RAILWAY RESERVATION SYSTEM TITLE - TRACK MATE

DOCUMENT-1 -BUSINESS CASE DOCUMENT

► Why is this project initiated?

Ans-

This project is initiated to digitize and automate the railway reservation system, eliminating inefficiencies in manual ticket booking. The primary objectives include:

Enhancing **customer convenience with 24/7** booking access.

Reducing **manual errors** in ticket issuance and seat allocation.

Ensuring real-time updates on train schedules, seat availability, and dynamic pricing.

Improving revenue tracking and preventing fraudulent practices.

Offering multiple secure digital payment options for ease of transactions.

Increasing operational efficiency for railway employees.

► What are the current problems?

Ans-

Time-Consuming Process: Customers have to physically visit booking counters, leading to long queues and wasted time.

Limited Accessibility: Reservation counters have fixed working hours, making it inconvenient for customers to book tickets outside those hours.

Lack of Real-Time Availability: Customers cannot instantly check train schedules, seat availability, or fare details.

Error-Prone Manual Entries: Human errors in ticketing and reservation entries can lead to incorrect bookings or discrepancies.

Difficulty in Cancellations/Refunds: Manual handling of ticket cancellations and refunds is slow and tedious for customers.

Limited Payment Options: Manual systems rely on cash or limited offline payment methods, restricting convenience for customers.

No Transparency: Customers may not have clarity on waiting list status, ticket confirmation probability, or dynamic fare changes.

➤ With this project how many problems could be solved?

Ans-

By implementing the online railway reservation system, the following issues will be resolved:

- Eliminates long queues with online booking.
- 24/7 access for ticket reservations.
- Real-time seat availability & pricing updates.
- Automated booking confirmations & waitlist tracking.
- Secure digital payment integration (Credit/Debit Cards, UPI, Net Banking, Wallets).
- Faster & automated refunds/cancellations.
- Minimizes human errors in ticket issuance.
- Increases transparency with clear ticket status & pricing details.

► What are the resources required?

Ans-HUMAN RESOURCE (Project team)

Project Manager- Oversee project execution, manage budgets, and ensure timelines.
Business Analyst- Gather requirements, define business needs, and bridge between stakeholders & IT teams.
UI/UX Designers- Create a user-friendly interface for web & mobile applications.
Software Developers- Develop front-end and back-end of the application.
Database Administrator (DBA)- Manage railway database for ticketing & schedules.
Network Administrator- Ensure connectivity and server maintenance.
Testers (QA Team)- Conduct system, security, and performance testing.
Support & Training Team- Provide technical support and train railway staff & customers.

TECHNICAL RESOURCE

Cloud-Based Servers for hosting the application.
Database Management System (MySQL, Oracle) for ticketing and customer data.
Payment Gateway Integration for secure transactions.
Security Tools (SSL encryption, Firewall, Anti-fraud mechanisms).
Software Licenses for development frameworks.

FINANCIAL RESOURCES

Budget: For salaries, hardware, and training materials and for workspace.

► How much organizational change is required to adopt this technology?

Ans-

The organizational change required will include:

Staff Training & Skill Development – Train railway staff on using the new digital system.

Process Standardization – Shift from paper-based to digital workflows.

Customer Awareness – Educate customers about online booking via advertisements & campaigns.

Infrastructure Setup – Deploy computer systems at railway stations for assistance. **Policy Adjustments** – Modify railway policies for digital payments, refunds, and cancellations.

► Time frame to recover ROI?

Ans-

Estimated ROI Recovery: **2 to 3 years** (depending on adoption rate and operational savings). Revenue Increase: More bookings due to 24/7 availability, better seat utilization, and reduced errors.

Cost Savings: Fewer staff required at counters, reduced operational costs. Faster Processing: Online payments reduce cash handling and fraud risks.

► How to identify Stakeholders?

Ans-

Primary Stakeholders

- Passengers (Customers)- Use the system for booking, cancellations, and refunds.
- **Railway Staff-** Manage bookings, cancellations, and customer support.
- Ticketing Agents- Assist customers and ensure smooth booking processes.

Secondary Stakeholders

- Railway Board/Management- Oversee project execution and ensure compliance.
- IT Team (Developers, Testers, DBA)- Design, develop, test, and maintain the application.
- Payment Gateway Providers-Facilitate secure online transactions.
- Vendors & Service Providers-Supply infrastructure, software, and cloud solutions.

DOCUMENT 2: BA APPROACH STRATEGY

1. Project Initiation:

- Understand the project objectives, scope, and constraints.
- Identify key stakeholders and establish communication channels.
- Conduct a preliminary assessment of business needs and requirements.

2. Elicitation Techniques

The following elicitation techniques will be used to gather requirements effectively:

- Interviews Direct discussions with railway officials and ticketing staff.
- Workshops Engaging multiple stakeholders to define key processes.
- **Observation** Studying the manual ticketing process for gaps and inefficiencies.
- Surveys/Questionnaires Collecting feedback from end-users.
- **Prototyping** Creating wireframes/mockups for better visualization.
- **Document Analysis** Reviewing existing ticketing policies and procedures.

3. Stakeholder Analysis using RACI:

- Identify stakeholders and their roles using RACI (Responsible, Accountable, Consulted, Informed).
- Determine each stakeholder's level of involvement and expectations regarding the project.
- Need to use this analysis to allocate responsibilities, manage expectations, and ensure effective communication.

Stakeholders	Responsible	Accountable	Consulted	Informed
Passengers			С	I
(Customers)				
Railway Staff	R		С	I

Ticketing Agents	R		С	
Railway		Α	С	Ι
Board/Management				
Payment Gateway				I
Providers				
Developers	R			
Vendors	R			
Project Manager	R	Α		
Business Analyst	R			
UI/UX Designers	R			
Testers	R			
Trainers	R			

4.Documents to write:

- Business Requirement Document (BRD)
- Functional Requirement Specification (FRS)
- Process Flow Diagrams
- Use Case
- User Stories
- Requirement Traceability Matrix (RTM)
- Test Plan & Test Cases
- UAT Test Cases
- Client Project Acceptance Form

5. Document Sign-off Process:

- Share draft documents with stakeholders for review and feedback.
- Incorporate feedback and revisions as necessary.
- Obtain formal sign-off from stakeholders indicating their acceptance of the documents.
- Maintain version control to track changes and updates.

6. Client Approvals:

- Present finalized documents to the client for approval.
- Provide explanations and clarifications as needed to ensure understanding.
- Obtain formal approval from the client through signed agreements or email confirmation.

7. Communication Channels:

- Establish regular meetings with stakeholders to discuss project progress, issues, and updates.
- Utilize email, project management software, and collaboration tools for asynchronous communication.
- Maintain an open-door policy for stakeholders to raise concerns or provide feedback.

8. Change Request Handling:

Step 1: Receive Change Request – Capture in Change Request Document (CRD).

Step 2: Impact Analysis – Assess timeline, cost, and risk.

Step 3: Approval Process – Review by client and project sponsor.

Step 4: Implementation – Develop and test the change.

Step 5: **Sign-Off** – Obtain approval before deployment.

9. Updating Project Progress to Stakeholders:

- Provide regular updates on project milestones, deliverables, and risks.
- Use status reports, dashboards, and presentations to communicate progress effectively.
- Highlight achievements, challenges, and upcoming tasks to keep stakeholders informed.

10. UAT & Client Project Acceptance Sign-Off

- Conduct UAT Testing Sessions with railway staff.
- Log and resolve issues reported by users.
- Once all test cases pass, obtain formal sign-off from railway officials.

The Client Project Acceptance Form will include:

- Confirmation of functionalities delivered.
- List of resolved issues.
- Final approval from client stakeholders.

DOCUMENT 3- FUNCTIONAL SPECIFICATIONS

Project name	TRACK MATE
Customer name	RADHIKA
Project Version	1.0
Project Sponsor	KAMAL
Project Manager	VIJAY
Project Initiation date	1-02-2025

FUNCTIONAL SPECIFICATIONS:

Req ID	Req name	Description	Priority	
FR001	User Registration	The system should allow users to register with	s to register with High	
		their details like name, contact, email, and ID		
		proof.		
FR002	User Login &	Users should be able to log in using	High	
	Authentication	email/phone and password with OTP		
		verification.		
FR003	Password Reset	Users should be able to reset their passwords via email/SMS OTP.	Medium	
FR004	Train Search	Users should be able to search for trains based	High	
		on source, destination, and date.		
FR005	Seat Availability	The system should display real-time seat	High	
	Check	availability based on user search criteria		
FR006	Fare Calculation	The system should calculate fare dynamically	High	
		based on class, distance, and concession rules.		
FR007	Ticket Booking	Users should be able to book tickets by selecting	High	
		train, class, and passenger details.		
FR008	PNR Generation	A unique Passenger Name Record (PNR)	High	
		number should be generated after a successful		
		booking.		
FR009	Payment	The system should integrate with multiple	High	
	Integration	payment gateways (UPI, Credit/Debit Card, Net		
		Banking, Wallets).		
FR010	E-Ticket	The system should generate an electronic ticket	High	
	Generation	(PDF & SMS) after successful payment.		
FR011	Licket	Users should be able to cancel booked tickets	High	
	Cancellation	policies.		
FR012	Refund	The system should process refunds based on	High	
	Processing	refund rules and original payment method.		
FR013	Train Schedule	The system should display train schedules,	Medium	
	Information	routes, and stops.		
FR014	Real-Time Train	Users should be able to track train status and	Medium	
	Tracking	expected arrival/departure times in real-time.		
FR015	Waitlist & RAC	The system should handle RAC (Reservation	High	
	Management	Against Cancellation) and Waitlist ticketing.		
FR016	Premium Booking	Users should be able to book Tatkal & Premium	High	
		Tatkal tickets with predefined rules and limited		
		seats.		
FR017	Special Quota	The system should allow booking under special	Medium	
	Booking	quotas like senior citizens, defense personnel,		
		etc		
FR018	Seat Selection	Users should be able to select preferred seats	Medium	
		(window, aisle, etc.) it available.		

FR019	Auto-Upgrade Feature	The system should auto-upgrade Waitlisted	Low
FR020	Bulk Booking	The system should support bulk booking for corporate or group travelers	Low
FR021	Loyalty & Reward System	A reward system should be implemented to provide points for frequent travelers.	Low
FR022	Multi-Language Support	The application should support multiple languages for better user experience.	Medium
FR023	Mobile App Compatibility	The system should be mobile-responsive and work on both Android & iOS apps.	High
FR024	SMS & Email Notifications	Users should receive SMS/Email updates for ticket confirmation, cancellations, and train status.	High
FR025	Customer Support Integration	Users should be able to connect with customer support via chat, call, or email.	Medium
FR026	MIS Reporting	The system should generate reports for bookings, cancellations, revenue, and user data.	Medium
FR027	Role-Based Access	Access Control Admins, ticketing agents, and users should have role-based access to functionalities.	High
FR028	Admin Dashboard	Admins should have a dashboard to manage users, bookings, refunds, and system settings.	High
FR029	Fraud Detection & Security	The system should detect fraudulent activities and ensure secure transactions.	High
FR030	Offline Ticketing Support	The system should allow railway counters to book tickets using the same platform.	High
FR031	Integration with ID Verification	The system should integrate with government ID verification APIs for user authentication.	Medium
FR032	Feedback & Review System	Users should be able to provide feedback and rate their booking experience.	Low
FR033	Third-Party API Integrations	The system should support API integrations with hotels, taxis, and food services.	Low
FR034	Discount & Promotional Offers	The system should provide discounts and promotional offers for special occasions.	Medium
FR035	Accessibility Features	The system should include accessibility features for visually impaired users.	Low

DOCUMENT 4- REQUIREMENT TRACEABILITY MATRIX

Req	Req name	Req Description	Priorit	Desi	D1	T1	D2	Т2	UAT
ID			у	gn					
FR001	User	The system should allow	High	Yes	comple	In	compl	In	Pendi
	Registratio	users to register with their			ted	compl	eted	compl	ng
	n	details like name, contact,				eted		eted	
		email, and ID proof.							

FR002	User Login	Users should be able to log	High	Yes	comple	In .	compl	In	Pendi
	&	in using email/phone and			ted	compl	eted	compl	ng
	Authentic	password with OIP				eted		eted	
50000	ation	Verification.	N 4 l'	No					Dead
FRUU3	Password	Users should be able to	m	res	comple	IN	IN	IN	Penal
	Reset	ampil/SMS OTD	111		leu	otod	otod	otod	ng
	Train	Usors should be able to	High	Voc	complo	compl	compl	In	Pondi
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Search	search for trains based on	Tingi	165	tod	otod	otod	compl	ng
	Search	source destination and			leu	eleu	eleu	otod	пе
		date						cicu	
FR005	Seat	The system should display	High	Yes	comple	compl	compl	compl	Pendi
	Availability	real-time seat availability			ted	eted	eted	eted	ng
	Check	based on user search							0
		criteria							
FR006	Fare	The system should	High	Yes	comple	In	In	In	Pendi
	Calculatio	calculate fare dynamically	_		ted	compl	compl	compl	ng
	n	based on class, distance,				eted	eted	eted	
		and concession rules.							
FR007	Ticket	Users should be able to	High	Yes	comple	compl	compl	In	Pendi
	Booking	book tickets by selecting			ted	eted	eted	compl	ng
		train, class, and passenger						eted	
		details.							
FR008	PNR	A unique Passenger Name	High	Yes	comple	compl	In .	In .	Pendi
	Generatio	Record (PNR) number			ted	eted	compl	compl	ng
	n	should be generated after					eted	eted	
FD000	Dourmont	The sustem should	Lliah	Vac	comple	compl	compl	compl	Dondi
FRUU9	Payment	integrate with multiple	піgn	res	tod	otod	otod	otod	penui
	n	navment gateways (LIPI			leu	eleu	eleu	eleu	iig
		Credit/Debit Card Net							
		Banking, Wallets).							
FR010	E-Ticket	The system should	High	Yes	comple	In	In	In	Pendi
	Generatio	generate an electronic	0		ted	compl	compl	compl	ng
	n	ticket (PDF & SMS) after				eted	eted	eted	0
		successful payment.							
FR011	Ticket	Users should be able to	High	Yes	comple	compl	compl	In	Pendi
	Cancellati	cancel booked tickets and			ted	eted	eted	compl	ng
	on	receive refunds based on						eted	
		cancellation policies.							
FR012	Refund	The system should process	High	Yes	comple	compl	compl	In .	Pendi
	Processing	refunds based on refund			ted	eted	eted	compl	ng
		rules and original payment						eted	
ED012	Train	The system should disalar	Madin	Vec	comela	In	comel	comel	Dondi
FR013	Schodulo	train schodulos routos	m	res	tod	iii compl	otod	otod	renai
	Scheudle	and stons			leu	otod	eleu	eleu	ыя
		and stops.				eleu			

	Informatio								
50014	n Deal T iona	The second s	D.d.s. al.	Mara		1.			Dead
FR014	Real-Time	Users should be able to	m	res	comple ted	in compl	in compl	in compl	Pendi
	Tracking	expected arrival/departure			ieu	eted	eted	eted	пg
	in denting	times in real-time.				cicu	cicu	cica	
FR015	Waitlist &	The system should handle	High	Yes	comple	compl	compl	In	Pendi
	RAC	RAC (Reservation Against			ted	eted	eted	compl	ng
	Managem	Cancellation) and Waitlist						eted	
	ent	ticketing.							
FR016	Premium	Users should be able to	High	Yes	comple	compl	In	In	Pendi
	BOOKING	DOOK latkal & Premium			ted	eted	compi	compi	ng
		nredefined rules and					eleu	eleu	
		limited seats.							
FR017	Special	The system should allow	Mediu	Yes	comple	In	In	In	Pendi
	Quota	booking under special	m		ted	compl	compl	compl	ng
	Booking	quotas like senior citizens,				eted	eted	eted	
		defense personnel, etc							
FR018	Seat	Users should be able to	Mediu	Yes	comple	compl	In	In	Pendi
	Selection	select preferred seats	m		ted	eted	compl	compl	ng
		(window, aisle, etc.) if					eted	eted	
FR019	Auto-	The system should auto-	Low	Yes	comple	In	In	In	Pendi
111015	Upgrade	upgrade Waitlisted tickets	2011	103	ted	compl	compl	compl	ng
	Feature	if higher class seats				eted	eted	eted	0
		become available.							
FR020	Bulk	The system should support	Low	Yes	comple	In	In	In	Pendi
	Booking	bulk booking for corporate			ted	compl	compl	compl	ng
		or group travelers.				eted	eted	eted	
FR021	Loyalty &	A reward system should be	Low	Yes	comple	compl	In	In	Pendi
	Reward	noints for frequent			ted	eted	compi	compi	ng
	System	travelers					eleu	eleu	
FR022	Multi-	The application should	Mediu	Yes	comple	compl	compl	In	Pendi
	Language	support multiple	m		ted	eted	eted	compl	ng
	Support	languages for better user						eted	
		experience.							
FR023	Mobile	The system should be	High	Yes	comple	compl	compl	compl	Pendi
	Арр	mobile-responsive and			ted	eted	eted	eted	ng
	Сотратон	WORK ON DOTH ANDROID &							
FR024	ILY SMS &	Users should receive	High	Vec	comple	compl	compl	compl	Pendi
11024	Fmail	SMS/Fmail undates for	111611	103	ted	eted	eted	eted	ng
	Notificatio	ticket confirmation.							סיי
	ns	cancellations, and train							
		status.							

					· ·	· .			
FR025	Customer	Users should be able to	Mediu	Yes	comple	compl	compl	In	Pendi
	Support	connect with customer	m		ted	eted	eted	compl	ng
	Integratio	support via chat, call, or						eted	
	n	email.							
FR026	MIS	The system should	Mediu	Yes	comple	compl	In	In	Pendi
	Reporting	generate reports for	m		tod	otod	compl	compl	nσ
	Reporting	bookings cancellations				cicu	otod	otod	"8
		bookings, cancenations,					eleu	eleu	
		revenue, and user data.			· .				
FR027	Role-	Access Control Admins,	High	Yes	comple	In	compl	In	Pendi
	Based	ticketing agents, and users			ted	compl	eted	compl	ng
	Access	should have role-based				eted		eted	
		access to functionalities.							
FR028	Admin	Admins should have a	High	Yes	comple	compl	compl	In	Pendi
	Dashboard	dashboard to manage	-		ted	eted	eted	compl	ng
		users bookings refunds						eted	0
		and system settings						cicu	
FR029	Fraud	The system should detect	High	Yes	comple	compl	compl	compl	Pendi
11025	Detection	fraudulent activities and		105	ted	eted	eted	eted	nσ
	& Security					cicu	cicu	cicu	טיי
	& Security	transactions							
50000	0.00								
FR030	Oπline	The system should allow	High	Yes	comple	compi	in .	compi	Penai
	Ticketing	railway counters to book			ted	eted	compl	eted	ng
	Support	tickets using the same					eted		
		platform.							
FR031	Integratio	The system should	Mediu	Yes	comple	compl	In	In	Pendi
	n with ID	integrate with government	m		ted	eted	compl	compl	ng
	Verificatio	ID verification APIs for user					eted	eted	
	n	authentication.							
FR032	Feedback	Users should be able to	Low	Yes	comple	In	In	In	Pendi
	& Review	provide feedback and rate			ted	compl	compl	compl	ng
	System	their booking experience.				eted	eted	eted	-
FR033	Third-	The system should support	Low	Yes	comple	compl	In	In	Pendi
	Party API	API integrations with			ted	eted	compl	compl	ng
	Integratio	hotels, taxis, and food					eted	eted	_
	ns	services.							
FR034	Discount &	The system should provide	Mediu	Yes	comple	In	compl	In	Pendi
	Promotion	discounts and promotional	m		ted	compl	eted	compl	ng
	al Offers	offers for special occasions.				eted		eted	
FR035	Accessibili	The system should include	Low	Yes	comple	In	compl	In	Pendi
	ty	accessibility features for			ted	compl	eted	compl	ng
	Features	visually impaired users.				eted		eted	

DOCUMENT 5 – BRD TEMPLATE

TRACK MATE COEPD 2025 Version 1.0 NAVA DEEPU

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1.DOCUMENT REVISIONS –

Date	Version Number	Document Changes
1-02-2025	0.1	Initial draft of the project
		documentation
10-02-2025	0.2	Added project objectives
		and success criteria
18-02-2025	0.3	Included stakeholder
		analysis and elicitation
		techniques
27-02-2025	0.4	Completed functional
		requirements and
		requirement traceability
		matrix
8-03-2025	0.5	Updated priority and status
		in requirement traceability
		matrix
15-03-2025	0.6	Added Detailed Business
		Requirements
25-03-2025	0.7	Incorporated Appendices
		and finalized document
31-03-2025	0.8	Final review and formatting
		adjustments

2.Approvals

Role	Name	Signature	Date
Project Sponsor	Kamal	Signature	1-02-2025
Business Owner	Midhuna	Signature	1-02-2025
Project Manager	Vijay	Signature	1-02-2025
System Architect	Sai	Signature	1-02-2025
Development Lead	Kushal	Signature	3-02-2025
User Experience Lead	Karthik	Signature	3-02-2025
Quality Lead	Sruthi	Signature	3-02-2025
Content Lead	Manisha	Signature	3-02-2025

3.RASCI Chart for This Document

Codes Used in RASCI Chart:

R: Responsible - Responsible for creating this document.

A: Accountable- Accountable for accuracy of this document

C: Consulted - Provides input

I: Informed - Must be informed of any changes.

Stakeholders	Responsible	Accountable	Consulted	Informed
Passengers			С	1
(Customers)				
Railway Staff	R		С	1
Ticketing Agents	R		С	1
Railway		Α	С	I
Board/Management				
Payment Gateway				1
Providers				
Developers	R			
Vendors	R			1
Project Manager	R	Α		
Business Analyst	R			
UI/UX Designers	R			
Testers	R			
Trainers	R			

- Railway Board/Management is Accountable (A) because they make final decisions and approvals.
- Project Manager is both Responsible (R) and Accountable (A) because they ensure project success.
- Railway Staff and Ticketing Agents are Responsible (R) for using the system, but also Consulted (C) because their feedback shapes system design.
- Passengers, Vendors, and Payment Gateway Providers are only Informed (I) because they don't contribute to the system directly but need updates.

4.1. Business Goals

Seamless Booking Experience

Provide users with an intuitive and user-friendly interface for ticket reservations and cancellations.

Offer multi-platform accessibility (web and mobile applications).

Reduce Time for Reservations and Cancellations

Enable quick and efficient booking processes through automation.

Minimize manual interventions to speed up ticket issuance and refunds.

Real-Time Updates

Ensure real-time synchronization with train schedules, seat availability, and ticket status. Notify users instantly about delays, cancellations, or changes in schedules.

Data Security and Fraud Prevention

Implement secure payment gateways with encryption to protect user data. Introduce mechanisms to prevent unauthorized access and fraudulent bookings.

4.2. Business Objectives

Digital Transformation – Transition from manual booking to an automated online system to improve efficiency.

Seamless Booking Experience – Provide a user-friendly interface for customers to book tickets easily.

Real-time Updates – Enable real-time availability, booking status, and train schedules. **Reduced Reservation Time** – Minimize ticket booking and cancellation time through automation.

Data Accuracy & Security – Ensure secure transactions and accurate passenger records.
 Revenue Optimization – Improve ticket sales, reduce fraud, and enhance financial tracking.
 Operational Efficiency – Reduce workload for railway staff and streamline operations.
 User & Staff Training – Implement training programs for railway employees and end users.
 Regulatory Compliance – Ensure adherence to government transport policies and security standards.

Scalability & Maintenance – Design a system that supports future enhancements and maintenance.

4.3. Business Rules

As a Business Analyst for the Railway Reservation System, you need to establish Business Rules aligned with organizational policies, procedures, and regulations. Below is a concise overview:

1. Organization Policies

User Eligibility: Only registered users can book tickets; identity verification is mandatory. **Ticket Pricing & Discounts**: Prices vary based on class, route, and demand; special discounts for senior citizens, students, and military personnel.

Refund & Cancellation: Cancellations are allowed within a specified period; refund rules depend on the time of cancellation.

Data Privacy & Security: User data must be protected per cybersecurity and government regulations.

Multi-Channel Booking: Tickets should be available via web, mobile, and authorized kiosks.

2. Procedures

Booking Process: Users must log in, select train details, provide passenger information, and complete payment to confirm booking.

Payment & Confirmation: Payments through credit/debit cards, UPI, net banking; instant booking confirmation via email/SMS.

Modification & Cancellation: Users can modify journey details before departure within allowed conditions.

Seat Allotment & Availability: Automated seat allocation based on availability and user preference (e.g., window seat, lower berth).

Waitlist & Tatkal Booking: Waitlisted tickets get auto-confirmation based on availability; Tatkal tickets open a day before the journey.

3. Rules & Regulations

Ticket Validity: A ticket is valid only for the specified journey date and time. **Identity Proof Requirement**: Passengers must carry a valid government ID while traveling. **Child & Senior Citizen Rules**: Children below a certain age travel free; senior citizens get priority seating and fare discounts.

Baggage Limitations: Passengers must adhere to baggage weight limits; excess luggage requires extra charges.

Refund & Compensation Policies: Refunds are subject to cancellation timing and conditions; compensation for train delays as per rules.

Government Compliance: System must adhere to transport ministry regulations and taxation policies (e.g., GST on tickets).

4.4. Back ground

The railway reservation system currently operates manually, leading to inefficiencies such as long wait times, booking errors, and limited accessibility. To address these challenges, an online booking application will be developed to streamline the reservation process, ensuring a seamless and user-friendly experience. This system will enable passengers to book tickets, check availability, and make payments in real-time, reducing dependency on manual intervention. The project aims to enhance operational efficiency, provide real-time updates, improve data security, and support better customer service through a digital transformation of the existing process.

4.5. Project Objective

- If a passenger wants to reserve ticket(s), firstly, he/she has to log in to the Railway system with valid credentials. Then, the passenger has to provide his/her details with the date of the journey, names of the passengers and their details, origin station details, destination station details, and the class type of the required ticket(s).
- The Railway Reservation System will provide the available Train-list, and Seatavailability, via-details.
- To book a ticket passengers can pay through online/offline mode. After successful payment of the ticket fare the System will generate the ticket and PNR no. will be given to the passenger. The System also keeps the payment details and sends them to the system Admin.
- The Passenger can check PNR status (confirmed, RAC, waiting list) by entering the PNR no. into the Reservation system.
- The Reservation system should store all train details, fare details (by zone, class, and date wise), PNR no, date of trains, etc. This maintenance should be controlled by the Admin.
- The System also has refund rules which have a date of reservation, ticket fare, and refundable percentage. The passenger can simply cancel the ticket(s) by entering the PNR no and a cancel ticket request. After cancelation, the Admin will pass the refundable amount to the System and the System will give the refundable amount to the passenger.

4.6. Project Scope

The project scope outlines the boundaries and deliverables of the Track mate project. It defines what features and functionalities will be included in the final product and what aspects are considered out of scope. The project scope encompasses both the in-scope functionality that will be developed as part of the project and the out-of-scope functionality that will not be addressed.

In-Scope Functionality:

User Registration & Authentication: Secure login for users to access the booking system. **Train Search**: Users can search for available trains based on routes, timings, and seat availability.

Booking & Cancellation: Users can book and cancel train tickets based on their search. **Payment Integration**: Secure online payment gateway for ticket booking.

Booking Confirmation: Instant booking confirmation with digital ticket generation.

Real-Time Updates: Live train status updates (delays, cancellations, etc.).

Admin Dashboard: Admin can manage train schedules, track bookings, and process cancellations.

Seat Availability: Real-time availability of seats on each train.

Data Security: Protection of user information and transaction details.

Out Scope Functionality:

Offline Ticket Booking: No provision for manual ticket booking via counters or any nondigital means.

Third-Party Integrations: No integration with third-party travel agencies or services outside the railway network.

Extended Customization: No customizations outside predefined features.

5. Assumptions

- Booking Agents will be having a valid user name and password to access the software
- The software needs booking agent to have complete knowledge of railways reservation system.
- Software is dependent on access to internet.

6. Constraints

Budget: The total budget allocated for the project is 2 Crores INR, which needs to be adhered to for development, implementation, and maintenance.

Timeline: The project duration is fixed at 18 months, with milestones and deadlines to meet for various stages (requirements gathering, design, development, testing, and deployment). **Data Security**: Ensuring the protection of user data and payment details, in compliance with regulations such as GDPR or local data protection laws.

System Performance: The application must handle a high volume of transactions, especially during peak booking times, ensuring real-time updates and fast processing times.

Integration with Existing Systems: The new booking system needs to integrate smoothly with existing manual processes, database systems, and third-party tools, without disrupting current operations.

User Accessibility: The system should be accessible to users across different devices (PCs, smartphones, tablets) and support multiple languages, ensuring ease of use. **Scalability:** The system must be designed to scale for future growth, supporting new functionalities, more users, and additional railway stations.

Compliance: The system must comply with relevant government regulations, railway rules, and industry standards for digital transactions, booking processes, and user privacy. **Quality Assurance:** The application must undergo rigorous testing for performance, security, and usability, ensuring no major issues during deployment and operation. **Vendor Dependence:** Any third-party services or vendors selected for payment gateways,

SMS notifications, or APIs must meet project deadlines and quality requirements.

7. Risks

A risk is something that could affect the success or failure of a project. The strategy for handling the risk. Strategies include the following:

- Avoid: Do something to eliminate the risk.
- Mitigate: Do something to reduce damage if risk materializes.
- Transfer: Pass the risk up or out to another entity.
- Accept: Do nothing about the risk. Accept the consequences.

Technological Risks:

- **Integration Issues**: Challenges in integrating the new system with existing infrastructure or third-party systems.
- **Scalability**: Ensuring that the portal can handle large volumes of data and users simultaneously.
- Data Security: Protecting sensitive information from unauthorized access.
- **Reliability and Uptime**: Ensuring the system is robust and consistently available.
- **Technology Obsolescence**: The chosen technology stack becoming outdated quickly.

Skills Risks:

- Lack of Expertise: Shortage of technical skills in specific technologies required for the system.
- **Training Gaps:** Insufficient training for staff and users leading to inefficient system usage.

Political Risks:

- **Regulatory Changes**: Changes in government policies or regulations affecting the system.
- **Stakeholder Conflicts**: Differing interests among stakeholders may delay or disrupt the project.

Business Risk:

- **Cost Overruns**: The project exceeding budget due to unforeseen issues or scope changes.
- Market Acceptance: might be resistant to change, affecting the adoption rate.
- **Return on Investment (ROI):** The project may not deliver the expected financial benefits or improvements in efficiency.

• **Vendor Dependence:** Over-reliance on third-party vendors for critical components, which could lead to delays or additional costs.

Requirements Risk:

- **Changing Requirements**: Evolving needs from stakeholders leading to scope creep and potential delays.
- **Incomplete Requirements**: Initial requirements may not fully capture the needs of all users, leading to rework.
- **Requirement Conflicts**: Different stakeholders might have conflicting requirements, complicating the development process.

Other Risks:

- **Project Timeline**: Unanticipated delays extending the project timeline.
- **User Adoption**: Resistance from staff and customers in adopting the new system, leading to underutilization.
- **Maintenance and Support**: Ensuring ongoing support and maintenance post-launch to address bugs, updates, and user issues.

8. Business Process Overview

This section provides an overview of the business process, outlining the existing legacy system (AS-IS) and the proposed recommendations (TO-BE) for the new railway reservation system.

8.1. Legacy System (AS-IS)

Currently, the railway reservation process is handled manually, leading to inefficiencies, delays, and data inconsistencies. The key challenges include:

Manual Booking Process: Passengers visit railway counters to book tickets, leading to long waiting times.

Paper-Based Records: Reservation details are maintained in registers, increasing the chances of errors and mismanagement.

Limited Real-Time Availability: Seat availability updates are slow, resulting in booking conflicts.

Payment Issues: Only cash payments are accepted, making the process inconvenient for users.

Dependency on Agents: Travelers often rely on third-party agents, increasing costs and chances of fraud.

Lack of Centralized Data: Manual handling of data makes it difficult to track and analyze passenger trends.

AS-IS Process Flow Diagram

Passenger visits the reservation counter \rightarrow 2. Fills out a booking form \rightarrow 3. Staff checks seat availability manually \rightarrow 4. Reservation details recorded in register \rightarrow 5. Payment made in cash \rightarrow 6. Printed ticket handed to passenger

8.2. Proposed Recommendations (TO-BE)

The new railway reservation system will replace the manual booking process with an automated, software-based solution. The key improvements include:

Online Booking System: Passengers can book tickets through a web or mobile application. **Real-Time Seat Availability:** Instant updates on available seats prevent overbooking.

Automated Payment Gateway: Multiple payment options, including credit/debit cards, UPI, and wallets, will be integrated.

E-Ticketing & Digital Records: Digital tickets will be generated, reducing paper usage.

Centralized Database: A unified system to store and manage passenger and booking data efficiently.

Automated Cancellations & Refunds: Users can cancel tickets online with an automated refund process.

Improved Security Measures: Data encryption and authentication mechanisms ensure secure transactions.

TO-BE Process Flow Diagram

Passenger logs into the online reservation system \rightarrow 2. Searches for available trains \rightarrow 3. Selects a train and seat \rightarrow 4. Makes payment through an integrated payment gateway \rightarrow 5. Receives an e-ticket via email/SMS \rightarrow 6. Booking details updated in the central database

By implementing this TO-BE system, the new railway reservation process will significantly enhance efficiency, reduce booking time, and improve customer experience while ensuring real-time data accuracy and security.

Requirement	Requirement	Requirement Description	Priority
ID	Name		
BR-001	User Registration	The system should allow users to register	High
		using personal details like name, email,	
		phone number, and ID proof.	
BR-002	User Login &	Users should be able to log in securely using	High
	Authentication	credentials or OTP-based authentication.	
BR-003	Search Train	Users should be able to search for available	High
	Availability	trains based on source, destination, and	
		date.	
BR-004	Seat Availability	The system should provide real-time seat	High
	Check	availability for different train classes.	
BR-005	Ticket Booking	Users should be able to book tickets by	High
		selecting a train, class, and number of	
		passengers.	
BR-006	Payment Gateway	The system should support multiple	High
	Integration	payment methods (Credit/Debit Card, UPI,	
		Net Banking, Wallets).	
BR-007	Ticket Generation	After payment, an e-ticket with a unique	High
		PNR number should be generated and sent	

9. Business Requirements

		to the user.	
BR-008	Ticket	Users should be able to cancel their booked	High
	Cancellation	tickets and receive a refund as per policy.	
BR-009	Refund Processing	The system should process refunds based	High
		on the cancellation policy and return	
		money to users.	
BR-010	PNR Status Inquiry	Users should be able to check their ticket	High
		status using their PNR number.	
BR-011	Train Schedule	The system should provide train schedules,	Medium
	Information	routes, and expected arrival/departure	
		times.	
BR-012	Fare Calculation	The system should calculate ticket fares	High
		based on class, distance, and concessions.	
BR-013	Premium Booking	The system should support Tatkal and	High
		Premium quota booking as per railway	
		rules.	
BR-014	Seat Selection	Users should be able to choose their	Medium
		preferred seats while booking tickets.	
BR-015	Loyalty Program &	The system should support discount codes,	Medium
	Discounts	loyalty programs, and promotional offers.	
BR-016	User Profile	Users should be able to manage their	Medium
	ivianagement	profiles, update details, and view past	
	Chac Q Empil	DOOKINgs.	L l'ala
BK-017	SIVIS & Email	The system should send booking	High
	Notifications	Commutions, reminders, and alerts via	
BP_018	Mohilo Ann	The system should be accessible via a	High
BI(-018	Compatibility	mobile application for Android and iOS	1 lig11
	compationity	lisers	
BR-019	Multi-Language	The system should support multiple	Medium
DIVOID	Support	languages for accessibility across regions.	Wieddani
BR-020	Live Train Tracking	Users should be able to track real-time train	Medium
		locations and delays.	
BR-021	Customer Support	Users should be able to contact customer	Medium
	Integration	support via chat, email, or phone.	
BR-022	System Security &	The system should follow data security	High
	Data Privacy	protocols like encryption and secure login	U
		methods.	
BR-023	Admin Dashboard	Admins should be able to monitor	High
	& Reports	bookings, cancellations, revenue, and other	
		key metrics.	
BR-024	Third-Party API	The system should integrate with railway	High
	Integration	APIs for real-time updates.	
BR-025	Accessibility	The system should be compliant with	Medium
	Compliance	accessibility standards for users with	
		disabilities.	



10. Appendices

10.1. List of Acronyms

UAT-User Acceptance Testing BRD- Business Requirement Document BR- Business Requirement UI- User interference PNR- Passenger Name Record

10.2. Glossary of Terms

PNR (Passenger Name Record) – A unique identifier for a booked ticket. WL (Waitlist) – A status indicating a ticket is on the waiting list.

RAC (Reservation Against Cancellation) – A ticket that allows partial travel with a seat but not a full berth.

CRS (Central Reservation System) – A backend system managing ticket bookings, cancellations, and availability.

Quota – A predefined ticket allocation for specific passenger categories (e.g., General, Ladies, Senior Citizen).

E-Ticket – A digital train ticket booked online, requiring a valid ID for travel.

10.3. Related Documents

Functional Specifications Technical Design Document This Business Requirements Document (BRD) provides a comprehensive overview of the objectives, scope, requirements, and other relevant aspects of the Track mate project. RTM Stakeholder Analysis