

Courier Tracking System Using Python

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ABSTRACT

The Courier Tracking System is a comprehensive software solution designed to simplify the tracking process for courier packages. The system utilizes Python and Django, two popular programming languages, to create a user-friendly platform that is accessible to both customers and authorized personnel. The system is structured around a centralized database that stores all relevant information about the package, including the sender's name, recipient's name, package number, current location, and status. This data is entered into the system by authorized personnel at various distribution centers, and it is automatically updated in real-time as the package moves through the distribution channel.

1. INTRODUCTION

The Courier Tracking solution is a complete software solution developed to simplify courier items tracking. It uses a centralised database to record and manage critical package information, such as the sender's name, the recipient's name, the package number, the current position, and the status. Customers may quickly track the progress of their shipments as they go through the delivery

process by utilising this system, owing to the availability of up-to-date recorded information.

The Courier Tracking System is being implemented to handle typical concerns such as inquiries

and complaints about delayed or missing goods. The solution lowers the need for consumers to contact customer service or make enquiries by giving them with access to the most recent tracking information, thereby boosting their happiness and experience.

Furthermore, the Courier Tracking System improves the openness and dependability of courier delivery services. The system's real-time tracking information improves the overall visibility and dependability of the delivery process. Customers may learn about the current status and location of their items, allowing them to plan ahead of time and have peace of mind regarding the status of their shipments.

From an operational standpoint, the Courier Tracking System has various advantages. By reducing customer enquiries and complaints, the pressure on customer support personnel is reduced, allowing them to focus on more vital activities. Furthermore, the system's real-time tracking features lead to better delivery efficiency.

Overall, the Courier Tracking System is a novel and efficient solution that improves the transparency, reliability, and overall client experience in courier delivery services. The solution decreases enquiries and complaints while enhancing operational efficiency and saving costs by providing consumers with real-time tracking information.

2. LITERATURE REVIEW

Courier Tracking Systems are becoming increasingly important in enhancing customer experience and operational efficiency in courier delivery services. However, existing systems still have holes and limits that must be addressed. The purpose of this literature study is to identify and debate the gaps between existing Courier Tracking Systems and the proposed system, as well as to recommend areas for improvement and future research. Some of them include:

Limited Real-Time Tracking Accuracy:

Existing Courier Tracking Systems may provide real-time tracking information with delays or errors. This chasm is caused by challenges with data synchronisation, network latency, and delays in updating package statuses. The suggested system should strive to close these gaps by providing reliable and up-to-date tracking data via enhanced data synchronisation techniques and efficient network architecture.

Inadequate Integration with Last-Mile Delivery: Many existing systems track items until they reach the local distribution centre but fail to offer precise tracking during the last-mile delivery. This chasm frequently results in consumer unhappiness and ambiguity about the actual delivery time. The suggested system should fill this need by combining real-time tracking capabilities with last-mile delivery operations, allowing customers to follow products until they arrive at their door.

Limited Visibility in Multimodal Shipments:

Courier services can include numerous means of conveyance, resulting in limited visibility. Existing systems may be unable of providing complete tracking information across many modes of transportation, resulting in decreased visibility and coordination. The suggested system should seek to overcome this gap by combining monitoring data from numerous types of transportation.

Limited Integration with Supply Chain Partners:

Existing Courier Tracking Systems may have limited integration capabilities with supply chain partners such as merchants, manufacturers, and customs authorities. This chasm prevents the supply chain from exchanging and coordinating information in real time. The suggested system should prioritise interaction with supply chain partners, real-time data sharing, and cooperation for effective package tracking and delivery.

This examination of the literature revealed significant gaps between existing courier tracking systems and the proposed approach. Addressing these gaps would result in more dependable and effective tracking systems,

which will improve the customer experience and operational efficiency in courier delivery services. Future research will concentrate on creating novel methods to close these gaps and increase the capabilities of Courier Tracking Systems.

3. PROPOSED SYSTEM

The proposed system is intended to fill gaps in existing courier tracking systems by providing improved tracking accuracy, seamless integration with last-mile delivery, improved visibility in multimodal shipments, personalised customer engagement, and efficient integration with supply chain partners. This includes:

Real-Time Tracking Accuracy: The proposed system leverages strong data synchronisation procedures to assure reliable and up-to-date tracking information. To minimise delays and mistakes in updating package statuses, it makes use of modern technologies such as real-time data streaming and cloud-based infrastructure. This guarantees that clients always have access to the most up-to-date and timely tracking information.

Integration with Last-Mile Delivery: The suggested method bridges the gap between tracking goods at distribution centres and the final-mile delivery phase. This is accomplished by integration with GPS-enabled mobile devices carried by delivery staff. Customers can follow their products in real time as they travel through the last-mile delivery process thanks to this connection. It also allows for effective route optimisation, proof-of-delivery updates, and consumer engagement with delivery staff, all of which contribute to increased transparency and customer satisfaction.

Enhanced Visibility in Multimodal Shipments: To address the issue of restricted visibility in multimodal shipments, the suggested system seamlessly combines tracking data from numerous modes of transportation. It connects with logistics partners such as airlines, shipping businesses, and transportation companies to gather real-time tracking updates across the whole supply chain.

The proposed Courier Tracking and Delivery Management System is a complete solution that fills holes in existing Courier Tracking Systems. The proposed system aims to improve the overall customer experience and operational efficiency in courier delivery services by focusing on real-time tracking accuracy, integration with last-mile delivery, visibility in multimodal shipments, personalised customer engagement, and seamless integration with supply chain partners. The implementation of this system will result in increased transparency, fewer customer inquiries, optimised delivery operations, and greater collaboration across the supply

chain, eventually benefiting both consumers and courier service providers.

4. METHODOLOGY ARCHITECTURE

An architectural diagram is a visual depiction of an application's or system's components, linkages, and interactions. The architecture diagram for a particular application might differ based on its complexity and the architectural style chosen. However, the following is a broad overview of the components that are often present in an application architecture diagram.

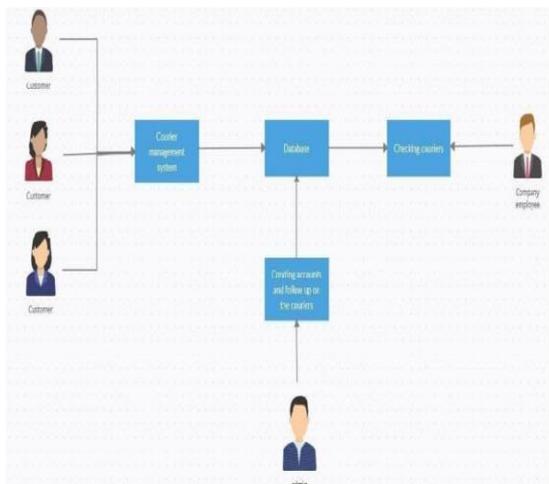


Figure 1: System Architecture of Courier Management System

The diagram will depict the communication and interaction flow between the courier service application's various components. It will depict the data, control, and event flow between user interfaces, application modules, the data layer, external systems, and other components.

A courier service application's architecture can be developed to guarantee effective order processing, package tracking, and smooth coordination among the numerous players engaged in the delivery process.

The courier service application's UI layer contains interfaces for clients, delivery staff, and administrative users. It includes features including order placing, parcel tracking, account administration, and reporting. Web interfaces for consumers and administrative users, as well as mobile applications enabling delivery people to access key elements on the move, may be included in the UI layer.

The application layer ensures that client orders are handled efficiently, that delivery workers are assigned, and that delivery routes are managed. It may also include business rules and algorithms to improve delivery efficiency and reduce transit times.

The architecture presented here serves as a foundation for developing a full courier service application that enables efficient order administration, parcel tracking, and coordination among multiple parties. It allows for seamless communication, improves the client experience, and optimises the delivery process for dependable and timely service.

DATA FLOW DIAGRAM

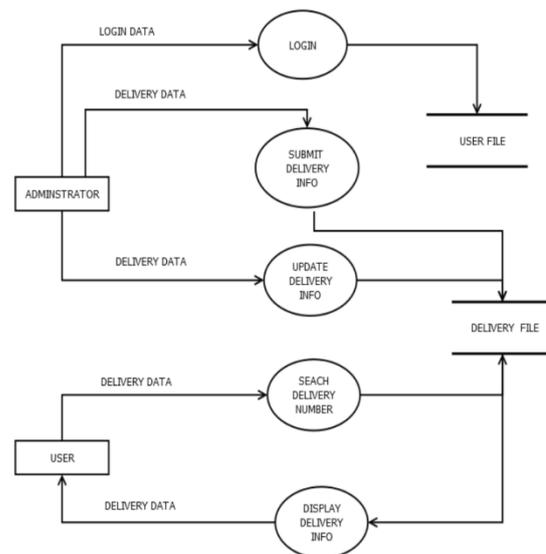


Figure 2: Data Flow diagram

The data flow diagram (DFD) shown above is a graphical depiction of the data flow within the application. It illustrates how data is inputted, processed, stored, and outputted in a system, emphasising the relationships between various components.

The DFD represents these components and their interactions using symbols and notation. Data flows are represented by arrows, and labels can be added to indicate the data being moved. Processes are often represented by circles or rectangles, whereas data storage and external entities are represented by rectangles or squares.

5. EXPERIMENTAL RESULTS

These are the results of the Courier tracking system application:



Figure 3: Login page

Login module is necessary to place a courier as it is important for safety and security.

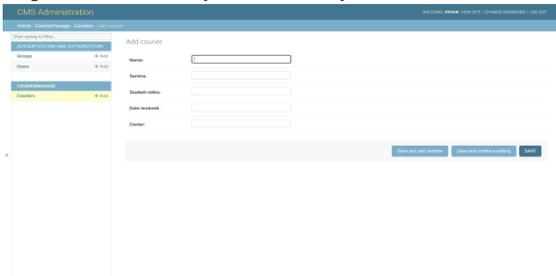


Figure 4: Add courier page

The website features a courier information form, where users may submit pertinent courier information. This form may contain sections such as the courier's name, contact information, vehicle details (if available), and any other information pertinent to the courier's profile.



Figure 5: Manage courier page

The page allows you to add a new courier to the system. When the user completes and submits the courier information form, the programme validates and saves the courier's information in the database. This enables the newly added courier to be selected in other portions of the application.

The findings will give vital insights into the application's efficacy and efficiency, enabling for additional upgrades and enhancements to the courier service.

6. CONCLUSION

The 'Courier Management System' project was created for and with the assistance of courier services. The system was tested, and its performance was determined to be decent. Everything that was required was created. The system was designed to be stoner-friendly, with assistance communication for the customer. This design may easily be modified to match your individual needs. I hope this design will assist you in sharpening your bents. This is how you create a Courier Management System in Python using Django.

7. FUTURE ENHANCEMENT

This section describes the work that will be included in future editions of the programme. Add extra features to the system, such as bar codes, to make the work easier. Improve the user interface by include more interactive elements. Add Deals and special Offer information to the home page. Add Recipes of the Week/Day to the Home Page. Add several payment options such as PayPal, cash, gift cards, and so on. Allow the storage of payment information for future use.

8. REFERENCES

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