



ONLINE BUS TICKET BOOKING USING CLOUD COMPUTING

¹Neeraj Kumar Gupta ²Mahwish perwaiz

Department of CSE

Arya College of Engineering, Jaipur, Rajasthan, India

Abstract: The advancement of cloud computing technology has revolutionized various industries, including the transportation sector. Online bus ticket booking systems have become increasingly popular due to their convenience and accessibility. This research paper presents the design, implementation, and performance evaluation of a cloud-based online bus ticket booking system. Leveraging cloud computing infrastructure, the system offers scalability, reliability, and cost-effectiveness, catering to the dynamic demands of users and bus operators. The paper discusses the architectural components of the system, including frontend application, backend services, cloud infrastructure, database management, authentication, payment processing, bus schedule management, ticket booking, reservation, notifications, analytics, and monitoring. Furthermore, the paper evaluates the performance of the system in terms of scalability, availability, response time, and cost efficiency. Through extensive experimentation and analysis, the results demonstrate the effectiveness of cloud-based solutions in enhancing the scalability, reliability, and performance of online bus ticket booking systems. The findings of this research provide valuable insights for the design, development, and deployment of cloud-based applications in the transportation domain.

Keywords: Cloud computing, Online bus ticket booking, Scalability, Reliability, Performance evaluation.

Introduction

In recent years, the transportation industry has witnessed a significant transformation with the advent of cloud computing technology. Online bus ticket booking systems have emerged as a popular choice for travelers, offering the convenience of booking tickets from anywhere at any time. Cloud computing provides a scalable, reliable, and cost-effective platform for deploying such systems, enabling seamless interactions between users and bus operators. This research paper aims to explore the design, implementation, and performance evaluation of a cloud-based online bus ticket booking system. By leveraging the capabilities of cloud computing, the system aims to address the challenges associated with traditional ticket booking processes, such as limited scalability, lack of availability, and high infrastructure costs.

Cloud Computing

Cloud computing is a technology that enables access to computing resources, such as servers, storage, and software applications, over the internet. Instead of storing data or running programs on a local computer or server, users can access these resources remotely from cloud service providers. This allows for flexible and scalable usage, as well as cost-effective solutions, since users typically pay only for the resources they consume.

Cloud computing services are commonly categorized into three main models:

Infrastructure as a Service (IaaS):

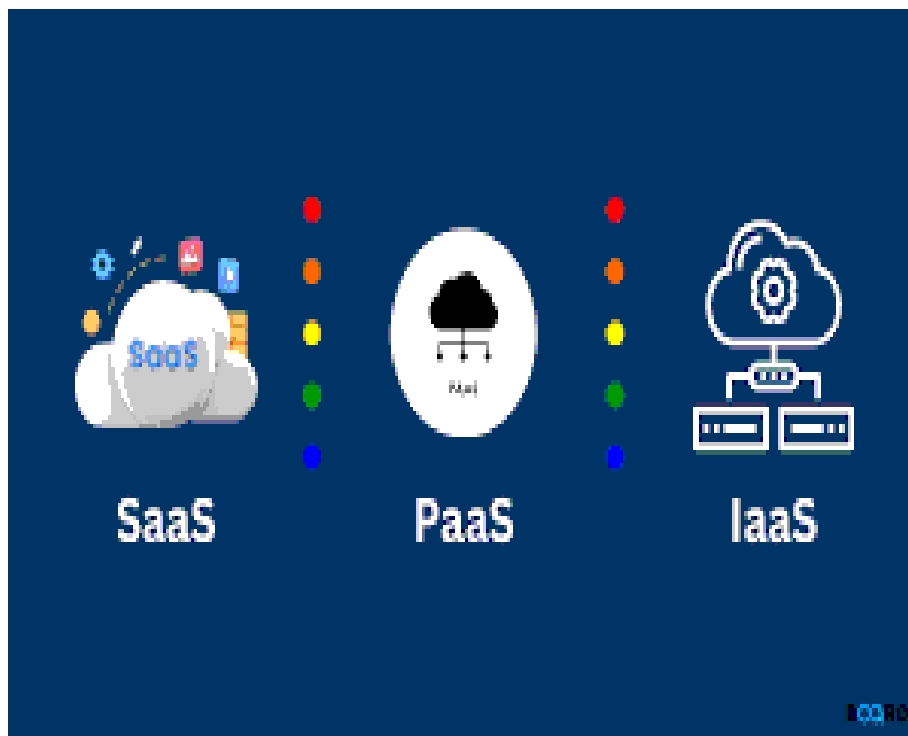
In this model, cloud providers offer virtualized computing resources over the internet, such as virtual machines, storage, and networking. Users can provision and manage these resources, including operating systems and applications, as needed.

Platform as a Service (PaaS) :

PaaS is a cloud computing model that provides a platform allowing users to develop, run, and manage applications without the complexity of building and maintaining the underlying infrastructure. PaaS offers tools, libraries, and middleware needed for application development and deployment, enabling developers to focus on coding and innovation without worrying about server management or hardware provisioning.

Software as a Service (SaaS) :

SaaS is a cloud computing model that delivers software applications on a subscription basis. Instead of installing and maintaining software locally on individual devices, users access and use applications hosted by the SaaS provider via a web browser. SaaS eliminates the need for software installation, updates, and maintenance, offering users convenience, scalability, and cost-effectiveness.



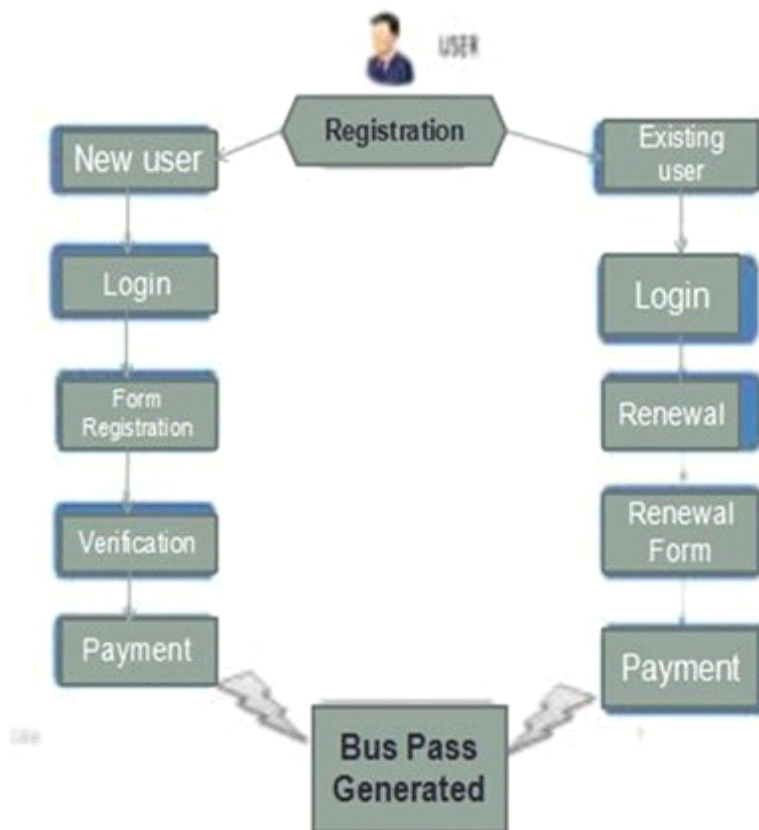
System Architecture

The proposed online bus ticket booking system architecture comprises several key components, including:

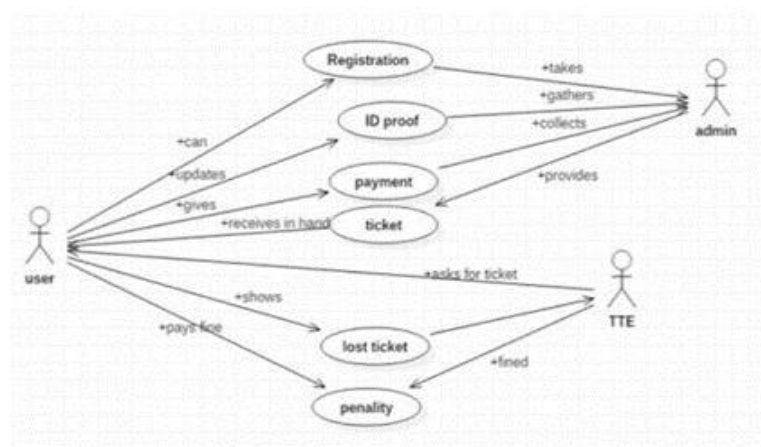
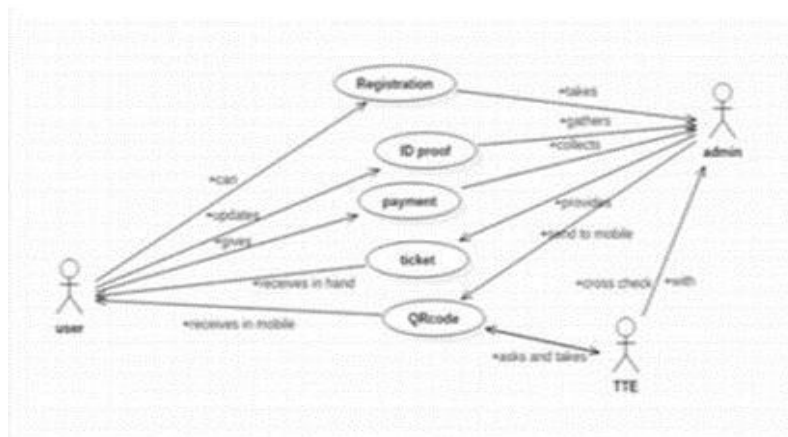
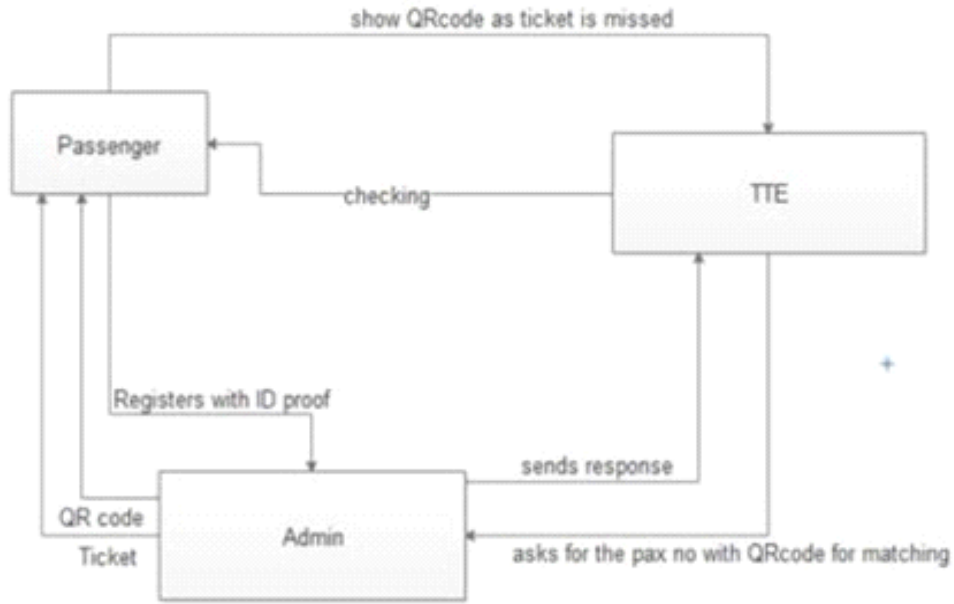
- **Frontend Application:** A user-friendly web interface or mobile application through which users can browse bus routes, check schedules, and book tickets.
- **Backend Services:** Core functionalities such as user authentication, ticket booking, payment processing, and bus schedule management are handled by backend services deployed on cloud infrastructure.
- **Cloud Infrastructure:** The entire system runs on cloud infrastructure provided by platforms like Amazon Web Services (AWS), Google Cloud Platform (GCP), or Microsoft Azure, ensuring scalability, reliability, and cost-efficiency.

- Database Management: A cloud-based database stores information about users, bus routes, schedules, and bookings, providing high availability, durability, and scalability.
- Authentication and Authorization: Cloud-based identity services handle user authentication and authorization securely, ensuring access control and data protection.
- Payment Processing: Integration with payment processing services like Stripe or PayPal enables secure and seamless transactions for ticket bookings.
- Bus Schedule Management: Bus operators can manage their schedules through a cloud-based portal or API, ensuring real-time updates and synchronization with the booking system.
- Ticket Booking and Reservation: The backend system manages ticket booking and reservation processes, handling seat allocation and ensuring a smooth booking experience for users.
- Notifications: Cloud-based notification services send booking confirmations, reminders, and updates to users via email or push notifications, enhancing user engagement and satisfaction.
- Analytics and Monitoring: Cloud-based analytics and monitoring services provide insights into system performance, usage patterns, and help in identifying and resolving issues proactively.

FLOW CHART



ER DIAGRAM



ADVANTAGES

- Passengers don't have to waiting time in queue.
- Information is accurate.
- It is a fast process.

DISADVANTAGES

- It is time consuming
- It consumes lot of manpower to better results.
- Retrieval of data takes lot of time.
- Percentage of accuracy is less.
- Reports take time to produce.

Performance Evaluation

To evaluate the performance of the cloud-based online bus ticket booking system, various metrics such as scalability, availability, response time, and cost efficiency are considered. Performance tests are conducted under different scenarios to assess the system's ability to handle varying loads and ensure high availability. The results of the performance evaluation demonstrate the effectiveness of cloud-based solutions in enhancing the scalability, reliability, and performance of online bus ticket booking systems, thereby providing a seamless booking experience for users and bus operators alike.

Conclusion

In conclusion, this research paper presents a comprehensive overview of a cloud-based online bus ticket booking system, highlighting its design, implementation, and performance evaluation. By leveraging cloud computing technology, the system offers scalability, reliability, and cost-effectiveness, addressing the challenges associated with traditional ticket booking processes. The findings of this research provide valuable insights for the design, development, and deployment of cloud-based applications in the transportation domain, paving the way for enhanced user experience and operational efficiency in the bus transportation industry.