SCHOOL OF INFORMATION, COMPUTER AND COMMUNICATION TECHNOLOGY
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Kick-Off Report
QikVid – Video Processing and Distributing Application

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Overview and Background

Current video-sharing platforms like TikTok have closed source code that does not allow the public to check the efficiency or safety of the platform. Due to the nature of these video-sharing platforms, we believe that an open-source approach would be more appropriate as the platform will serve as an online public space for people to share their videos and therefore, should have access to the source code as well.

Furthermore, there have been multiple criticisms about video recommendation algorithms and the invasion of users' privacy. Although this feature can be helpful, there have been multiple instances where companies are found to sell user data to other organizations. In a world where privacy is becoming a priority concern, better platform implementations should be created.

Lastly, these video-sharing platforms tend to have intrusive amounts of advertisements that are usually not related to the user's demand. Our aim is to create a nonprofit free online video sharing platform that people can use in a safe online environment.

Problem Statement

Our goal is to create a free open-source cloud-based application that allows users to upload videos on a cloud server and have access to them later on to view, edit, or delete them. This involves establishing efficient video encoding algorithms and cloud server optimization to effectively provide the service to the users.

Key Users and Stakeholders

1. Users
   a. Video Uploader – Content creators and people who love to make short videos
   b. Video Viewer – People who enjoy watching the videos uploaded by other users
2. Admin
   a. Content moderators – Staff who oversee the content on the application.

Functional requirements

- User Management System
    - Admins can view, edit, and deactivate user accounts on the application
    - Admins can define new video categories
- Users can upload videos and set titles as well as descriptions of them
- Users can comment on videos, including the video owner
- Videos loop until users want to go to the next video
- Videos get distributed to each user randomly and play one at a time
- Each video has a like counter, that increases by one every time a user clicks on it

Nonfunctional requirements

- User Interface
    - Time-Zone: Bangkok (UTC+7)
    - Input/Output devices: Desktop, Laptop PC, Mobile
    - Handle multiple users simultaneously
    - Web application
- Performance
    - Video size limit: no longer than 30 seconds and no more than 100 megabytes.
    - Response time must be less than 5 seconds
- System Interface
    - Inputs (APIs): Media Services API v3 – Microsoft Azure
    - Outputs: MP4
- Quality
    - Runs 24/7 without interruption
- Backup
    - There is at least one video backup location
    - System backup on a weekly basis
    - Admins are responsible for backing up server data
- Security
    - Only users who upload the video have access to edit or delete the video
    - Admins can view/edit/delete all videos
    - Access Control – Admin can define the control rights of each user

Programming Language

- Javascript
- HTML
- CSS
- Python
- SQL

Cloud Technology and Components

- Cloud provider: Microsoft Azure
  - Web application deployment and User authentication: Azure App Service
    Azure App is a service provided by Microsoft Azure for building and hosting web applications and RESTful API with support for Node.js and other languages.
  - Databases and storage: SQL Server and Azure Blob Storage
    SQL server is used to handle the data generated by users such as likes and comments count, while Azure Blob Storage is used to store large volumes of unstructured data for cloud applications.
  - Video streaming services: Azure Media Service Encoder, Azure Media Services Streaming Endpoint, and Azure Media Player
    Azure Media Service provides video encoding and streaming services to serve video distributing applications. Azure Media Player is used to provide playback and JavaScript API support.
  - Video distributing: Content Delivery Network
    Content Delivery Network or CDN provides a reliable method of delivery of video via a web application platform.
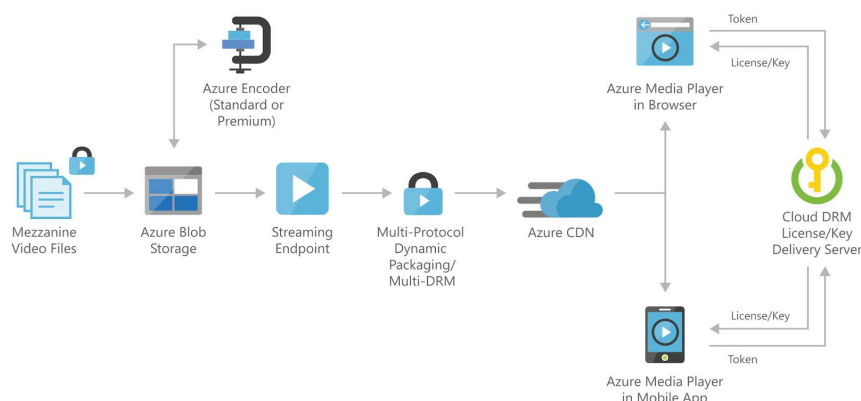 - Content protection: Multi-DRM content protection

Figure 1: Architecture of the video streaming and distributing application
(Reference: Video-on-demand digital media, Microsoft Azure)

Framework and Tools

- Source and version control
  - Git
  - GitHub
- Front-end Development
  - React
- Back-end Development
  - Node.js
  - Express.js
- Databases and Storage
  - MS SQL or MongoDB
  - Azure Blob Storage for video storage
- Virtualization
  - Docker

UI Mock-up design

User Pages

- The Login and Sign up page
- The user profile page contains a list of uploaded videos, a profile picture, and a username
- The video feed page contains a video playing, a like button, a number of Likes, and comments
- The Upload video page can only upload the video for up to 30 seconds and not larger than 100 megabytes, then the user can add the video title and description later.

Admin Pages

- The user management page shows the list and information about users. It can activate and deactivate user accounts from this page.
- The video management page shows the likes and comments of each video as well as video management such as deleting the video.

Admin Page:

User management Page

Title

Account Name	Deactivate
Account Name	Deactivate
Account Name	Deactivate
Account Name	Deactivate

Video management page

User Name

Delete button

3 likes

3 likes

References

Microsoft. (2022). Video-on-demand digital media – Azure Solution Ideas.
Retrieved September 8, 2022, from Microsoft Azure Documentation website:
https://docs.microsoft.com/en-us/azure/architecture/solution-ideas/articles/digital-media-video