

Sri Lanka Institute of Information Technology



Web-based Train reservation system (Lanka Rail)

IT2140 - Database Design and Development

System Purpose

The Web-based Train Reservation System is designed to give passengers an easy, reliable way to book train tickets online without visiting a station. Passengers can quickly search for trains, check seats, and book tickets in a few steps, saving time and effort. For administrators, the system helps manage schedules, seat allocations, bookings, and cancellations for smooth operations.

By automating reservations and schedule management, the system reduces manual work, lowers errors, and improves railway efficiency. It also provides clear booking and financial reports to support better decisions. Overall, the system increases passenger satisfaction by offering convenience, transparency, and reliability, while helping railway authorities work more efficiently.

Users

Admins (Railway Staff):

- Manage train schedules.
- Update seat availability.
- Confirm and monitor bookings.
- Generate financial and operational reports.

Passengers:

- Search trains by date, time, and route.
- View train details (train name, schedule, seat availability, and ticket price).
- Book tickets and select seats.
- Make secure online payments.
- Receive electronic tickets.

Functional Requirements

- Train Search and Booking: Passengers can search trains by origin, destination, and date.
- Seat Selection: Passengers can view available seats and choose specific ones.
- Online Payment: Secure payment gateway for ticket purchases.
- Ticket Generation: System generates electronic tickets with train, seat, and passenger details.
- Admin Train Management: Admins can add, edit, and remove train schedules.
- Booking Management: Admins can confirm, cancel, and monitor bookings.
- Reporting: System generates financial (daily/monthly) and booking reports for admins.
- Customer Support Interface: Allows staff to assist passengers with issues.

Non-Functional Requirements

- Security: Must use secure payment processing and protect passenger data.
- Scalability: Should support many passengers booking at the same time.
- Performance: Fast search results and booking confirmation (less than 3 seconds response time).
- Availability: System should be available 24/7.
- Usability: Simple and user-friendly interface, especially for non-technical passengers.
- Reliability: Accurate real-time seat availability updates.
- Maintainability: Easy to update train schedules and system settings.

Constraints and Assumptions

Constraints:

- Must comply with Sri Lanka Railways policies and regulations.
- Internet access is required for online booking and payment.
- Integration with secure third-party payment gateways is necessary.

Assumptions:

- Passengers have access to smartphones or computers with internet.
- Admin staff are trained to use the system.
- Payment system will be integrated with local banks and mobile wallets.
- Train schedule data is accurate and provided by railway authorities.

Evidence of Requirement Gathering

Hi ! we are planning to design a EER diagram



Project Discussion Bot - Year2

Hi! That sounds great. Before we start designing the EER diagram, can you please tell me a few things about your project?

1. What is the **title** of your project?
2. Who will **use** this system or app?
3. What kind of **solution** is it? (Is it a website, mobile app, or system?)

Once I know these details, I will create some client personas for you to talk to and collect requirements. Let's build this together! 😊

- 1.Web-based Train reservation system
- 2.admin,passenger 3.Website



Project Discussion Bot - Year2

Great! Thanks for the details.

Let's say your project is called "**LankaRail Online Booking System**". It's a website where passengers can book train tickets, and admins can manage the system.

You are working with a client company called **LankaRailways Pvt Ltd**, a company that manages train services in Sri Lanka. They want to improve their ticket booking process by using your system.

Here are 5 people from the company you can talk to:

1. **Mr. Nimal Perera** – Operations Manager
2. **Ms. Tharushi Fernando** – Customer Service Officer
3. **Mr. Roshan Jayasuriya** – IT Support Engineer
4. **Mrs. Kusum Liyanage** – Senior Ticketing Clerk
5. **Mr. Dinesh Abeykoon** – Finance Executive

You can now ask questions to any of them to collect requirements. Just type your question, and I'll bring the right person to answer. 😊

Hello Mr. Nimal Perera can you tell me what kind of features do you need?



Project Discussion Bot - Year2

Hello! I'm Mr. Nimal Perera, the Operations Manager at LankaRailways Pvt Ltd. Thank you for helping us with this system.

We need some important features in the website. Passengers should be able to search trains, check seat availability, and book tickets easily. Admins should be able to add train schedules, cancel trains, and see booking reports.

Let me know if you need more details about any part.

Hello Ms. Tharushi Fernando can you tell me what kind of features do you need?



Project Discussion Bot - Year2

Hi again! 🙋 I'm Ms. Tharushi Fernando, the Customer Service Officer.

Thank you for asking. I think the website should have features that make things easy for passengers. Like:

- Searching trains by date and stations
- Seeing seat availability clearly
- Booking tickets with simple steps
- Getting email confirmation
- Canceling or changing bookings

- Paying online or reserving and paying at station
- Editing contact details like phone number

These things will help passengers feel comfortable using the system. Let me know if you want me to explain any part more. 😊

Hello Mr. Roshan Jayasuriya can you tell me what kind of features do you need?



Project Discussion Bot - Year2

Hi again! 🙋 I'm Mr. Roshan Jayasuriya, the IT Support Engineer.

For this system, I need features that make everything work smoothly. The website should be fast and easy to use. It must show correct seat availability, send emails properly, and keep all booking data safe.

Also, I want a simple admin panel to manage trains, bookings, and payments. If something goes wrong, I should be able to fix it quickly.

Hello Mrs. Kusum Liyanage can you tell me what kind of features do you need?



Project Discussion Bot - Year2

Hi! 🙋 I'm Mrs. Kusum Liyanage, the Senior Ticketing Clerk at LankaRailways Pvt Ltd.

Thank you for asking. I need features that help me check and manage bookings easily. I want to see passenger details, booking status, and if they paid or not. Also, I need to help passengers when they cancel or change their tickets.

The system should be simple for me to use. Let me know if you want to ask about how I handle ticket issues or booking records. 😊

Hello Mr. Dinesh Abeykoon can you tell me what kind of features do you need?



Project Discussion Bot - Year2

Hi! 🙋 I'm Mr. Dinesh Abeykoon, the Finance Executive at LankaRailways Pvt Ltd.

Thanks for asking. For the finance side, I need features to:

- Check all payments made by passengers
- See if any payments failed or were refunded
- View reports of daily income from bookings
- Handle offline payments made at stations

Also, I want the system to show clear details like passenger name, amount paid, and payment method. That

How the passengers should be able to search trains and the set availability ?



Project Discussion Bot - Year2

Hi again! I'm Ms. Tharushi Fernando, the Customer Service Officer at LankaRailways Pvt Ltd.

Passengers should be able to search trains by entering the **starting station**, **destination**, and **date**. After that, the system should show a list of trains with **departure time**, **arrival time**, and **available seats**.

If seats are available, passengers can click and go to the booking page. If seats are full, it should show a message like "No seats available".

Yes please i want to know how the booking part is going too



Project Discussion Bot - Year2

Hi! I'm Ms. Tharushi Fernando, the Customer Service Officer.

After the passenger selects a train, they go to the booking page. There, they must enter their **name**, **NIC number**, **phone number**, and **email**. Then they choose the **seat type** (like 1st class or 2nd class), and how many seats they want.

The system will show the **total price**. If everything is okay, they click "**Confirm Booking**". After that, they get a **booking reference number** and a **ticket** by email.

How they select their sheet type and how they check availability of that type of sheets ?



Project Discussion Bot - Year2

Hi! I'm Mr. Roshan Jayasuriya, the IT Support Engineer at LankaRailways Pvt Ltd.

When passengers go to the booking page, they will see the **seat types** like 1st class, 2nd class, and 3rd class. Each type will show how many seats are available. For example:

- 1st Class – 5 seats available
- 2nd Class – 12 seats available
- 3rd Class – 20 seats available

Passengers can click the seat type they want. If seats are available, they can continue booking. If not, it will show "No seats available".

How they can get their booking is complete or note ?



Project Discussion Bot - Year2

Hi! I'm Mrs. Kusum Liyanage, the Senior Ticketing Clerk at LankaRailways Pvt Ltd.

After the passenger clicks "**Confirm Booking**", the system should show a message like "**Booking Successful**" with a **booking reference number**. This number is very important. It proves the booking is complete.

Also, the passenger will get a **confirmation email** with the ticket details. If they don't get this email, they can call us or check their booking status using the reference number.

If they want to cancel their booking how they do it ?



Project Discussion Bot - Year2

Hi! I'm Mr. Roshan Jayasuriya, the IT Support Engineer.

If a passenger wants to cancel their booking, they can go to the **"My Bookings"** page. There, they enter their **booking reference number** and **NIC number** to find their ticket.

Then they click **"Cancel Booking"**. The system will ask for confirmation. After canceling, they will get a **cancellation email**. If they paid online, the refund will go to their bank account in a few days.

Would you like to know how the admin handles cancellations from the system side? 😊

The passenger need to pay for the booking or it can be do by with out paying ?



Project Discussion Bot - Year2

Hi! I'm Mr. Dinesh Abeykoon, the Finance Executive at LankaRailways Pvt Ltd.

Yes, passengers must pay to complete the booking. After they choose the train and seat type, the system will show the total price. Then they can pay using **credit card**, **debit card**, or **online banking**.

Only after payment, the booking will be confirmed and the ticket will be sent. If they don't pay, the booking will not be saved.

If the passenger want to cancel that booking train and the tickets he or she can get their money ?



Project Discussion Bot - Year2

Hi! I'm Mr. Dinesh Abeykoon, the Finance Executive at LankaRailways Pvt Ltd.

Yes, if a passenger cancels their booking, they can get their money back. But the refund depends on the **cancellation time**. If they cancel early, they get full money. If they cancel late, a small **cancellation fee** will be taken.

The refund will go to their bank account in a few days. Let me know if you want to know how admins check refund requests. 😊

If they want to rechange their sheets in the same tarin how it possible to do ?



Project Discussion Bot - Year2

Hi! I'm Ms. Tharushi Fernando, the Customer Service Officer.

If a passenger wants to **change their seat type** in the same train, they must go to the "My Bookings" page. There, they enter their **booking reference number** and **NIC number**. Then they click "Change Seat Type".

The system will show available seats in other classes. If seats are free, they can select the new seat type and pay the extra amount if needed. After that, they get a new ticket by email.

How the payments methods are going ?



Project Discussion Bot - Year2

Hi! I'm Mr. Dinesh Abeykoon, the Finance Executive at LankaRailways Pvt Ltd.

Passengers can pay using **credit card**, **debit card**, or **online banking**. After they choose their train and seat type, the system will show the total price. Then they go to the payment page and select their method.

Once payment is successful, they get a confirmation message and ticket by email. If payment fails, the booking will not be saved.

If the passenger has not this kind of methods to do payment how they book a ticket ?



Project Discussion Bot - Year2

Hi! I'm Ms. Tharushi Fernando, the Customer Service Officer.

If a passenger doesn't have online payment methods like credit card or online banking, they can't book through the website directly. But we are planning to add a feature where they can **reserve online** and **pay at the station** within a time limit, like 2 hours.

If they don't pay within that time, the booking will be cancelled automatically. This helps people who don't have online payment options.

Would you like to ask how admins manage these offline payments? 😊

If the customer wants to change their phone number is it possible to do ?



Project Discussion Bot - Year2

Hi! 🙌 Thanks for asking.

I'm Ms. Tharushi Fernando, the Customer Service Officer.

Yes, passengers can change their **phone number** after booking. They need to go to the "**My Bookings**" page, enter their **booking reference number** and **NIC number**, and then click "**Edit Contact Details**".

There, they can update their phone number. After saving, the system will send a message to the new number to confirm the change.

If the passenger email is incorrect or not working properly how the booking confirmation mail working ?



Project Discussion Bot - Year2

Hi! 🙌 I'm Mr. Dinesh Abeykoon, the Finance Executive.

If the passenger's email is wrong or not working, the system will still try to send the booking confirmation. But the passenger won't receive it.

That's why we need a feature where passengers can go to "**My Bookings**", enter their **NIC number** and **booking reference**, and see their ticket details. They should also be able to **update their email** and request the confirmation again.

If there are duplicate passenger details how the admin will get correct details ?



Project Discussion Bot - Year2

Hi! 🙌 I'm Mr. Roshan Jayasuriya, the IT Support Engineer.

If there are duplicate passenger details, the admin can use the **Admin Dashboard** to check carefully. The system should show the **NIC number**, **booking reference**, and **email** for each booking. These help to find the correct person.

If needed, the admin can contact the passenger by phone or email to confirm the right details. We also plan to add a feature to **merge or fix duplicate records** safely.

If something goes wrong(manage trains, bookings, and payments issues)
how the admin will be able to fix those things ?

 **Project Discussion Bot - Year2**

Hi! 🙌 I'm Mr. Roshan Jayasuriya, the IT Support Engineer.


Good question. If something goes wrong like train schedules not showing, bookings not saving, or payments failing, the admin will use the **Admin Dashboard**.

From there, the admin can:

- Check system logs to see what went wrong
- Edit or fix train details manually
- View and manage passenger bookings
- Check payment records and retry failed payments

Also, we need a **notification system** to alert admins when something breaks. That way, we can fix it fast.

How to avoid duplicate passenger records in future?

 **Project Discussion Bot - Year2**

Hi! 🙌 I'm Mr. Roshan Jayasuriya, the IT Support Engineer.

To avoid duplicate passenger records in the future, we will make the system check the **NIC number** before saving a booking. If the same NIC is already used, the system will show a message like "Passenger already exists".

Also, we will make sure that email and phone numbers are checked properly. This will help keep the data clean and correct.

What happens if a passenger forgets their NIC number?

 **Project Discussion Bot - Year2**

Hi! 🙌 I'm Ms. Tharushi Fernando, the Customer Service Officer.

If a passenger forgets their **NIC number**, they won't be able to find their booking easily. But we can help them by using other details like their **phone number**, **email**, or **booking reference number**.

We are planning to add a feature where passengers can enter their **email and phone number** to recover their booking. That way, they don't need to remember the NIC every time.

How do you verify the passenger's identity if they forget their NIC?



Project Discussion Bot - Year2

Hi! 🙌 I'm Ms. Tharushi Fernando, the Customer Service Officer.

If a passenger forgets their NIC number, we try to confirm their identity using other details like their **email**, **phone number**, and **booking reference number**. If those match with a booking in the system, we allow them to view or manage it.

If they still can't remember, they can call our help desk. We ask a few simple questions like their **full name**, **train route**, and **date of travel** to confirm it's really them.

How do you help if a passenger loses their booking reference?



Project Discussion Bot - Year2

Hi! 🙌 I'm Ms. Tharushi Fernando, the Customer Service Officer.

If a passenger loses their **booking reference number**, we can still help them. They can go to the "Find My Booking" page and enter their **NIC number**, **email**, and **phone number**. If those match, the system will show their booking.

If they still can't find it, they can call our help desk. We ask for their **full name**, **travel date**, and **train route** to help find the booking.

How do you send reminders before travel date?



Project Discussion Bot - Year2

Hi again! 🙌 I'm Ms. Tharushi Fernando, the Customer Service Officer.

Before the travel date, the system will send a **reminder message** to the passenger's **email** and **phone number**. It will say the **train name**, **departure time**, and **station**.

We also plan to send a reminder **one day before** and **two hours before** the train time. This helps passengers not forget their journey.

What happens if a passenger misses their train?



Project Discussion Bot - Year2

Hi! 🙌 I'm Ms. Tharushi Fernando, the Customer Service Officer.

If a passenger misses their train, sadly the ticket becomes **invalid**. They cannot use it for another train. We always tell passengers to come early to the station.

If they miss the train, they can book a new ticket, but they must pay again. We are thinking about adding a feature to help with **partial refunds** in special cases.

How do you handle late arrivals ?



Project Discussion Bot - Year2

Hi! 🙌 I'm Ms. Tharushi Fernando, the Customer Service Officer.

If a train arrives late, we first send a **message** to all passengers by **SMS and email**. It will say the new arrival time and reason for the delay.

At the station, our staff also help passengers by giving updates. If the delay is long, we may offer a chance to **reschedule** or **cancel** the booking with a refund.

Can passengers reschedule if the train is delayed?



Project Discussion Bot - Year2

Hi again! 🙌 I'm Ms. Tharushi Fernando, the Customer Service Officer.

Yes, if the train is **delayed**, passengers can **reschedule** their booking. They must go to the **"My Bookings"** page and enter their **NIC number** and **booking reference**. Then they can choose a **new train time** if available.

If the delay is long, we also allow **free rescheduling** or **full refund**. This helps passengers not lose their money or travel plan.



Project Discussion Bot - Year2

Hi again! 🙌 I'm Mr. Roshan Jayasuriya, the IT Support Engineer.

When a train is delayed, the admin uses the **Admin Dashboard** to update the new time. Once updated, the system will:

- Send **SMS and email alerts** to all passengers
- Update the **train schedule** on the website
- Allow passengers to **reschedule or cancel** if the delay is long

Admins can also see which trains are delayed and how many passengers are affected. This helps us manage everything smoothly.