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Courier Connect Using Django

B. Sri Ramya[1], K. N S L Padma Janaki[2], B.R.V. N Chandra Reddy[3], P.V.V.Nagendra[4] , HarshadKrishna.U[5], U. Raj Kumar[6]

[1] Assistant professor, Department of Computer Science and Engineering, Sri Vasavi Engineering College, Tadepalligudem Andhra Pradesh, India
[2-6] Department of Computer Science and Engineering, Sri Vasavi Engineering College, Tadepalligudem, Andhra Pradesh, India

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ABSTRACT

Courier Connect is a software system that aims to improve the delivery process of small businesses and private shops that offer courier services. It is developed using Django, a web framework that enhances the development and deployment of web applications. Courier Connect consists of numerous sections that address different facets ofcourier delivery operations, like customer management, order management, courier personnel management, invoice and payment management, and reporting. Courier Connect streamlines the entire delivery process from order booking to final delivery, simplifying the management of customer details, order tracking, courier personnel assignment and performance, invoice generation, payment processing, and report generation. Courier Connect also delivers useful insights into the delivery operations through its reporting module, which will help to increase the efficiency and quality of the courier service. Courier Connect is user-friendly, reliable, and cost-effective, providing a high-quality courier service to customers. It is also scalable and customizable, allowing small businesses and private shops to tailor the system to their specific requirements and preferences. Courier Connect is a novel software solution that addresses the challenges faced by micro-entrepreneurs in efficiently delivering parcels, ultimately offering a better customer experience.

KEYWORDS

Micro Entrepreneurs, Courier Connect, Django, Customer Experience Improvement, Order Tracking, Delivery Management, Small businesses

INTRODUCTION

Efficient courier management is critical for businesses and organizations that rely on deliveries and logistics. However, handling the end-to-end courier workflow can be extremely challenging, especially for small-scale entrepreneurs and shops with limited resources and infrastructure. The various manual processes involved in managing customer information, tracking orders, coordinating delivery personnel, planning routes, and monitoring the entire delivery operation can be quite complex. This often leads to significant inefficiencies, delays, increased costs, errors, fraud risks, and poor customer experience. Hence, there is a pressing need for detailed software way out that has the potential to automate and simplify courier business operations to overcome these challenges.

In this paper, we propose Courier Connect – an intelligent, automated courier management system that aims to streamline the end-to-end delivery workflow for small businesses. Courier Connect provides a centralized online platform with features for customer order booking, processing, allocation, dispatch, delivery, tracking, invoicing, payment collection, and advanced analytics. The system intends to bring transparency, convenience, and reliability for customers while improving productivity, efficiency, quality of service, and cost savings for the business.

Courier Connect is developed using the used and flexible Django web framework, which allows for development and a straightforward design. Django is a Python based framework that offers a pattern called model template view along, with built in features, for common functionalities. It has strong community support and excellent documentation and has been used to build many complex, database-driven websites and web applications successfully. These advantages make Django a suitable choice for developing a feature-rich, scalable courier management system like Courier Connect.

LITERATURE REVIEW

- Authors of [1] proposed Online Courier Management, which can track their courier in real-time and receive timely updates as it reaches each checkpoint. The admin can update the checkpoints and track the courier's movement.

- Authors of [2] provide the search facilities depending on like Courier, Delivery, Bill, and Payment. It also shows the information and Description of the courier and delivery.

- The author of [3] put forward a proposal, for a Courier Management system that utilizes cloud computing. The aim is to address the issues related

to centralization and ineffective updates in courier management systems. In this paper, the authors say that by means of Cloud Computing, we can enable scaling and load balancing to produce High Availability and Fault Tolerance.

- Authors of [4] said that the primary goal of this system is to connect all branches to the centre database so everywhere is information the same. This system increases the efficiency and increases the customer satisfaction level.

- The authors in [5] are to design and execute a system, for managing packaging and delivery in a courier service. This system aims to automate the tracking and monitoring process, for recipients of deliveries.

- The authors, in [6] proposed the use of Cost and Market-based Pricing in the Courier Express and Parcel Service. This analysis emphasizes the value of integrating cost-based pricing with market and competitor-oriented pricing in the CEP sector to augment the benefits of pricing strategies. Additionally, this study examines a phenomenon called driver learning and its modelling, which acknowledges that drivers become more acquainted with locations over time resulting in reduced route times for repeated routes, on a daily basis.

EXISTING SYSTEM

The existing system for courier management is largely manual and paper-based, which poses several challenges and limitations for both customers and staff. Customers have to physically visit the courier office to book their orders, fill out forms, pay cash, and receive receipts. They have no way of tracking their orders online or receiving updates on their delivery status. In addition they need to depend on phone calls or emails, for interacting with the staff or delivery personnel, which can sometimes lead to inefficiency and unreliability.

Staff members have to enter Customer information manually, order details, payment details, and delivery details into registers or spreadsheets. They have to assign delivery personnel, plan routes, and update checkpoints manually. They have no access to real-time data or analytics on delivery performance, customer feedback, or revenue generation. They also face challenges such, as mistakes made by people loss of data breaches, in security, fraudulent activities and theft.

The existing system is not user-friendly, efficient, or secure. It causes inconvenience, uncertainty, and delays for customers. It also results in high operational costs, low productivity, poor quality of service, and low customer satisfaction for staff.

PROPOSED SYSTEM

The designed system is a Courier Connect using Django a widely used open-source web framework noted for its power and popularity. Courier Connect aims to provide a centralized platform that is user-friendly for managing the delivery process from booking orders to finalizing deliveries. The Courier Connect has the following features and benefits:

Customers can conveniently book couriers online using their smartphones or computers. They can enter their personal information, order details, pickup and delivery locations, and payment preferences. They may also select from different delivery options such as express, standard, or economy.

Customers can track their couriers in real-time using a unique tracking ID. They could spot the current location of their couriers on a map, the estimated time of arrival, and the name and contact number of the delivery personnel. They might also get alerts via SMS or email about their delivery status.

Staff members can efficiently handle customer information, order details, courier personnel details, invoicing information, and payment details—all while benefiting from reports and analytics on delivery performance.

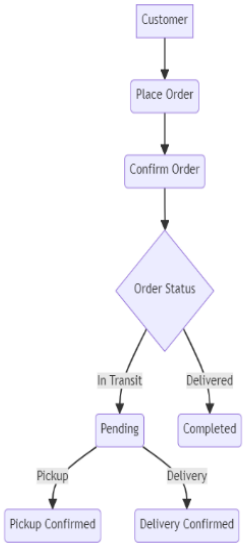

Fig 1. Data Flow Model for Customer

They can use a dashboard to view and manage all the orders in progress, completed, or cancelled. They can also generate invoices and receipts for customers and collect payments online or offline.

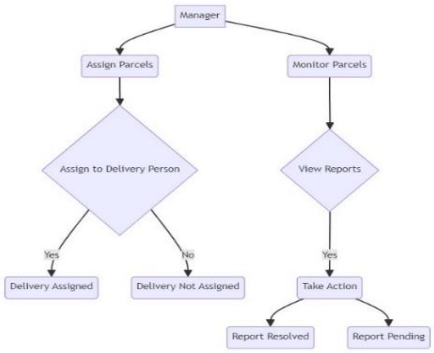

Fig 2. Data Flow Model for Manager

Staff members can assign delivery personnel to orders based on their availability, location, and capacity. They can also optimize routes for delivery personnel using AI-powered algorithms that incorporate factors like traffic conditions, weather conditions, distance, and time. They can also update checkpoints and track couriers' movement using GPS technology.

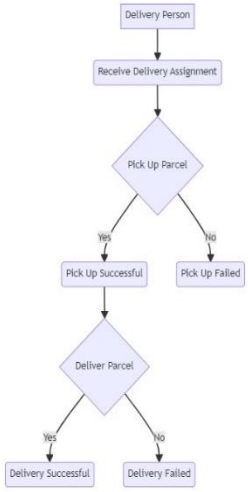

Fig 3. Data flow Model for the delivery agent

The administrator can supervise and manage every aspect of the courier management process. This includes tasks such as adding or removing staff members, setting delivery rates, generating reports, and more. The administrator can also customize the system according to their requirements and preferences.

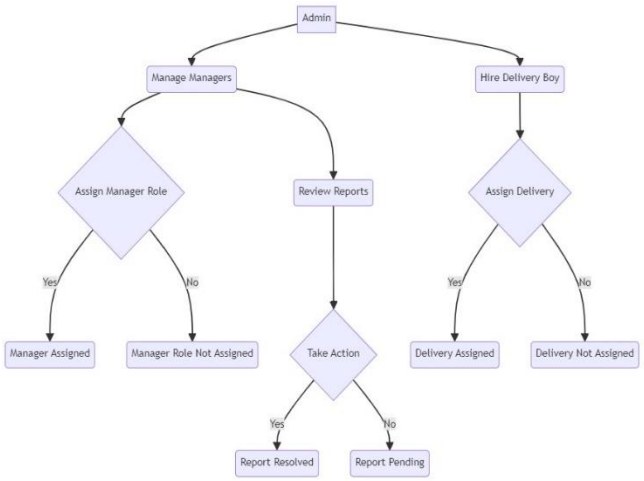

Fig 4. Data Flow Model for admin

The proposed system is user-friendly, efficient, and secure. It provides convenience, certainty, and speed for customers. It also reduces operational costs, increases productivity, improves quality of service, and enhances customer satisfaction for staff.

The courier management system is the central component that connects all the other components and manages the delivery process. The courier management system receives orders from customers, assigns delivery personnel to orders, tracks couriers' movement, updates delivery status, sends notifications to customers, collects payments from customers, generates invoices and receipts for customers, and provides reports to the Manager and the admin.

SYSTEM ARCHITECTURE

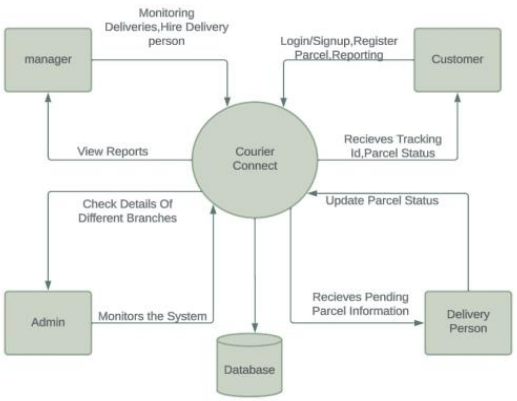

Fig 5. system architecture

Admin module: The admin module allows the admin to manage all aspects of the system. This includes creating and managing users, tracking orders, generating reports, hiring and managing delivery personnel, and assigning deliveries.

Customer module: The customer module allows customers to register for an account, place orders, track their orders, provide feedback, and report lost or damaged items.

Delivery boy module: The delivery boy module allows delivery personnel to view and manage assigned orders, track their routes, update the delivery status of orders, and communicate with customers in case of any issues.

Manager module: The manager module offers an overview of the system to managers. It empowers them to assess system performance pinpoint areas, for enhancement and generate company resources.

RESULTS AND DISCUSSIONS

1.Home Page

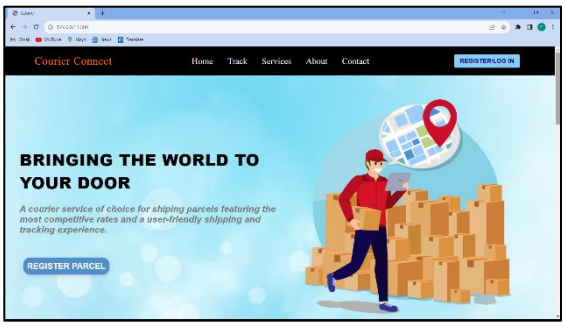

Fig 6. Home Page

The Homepage consists of sign-up and login ,Parcel Registration and parcel Tracking, Services, About and Contact Information.

2.Signup page

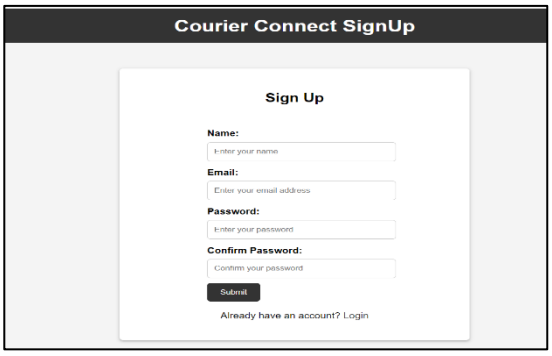

Fig 7. Sign-up page

The Customer has to sign up with the personal details on the website.

3.Login page

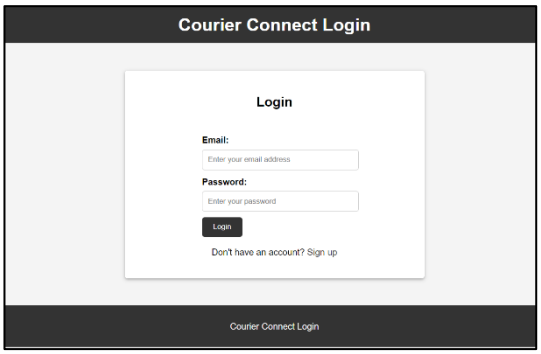

Fig 8. Login page

The manager/delivery agent/customer can log in with their credentials on the website.

4.Parcel Registration page

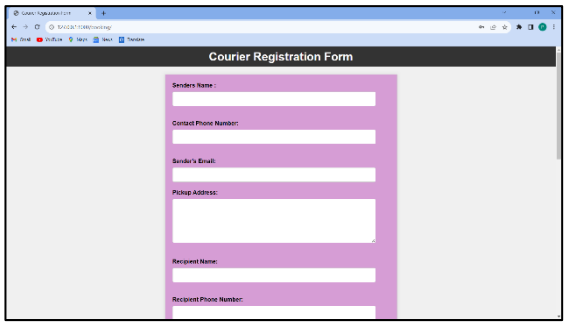

Fig 9. Parcel Registration page

To register parcel first customer has to login with his/her credentials then customer can register parcel by filling necessary details of sender and receiver.

5.Tracking Page

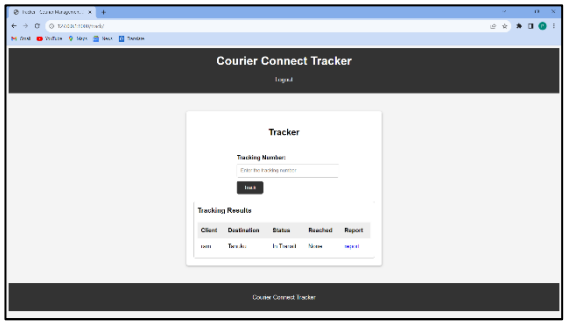

Fig 10. Tracking Page

After successful parcel Registration admin will send tracking id to customer mail. so that customer can track the status of parcel in above page and customer can report if any issues.

6.Manager Dashboard

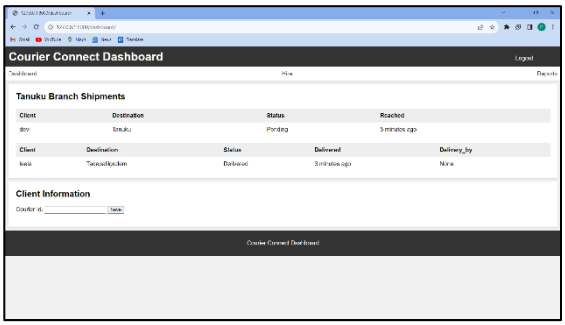

Fig 11. Manager page

After successful login manager is redirected to above page and he can view all the parcels and status of parcels in branch Manager can view all the reports in assigned branch and manager can hire delivery agents which is shown in below page

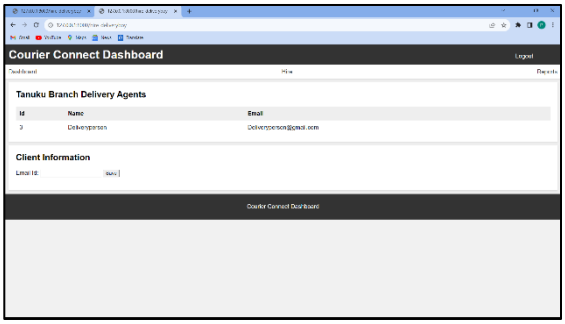

Fig 12

Managers can view all the reports in the assigned branch which is illustrated in fig 13

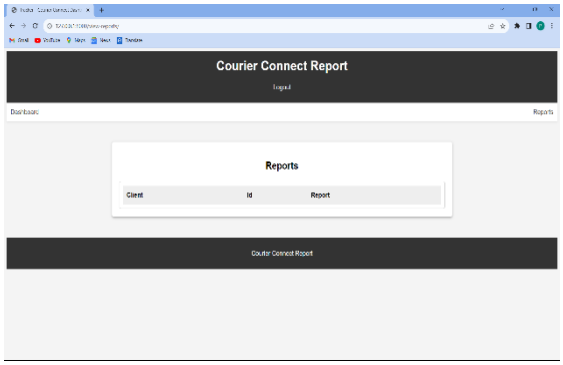

Fig 13

7.Delivery agent Page:

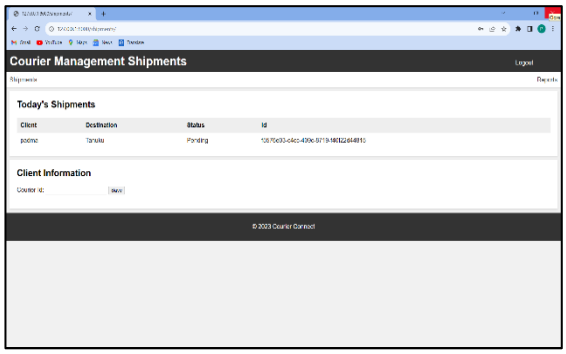

Fig 14. Delivery person page

After Successful login Delivery agent is redirected to the shipments page and a Delivery person can view all the pending deliveries and Delivery person can update the parcel status after a successful delivery

8.Django admin page

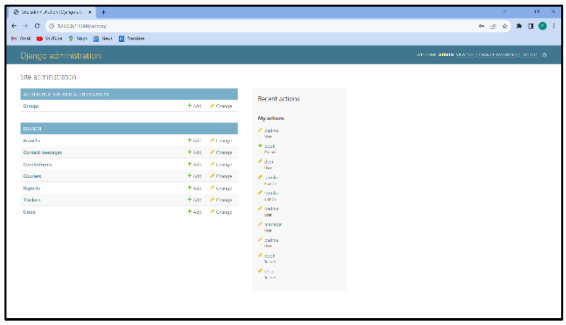

Fig 15. Django admin page

FUTURE SCOPE

The Courier Connect project, which utilizes Django is a software system created to establish a platform, for managing courier delivery processes. This system offers user features that prioritize efficiency and security. Nevertheless, some methods exist to make it even better and more effective. Let me provide you with examples;

1. Integration with systems; To streamline delivery operations alongside inventory management or e-commerce platforms the system could benefit from integrating with these systems. This would enable businesses to synchronize their deliveries with aspects of their operations.

2. Mobile optimization; As more customers rely on devices for managing deliveries enhancing the user interface of the system should be mobile-friendly would significantly improve accessibility and convenience for both consumers and staff.

3. Data analytics; By integrating data analytics capabilities, into their system businesses can gain insights, into their delivery operations. This allows them to identify trends and make decisions based on data ultimately optimizing their processes.

4. Sustainability features; Considering the increasing focus on sustainability integrating features, within the system that facilitate optimized delivery routes reduce vehicle emissions and promote eco practices would provide businesses with options to reduce their carbon footprint. Incorporating these enhancements or others will allow the system to tailor and progress toward meeting the evolving needs of both businesses and consumers.

CONCLUSION

The Django-based Courier Connect project is a software system created to streamline the management of courier delivery services. Its main purpose is to provide a platform where customers can easily book couriers, track their deliveries in time, and stay updated on their delivery status through notifications. Additionally, the system empowers staff members to handle customer information efficiently, order details, courier personnel data, invoicing information, and payment details and generate reports and analytics regarding delivery performance. Moreover, the system offers administrators control over all facets of the courier management process by allowing customization based on requirements and inclinations.

This user-friendly, efficient, and secure system brings convenience, certainty, and speed to customers seeking courier services. It besides reducing expenses, it also boosts productivity while enhancing service quality and customer satisfaction for staff members. Businesses that heavily rely on courier services for product shipment will find this system invaluable. Automating tasks provides real-time tracking and reporting capabilities while optimizing delivery routes in a manner that enables businesses to improve efficiency levels significantly while increasing productivity. Furthermore, it provides visibility into the delivery process, resulting in customer service while saving on overall delivery costs.

The actual results of implementing the system will vary according to the requirements of each business, the functionalities of the software, and how it is implemented. Nevertheless, the system can prove to act as a resource for businesses aiming to optimize their courier delivery process and enhance their performance.

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