

Travel Desk Management Application

Overview

This document describes the complete design and implementation of the **Travel Desk Management Application** built using **ASP.NET Core MVC (Code-First)** with **SQL Server**. The system manages international travel requests, approvals, bookings, employees, and admin users with secure authentication.

Technology Stack

- **Backend:** ASP.NET Core MVC (.NET 9 compatible)
 - **Frontend:** Razor (CSHTML) + Bootstrap 5
 - **Database:** SQL Server (EF Core – Code First)
 - **ORM:** Entity Framework Core
 - **Authentication:** Custom Admin Login with BCrypt + JWT
 - **Architecture:** MVC + DTOs + Validation
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Application Modules

1. Authentication & Login Module
 2. Employee Management Module
 3. Travel Request Management Module
 4. Travel Booking Management Module
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1 Authentication & Login Module

Purpose

Secure access for administrators and travel managers.

Key Features

- Admin login using username & password
- Password hashing using BCrypt
- JWT-based authentication
- Session-based login handling

Password Hashing (BCrypt)

```
model.PasswordHash = BCrypt.Net.BCrypt.HashPassword(password);
```

Login Flow

1. User enters credentials
 2. Password verified using BCrypt
 3. JWT generated on success
 4. JWT stored in session
 5. Unauthorized users redirected to Login page
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2 Employee Management Module

Purpose

Maintain employee master data for travel requests.

Key Features

- Add, Edit, View, Delete Employees
 - Enum-based Designation dropdown
 - Active / Inactive status
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3 Travel Request Management Module

Purpose

Allow employees to request international travel.

Key Features

- Create travel requests
- Enum-based Purpose with “Other” option
- Conditional textbox for Other Purpose
- Approval workflow (Approve / Reject)
- Status-controlled system

Validation Rules

- Return Date \geq Departure Date
 - Departure Date \geq Today
 - OtherPurpose required if Purpose = Other
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Travel Booking Management Module

Purpose

Manage confirmed bookings for approved travel requests.

Key Features

- Create bookings only for Approved requests
 - Dropdown shows Employee + From → To
 - Edit, View, Delete bookings
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Code First Approach (EF Core)

Migration Commands

```
dotnet ef migrations add InitialCreate  
dotnet ef database update
```

Benefits

- Strongly typed schema
 - Version-controlled DB changes
 - Easy rollback & maintenance
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Security Considerations

- Passwords never stored in plain text
 - PasswordHash never shown in UI
 - JWT authentication enforced
 - Role-based authorization possible
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UI & UX

- Bootstrap 5 cards & tables
 - Responsive layouts
 - Validation messages
 - Conditional form fields
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Conclusion

The Travel Desk Management Application is built using enterprise-level best practices including:

- Secure authentication
- Clean separation of concerns
- Enum-based controlled data
- LINQ-driven data access
- Code-first database design

This architecture ensures scalability, maintainability, and security.

End of Document