southworks

Building a Smart Video Metadata Enrichment & Search Solution Video CMS

Introduction

For NAB 2025, SOUTHWORKS has introduced a state-of-the-art Video Content Management System (VCMS) that seamlessly integrates AI at every stage. This cutting-edge solution allows users to upload videos and leverage advanced AI technologies to automatically generate detailed metadata. An innovative chatbot further enhances the user experience by enabling real-time interactions and a powerful semantic search across specific video insights or the entire library. Designed with ease of use in mind, this intuitive platform empowers users to explore their content more deeply, offering rich customization and enrichment through the latest Generative AI capabilities.

The Challenge

SOUTHWORKS tackled the challenge of automating metadata enrichment for video content by developing a fully automated AI-driven pipeline that seamlessly analyzes and processes video assets. After indexing, the VCMS solution empowers users with real-time interaction capabilities, enabling efficient access to specific video insights. Additionally, it offers a comprehensive semantic and multimodal search experience, enhancing discoverability and streamlining content management.

The Solution: AI-Powered Video CMS

To address these challenges, we employed various Microsoft AI services:

Azure Video Indexer:

Utilized to extract insights from the video content, ensuring rich metadata for each uploaded video.

Azure AI Vision:

Used to complement the AI pipeline with in-depth image analysis of video keyframes.

Azure AI Content Understanding:

Used to analyze video content transforming it into structured, organized, and searchable data, making it possible to query video assets without any model training or fine-tuning.

Azure AI Search:

Multimodal vector store to enable efficient retrieval of video insights and frames, optimizing search performance and ensuring quick access to relevant content.

Azure OpenAI:

Used to power video summarization by analyzing content and generating concise summaries, while also enabling an interactive chatbot experience for seamless content exploration.

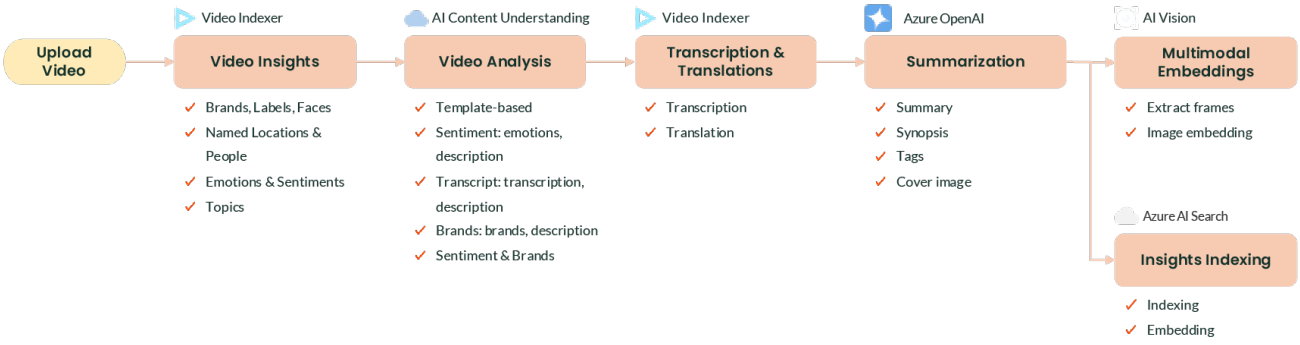
Azure AI Content Safety:

Ensured that all the content is safe and compliant, by automatically detecting and filtering out any offensive inappropriate content.

Technical Implementation Details

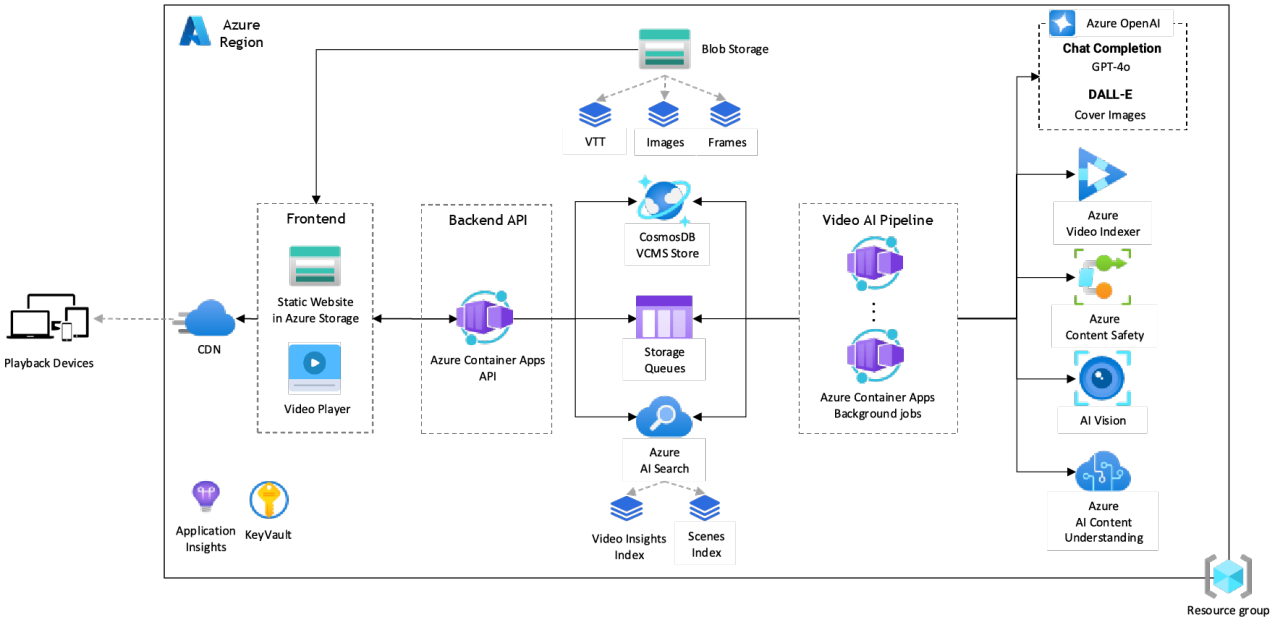
AI-powered Analysis Pipeline

The diagram below illustrates the AI-powered analysis and indexing pipeline executed for each video processed by the VCMS.



Architecture Diagram

The diagram below outlines the high-level architecture of the solution deployed in Azure, showcasing the Azure services utilized for both the indexing and search processes.



VCMS solution diagrams

The Content Ingestion Flow: Indexing Content with Azure AI

The indexing process for video content within the Azure AI Video Content Management System (VCMS) involves several stages to enhance searchability and accessibility. It starts right after video upload, where **Azure Video Indexer** extracts insights like brands, labels, faces, locations, emotions, sentiments, and topics.

Azure AI Content Understanding then performs detailed video analysis, including shot detection and description, sentiment analysis, and categorization. The audio transcription and translations into multiple languages are used to generate summaries, synopses, tags, and cover images, leveraging LLMs from **Azure OpenAI**. **Azure AI Vision** extracts frames and creates image embeddings for multimodal indexing. Finally, **Azure AI Search** stores these insights in a searchable database for efficient semantic and hybrid search.

This multi-stage indexing pipeline ensures video content is analyzed and processed effectively, enabling users to find and interact with the content seamlessly.

Search Flow: Enhancing Search Experience with Azure AI

The search flow within the Azure AI Video Content Management System (VCMS) is designed to provide efficient and accurate retrieval of video insights through both text and image searches. When a user initiates a search, text queries are processed using **Azure OpenAI** embeddings models, which convert the search terms into text embeddings. These embeddings are then used to perform similarity search queries with **Azure AI Search**, enabling keyword and semantic search capabilities within the video insights index.

For image searches, **Azure AI Vision** performs image analysis and generates multimodal embeddings that combine both visual and textual data. These embeddings are stored in **Azure AI Search**, enabling semantic search across video scenes for enhanced content retrieval.

This dual approach ensures that users can perform comprehensive searches, retrieving relevant video content quickly and accurately, and enhancing the overall search experience within the **VCMS**.

Conclusion

By harnessing Azure AI Foundry and Azure AI services, SOUTHWORKS effectively enhanced video content management and search capabilities, significantly improving user interaction and experience with the Video CMS.

Enhancing Video Content Management and Discoverability with Azure AI

The Azure AI Video Content Management System (VCMS) demonstrates how AI can revolutionize user experience and video content management. Utilizing Azure Video Indexer, Azure AI Content Understanding, Azure OpenAI, and Azure AI Search, the VCMS provides detailed video insights, efficient transcription, and translation, and robust search functionalities. These technologies ensure users can effortlessly manage, search, and interact with video content, making information retrieval more intuitive and enhancing overall engagement and accessibility.

Ready to make your video content as searchable and intelligent as the rest of your digital assets?

With AI-powered metadata enrichment and video search capabilities, SOUTHWORKS can help you unlock the full value of your video library — making content easier to manage, find, and engage with.

Book a session with a SOUTHWORKS expert to explore how our Smart Video Metadata Enrichment & Search solution can be tailored to your organization's needs.

Let's talk about how to transform your video archive into a truly intelligent platform.

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