Polyglot Vision

Team Members:

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Project Description:

Goal:

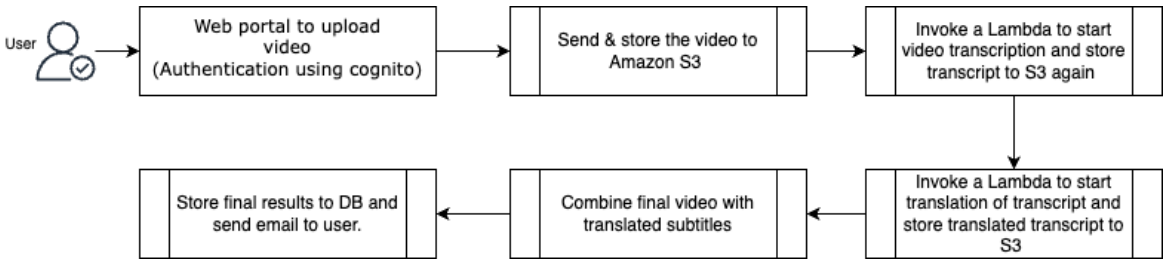
The primary goal of this project is to implement a cloud based solution for seamless video subtitle translation utilizing AI/ML-based services like Amazon Transcribe, Amazon Translate, and Amazon Polly to create an efficient, scalable, and cost-effective system that automates the process of video transcription and translation into multiple languages.

Motivation:

The motivation behind our video subtitle project lies in a unique opportunity for our team to deepen our expertise in cloud technology. By integrating AWS Transcribe and Translate, we aim to master the complete flow of a cloud-based solution, understanding the intricacies of virtual environments through serverless programming for specific tasks. This involves using Amazon EC2 instances, kind of like virtual computers, and making sure our application can handle different amounts of work by automatically adjusting the number of instances using a system called autoscaling. We'll also be using Kubernetes and Docker to organize and manage our application. To handle traffic well, we're adding an Application Load Balancer (ALB) that spreads the workload across multiple instances.

This project serves as a hands-on learning experience, allowing us to gain valuable insights into optimizing resource allocation, scalability, troubleshooting on cloud platforms along with budget management for our usage and service. This will be helping us stay at the forefront of innovative cloud solutions.

High Level System Block Diagram:



At present, our system exclusively extracts subtitles, translates them, and returns the final video with translated subtitles.
If time allows, we aim to integrate Amazon Polly to convert the translated subtitles into audio and seamlessly merge it with the video, offering a fully translated video experience.

Cloud Technologies used:

AWS Cloud: A cloud computing platform that provides a wide range of services for computing, storage, and networking.
Amazon Cognito: An identity platform for web and mobile apps that provides user directory, authentication, and authorization services.
Amazon S3: A scalable object storage service that provides secure and durable data storage.
Amazon EC2: A web service that provides resizable compute capacity in the cloud.
Amazon Transcribe: An automatic speech recognition (ASR) service that converts speech to text.
Amazon Translate: A neural machine translation service that provides fast and high-quality language translation.
Amazon Polly: A text-to-speech (TTS) service that uses advanced deep learning technologies to synthesize speech.
Amazon SES: A flexible and scalable email service that enables businesses to send and receive email using their own email addresses and domains.
Amazon Lambda: A serverless computing service that lets you run code without provisioning or managing servers.
Amazon DynamoDB: DynamoDB offers a fast persistent key–value datastore with built-in support for replication, autoscaling, encryption at rest, and on-demand backup among other features.

Task Division:

	Module	Assignee
1.	AWS infrastructure creation using Terraform	Snehal, Sourabh
2.	Develop a front-end for users to upload a video	Sourabh
3.	Develop a backend to send in S3.	Silvi
4.	Develop functions to transcribe and then translate the video subtitles.	Sreeja
5.	Develop the scripts/APIs to combine the video output and send email to the user.	Snehal