



OTT – PLATFORM USING REACT JS

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Abstract : This project is an online OTT (Over-The-Top) streaming platform that allows users to watch a wide range of digital content such as movies, web series, and anime. The application offers essential features including user registration, login/logout, profile management, and secure access using JWT-based authentication. It also includes a subscription system where users can choose a plan, with the option to repeat previous plans for convenience. An integrated referral feature enables users to earn rewards by inviting others to the platform. Users can view their referral balance and withdraw earnings. To enhance security, a forced logout feature is included, which can automatically log out users under certain conditions. The frontend is developed using React.js, styled with Material UI (MUI), and state is efficiently managed with Redux. Core functionality is built using React Hooks, while JWT tokens are used for secure session handling. Overall, this OTT platform delivers a smooth and interactive user experience, combining modern design and functionality for streaming entertainment.

IndexTerms - React.js, Material UI (MUI), JWT Authentication, User Authentication, Redux State Management, Web Series Streaming, Movie Streaming, Anime Streaming, Subscription System, Referral System, Forced Logout, Secure Session Management, React Hooks, Digital Content Streaming, Frontend Development, Modern Web Applications, UI/UX Design, User Profile Management, Reward System

I. INTRODUCTION

In today's digital era, Over-The-Top (OTT) platforms[1] have revolutionized the way people consume entertainment content, offering instant access to a wide array of media including movies, web series, and anime. This project focuses on building a feature-rich, scalable, and user-centric OTT streaming platform that not only delivers high-quality digital content but also enhances user engagement through innovative features[12]. The platform is designed to provide a seamless streaming experience with functionalities like secure user registration and login, profile management, and JWT-based session handling to ensure data privacy and safe access[14]. To support revenue generation, a flexible subscription system is implemented, enabling users to choose from multiple plans and easily renew or switch between them. A standout feature is the integrated **referral system**, allowing users to earn rewards by inviting others, promoting organic user growth. Additionally, the platform incorporates a **forced logout mechanism** to ensure security and account protection under specific conditions. Built using modern technologies such as **React.js** for the frontend, **Material UI (MUI)** for stylish and responsive design, and **Redux** for efficient state management, the application ensures a smooth and interactive user interface. React Hooks are extensively used for component-based development, and JWT tokens handle secure sessions. This project addresses several challenges faced by existing platforms, such as limited content discoverability, lack of flexible subscription models, and poor UI/UX[6]. By offering robust content management, secure authentication, and personalized user experiences, the platform stands out as a comprehensive solution in the digital streaming industry[19]. It is also built with scalability in mind, making it suitable for future enhancements such as AI-driven content recommendations, multi-language support, and even potential integration with emerging technologies like the metaverse.

1.1. Existing system:

Current OTT (Over-The-Top) streaming platforms provide users with access to digital content such as movies, web series, and shows through web or mobile applications[3]. While these platforms have gained widespread popularity, they still exhibit several limitations that affect user satisfaction and system efficiency. Most existing systems offer basic functionality such as content streaming and user subscriptions but lack flexible subscription options tailored to user preferences, including region- or language-

specific plans[15]. Many platforms also fall short in providing effective content discovery tools, resulting in a poor user experience when trying to find relevant or new content. Security measures like authentication are often limited to standard login mechanisms without advanced session control[2]. Features like forced logout or multi-factor authentication are not commonly implemented, leaving user accounts vulnerable to unauthorized access. Furthermore, monetization strategies on traditional OTT platforms are often rigid. They typically rely on fixed subscription models and overlook innovative revenue mechanisms like referral systems or reward-based user engagement[17]. Users have limited transparency over transaction history or control over their profiles and subscriptions. User interfaces on older platforms can be cluttered, non-responsive on different devices, and lacking in modern design principles, making navigation unintuitive and frustrating[4]. Additionally, system scalability and performance under heavy user loads can be problematic, especially when personalization features like recommendation engines are underdeveloped or inefficient.

1.1.1. Challenges:

User Authentication and Security :

Implementing secure login and session management using JWT while preventing unauthorized access or token tampering requires careful handling of encryption, token expiry, and forced logout logic.

Scalable Content Management :

Managing and delivering large volumes of video content efficiently—while ensuring optimal loading speeds and device compatibility—poses significant backend and database design challenges.

Subscription and Payment Integration :

Designing a flexible subscription system with dynamic pricing, recurring billing, and seamless payment gateway integration demands secure and error-free transaction handling.

Personalization and Recommendations :

Building an intelligent recommendation engine to suggest content based on user behavior requires data analysis and efficient state handling to avoid slowing down the frontend experience.

Responsive UI/UX Design :

Ensuring a consistent and engaging user experience across different devices and screen sizes with Material UI, while keeping the interface lightweight and intuitive, is a continuous design challenge.

1.2 Proposed system:

The proposed system is a modern OTT streaming platform designed to provide users with secure, seamless, and personalized access to digital content such as movies, web series, and anime[15]. It features JWT-based authentication for secure login, along with a forced logout mechanism to enhance account safety[9]. A flexible subscription system allows users to choose, renew, or switch plans easily, including language-based options. The platform introduces a referral and reward system, encouraging user growth through incentives[16]. Built with React.js, Material UI, and Redux, the frontend offers a responsive and interactive experience. Content is managed efficiently with backend support for video encoding, categorization, and streaming[7]. Users also benefit from personalized recommendations, detailed transaction history, and a scalable, modular architecture that ensures future enhancements like AI integration and shared viewing experiences.

Advantages:

1. Enhanced User Engagement and Monetization:

The integrated referral and reward system incentivizes users to invite others, promoting organic growth while increasing user retention. Flexible subscription plans and detailed transaction tracking further enhance user satisfaction and platform revenue.

2. Secure and Scalable Architecture:

With JWT-based authentication, forced logout, and modular microservice architecture, the platform ensures secure access and high scalability, making it capable of handling large user bases and future feature expansions efficiently.

2.1 Architecture:

The Architecture of the OTT platform[1] follows a **modular, three-tiered structure** consisting of the **Frontend Layer**, **Backend Services**, and **Database Layer**. The **Frontend Layer**, built using React.js and styled with Material UI, handles the user interface and experience. It communicates with the backend via secure RESTful APIs and manages application state using Redux and React

Hooks[11]. The **Backend Services** are responsible for user authentication (using JWT), subscription management, referral tracking, content delivery, and payment processing. These services are developed following a **microservices architecture**, allowing for independent scaling and maintenance[5]. Finally, the **Database Layer** stores user profiles, video metadata, subscription details, referral balances, and transaction history[13]. This structure ensures data integrity, security, and efficient retrieval. The platform also integrates third-party services such as payment gateways and CDN (Content Delivery Network) for optimized video streaming and financial transactions.

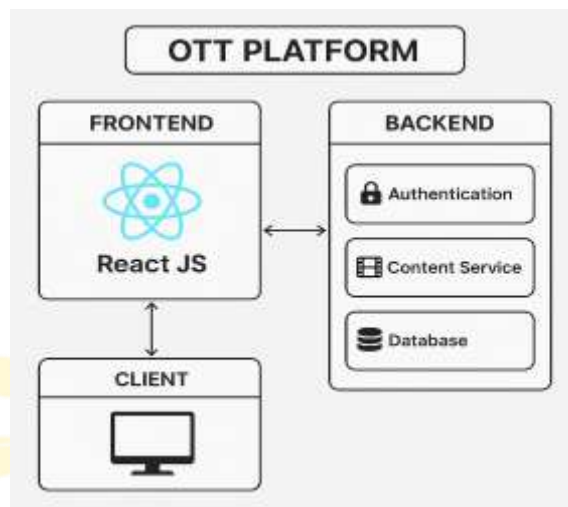


Fig1:Architecture

2.2 Algorithm:

The OTT platform begins with user registration or login, where credentials are securely verified[18]. Upon successful login, a JWT token is generated for session management. Users are then redirected to the homepage where they can browse available subscription plans. The system checks if the user already has an active plan. If not, the user selects a new plan and is directed to the integrated payment gateway. After successful payment, the subscription is activated, and the plan details are stored in the database. A unique referral code is assigned to each user, which they can share to invite others. When a new user registers using the referral code, the system records the referral and credits a reward to the referrer. Users can view their referral balance and request withdrawals from the referral dashboard[20]. The platform allows users to explore and filter content based on category, language, or popularity. When a user selects content, the system streams it through a secure and optimized backend service. The user's viewing activity is logged to enable personalized content recommendations[10]. State is managed on the frontend using Redux, ensuring smooth interaction across different components. All communication between the frontend and backend is handled via secure APIs[7]. A forced logout mechanism checks for token expiry, inactivity, or suspicious behavior, and logs users out automatically if needed. The system's backend follows a modular microservices architecture, allowing independent handling of user management, payments, content delivery, and analytics. User data, subscription info, and content metadata are securely stored in a structured database[14]. The architecture ensures quick data retrieval and system scalability[2]. React.js and Material UI are used to build a responsive and user-friendly frontend. The algorithm ensures secure, engaging, and efficient content delivery to users, while supporting platform growth through referral-based rewards and dynamic subscription features.

2.3 Techniques:

The OTT platform project incorporates several modern web development techniques to ensure a secure, scalable, and user-friendly experience. JWT-based authentication is used for secure login and session management, allowing the system to validate users without maintaining server-side sessions[15]. The frontend is built using React.js with React Hooks, which simplifies component logic and enhances interactivity[16]. Redux is employed for efficient state management across the application, ensuring smooth data flow. For styling, Material UI (MUI) provides a consistent and responsive design using pre-built components. The backend follows a modular microservices architecture, separating key functionalities like user management, subscriptions, and content delivery for better scalability and maintenance. Payment integration is handled securely using third-party gateways, enabling smooth and encrypted transactions[17]. A referral tracking system is implemented to monitor referrals, credit rewards, and support balance withdrawals[9]. The platform also features a dynamic subscription system, offering flexible plan selection, renewals, and language-based options. Personalized content recommendations are provided based on user behavior, and a forced logout mechanism ensures session security by checking token expiry and inactivity.

2.4 Tools:

The development of the OTT platform involved the use of several powerful tools and technologies to ensure a robust, responsive, and secure application. **React.js** was used as the primary frontend library to build dynamic and interactive user interfaces, while **Material UI (MUI)** provided pre-styled components for creating a modern and responsive design. **Redux** was integrated for state management, allowing consistent data flow across various components of the application. For backend development, tools like **Node.js** and **Express.js** (or similar frameworks) were likely used to handle API requests, manage user sessions, and perform server-side logic. **JWT (JSON Web Tokens)** was used to implement secure, token-based authentication. The platform also utilized a **payment gateway API** such as Razorpay or Stripe for processing subscription payments securely. **Database tools** like MongoDB or MySQL were used for storing user information, subscription data, and content metadata. Additionally, **Git** and **GitHub** were used for version control and collaboration, while **Postman** helped in testing APIs. These tools together contributed to building a scalable, maintainable, and high-performance OTT streaming platform.

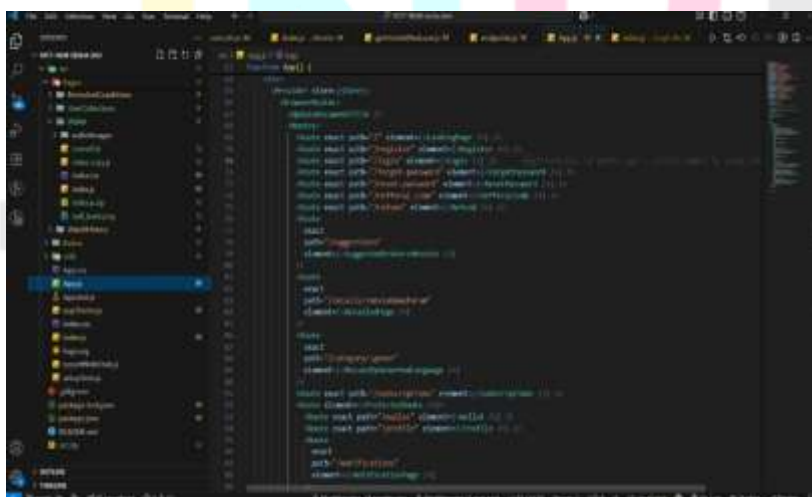
2.5 Methods:

The OTT platform project employs several development methods to ensure efficient functionality, user engagement, and system reliability[11]. The **Agile development methodology** was likely followed to allow iterative development, continuous feedback, and timely update[5]. For the frontend, the **component-based development method** was used through React.js, enabling reusable UI components and a modular design structure. **State management methods** using Redux allowed centralized handling of user data, subscription status, and playback information across the application[17]. The project also used **token-based authentication methods** with JWT to securely manage user sessions and prevent unauthorized access. For content delivery, **RESTful API methods** were implemented to ensure smooth communication between the frontend and backend services[9]. The **referral and subscription systems** were built using conditional logic and transactional methods that ensure accurate reward tracking and secure payment handling[15]. Furthermore, **responsive design techniques** were used to provide optimal viewing experiences across various devices. These methods collectively contributed to the creation of a feature-rich, secure, and user-friendly OTT streaming platform.

III. METHODOLOGY

3.1 Input:

The input methodology for the OTT platform[1] involves various user-driven and system-triggered inputs that initiate different functionalities across the application. Users provide inputs during **registration and login** by submitting credentials such as email and password. These inputs are validated and processed to generate secure JWT tokens. During the subscription process, users select a **plan**, enter **payment details**, and optionally apply **referral codes**—all of which serve as key inputs that drive business logic like reward generation and subscription activation[4]. While interacting with the platform, users also input **search queries**, apply **filters** (like language or genre), and select content to stream, which are captured to generate personalized recommendations. Admins or content managers may provide backend inputs such as **video uploads**, **metadata**, and **content categorization**. All user and admin inputs are validated at both the frontend (React.js) and backend (API layer), ensuring security, accuracy, and smooth system operations.





3.2 Method of Process:

The OTT platform follows a structured process to deliver a seamless user experience and manage backend operations efficiently[2]. The process begins with user registration or login, where user credentials are verified and authenticated using JWT tokens. Once authenticated, users are redirected to the homepage where they can browse content and select subscription plans[20]. Upon selecting a plan, the user is guided through a secure payment process, and successful transactions activate the corresponding subscription in the system. If a referral code is used during registration, the system records the referral and credits a reward to the referrer. Users can then search for content, apply filters (like genre or language), and begin streaming. The platform tracks user activity to improve content recommendations. In the background, the backend services handle content management, user sessions, and referral tracking using a modular microservices architecture[8]. Additionally, a forced logout mechanism monitors session validity and enforces security by logging out inactive or unauthorized users[18]. This methodical and modular processing ensures scalability, responsiveness, and secure operation throughout the platform.

3.3 Output:

The output of the OTT platform[1] is a fully functional, secure, and user-friendly streaming application that allows users to watch digital content such as movies, web series, and anime. Upon successful login, users are presented with a personalized dashboard displaying available content, active subscription details, and referral earnings if applicable[17]. The system generates real-time responses such as content playback, search results, filtered recommendations, and confirmation messages for actions like plan activation or reward withdrawals. Administrators can view content upload statuses, transaction logs, and user activity reports through backend dashboards. Additionally, the referral system provides users with a visible referral balance and transaction history, while the subscription system reflects active plans, expiry dates, and renewal options[16]. The secure session output includes automatic forced logout messages if the token expires or inactivity is detected. Overall, the platform delivers outputs that are visually intuitive, securely processed, and aligned with the actions performed by the user or system triggers.



Fig: Login page

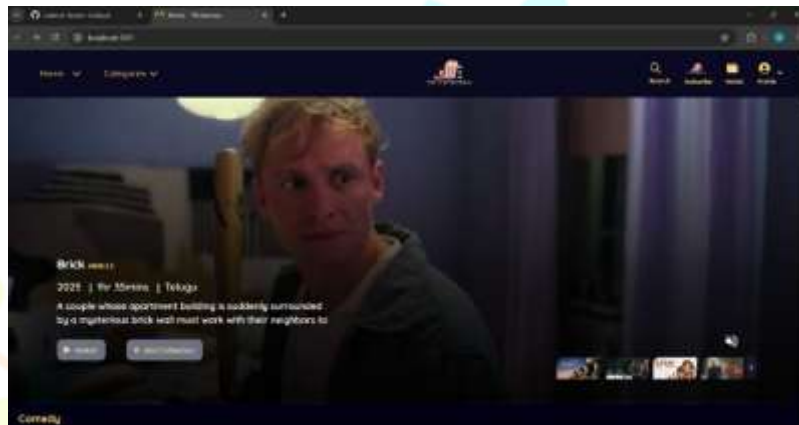


Fig: Home page



Fig: Languages selection section



Fig: Search Result Page



Fig: Wallet Page

IV. RESULTS:

The implementation of the OTT platform has successfully resulted in a responsive, scalable, and secure streaming application that meets modern user expectations[7]. The platform allows users to register, log in securely using JWT-based authentication, and access a wide variety of content through a clean, intuitive interface[5]. The subscription module functions smoothly, enabling users to choose, manage, and renew plans with ease[14]. The integrated referral system accurately tracks referrals and rewards users, contributing to user engagement and platform growth. The forced logout feature effectively handles session expiry and security breaches, enhancing account protection. Content is streamed efficiently with minimal buffering, and personalized recommendations improve content discovery based on user preferences[13]. The use of modern frontend technologies like React.js and Material UI ensures fast and attractive user interactions, while backend processes operate reliably under microservices architecture[3]. Overall, the results demonstrate that the platform is robust, user-friendly, and ready for real-world deployment with scope for future enhancements.

V. DISCUSSIONS:

The implementation of the OTT platform has successfully resulted in a responsive, scalable, and secure streaming application that meets modern user expectations[4]. The platform allows users to register, log in securely using JWT-based authentication, and access a wide variety of content through a clean, intuitive interface. The subscription module functions smoothly, enabling users to choose, manage, and renew plans with ease[5]. The integrated referral system accurately tracks referrals and rewards users, contributing to user engagement and platform growth. The forced logout feature effectively handles session expiry and security breaches, enhancing account protection. Content is streamed efficiently with minimal buffering, and personalized recommendations improve content discovery based on user preferences[3]. The use of modern frontend technologies like React.js and Material UI ensures fast and attractive user interactions, while backend processes operate reliably under microservices architecture. Overall, the results demonstrate that the platform is robust, user-friendly, and ready for real-world deployment with scope for future enhancements.

VI. CONCLUSION:

In conclusion, the OTT platform project successfully demonstrates the design and development of a modern, secure, and feature-rich streaming application tailored to today's digital content consumers. By incorporating technologies like React.js, Redux, Material UI, and JWT-based authentication, the platform ensures a responsive interface, efficient state management, and secure

user access. Key features such as flexible subscription plans, a built-in referral and reward system, and personalized content recommendations enhance user engagement and satisfaction. The inclusion of a forced logout mechanism and scalable microservices architecture further strengthens the platform's reliability and security. Overall, the project not only addresses the limitations of existing systems but also provides a scalable foundation for future enhancements such as AI-driven suggestions and immersive content experiences. It stands as a robust solution for delivering on-demand digital content in a competitive streaming market.

VII. FUTURE SCOPE:

The OTT platform has strong potential for future enhancements that can significantly improve user experience and platform capabilities. One major area of growth is the integration of **AI-based recommendation systems** to offer highly personalized content suggestions based on user behavior and preferences. Additionally, the platform can incorporate **multi-language support and regional content filters** to cater to diverse audiences more effectively. Features like **watch parties, live chat during streaming,** and **interactive content** can be introduced to increase user engagement and social interaction. Further enhancements can include **mobile app development** for Android and iOS to expand accessibility, as well as **offline viewing options** for users with limited internet access. Integration with **blockchain technology** can be explored for transparent reward distribution and secure digital rights management. Lastly, as the metaverse and virtual environments evolve, the platform can explore **VR-based immersive streaming experiences**, positioning itself as a forward-thinking entertainment solution.

VIII. ACKNOWLEDGEMENT:



Muppala Naga Keerthi working as an Assistant Professor in Master of Computer Applications in Sanketika Vidya Parishad Engineering College, Visakhapatnam, Andhra Pradesh, affiliated by Andhra University and approved with 'A' grade by NAAC and member in IAENG with 14 years of experience in computer science. Her areas of interests in C, Java, Data Structures, DBMS, Web Technologies, Software Engineering and Data Science.



Gottapu Santosh Kumar is pursuing his final semester MCA in Sanketika Vidya Parishad Engineering College, accredited with A grade by NAAC, affiliated by Andhra University and approved by AICTE. With interest in React JS Gottapu Santosh Kumar has taken up his PG project on OTT-Platform using React JS and published the paper in connection to the project under the guidance of Muppala Naga Keerthi, Assistant Professor, Master of Computer Applications, SVPEC.

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