yMedia: Video Streaming and Sharing Platform

Project Report

CSE299 – Junior Design

Section 04 — Group 06

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1. Introduction

Video streaming and sharing platforms have become an integral part of modern digital ecosystems. They support a wide range of activities including entertainment, education, communication, and creative expression. As these platforms continue to evolve, they often introduce increasingly complex features, extensive recommendation systems, and dense user interfaces. While these additions may benefit advanced users, they can negatively impact usability for casual viewers and emerging content creators.

The yMedia project aims to address this imbalance by developing a lightweight, intuitive, and user-focused video streaming and sharing platform. Rather than replicating the scale and complexity of existing platforms, yMedia emphasizes clarity, performance, and essential functionality. The platform is designed to allow users to watch, upload, and manage video content efficiently without being overwhelmed by unnecessary features.

This project is undertaken as part of the CSE299 (Junior Design) course and applies theoretical knowledge of software engineering, full-stack development, and user experience design in a practical context. This report presents the conceptual foundation, system design, development progress, and future direction of the yMedia platform.

2. Background and Literature Review

A comprehensive review of existing video-sharing platforms such as YouTube, Vimeo, and similar services reveals a consistent trend toward feature expansion and algorithm-driven content delivery. While these platforms offer powerful tools for creators and advertisers, their increasing complexity can reduce accessibility for general users.

Research and platform analysis indicate that feature-heavy systems often suffer from usability issues, including cluttered interfaces, longer load times, and a steep learning curve. Studies on user engagement also suggest that excessive recommendations and algorithmic prioritization may limit content visibility for new or small creators, making it difficult for them to gain traction.

Additionally, performance remains a concern, particularly for users accessing platforms on mobile devices or low-bandwidth networks. These findings highlight a clear gap in the current landscape for a platform that prioritizes simplicity, speed, and user-centered design.

3. Project Motivation

The motivation behind yMedia arises from the observation that many users do not require advanced or monetization-focused tools to enjoy or share content. A significant portion of

users simply want a platform where they can browse videos comfortably, upload content easily, and interact meaningfully without distractions.

yMedia is inspired by the concept of functional minimalism—providing users with what they need, when they need it, in a visually calm environment. The platform seeks to recreate a sense of ease and familiarity while still supporting modern web standards and scalability.

4. Project Goals and Objectives

The primary goal of yMedia is to design and implement a clean, functional, and scalable video-sharing platform using modern web technologies. The project aims to strike a balance between usability and technical robustness.

The platform supports secure user authentication, smooth video upload and playback, organized content discovery through categories, and meaningful user interaction through likes, comments, and reposts. Visual clarity and interface consistency are emphasized to ensure a pleasant user experience across devices.

5. Proposed System Overview

yMedia is implemented as a full-stack web application based on the MERN stack, supported by cloud-based storage services. The system allows users to create accounts, manage profiles, upload and organize videos, and interact with content through intuitive features.

Category-based browsing and repost functionality enhance discoverability and engagement. A structured settings page provides users with control over their account and preferences, reinforcing personalization and usability.

6. System Architecture and Technology Stack

The system follows a modular, layered architecture to ensure maintainability and scalability. The frontend is built using React.js, enabling responsive design and reusable components. The backend uses Node.js and Express.js to manage API requests and authentication.

MongoDB is used for data storage, while Firebase Cloud Storage handles video uploads securely and efficiently. JWT-based authentication ensures secure access control and session handling.

7. Feature Design and Functional Scope

yMedia includes features supporting both viewers and creators. User management allows secure registration, login, and profile control. Video management enables uploading, categorization, and deletion of content.

Interaction features such as likes, comments, and reposts promote engagement without overwhelming users. Category-specific banners improve content discovery, and Progressive Web App support enhances accessibility.

8. Implementation Progress

The project has established a stable development structure with separate frontend and backend components. Core features including authentication, video upload, and category browsing have been implemented and tested locally.

Firebase integration and MongoDB connectivity have been successfully configured. UI consistency has been improved through iterative refinements to layout, spacing, and component structure.

9. Challenges Faced and Solutions

Visual consistency across pages required multiple iterations and was addressed using reusable components. Video storage challenges were resolved through Firebase integration.

State management complexities were handled using structured API responses and controlled frontend updates.

10. Future Scope and Enhancements

Planned enhancements include search and filtering features, creator analytics, and real-time notifications. Additional personalization options may be introduced while maintaining simplicity.

The system's modular design supports these improvements without major architectural changes.

11. Conclusion

yMedia presents a balanced approach to video streaming platform design by prioritizing usability, clarity, and performance. Instead of competing with large-scale platforms, it focuses on delivering essential features in a structured and accessible manner.

The use of the MERN stack and Firebase Cloud Storage provides a reliable technical foundation, while the platform's modular architecture supports future growth. Overall, yMedia demonstrates effective application of software engineering principles and serves as a strong base for continued development.

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