University of British Columbia Okanagan

Project Plan - Video Streaming Using Cloud Technology

COSC 499 Capstone Software Engineering

Team #18

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Project Proposal for Video Streaming Using Cloud Technology

Team Number: #18

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1 Overview

Our Minimum Viable Product is to create a peer-to-peer video streaming service where organizations also have the opportunity to host their services. The idea is to provide professions like doctors or teachers a platform where users can register as either patients or students and send videos to the professionals when required. For example, a doctor may request a patient to send a video of some particular symptoms or a teacher may ask a student to send a video for a speaking comprehension. The purpose of the software is to provide very easy and convenient peer-to-peer connection from anywhere in the world. It also helps solve the problem of providing people with limited infrastructure in their area to be able to connect to professionals like Doctors so they can get necessary services. The fact that users have the ability to contact medical practitioners or teachers from even the most remote of places provides unique functionality. Users would want to use our platform because it allows users to easily connect to each other with just a few clicks. The simplicity in the functionality means that users of any skill levels will be able to access the software even in the most remote of locations. We believe our solution is more optimal than others as there are very few apps that provide similar functionality in the terms of being able to get a consultation within just a few clicks. It requires just a few clicks to be registered in a clinic or a classroom meaning it is very quick to pick up.

1.1 Envisioned Usage

The platform is meant for users to record and upload videos to stream. The users can either register as admins or regular clients and join organizations to share and upload videos to stream making them accessible to admins and to share it with other users with an option to blur videos for privacy. Admins and Users can also send and receive messages to make comments on the videos and interact with the receiver or sender. Professionals like Teachers and Doctors can send or request videos from their students and patients respectively. Teachers can create a classroom shell for accepting videos for assignments and students can join the shell through a link or code and then record videos and submit them. Similarly for Doctors, they can create their own clinics as organizations and connect with patients remotely. Patients can join the clinic and submit videos to the doctors about their symptoms and ailments. Patients also have the option to blur their faces for privacy and doctors can also blur the patients faces in case the doctor wants a second opinion from other doctors and they want to maintain the patient's privacy with other doctors. There will also be an 'Other' option when creating an organization for other professionals like Plumbers, so people can share videos and get solutions and advice online remotely.

2 Major Milestones

Deadline	Deliverable
Term 1 week 9: Mini Presentation	The first two features that we aim to have functional by week 9 are our user log-in/sign-up feature with permissions and to create an organization structure in the back-end. Both these features will be tested to ensure no conflicts are present.
Term 1 week 13: Design submission	This milestone we are largely focusing on design and implementation of our designs. The initial steps for this milestone will be UI design, ER design, system architecture design and beginning to create tests. Once our designs are solidified we will implement the database and UI. We'll also start focusing on some core features of our application such as video recording and specialized organization control pages for various professions. Our final task will be creation of the milestone video and creation of a design document.

Term 2 week 4: Peer Testing	This milestone will focus on core technical aspects for our application. Primarily, tools for the videos themselves will be worked on. We plan to implement video sharing, video editing tools, video playback tools, commenting, manual (or automatic, if feasible) captioning, privacy options using OpenCV, and saving videos to the internal database. We'll also set up an Angular container to be able to run and validate our apps functions.We also want to add calendar integration to be able to add things like deadlines. Finally, we also want to add a direct messaging system for communication between users.
Term 2 week 8: Peer Testing	This second-to-last milestone will largely be directed towards ease of use and privacy for users, as well as polishing existing features. The planned features for video privacy are video deletion, encryption, privacy options for sharing as well as selecting video format for sharing. We'll add a feedback system with notifications associated. A large focus will be placed on fixing any bugs and adjusting existing features based on peer feedback.
Term 2 week 13: Final project	The final milestone will be focused on further refinement of the app and completing the required submission tasks. We

submission	will finalize our documentation and create a video presentation. We will continue to work through any bugs that remain.

Table 1: Proposed Project Milestones: This table features all milestones we aim to accomplish by each week listed.

3 Technology Stack

The User can access the application over the internet using a web browser using a computer or any smartphone. The application will have cross-platform compatibility and will support usage for all kinds of devices.

Frontend:

- **HTML/CSS** - Simplest and best options for building web pages. Used widely with plenty of support and documentation.
- **Angular -** Choice of Framework ideal for building web applications enabling users to build their own components

Backend:

- **Java** - Java, being platform-independent, inherently supports cross-platform development. You can use it on various operating systems without modification.
- **VSCode -** User-friendly IDE that works with various programming languages and works with multiple operating systems which helps with both mobile and web applications

Authentication:

- **Amazon Cognito** - Adds user Management and provides a platform for secure user login and authentication. It provides functionality for both mobile and web apps

Video Processing:

- **Amazon Elemental MediaConvert** - Easy way to provide functionality for video transcoding

providing high quality video and audio output in various video formats

- **Amazon Elemental MediaStore** - Easy way to deliver (and store) live video content in a low latency, consistent, and dynamic way.

Database:

- **Amazon RDS (Relational Database Service)** - Choosing MySQL as choice of relational database for storing user data and video metadata
- **MySQL** - It is scalable and user-friendly while having the ability to handle large databases
- **Amazon S3 (Simple Storage Service)** - An easy cloud storage solution for securely storing video files and data. It is scalable and works well with the rest of the AWS stack

Containers: Docker and Amazon ECS (Elastic Container Service)

4 Teamwork Distribution and Anticipated Hurdles

Category	Sam	Mackenzie	Ishaan	Segundo	Nik
Experience	COSC 341- Made a Carpooling App for the class project where had to work with Android Studio and Java IB CS Project- Made a inventory management software for a local business using MySQL and Java	COSC 360 - Web design /programming using HTML, CSS PHP, and JS. Made a basic website for a local business using HTML, CSS and JS. COSC 341 - used android studios and java to create a food ordering app	COSC 320 - Designed algorithm to pull 1M+ tweets, expand abbreviations, and rewrite the tweets. Had to meet with team members and collaborate to come up with an efficient algorithm to solve our problem.	In my COSC 304 group project, I was able to work on a mock grocery store webpage with HTML/CSS and JDBC to interact with and display data from the databases.	COSC 320 - designed algorithm to pull 1M+ tweets, expand abbreviations, and rewrite the tweets. Coordinated team meetings to come with a viable solution for our algorithm.
Good At	Java, SQL, Github, HTML/CSS,	Java, SQL, javascript, html/css, php github, Python,	Java, SQL, HTML/CSS, Project management,	Java SQL HTML/CSS Project Planning	Java, SQL, HTML/CSS, VBA, Power Platform,

	Android App Development		code reviewing, Documenting, Android App Development	Communication Github	Android App Development
Expect to Learn	Testing, Angular, AWS Tools, Using APIs	Angular, project management, automated testing, AWS	Unit Testing, AWS, Angular, various APIs	AWS Angular Further developing web development and UI skills.	AWS, Angular, APIs that AWS offers

Table 2: Team Experience, Expertise, and Areas of Learning: All of our team has had experience in working on either personal projects or past coursework projects that have provided transferable interpersonal and technical skills to this current project. Our team has a great foundation of learned languages and skills that will help us further accomplish all milestones within the project scope. Additionally, our team is prepared to learn any new languages or project related skills that will help the project succeed.

Category of Work/Features	**Sam**	**Mackenzie**	**Ishaan**	**Segundo**	**Nik**
Project Management: Github Maintenance	✓	✓	✓	✓	✓
Technical Direction: Time Estimation, Making Programming Choices		✓			
Technical Help: Finding Technical Solutions				✓	
Troubleshooting: The Go-To When Others Are Stuck					✓
Features Listed Below					
Automatic testing setup	✓	✓	✓	✓	✓
User creation and logging in		✓			
Organization creation					✓
System Architecture Design	✓	✓	✓	✓	✓
User Interface Design		✓			
ER Design				✓	
CSS Development		✓			
Database Implementation				✓	
Video Recording			✓		

implementation					
Organization control					✓
In-app video sharing					✓
Video editing tools					✓
Video playback tools					✓
Manual/Automatic captioning				✓	
Angular Container Setup		✓			
OpenCV privacy settings			✓		
Calendar integration			✓		
Direct Messaging System			✓		
Video deletion				✓	
Encryption		✓			
Feedback system	✓				
Notifications	✓				
Privacy level settings for videos	✓				
Downloading videos with selected format	✓				
Bug fixing	✓	✓	✓	✓	✓
Features Listed Above					
Database Setup					
Presentation Preparation	✓				
Design Video Creation		✓			
Design Video Editing	✓				

Design Report			✓	✓	
Final Video Creation		✓			
Final Video Editing	✓				
Final Team Report			✓		
Final Individual Report			✓		

Table 3: Expected Areas of Contributions: The work distributed to each team member has been determined given their experience and areas of interest within the project.