Swami Keshvanand Institute of Technology,

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STUDENT KIT

Objective -

The objective of this project is to design and implement a user-friendly Online Toll Payment System that modernizes toll collection processes, enhances traffic flow efficiency, and provides a seamless payment experience. The system integrates real-time notifications, secure payment gateways, and automated receipt generation to simplify toll transactions.

Requirement Specifications (RS) -

S.No.	Requirement	Essential/Desirable	Description
1	Real-Time Notifications	Essential	Sends alerts about toll plaza name and fees 1-2 kilometers before arrival
2	Payment Gateway	Essential	Secure online payment through mobile wallets, credit cards, or net banking
3	Receipt Generation	Essential	Generates QR code or barcode for quick scanning at the toll plaza
4	Payment Module	Essential	A secure payment gateway for handling subscriptions or purchases.
5	Multiple Payment Options	Essential	Supports various payment modes for user convenience.
6	Toll Management Dashboard	Desirable	Allows admins to monitor toll transactions and traffic data

Database Field Specification -

1. User Table

No.	Field Name	Range of Valid Values	Remarks
1	UserID	Auto-increment	Unique identifier for each user.
2	Name	Alphanumeric (max 50)	Full name of the user.
3	Email	Valid email format	Ensures unique email addresses.
4	Password	8-20 chars, must include symbols	Encrypted for secure storage.
5	Vehicle ID	‘Alphanumeric (max 15)	Links the user to their vehicle.

2. Toll Plaza Table

S.No.	Field Name	Range of Valid Values	Remarks
1	Plaza ID	Auto-increment	Unique identifier for each iser/
2	Name	Alphanumeric (max 50)	Name of the toll plaza
3	Location	Alphanumeric (max 100).	Geographical location of the toll plaza
4	Fee	Decimal (e.g., 0.00-9999)	Toll fee for various vehicle types

3. Payment Table

Field Name	Range of Valid Values	Remarks
PaymentID	Auto-increment	Unique identifier for each payment.
UserID	Reference to UserID	Links the payment to the user.
Amount	Decimal format	Total amount paid.
Payment Date	Date format	Date when the payment was made.
Payment Status	‘Success’, ‘Failure’	Indicates the status of the payment.

High-Level Design (HLD) / Detailed Design (DD) -

System Overview

Frontend Layer:
Developed using modern web technologies for a responsive and intuitive user experience. Key features include:

- Payment processing and receipt generation
- Toll data management
- Secure user authentication

Database Layer:
A combination of SQL and NoSQL databases ensures efficient handling of transactional and unstructured data, like toll locations and real-time traffic analytics.

Test Plan -

No.	Test Case Title	Description	Expected Outcome	RS Requirement Being Tested	Result
1	Notification Test	Check for timely toll fee alerts.	Alerts received before toll plaza.	Real-Time Notifications	Pass
2	Payment Test	Verify successful payment processing.	Payment completes without errors.	Payment Gateway	Pass
3	QRCode Receipt Test	Ensure QR code is generated post-payment.	QR code is scannable and valid.	Receipt Generation	Pass
4	Dashboard Access Test	Check toll admin's ability to monitor data.	Admin views transaction history.	Toll Management Dashboard	Pass

Conclusion -

The Student Kit for the Online Toll Payment System represents a significant step forward in modernizing toll collection infrastructure. By integrating real-time notifications, multiple payment options, and automated receipt generation, it ensures a seamless experience for drivers, reducing delays and improving traffic flow. The system enhances convenience by providing users with timely toll information and offering secure, flexible payment methods, including mobile wallets and credit cards.

With its emphasis on efficiency, the system minimizes the time spent at toll plazas, leading to lower congestion, reduced fuel consumption, and a smaller carbon footprint. The use of QR codes or barcodes for entry eliminates manual intervention, further speeding up the process and ensuring accuracy in toll collection.