

Suitcase Pro

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Abstract: *Suitcase Pro introduces a QR-based flight inventory management solution, aiming to optimize the efficiency and precision of flight inventory control procedures. This innovative system revolves around a digital approach to travel bookings, eliminating the need for paper and embracing mobile connectivity, all facilitated through QR codes. Through a browser-accessible web page, users gain access to comprehensive flight schedules and an online reservation platform. This platform empowers customers to securely purchase flight tickets with their debit/credit cards, accompanied by web connectivity. Notably, the implementation employs QR codes to oversee and keep luggage records up to date. These QR codes enable the airport department to effortlessly access passenger details. Concurrently, distinct QR codes are assigned to merchandise within the airport, underscoring the versatility of QR codes in effectively tracing product location and ownership information*

Keywords: Suitcase, QR - Coding, Inventory Management System, Luggage tracking, Flyers, MERN Stack, Travel with suitcase.

I. INTRODUCTION

Bar codes have emerged as a widely embraced technology for decoding custom data, mainly due to their adeptness at swift, accurate, and efficient reading. These bar codes fall into three distinct categories: 3D, 2D, and ID. 3D barcodes possess dimensions that can be etched onto products, while 2D barcodes contain information along both vertical and horizontal axes. In contrast, ID barcodes convey data horizontally. Consequently, a typical 3D barcode boasts a capacity a hundredfold greater than that of an ID barcode [1].

As the utilization of bar codes extended to encompass package, courier, and luggage tracking, there arose a need for enhanced storage capabilities for diverse data types. This demand, however, led to escalated printing costs, complicated reading procedures, and expanded bar code dimensions.

To address these concerns, 2D codes emerged as a more convenient alternative, rectifying the challenges associated with ID codes. Denso Wave pioneered the development of 2D codes in 1994, ushering in a new era of practicality and efficacy.

In our proposed work, we employ QR codes, a type of 2D barcode, to identify travel bookings made by specific individuals. Unlike ID barcodes, QR codes occupy minimal space and can function as a database. Their data capacity surpasses that of ID barcodes, accommodating binary, alphanumeric, or numeric information, up to 2953 bytes.

A fraction of the QR code is allocated to error correction and actual data storage. The QR code's predominant section defines the version and data format, ensuring precise timing, alignment, and placement. The QR code's smallest unit is called a module, while an empty perimeter, the quiet area, surrounds it by around 4 modules. Through adept encoding methods, even examination certificates can be issued using QR codes.

II. METHODOLOGY

The conventional tracking system reliant on ID barcodes has transitioned, making way for the widespread adoption of QR codes. This shift is attributed to the QR codes' capacity to accommodate significantly more data compared to traditional ID barcodes. A standard QR code is capable of encoding information along both vertical and horizontal axes, allowing it to represent up to 7089 characters of data. Furthermore, by utilizing encoding techniques, a QR code can encompass the same volume of data as an ID code, while reducing the required space by one-tenth

Unlike the QR code, the ID barcode necessitates specific scanning angles for accurate reading. Conversely, the QR code offers convenience, as it can be scanned effectively regardless of the scanner's orientation. Additionally, even if a portion of the QR code is compromised, the incorporated error correction enables successful data retrieval. This capability is absent in the ID barcode system. Powered by the robust MERN (MongoDB, Express.js, React.js, Node.js) [2 - 5] stack, Suitcase Pro seamlessly melds a robust backend with an intuitive frontend.

In this paper, we present a QR based ticket booking system – Suitcase Pro that can be used in the airports to track the passenger's luggage based on the schedule of the passenger from the information gathered through the online reservation system and company flights.

Architecturally, Suitcase Pro embraces four modules: Administrative for platform oversight, Airport authority for airport staff management, Cargo Staff for luggage verification, and Passenger for seamless exploration.

III. EXISTING AND PROPOSED SYSTEMS

A) Existing Systems

Passengers and their luggage go through a series of steps to gain entry onto an airplane. The typical process includes: Ticketing and Check-in, Security Screening, Immigration and Customs, Departure Lounge, Boarding, Stowing Luggage, Safety Briefing, Take-off. The exact process may vary depending on the airport, airline, and flight regulations. It's important for passengers to follow instructions from airline staff and authorities to ensure a smooth and safe boarding process.

B) Limitations of Existing Systems

- **Barcode Limitations:** While barcodes were used in some luggage management systems, they had limitations. Traditional barcodes could only store a limited amount of information, and the scanning process required line-of-sight, making it less efficient and reliable.
- **Paper-Based Systems:** Many luggage management systems used paper-based methods for tracking and recording baggage. This led to a high risk of paper documents being lost, damaged, or misplaced.
- **Limited Tracking:** Tracking the movement of luggage through various stages of transportation and handling was challenging. Baggage handlers and staff had limited visibility into where each piece of luggage was at any given time.
- **Communication Delays:** Communication between different points in the luggage management process, such as between airport terminals or transportation hubs, was not as instantaneous as it is today. This led to delays in information sharing and coordination.

C) Proposed System: Suitcase Pro

Suitcase Pro, for traveller's unique id will be accommodated for flight ticket booking, baggage carried by them is checked utilizing the QR-Code without any problem. This QR-Code will be labelled with each luggage's and their weight can be checked easily.

Suitcase Pro uses a web-page program to carry out a portable e-ticketing travel framework. The website will provide all the rules for organizing transportation and webbased booking framework that will allow customers to purchase tickets during the web installation.

D) Advantages of Suitcase Pro

- **Streamlined Check-In:** Passengers can have QR codes on their mobile devices or printed tickets. These QR codes can be scanned at self-service kiosks or check-in counters, expediting the check-in process and reducing queues.
- **Real-Time Tracking:** QR codes enable real-time tracking of baggage at various stages of the journey, such as check-in, loading, transfer, and arrival. This enhances transparency and allows both passengers and staff to know the status and location of each piece of luggage.

- **Improved Security:** QR codes can be encrypted and have built-in security features, reducing the risk of unauthorized access to passenger information. This enhances the security and privacy of personal data.
- **Faster Baggage Handling:** Baggage handlers can scan QR codes to quickly identify the correct destination and route for each piece of luggage. This reduces handling errors, misrouting, and delays.

IV. BACKGROUND

The MERN stack is a popular combination of technologies used to build web applications. MERN stands for MongoDB, Express.js, React.js, and Node.js. Each component of the stack has a specific role to play in the web application development process. MongoDB is a NoSQL database that is used to store and manage the application data. Express.js is a server-side framework for Node.js that helps in building RESTful APIs [6] and handling HTTP requests. React.js is a front-end framework used for building user interfaces. Node.js is a server-side JavaScript runtime used to build scalable and high-performance applications.

The QR code that we are using in this proposed work is a type of 2D barcode. A typical QR code will be able to hold larger amount of information when compared with the ID bar code. This data can be in the form of binary data, alphanumeric data or numeric data which can hold a maximum of 2953 bytes of information.

V. RESULTS AND DISCUSSIONS

SCREENSHOTS

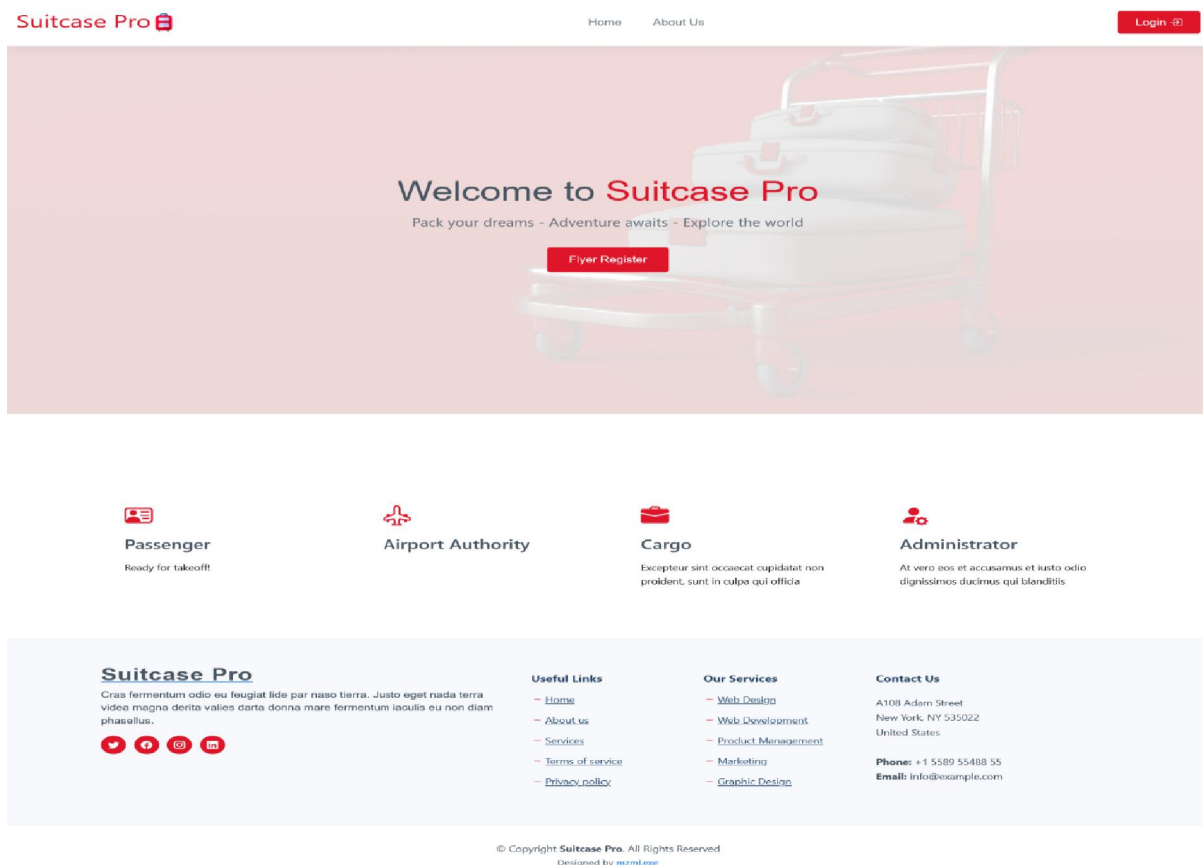
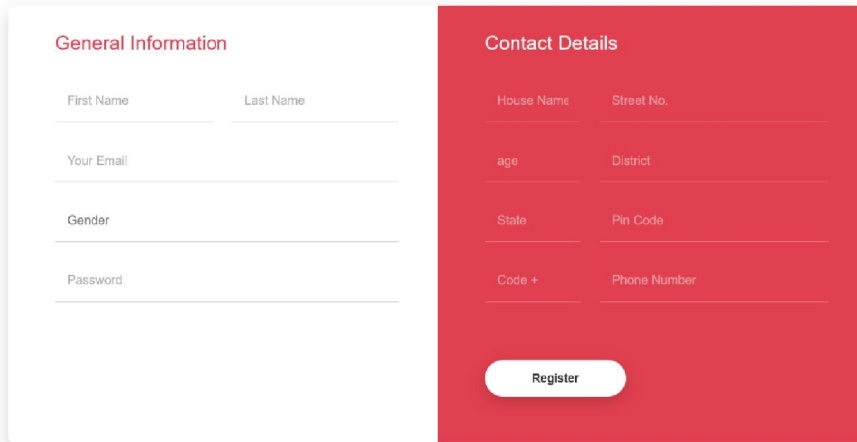
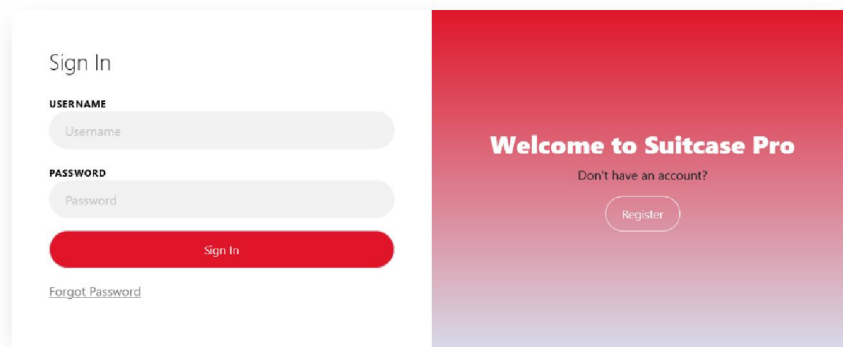


Figure 1: Home Page



The registration form is divided into two main sections: 'General Information' and 'Contact Details'. The 'General Information' section includes input fields for 'First Name', 'Last Name', 'Your Email', 'Gender', and 'Password'. The 'Contact Details' section includes input fields for 'House Name', 'Street No.', 'age', 'District', 'State', 'Pin Code', 'Code +', and 'Phone Number'. A 'Register' button is located at the bottom of the 'Contact Details' section.

Figure 2: Registration Page




The login form features a 'Sign In' section with input fields for 'USERNAME' (Username) and 'PASSWORD' (Password). A red 'Sign In' button is positioned below these fields. A link for 'Forgot Password' is located at the bottom left. The right side of the form has a red background with the text 'Welcome to Suitcase Pro' and 'Don't have an account?' with a 'Register' button.

Figure 3: Login Page

From: To: Date:


Flight ID	Company	Boarding Point	Depature	Destination Point	Arrival	Status
101010	Air India	Cochin International Airport (COK)	12:12	Doha Hamad International Airport (DOH)	18:18	<input type="button" value="Book"/>
101011	Air India	Cochin International Airport (COK)	12:25	Doha Hamad International Airport (DOH)	15:20	<input type="button" value="Book"/>
101012	Air India	Cochin International Airport (COK)	12:25	Doha Hamad International Airport (DOH)	15:20	<input type="button" value="Book"/>
101013	Air India	Cochin International Airport (COK)	12:25	Doha Hamad International Airport (DOH)	15:20	<input type="button" value="Book"/>
101014	Air India	Cochin International Airport (COK)	12:25	Doha Hamad International Airport (DOH)	15:20	<input type="button" value="Book"/>
101015	Air India	Cochin International Airport (COK)	10:25	Doha Hamad International Airport (DOH)	18:45	<input type="button" value="Book"/>
101016	IndiGo	Cochin International Airport (COK)	10:25	Doha Hamad International Airport (DOH)	18:45	<input type="button" value="Book"/>
101017	SpiceJet	Cochin International Airport (COK)	10:25	Doha Hamad International Airport (DOH)	18:45	<input type="button" value="Book"/>

Figure 4:Booking Page



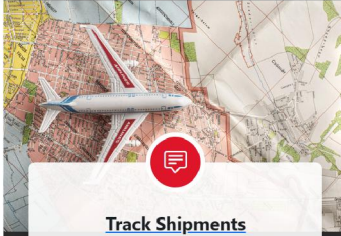
Inventory Management

Non et temporibus minus omnis sed dolor esse consequatur. Cupiditate sed error ea fuga sit provident adipisci neque.



QR by Suitcase Pro

Cumque et suscipit saepe. Est maiores autem enim facilis ut aut ipsam corporis aut. Sed animi at autem alias eius labore.



Track Shipments

Hic molestias ea quibusdam eos. Fugiat enim doloremque aut neque non et debitis iure. Corrupti recusandae ducimus enim.

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Figure 5:About Page

VI. CONCLUSION

In conclusion, the Suitcase Pro project aims to provide a comprehensive and efficient system for booking flights and managing luggage for passengers, cargo, and airport personnel. Throughout the project, I have designed [7] and implemented an inventory management system built on the MERN (MongoDB, Express.js, React.js, Node.js) stack. The platform offers a user-friendly interface ensuring that users can enjoy an easy and authentic user experience.

By using mobile Web-based applications, companies and individuals can make appropriate adjustments to their needs, and will save a lot of time in tracking the location of their luggage as they travel. When a transportation company fully adopts a ticketless mobile network travel system, it will not only allow passengers to buy tickets online, but will also reduce paper tickets for public transportation, thereby promoting the development of green information and communication technologies. It will also improve the user experience and increase convenience.

Suitcase Pro uses a web-page program to carry out a portable e-ticketing travel framework. The website will provide all the rules for organizing transportation and web-based booking framework that will allow customers to purchase tickets during the web installation. Through a feasibility study, it was determined that the project is both technically and economically viable. The system specification provides a clear outline of the software and hardware requirements. The software specification defines the operating system, web browser, front-end and back-end technologies, and the database used in the system [1]. The hardware specification specifies the minimum hardware requirements for the system to function effectively, including the processor, RAM, and hard disk.

The module description highlights the key modules of the system, including the admin, airport authority, cargo staff, and passenger modules. Each module has distinct functionalities, contributing to the overall operation and management of the Suitcase Pro platform. The admin module charts flights, add airports, manage all other logins. The airport authority module adds cargo staffs and verify passengers lists. The cargo module deals with scanning of passengers QR code and updating to databases. The Passenger Module deals with ticket booking, luggage tracking's.

For this undertaking, forthcoming investigations will delve into extracting data concerning electronic tickets by procuring statistical information from operators. The acquisition of such data holds significant worth in appraising travel methods, thereby facilitating the refinement of policies and planning for more efficient administration. This approach also holds promise in affording passengers the capability to monitor their belongings as they transition between flights during their journey, resulting in a streamlined and uncomplicated experience.

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