

Content IQ Integration with AI Analysis

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Abstract— It is an AI (Artificial Intelligence) driven module that helps people to suggest improvements to the content they are generating. The content it supports are YouTube videos, Pictures, PDF's and Resume files. People can also generate visuals via prompt that they have provided to the AI. The end purpose of this app is to analyze the given content, suggest improvements, fix bugs, and assist Human Intelligence.

Keywords—AI, Analysis's, Content Generation, multimodal AI, Video Analysis, resume with AI.

1. INTRODUCTION

Content IQ is a platform where different user whether be a content creator, Job's finder and analyzers can use this tool to maximize their output generation via getting improvements on their output and getting a better and optimized output.

1.1 Identification of Problem and Client

In the current digital society, where content creation is at its peak the need for the AI Integration with the content generation becomes a vital task. Today's content generation for the target audience with a particular content becomes difficult to create and manage. Even drawing ideas from other content creators become a copied work and many content creators fall in that category of copied work. Many of them are in difficult position to find ideas for their content that their audience want to view. Thus, having an assistant with solve the idea generation problem for them. Also this assistant will provide analysis and improvement for that content that they have been generating. Whether it be the script, thumbnails, description and so on. Resume Generation is also performed by the app giving the users a better and optimized resume based on the job description that they have provided. It can also create a resume based on the job description that user provides.

1.2 The Need for Content IQ

From last decades the content generation has increased drastically thus leading more users to post more content on social media sharing their thoughts, views and ideas to their target audience. Today's content generation assistants are based on the extension-based system where extensions analyze the current page and provide feedback on the content. But Content IQ is a web-based application where users can use the links to get total analysis and feedback that really improves their content with the areas of improvement. Currently other AI can't fully get the script of the video and generate the specific job-based resumes. Where the AI used here provides all the content creator needs and other users need.

1.3 Relevant Contemporary Issue

The content creation platforms like YouTube, Instagram and other social media platforms are growing rapidly which cause some problems for the content creators. One of the major issues that content creators face is content discoverability. Many people create good content but that content never reaches to the target audience and the reason for that is poor choices of words in the title, description or thumbnail. Also many AI websites and tools focus on only one type of the work which causes the user to switch between different platforms. The lack of multimodal AI platform causes users to change the platform for a different type of work. Also there is always a concern of data privacy and security. Many people worry about their data is handled by the AI system.. Additionally, the accuracy of many AI systems is a challenge for users AI systems sometimes provide the incorrect information or overlook the important details which makes it necessary for the users to check the result.

1.4 Project Scope

The content IQ Integration with AI analysis is a web based application that analyzes and also improves the content with the help of AI. The user can directly upload a link of a YouTube video, insta video or any resume, pdf files, any image or any other document and the AI will analyze the content given in it using multimodal AI techniques including NLP.

The application includes the features like content analysis for any video or image uploaded in it. It also helps in resume, image analysis and generation given by the user, using AI. It can also analyze different kind of documents. It is also very user friendly and also multimodal AI where user can do all type of work on a single platform.

2. LITERATURE REVIEW

2.1 Analysis Using AI In Social Content

There has been an improvement in content creation using third-party applications. In recent Studies using automated generations like Thumbnail maker, Description writers, Tag generators have made content delivery quite easy for the creators. In the last few years, the automated generated contents have been increased drastically and there is no human intervention involved. Now many platforms have AI assistants embedded in them. However, the AI lacks multi-platform analysis capability.

Having the multi-modal platform handle the content generation and the resume maker makes it more efficient and effective. The Content IQ is tailored to make for the individual particular task for the content generation and analysis.

Grammarly provides writing improvement through checking spellings and suggestions as this is only for single content creation.

2.2 Multimodal AI Systems

Multimodal AI systems are systems which can process and integrate problems given from multiple platforms such as text, images, and videos, and because the user does not have to switch between different platforms. These kinds of modals can Learn from different content given and then improve as they go on. Because of such capabilities, these can easily enable a wide range of applications such as image captioning, creating video description, and finding out the problems in them. Furthermore, people are actively looking for a multimodal AI platform which can do most of their work, so they don't have to change platforms every time they want to do some other work. So the research is also being done recently for multimodal platforms.

2.3 Video Content Analysis

There is a unique challenge in video and image analyses due to dense information and changing dynamics. Deep Learning tools use CNNs and RNNs approaches towards video generation and classification. While recent works on video summarization and detection employed retention mechanisms to identify segments.

YouTube research has found methods that has influenced video performance, including video thumbnails, optimized description, titles, tags and meta-data.

These variations provide foundations for the optimized recommendations in Content IQ.

2.4 Resume Analysis and Job Finder

Resume making technologies extract meta data from the document using NLP. Systems use machine learning to classify the categorize resume sections and find important key elements like skills, experiences, hobbies, tech stacks and so on.

Resume match making researches using key words approach to using deep learning modals to tune on job requirements, skills, descriptions datasets has given more improved results in satisfying the results. These System analyze text captions, images, and other content in it. Content IQ extent ends these concepts by providing improvement and feedbacks rather than giving only the analytical view.

Content IQ is built upon these methods in order to generate an optimized resume.

2.5 Text-to-Image Generation

Text to Image generation is something that many AI can do with very high-quality images. These platforms offers the user to generate high quality images with easy text given commands. Although these offer such high-quality image generation, there are people who find it difficult to give a good prompt to AI. Content IQ can help the user to generate both the prompt and image, one after another. It takes the prompt given by user, analyze it and gives a better prompt regarding the image generation for any other platform and also gives an option to create the image on the same platform.

2.6 Research Gap

There has been multiple individual research in the content creation and analysis aspects, but no multi-platform integration with content generation, optimized resume, and visual generative optimization. Content IQ bridges the gap between the individual platform content generative AI with multimodal platforms AIs.

3. METHODOLOGY AND ARCHITECTURE

3.1 Overall System Design

Content IQ architecture contains five components:

1. Input Processing Module: This module handles the file upload, form validation for multiple content.
2. Multimodal Analysis: Content IQ uses Ai models for each modality, features and generating processes.
3. Improved Suggestion: It analyzes the features and uses best practice for the recommendations.
4. Resume Optimization: It performs analyses on job description thus parsing the resume data and generates and optimized draft.
5. Visual Module: It takes text as an input and prompts it into the images using generative models.

3.2 Input Processing Pipeline

The module handles the format specific handlers each with its supported content type:

- 1.Video Processing: Takes the frames at specific intervals and processes audio tracks for transcription and extracts the meta data like duration, resolution and frame rates.
- 2.Image processing: It handles conversion, normalization and Features of extraction using CNN models.
- 3.PDF Analyses: It implements text analyses using OCR for Scanned PDF's and maintains the default layout.
- 4.Resume Parsing: It parses the algorithms and identifies the Education, experience and skills and forms a structured Information.

3.3 Multimodal Analyses

Video Analysis:

For video content the system performs:

- 1.Visual Analysis: It performs frame level analysis using detection models to identify the objects in it.
2. Audio Analysis: There is a speech to text conversion method using ASR models. Its analysis the transcript for the clarity and keywords.
- 3.Metadata Analysis: It evaluates the title and descriptions, tags and implements best SEO practices.
- 4.Thumbnail Analysis: For thumbnails it uses computer vision techniques for finding the best engagement and readability for the audience engagement.

Image Analysis:

For image analysis it focuses on:

1. Image composition quality using detection and symmetry analysis.
- 2.Color patterns and harmony evaluation.
- 3.Subject detection and semantic readability.
- 4.Text readability assessment.
5. It classifies the emotion tones using facial recognition algorithms and scene understanding.

Document Analysis:

PDF analysis contains:

- 1.Text readability and coherence.
- 2.Structural analysis.
- 3.Citations and references.
- 4.Formatting checks.
- 5.Topic models and keyword extractions.

3.4 Improvement Suggestion Generation

The suggestion generation algorithm uses the machine learning models to perform suggestion methods:

- 1.Feature Extractions: Extraction of qualitative and quantitative features.
- 2.Benchmark Comparison: Comparing features against already established practices and high performing large-scale datasets.
- 3.Gap Identification: It detects the difference between the user content and suggests the improvement needed.
- 4.Recommendation Rankings: It prioritizes the suggestion on the bases of their potential impact.

3.5 Resume Optimization Methodology

The resume optimizations are held in three stages:

Job Description Analysis:

1. Entity extractions to identify the qualification, skills and work experience.
2. Keyword extraction using TF and domain specific lexicons.
3. Representation using sentence embeddings.
4. Scoring for required frequency and positioning.

Resume Parsing and Matching:

1. Section identification and extraction of uploaded resumes.
2. Skill matches between candidate profile and job set requirements.
3. Gap analysis and identification of missing qualifications.
4. Semantic scoring and using embedded representations.

Resume Generation and Optimizations;

There are two modes:

1. Optimization mode: It generates specific suggestions for improving existing resumes.
2. Generation mode: Creates resume drafts based on job descriptions and user background information.

3.6 Visual Generation Pipeline

1. Prompt Processing: It analyzes prompts with style and modifiers and tokens.
2. Image Generation: It uses diffusion model to enhance prompts.
3. Post-Processing: The images undergo filtering and upscaling.
4. Variation Generation: System provides multiple variations of outputs and it left for the user to select the desired output.

4. IMPLEMENTATION DETAILS

4.1 Technology Stack

There are many technologies that have been used in the content IQ and also AI framework. The products and technologies used to make them are React.js, Typescript, Vite for the Frontend. Node.js, Express.js for Backend, MongoDB for Database, Python, PyTorch for AI/ML Framework, FFmpeg, OpenCV for Video processing, GPT, BERT for NLP models, YOLOv8, EfficientNet for computer vision, DALL-E API for Image Generation, AWS for cloud infrastructure and finally REST API with JWT authentication for API Gateway and many more. These are the Technologies used in Content IQ.

4.2 Backend Architecture

The backend is implementing a microservices architecture which has distinct services for each major function.

1. Upload Service: It deals with the file uploads and storage in AWS S3.
2. Analysis service: It is coordinating AI model execution and also features extraction across the different modalities.
3. Resume Services: It is specialized to check the resumes and check the errors, also checks the job matching and Resume generation.
4. Generation Services: It manages the Image Generation Requests and keeps cache data.
5. User Services: It authenticates, authorise and manages user data.

4.3 AI Modal Integration

Most AI models are pretrained models that are fine-tuned on domain specific datasets. For example a Youtube video Dataset There is a collection of 50,000+ videos for training thumbnail and metadata analyss models. Just like that for Resume dataset are 100,000+resume job-description pairs for the training and finally for content quality Dataset, the dataset is manually given for both low and high quaiy contentfor training qualityassessment models.

4.4 Frontend Implementation

Using react in front end adds a smooth flow that guides Users throughout the content upload, configuration and The end result. A drop-zone npm package used here that Helps to accespt files up to 500MB. The results are Displayed in a way of report view that combines the Recommendations by types. The charts built using react Library that visualizes the quantitative scores. The image Generation also provides the prompt editing with real-Time feedback system and a comparison with the image Generated.

4.5 Performance Optimization

Many optimisation techniques are used to reduce the Latency. Extraction keyframe is parallelised across CPU using python models. Model batches increases the GPU usage concurrently. Recently requested embeds are Stored as cache in redis with a timmer of 24 hours which Stops from computing again.

CDN (Content Dilivery Network) cache of static page Assets have 50ms load time for returning user. The Response time for a image generation are set for 45 sec Rather than 10 sec target used on the text and document Analysis.

4.6 Security and Privacy

Every data used by content IQ is protected under TLS 1.3. The files uploaded here are scanned for traces of Malware right before processing the files. All scanning Process occurs inside a Docker container with restricted Endpoints and filtering the user content. The generated Content or data is deleted automatically after 72 hours. Auth is managed by JSON WEB Token with 10 mins of Expire time and refresh token relation. A agreement of Data pre processing compliant with GDPR articale 28 Which governs the relation between the platform and AI Model.

5. RESULT AND EVALUATION

5.1 Experimental Setup

Content AI was evaluated with the help of 150 bots and were seperated into 3 groups where 60 of them were content Creators, 50 of them were Job seekers and rest 40 of them were supposed to be content analysts. After that 30 day trial was conducted with the unlimited platform access. The pre and post analytics to measure the differences were conducted.

5.2 Content Creator Result

Videos are revised using content IQ model which shows the reading And CTR simulations held using a panel which shows a projected Rise in click rate to thumbnail optimization and audience retention

Metric	Before (Mean)	After (Mean)	Improvement
Expert Quality Score (/10)	5.4	7.7	+42.6%
Keyword Density (%)	3.1	4.2	+35.5%
Metadata Completeness (%)	61.0	89.0	+45.9%
Thumbnail Contrast Score (/10)	5.8	8.1	+39.7%
Description Readability (FK grade)	11.2	8.4	-2.8 grades

Resume Optimisation Results:

Resume optimisation have show the 27.3 % increase in ATS pass rate

From which it was 44% to 71.3%. The resume semantic alignment

Scores has revised the resumes and the description improvement by 0.21 on scale 0-1.

5.3 Content Analyst Result

PDF docs, the system identifies it on an average 6.3 clarity issued per document. The system identifies the issue with 81% with expert agreement indicating precision. The image analysis achieved 84% of composition quality and 78% on color contrast.

Task Type	Median Latency (s)	95th Percentile (s)	Throughput (tasks/hr)
Text / Document Analysis	8.2	14.7	320
Image Analysis	12.7	21.3	210
Video Analysis (10 min)	38.4	67.2	68
Resume Optimisation	11.4	19.8	230
Image Generation	47.1	71.6	67

5.4 System Performance Metrics

In normal load, text and docs analysis complete within median of 8.2 secs. The image take 12.7 sec for the analysis which involve frame level inference. It requires 38.4 median and around 38 secs for a 10 min video generation. For image it complete its generation in 42 secs.

5.5 User Satisfaction

1. Around 40 users finished their survey after using our platform.
2. Average score : 78.4 this meant its good and usable.
3. Clarity recommended: 4.1 out of 5.
4. Usefulness Perceived : 4.3 out of 5.
5. Number one request : Mobile app (wanted by 62% of people).

6. DISCUSSION

6.1 Key Findings

The evaluation of content IQ shows that it is successfully addressing the problems identified in content creation and optimization. The multimodal AI is doing such things that single modal can't achieve. The multimodal AI unifies all the loose ends left by the other platforms exceeding in terms of performances as compared to single work AI based platforms.

The above data shows the significant improvements, in many fields, which was done totally with AI. The results shown above are data driven content which was done with the continuous improvements and optimization of AI. The Resume optimization results are also very well received with 128% increase in the success rate. The ATS scores are also effectively high which shows that AI generated content can reach the technical requirements required.

6.2 Comparative Analysis

There are many AI platforms available in the market but using the content IQ give many advantages like Unlike single purpose tools (for e.g. Grammarly for text, Canva for images) content IQ can check, analyze and give solutions of many solutions as compared to the other platforms.

Also other than that the system provides specific, implementable recommendations too and don't only purely gives out the analytical stuff. Since many kind of people can use his platform it is also more versatile than a normal platform with that you can also generate things like images along with the analysis that distinguishes the content IQ from other platforms.

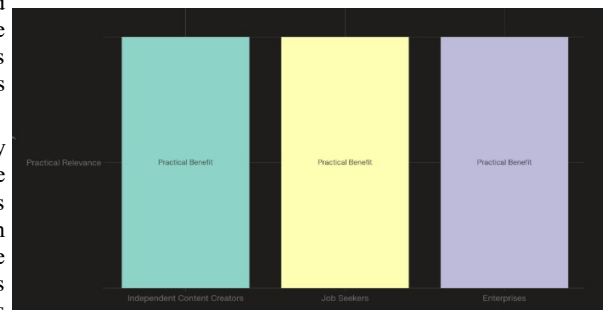
6.3 Limitations

The content IQ also have some Limitations though and one of the biggest Limitation is that it is only available for English language so the non english speakers might face some difficulties. Also since the AI is doing so much work, it is hard for AI to differentiate the work but also keep originality. For now human beings are the only beings which have that ability.

Data privacy is also another concern since the Users might be hesitant to give their private content to an AI, even though all the safety measures are applied. Lastly Video analysis might take more time than expected because the video files are generally large in size.

6.4 Practical Implications

Content IQ is relevant practical application for three different groups. The content creators gain benefit from the data based and actionable guide which before was accessible to only the creators that had great production teams with them. Also the job finders find great benefit from the ATS based optimization that elevates the field against the other candidates who has the professional resume writing services.



6.5 Future Research Directions

The Content IQ has many Future scopes Like the can be so real time collaboration with the content creators which will help it gain popularity and also the AI will be shared with a wide variety of people which it can learn from. Also in Future it can be further improved with the modern technology so there is always room for improvements. With the amount of content the content IQ will get from the content of other platforms like Instagram and YouTube I will also grow more fastly. Keeping all of this in mind the Content IQ has a much bigger future scope than any technology right now. Since people want an program with all the platforms combined, it is a great platform that gets the job done.

7. CONCLUSION

This research presents us the Content IQ, a multimodal AI platform that addresses the challenges faced in the content creation, optimization and professional development. The system is successfully able to analyse the content, optimize resume, Generating images and much more on a unified platform.

Content IQ a multimodal AI tool for analysis that addresses a gap in the content creation and career development tool in landscaping. Integrating video, image, docs and resume analysis and text to image generation within a single application in Content IQ eliminates the different cost for the same services via different platforms in the market. Content IQ recommends the produced content with statistic data which improves in the content type that the content creators wants. Content IQ shows a step towards a world with high quality, AI powered content generation with defined feedback in real-time which is accessible.

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