verbs being discovered, more Natural Language search possibilities
- Discovery of faces or character names are combined with this engine's discoveries to provide captions like – Tom Cruise and Cameron Diaz with sun glasses facing each other
- Improved Natural Language search makes search “Alexa like”
- Can construct a clip caption out of image caption in the future

What does this mean for you?

- Saves time

Key Differentiators

Machine Wisdom enabled “auto” features like Key Moments Playlists, Key Dialogues Playlists, Thumbnails and Image Captions are unique to CLEAR Vision Cloud and not available with any competing AI solution.

CLEAR Vision Cloud AI Action Toolkit

Discovery

When the world is increasingly getting accustomed to the convenience of Google Home and Alexa, why remain stuck with ancient search? CLEAR Vision Cloud AI Action Toolkit for Discovery is an AI search in Natural Language where one can:

AI Search for AI Data in Natural Language (like speaking to Alexa) enabled by Machine Wisdom

- Search for actors, objects, labels, dialogues, brands, etc. in combinations, in the same search string (E.g. Show me “Tom Cruise wearing sunglasses and saying *with me*, *without me*”)
- Contextual Search to bring up clips that are most relevant to the search string
- Search in Natural Language (E.g., Show me “Tom Cruise fighting on a plane”)
- Search can accommodate spelling mistakes
- Search can find similar sounding keywords when exact match does not exist

- Search can be tolerant to different forms of words i.e., an adjective form, rooted form or other such forms (E.g., Search for darkness when looking for Darker or Dark as keywords)
- Search can be done with equivalent meaning words (Synonyms)
- Search can be done with potentially alternative words (E.g., Vehicle instead of Car)
- Ability to find the right content in the library, even if the user does not know the exact keywords to look for
- When adjacent clips match the same string, search merges the clips to provide ONE result to act upon (add it to a clip library for export)

UI to browse metadata and edit: A comprehensive browse and edit catalogue

UI can be used to find content or to edit by a professional to further improve quality and relevance in a Hybrid model

- Browser discovered metadata and edit with absolute ease

- Scene marking: Be able to QC and adjust scene boundaries to correct shot boundaries
- Browse the metadata in a hierarchy of Scenes, Clips inside the scenes, Frames inside the Clips
- Edit Faces: Update a name to a face, when not automatically detected, and the face is learnt across the whole asset instantly. Can add character name to the face as well
- Add keywords and objects that have not been recognized
- Remove wrongly identified keywords with one click
- View a simplified summary of filtered metadata, while the larger discovered metadata is still searchable and editable
- Browse all categories like Faces, Keywords, Web Associations, Compliance, Key Moments, Key Dialogues, Not safe for work, etc.

Playlists

- Browse curated playlists on a genre basis
- Tenant admin can create custom playlists for their need through a playlist editor

- Clips from playlists can be added to a project from where the content time codes can be exported
- Enables faster content discovery with themes (time saved)
- Enables creation of packages and promos faster and more intuitively

Build a Promo/Package

- Ability to Search for clips based on a promo brief or a theme. Can add clips directly from search into a new project
- Ability to pick up clips from Playlists into a project
- Ability to select and export the assembly of clips in the project into an NLE like Adobe Premier Pro by way of an instantly downloadable EDL
- Reduces significant time in building a promo or a promotional package
- Can create more packages and promos in the same time or lesser amount of time

What's in it for you?

- A B2C experience in search
- Significant time savings

Key Differentiators

The AI Search for AI Data in Natural Language offering a seamless B2C experience is a key differentiator in the marketplace for AI solutions serving M&E industry. Equally unique are the UI to browse and edit catalog, faster content discovery with themes, and the speedy intuitive creation of promos and packages.



Discovery Use Cases

Broadcast, Studios, Production Houses, Direct to Consumer

- Archive tagging and Search
 - o Tag at scene and clip level of the archived and incoming media content to enable discovery of footage for re-use
 - o Employ an AI-enabled Search on discovered metadata to easily get to the clips that are relevant for re-use, syndication, promotion, etc.

Broadcast, Direct to Consumer

- Quick tagging of incoming content
 - o Tag incoming content at scene and clip level in equivalent time
 - o AI-enabled Search, ready-made compilations to highlight the key discoveries of the content
 - o Use the discoveries for preparing OTT metadata
 - o Provide on player – contextual scene metadata experience for OTT consumers

- Promos
 - o Search the asset in Natural Language to find the right content that fits the Promo brief
 - o Find ready-made themed clips from Compilations of metadata, ready to use in Promos
 - o Assemble the clips on a timeline, improving speed of content discovery of Promos by over 50%
 - o Enable Promo creation teams to produce many more varieties and combinations of Promo content in the same time
- Contextual Ads
 - o Find Celebrities, Objects (like Cars, Watches, Sunglasses, Costumes, Gadgets, etc.), Brands, Locations, etc. in the content to place relevant contextual ads in Broadcast or OTT
 - o Get recommended locations where Primary and Secondary ad elements can be placed in the content, in relevance to the content in the clip



CLEAR Vision Cloud AI Data Pack

Video Comparison

CLEAR Vision Cloud AI Data Pack for Video Comparison allows

- Close to 100% accuracy on Master-Master video comparison
- Finding matched, unmatched and moved segments
- Close to 100% frame accuracy on comparison
- Matching frames and clips even in the following situations
 - o One video is edited
 - o One video is zoomed, cropped
 - o One video has green backgrounds
- Comparing color scales
- Comparing texted and text-less
- Conformance from source
 - o Identify up to 3 best matching clips from the source that made it to the Master
 - o Match source clips with green screens
 - o Rank the matches
 - o Time codes match with a frame accuracy tolerance of less than 1 second on either side
- Customization to cater to many other re-versioning use cases

What's in it for you?

- Near complete automation of comparing masters
- Subtitle re-timing: Near complete automation on re-timing subtitles after compliance edits and other edits
- DI validation: Near complete automation on DI validation
- 90% automation of conformance for Re-mastering



CLEAR Vision Cloud AI Action Toolkit

Video Comparator

CLEAR Vision Cloud AI Action Toolkit – Video Comparator allows to

- Visually compare and validate matched, unmatched and moved video segments
- Download the EDLs of the matched, unmatched and moved video segments
- Obtain EDLs for added and cut segments frame accurately to help re-time subtitles
- Review and extract DI validation reports
- Review multiple source matches to master and extract EDLs for Re-conformance

What's in it for you?

- Near full automation of reviewing Master versions and in quick time, increasing efficiencies
- Near full automation of generation of DI validation reports
- Instant extraction of Re-conformance EDL to start the Re-mastering process

Key Differentiators

While there is near full-time automation, integrated with a MAM, use cases like automatic subtitle re-timing is a key differentiator in the marketplace. Similarly, automatic re-versioning/mastering of content from digitization of tapes is also available only with CLEAR Vision Cloud.



Video Comparator Use Cases

Studios/Content owners

- Compare Masters: Frame accurately compare different masters (e.g. DI vs. Network version) automatically to identify differences and pick the right one for edits, distribution
- Conform Source to Master: Generate an EDL of what content from the source/film scans made it to the master, to enable faster Re-mastering at high quality (SD -> 4K, HDR, 8K)
- Re-time Subtitles: Compare two masters to see frame accurate edits and identify inserts, cuts and edits so that Subtitles can be re-timed automatically
- Content and Color, Zoom, Texted segment comparator: Frame accurately compare content and identify matches and differences including content with zoom differences, color grades, texted overlays etc. for validation of DI





CLEAR Vision Cloud AI Data Pack

Compliance

CLEAR Vision Cloud AI Data Pack for Compliance offers the following features

- Identifies potential compliance issues across categories
 - o Violence: General, Weapon violence, Graphic, Gore, Self injury
 - o Visually Disturbing: Emaciated bodies, Corpses, Hanging
 - o Explicit Nudity: Nudity, Graphic male nudity, Graphic female nudity, Sexual activity, Illustrated nudity, Adult toys
 - o Suggestive: Female swimwear or underwear, Male swimwear or underwear, Partial nudity, Revealing attire
 - o Smoking
 - o Drinking
 - o Medical
- Has Advanced Metadata which identifies
 - o Logos/Brands
 - o Celebrities

- Ensures Verbal Compliance
 - o Identifies cuss words and cuss phrases and marks them

The compliance metadata does not claim 100% conformance to any compliance standards, however, offers a host of benefits.

What's in it for you?

- Automates detection of a set of key compliance issues
- Assists Hybrid models of compliance identification and editing
- Combined with CLEAR Vision Cloud AI Action Toolkit – Content Moderator, delivers higher actionability for compliance overview and compliance edits
- Use of Machine Wisdom to capture compliance issues from various sources and improve accuracy



CLEAR Vision Cloud AI Action Toolkit

Content Moderator

- View compliance issues marked on a cloud editor
- Filter compliance issues, review, edit time codes, delete false positives
- Choose compliance sensitivity levels: Low (can have more false positives, but safer), Mid and High (may miss out weak signals)
- Browse clips with compliance in the catalogue section and edit
- Add compliance clips to a project

Compliance Meter allows you to

- View compliance levels on various issues as a summary for the asset
- View Compliance Meter on what percentage of compliance issues exist in the content for a quick review

Auto Compliance edits

- Download automated bleep/mute EDLs for verbal profanity at 90%+ accuracy
- Download automated edited videos bleeping/muting verbal profanity

- Download compliance segments EDL
- Download compliance issues stitched as a video for review

What's in it for you?

- Faster compliance detection
- Reduces by 30-40% overall compliance edit times with just bleeps/mutes
- Reduces compliance edit effort on an NLE edit machine after being filtered by CLEAR Vision Cloud AI Action Toolkit – Content Moderator

Key Differentiators

CLEAR Vision Cloud AI Data Pack for Compliance in combination with the AI Action Toolkit – Content Moderator is a unique differentiator in the marketplace which can significantly enhance actionability for compliance overview & compliance edit and substantially reduce related efforts & resources.



Content Moderator Use Cases

Broadcast, Direct to Consumer

- Review different Compliance issues across the content and find out the Time In & Out
- Choose Compliance sensitivity levels to adjust the recall and precision of the Compliance issues
- Browse clips with Compliance and edit out the issues based on certain rules
- Auto Compliance edits – for profanity, visual issues etc.
- Checking content that is not safe for work (NSFW)
- Moderate user generated content automatically



CLEAR Vision Cloud AI Data Pack

Transcripts

CLEAR Vision Cloud AI Data Pack for Transcripts allows you to

- Transcript content in over 120 languages
 - o List of languages supported:
<https://cloud.google.com/speech-to-text/docs/languages>
 - o Automatic punctuation
- Translate content to over 120 languages
 - o List of languages supported:
<https://cloud.google.com/translate/docs/languages>
- Transliterate content from over 100 languages
 - o List of languages supported:
<https://docs.microsoft.com/en-us/azure/cognitive-services/translator/language-support>
- Use Machine Wisdom to synthesize multiple transcription engines to improve accuracy and detection

What's in it for you?

- Automatic transcripts enable better search of dialogues in the content on scale
- Enables detection of Key Dialogues
- Enhances efficiencies: Time and cost reduction in Subtitling
- Transliteration enables searching regional language content in English transcript

Key Differentiators

Usage of Machine Wisdom to improve accuracy of Transcription from multiple sources is an industry first and only available with CLEAR Vision Cloud.



CLEAR Vision Cloud AI Action Toolkit

Languages

This one-of-its kind AI Action Toolkit allows you to

- View Transcript in sync with Video
- Edit Transcript where the AI engines get it wrong
- View edited portions highlighted visually in the AI Toolkit – Languages
- Export the Transcript in SRT and VTT formats to enable time sync and finalization of Subtitles

What's in it for you?

Gain significant efficiencies in time and cost savings in Transcription, Subtitling and Closed Captioning

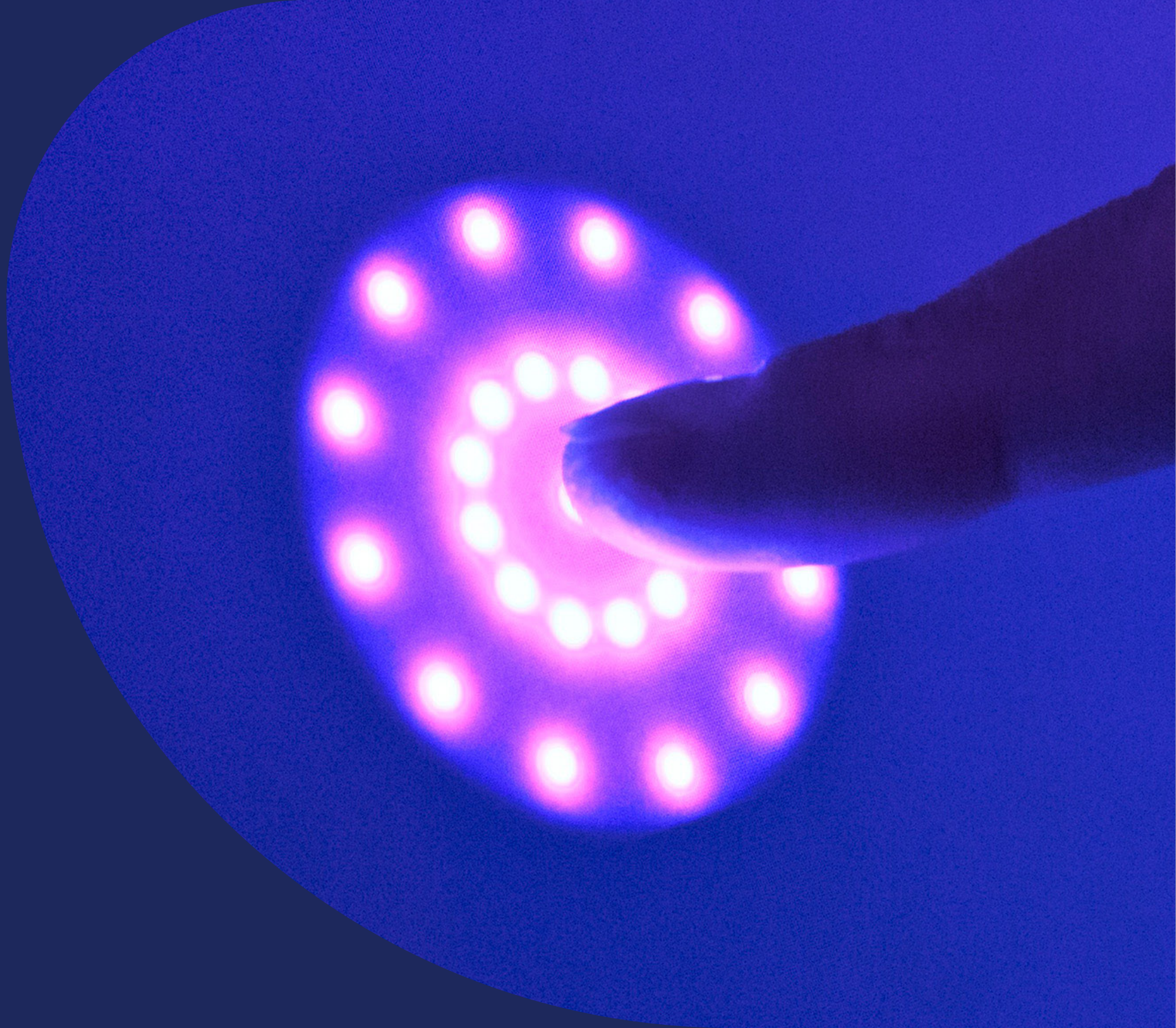


Language Tools Use Cases

Broadcast, Studios, Direct to Consumer

- Create subtitle in the same language and publish the content under tight SLA
- Achieve 70-95% accuracy in subtitling and be able to fill the gap with human intervention where the machine generated subtitles are not 100% accurate
- Mask the profane words in the subtitle if mandated
- Identify the speaker and split the subtitles accordingly
- Make sure that the subtitles are timed and synced with the shots and follow the in-house/regulator's rule in terms of number of characters per subtitle etc.
- Create subtitle in a language that is different from the source language of the content by translating from the original language





A hand holding a pen, writing on a blue background. The hand is positioned in the upper right corner, with the pen tip pointing towards the center. The background is a solid blue color with a subtle gradient.

Making AI Work For You

With a decade of experience in the M&E industry, nobody understands the unique business requirements of content enterprises – broadcasters, studios, production houses and D2C players – like we do. PFT is working round the clock to solve real world M&E business problems and build additional use cases to showcase how it can deliver AI-led business outcomes.

Accurate data and Actionable data are the hallmarks of CLEAR Vision Cloud. While other AI models available today in the market can offer data accuracy to some extent, none are capable of presenting accurate data that is actionable too.

**CLEAR Vision Cloud,
making AI work for you.**



For more information visit:

www.primefocustechnologies.com

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