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Implementation of Over the Top (OTT) Video Streaming Application

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ABSTRACT: Consumption of movies and other audio and video content has always been in the form of media such as theaters and television. As technology advances, the advent of VHS, DVD, Blu-ray, and disc rental services has made it readily available at home. Cable TV also delivered content via coaxial and fiber optic cables. Another enhanced service appeared with Direct To Home (DTH) technology over satellite and satellite dish, enabling them to deliver high quality broadcast and on demand content directly to consumers. Technological advances in recent years have made it more convenient to watch movies or TV with many online streaming or Video On Demand (VOD) services. VOD refers to streaming video content over the Internet through an application commonly referred to as Over-the-top (OTT). Viewers can access videos via the OTT app on any internet connected device, including smartphones, smart TVs, tablets, desktops, and laptops. This allows consumers to watch with improved sound and picture quality if they have a stable internet connection. OTT enables decentralization, bypassing cable, broadcast, satellite and other platforms that typically act as controllers or distributors. In the traditional media era, the only outlets for consumers have been movie distributors, movie theaters, television networks, or Multi-System Operators (MSOs). OTT allows content creators to interact directly with their audience through web pages or smartphone apps.

KEYWORDS: Over-The-Top (OTT), Direct-To-Home (DTH), Video-On-Demand (VOD), Multi-System-Operator (MSO).

I. INTRODUCTION

OTT stands for Over-The-Top. This means you can stream to multiple devices at any time thanks to Over-The-Top, a convenient short term that describes a new way to deliver movies and TV shows over the Internet without a TV service provider, cable or satellite. In a nutshell, we're talking about people paying an ISP like JIO, Airtel, and BSNL to access the internet to watch Netflix without paying for cable TV. OTT streaming lets you watch your favourite shows on Netflix or Amazon Prime Video without ads. One reason for the popularity of subscriptions like Netflix is that they don't have ads, which prevents viewers from stopping the show and wasting time watching ads, not the show itself. In previous years, consumers signed up for a cable TV subscription, and cable TV providers were responsible for the delivery and availability of program. In the modern era, users can subscribe to services such as Netflix or Spotify and access them over the Internet. Cable providers now only provide internet connectivity and have no way to control what users consume.

II. RELATED WORK

Many ideas and projects have been created as part of the development of a new platform in an attempt to reproduce many well-known OTT applications, but there is no relevant document to be considered a suitable reference. While researching, we discovered that previous projects related to our theme were built using old technologies like PHP, MySQL, HTML, CSS and JavaScript as an integrated system. They were working applications, but the technology used to develop them failed to create scalable web applications.

In [1] Sundaravel E. and Elangovan N. proposed that Video streaming has become one of the most successful ways to consume content in India. Small OTT platform raises funds from international investors making significant impact on the market. India's OTT service Hotstar is currently the market leader. Hotstar has highest penetration rate for free OTT users. Smartphones are the most widely used device in OTT video content consumption and Xiaomi is the most famous smartphone brand among OTT users. Jio is the most popular network service among OTT users, followed by Airtel and Vodafone Idea. The most preferred languages are Hindi and English.

In [2] Ritwik C and Anitha Sandeep mainly proposed that next-generation frameworks such as React.JS can greatly aid in the rapid development of web applications such as multi-page or single-page web applications with scalability.

In [3] Hezbullah Shah and Tariq Rahim Soomro proposed how Node.js has now created a full-stack developer that can manage server and client independently. Node.js is fast and reliable for large file and high network load applications thanks to its event-driven, non-blocking and asynchronous approach that allows developers to maintain entire projects in separate pages (SPAs).

In [4] Anjali Chauhan proposed that relatively newcomer to database space, MongoDB is the most popular NoSQL database. This is a great tool for building data warehouses, especially for features that take full advantage of the so-called "shared-nothing cluster architecture". This is an ideal open source database for building high performance data warehouses. Mostly non-relational, decentralized, scale-out next-generation NoSQL databases can meet most of the needs of today's applications. The main features of these databases are schema-free, non-joint, non-relational, easy replication support, simple API, and ultimately consistency.

In [5] Mr. Bhavin M. Mehta, Mr. Nishay Madhani, Mrs. Radhika Patwardhan described the Firebase API provided by Google and its unique features. It has been learned how to add Firebase to your web project and use different features in your web application. Google is constantly adding new features to Firebase. Therefore, in the future, you can explore these new features and learn how to implement them in your web application. Developers can save development time by using Firebase instead of the server for their application. Future research may focus on authentication services using Firebase, implement authentication in your application, cross authentication analysis Platform development. The survey can also focus on Firebase cloud features and hosting a server on the Firebase platform.

III. ANALYSIS OF PROBLEM

The conventional cable TV has been and is still dominating among the Indian audience, but even with all of its popularity it has some major drawbacks.

- Cable operators offer packages in which the customer has to pay for the entire package even though they consume very few contents from the overall package.
- Cable TV costs more in general and costs extra if we want some premium or high definition channels. The cable TV has a limited number of options to choose from.
- The video and audio quality of the television broadcast is of lower quality and cannot be changed by the consumer.
- The Video On Demand service is not available.
- Has generalized content and is not tailored for individual users.

IV. PROPOSED METHODOLOGY

Our proposed system is an Over The Top (OTT) Video Streaming Application that enables users to create their own account on the system and with proper credentials they can login into the system and consume the content. For this to work our system has two major modules that are Admin and Client. Communication between admin and client modules happens through the Application Programming Interface (API) created by us. The sub-modules of admin and client modules are listed in the table below.

ADMIN	CLIENT
<ul style="list-style-type: none"> • Login Module • Homepage Module (Graphs & Statistics) • Lists (Users, Movies, Playlists) • Creation Module (Movies & Playlists) 	<ul style="list-style-type: none"> • SignUp Module • SignIn Module • Forgot Password Module • Homepage Modules (Series & Movies) • Video Playback Module

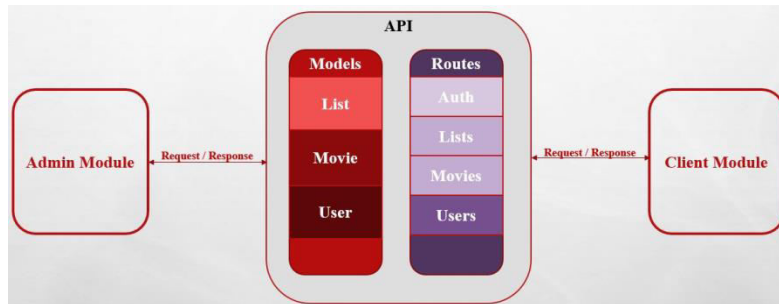


Figure 4.1: Application Programming Interface

API alone is not sufficient enough for the functioning of any system other factors such as frameworks and databases are needed for the proper flow and analysis of the data and for performing appropriate operations on them. In this system the React.JS is used as the frontend framework along with the Node.JS as a backend framework. Both of this frameworks are based on JavaScript. For the database MongoDB is used to store the informative or textual data while the cloud based Google Firebase Storage is used for media based data such as images and videos. All this technology stack works together to form our overall system.

V. RESULTS

Now let's take a look at how the actual system and its user interface looks along with its different modules. The images or snapshots shown below are divided in two main category of modules which is Client and Admin.

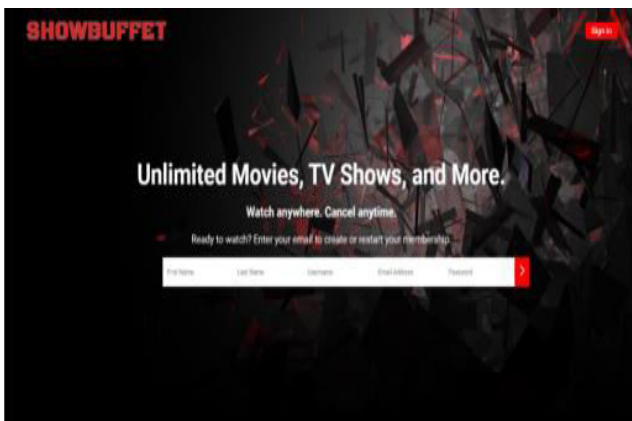


Figure.5.1. SignUp

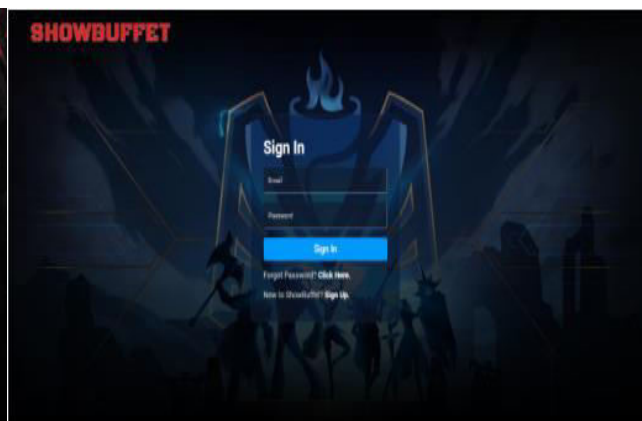


Figure.5.2. SignIn

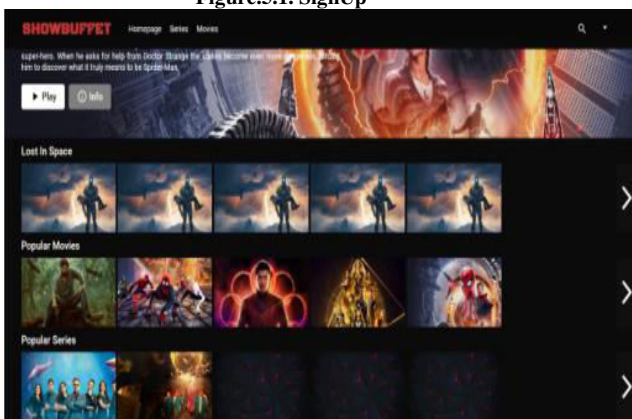


Figure.5.3. Homepage



Figure.5.4. Admin Login



Figure. 5.5. Admin Homepage



Figure. 5.6. User & Content Statistics

The figure 1, figure 2, and figure 3 represents the client side part of the project while figure 4, figure 5, figure 6 represents the admin side part of the project.

VI. CONCLUSION AND FUTURE WORK

In this project we explored the current market trends and the old technologies that are still being used in them which limits their scope for future enhancement. Along with that we also explored our problem statement's domain and understood the problems related to them. After the careful discussion we had the clear and concise idea of how to overcome the problem statement and proposed the system which enabled us to develop a system which was currently trending in the market along with the opportunity to learn industry level development knowledge.

The development of our project up to the current point was based on the data acquisition and analysis from the past and the present technological era. Even with all those things we have deduced many things by predicting the future enhancement for our project which could be significant improvement over what the current project is able to achieve.

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