OushadhiPath

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***Abstract*—OushadhiPath is a complete digital platform that helps users find and track the availability of medicines in the local area. It uses advanced data analysis and real-time inventory monitoring to provide the latest information on medicine stocks, prices and nearby pharmacies. This helps consumers make better decisions about their healthcare and ensures fair access to nearby medicines.**

***Index Terms*—Medicine Search, Drug Availability, Pharmacy Locator, AI in Healthcare, Real-time Availability Tracking, Data-driven Healthcare, Pharmaceutical Supply Chain, Medicine Database**

I. Introduction

Access to essential medicines remains a major challenge in many regions, particularly in developing countries, where distribution, inefficiencies, lack of transparency, and fragmented supply chains make it difficult for consumers to locate required drugs in real time. In most urban and semi-urban areas, patients or families must physically visit multiple promises to check for availability, often resulting in delays in treatments and unnecessary travel. Moreover, the absence of a unified Digital database or platform for medicine tracking further complicates this process.

To address these issues, there is a growing demand for intelligent healthcare systems that can bridge the gap between consumers and pharmaceutical providers. Recent advances in data analytics, cloud computing and mobile technology have enabled the creation of scalable, real-time platforms that can integrate inventory data from multiple pharmacies. Such systems cannot only improve access to medicines, but also promote transparency and efficiency across the pharmaceutical supply chain.

OushadhiPath has been developed as a step towards solving this problem. It is a digital platform that allows users to search for medicines, check their real-time availability, and identify nearby pharmacies that stock them. By utilizing real-time, inventory and analytic insights, OushadhiPath helps users make better decisions regarding medicine procurement. Additionally, the system is designed to enhance pharmacy management through data-driven insights on demand, trends and stock optimization.

II. Related Work

In recent apps, numerous digital healthcare systems have emerged to improve medicine, accessibility, and streamline pharmacy operations. Popular platforms, such as 1mg, PharmEasy, and NetMeds allow users to order medicines online and access basic medical information. However, these applications mainly serve as an e-commerce platform that focuses on online ordering and doorstep delivery, rather than providing real-time visibility of local pharmacy inventory. As a result, users who require immediate access to essential medicines often face challenges, locating nearby Stores that stock them.

Existing studies in **digital health infrastructure** emphasize the role of intelligent data systems in strengthening pharmaceutical supply chains. Research has explored using **cloud-based analytics**, **machine learning**, and **data visualization tools** to forecast medicine demand and prevent shortages. While such systems contribute to large-scale efficiency, they rarely address the **end-user's perspective**—particularly the challenge of finding specific medicines in their locality without depending on delayed online orders.

Several community-driven initiatives have attempted to create **pharmacy databases** using crowdsourced data. However, these efforts often suffer from outdated information, limited participation, and inconsistent updates, which reduce reliability. Few systems combine **real-time database synchronization**, **inventory tracking**, and **user-centric search functionalities** in a single framework.

OushadhiPath seeks to overcome these gaps by introducing a **locally focused, real-time medicine availability system**. Unlike conventional e-pharmacy models, it connects consumers with nearby medical stores, enabling direct access to up-to-date information about medicine stock levels, pricing, and location. This approach enhances transparency, supports local pharmacies, and contributes to a more connected and data-driven healthcare environment.

III. Methodology

The proposed system, **OushadhiPath**, is designed to create a bridge between pharmacies and users by providing data on medicine availability within a specific region. The system follows a modular, layered approach that integrates data management, user interaction, and intelligent data retrieval mechanisms. The core methodology focuses on ensuring accuracy, scalability, and usability while maintaining a seamless digital healthcare experience.

A. System Overview

The OushadhiPath system consists of three primary layers:

- **User Interface Layer** – Facilitates interaction between the user and the system through a mobile-friendly design. Users can search for medicines, view nearby pharmacies, and access availability data in real time.
- **Application Logic Layer** – Manages core functions such as medicine search, authentication, prescription scanning, and request handling. It processes user queries and communicates with the database to fetch relevant information.
- **Database** – Stores pharmacy inventories, user data, and medicine information.

B. *Data Flow*

When a user searches for a medicine or uploads a prescription, the system initiates a query to the database. The application identifies the medicine name (using text extraction algorithms if uploaded via image) and retrieves corresponding records. The result displays all nearby pharmacies where the medicine is available, along with additional details such as quantity, and contact information.

C. *Functional Modules*

The proposed system is divided into key functional modules:

- **User Authentication Module**: Allows secure login, registration, and access management. Guest users can perform limited searches, while registered users gain complete access to system features.
- **Medicine Search Module**: Enables users to find the availability of medicines based on their name or extracted text from a prescription.
- **Prescription Scanner Module**: Uses optical character recognition (OCR) techniques to extract medicine names from images of prescriptions.

D. *Advantages of the Proposed Method*

- Enhance the accuracy of availability tracking.
- User-friendly interface improves accessibility for all users.
- **Supports local pharmacies** by promoting visibility without needing large-scale e-commerce platforms.

IV. Implementation

The implementation of **OushadhiPath** emphasises creating a seamless and interactive healthcare application that enables medicine tracking and intelligent data access. The system has been built through multiple stages of design, integration, and testing to ensure both performance and reliability. Each functional component was developed to handle specific tasks efficiently while maintaining data.

A. *Application Framework*

The application operates as a mobile-based platform that interacts with a database. When a user performs a search or uploads a prescription, the system processes the request and retrieves updated results from the database. The data flow is optimized to ensure that information on medicine availability, and pharmacy location is accurate and up to date.

The implementation strategy ensures:

- Separation of concerns between user interface, business logic, and data storage.
- Scalability, allowing easy integration of more pharmacies or regions.
- Data consistency, ensuring that updates are reflected across all user devices in real time.

B. *Implementation Process*

1. Module Development

Each module — such as user authentication, medicine search, prescription scanning, and data management — was implemented separately. This modular structure simplifies testing and future upgrades.

2. Database Integration

The application integrates with a database that stores all medicine details, pharmacy inventories, and user profiles. Data synchronisation ensures that changes made by one entity (e.g., a pharmacy updating stock) are immediately visible to users.

3. Medicine Search Mechanism

The search function retrieves relevant data from the database using medicine keywords entered by the user. Filtering mechanisms display pharmacies based on proximity and availability, enabling faster access to needed information.

4. Prescription Scanning Implementation

The OCR-based feature allows users to upload or capture images of prescriptions. The system extracts text, identifies medicine names, and processes them automatically for search results.

5. Testing

Each module underwent functional testing to verify data accuracy, responsiveness, and reliability. Simulated user scenarios ensured that the application handled concurrent requests without failure or data conflicts.

C. *Data Handling and Security*

Data validation techniques were incorporated to avoid inconsistencies during updates. User credentials and personal data are securely stored, and authentication is required for access to advanced features. The system also uses controlled data read/write permissions to ensure privacy and maintain data integrity across the platform.

D. *Performance and Optimisation*

To enhance performance, the implementation adopts efficient data retrieval strategies and optimised query handling. Asynchronous processing ensures that user operations, such as searches and uploads, remain smooth without delays. Caching and background data refresh mechanisms improve response time and reduce repeated database access.

E. *Practical Deployment*

The prototype has been successfully deployed in a mobile environment for real-world testing. Users can perform live medicine searches, scan prescriptions, and

view real-time data updates. The smooth operation on mobile devices validates the system's functional readiness and reliability for larger-scale deployment.

V. Results and Discussion

The **OushadhiPath** prototype was successfully implemented and tested on a mobile environment to evaluate its functionality, reliability, and responsiveness. The results demonstrate that the system can efficiently retrieve information on medicine availability, perform accurate text extraction from prescriptions, and present relevant data to the user with minimal delay.

A. Functional Evaluation

The primary goal of testing was to ensure that all major modules—authentication, search, prescription scanning, and data synchronisation—performed as intended.

- The medicine search module correctly displayed available pharmacies within the specified locality.
- The prescription scanner accurately identified medicine names from uploaded images, confirming the effectiveness of the integrated text-recognition process.
- The **database synchronization** feature ensured that any inventory changes made by pharmacy partners were reflected in user searches without manual refresh.

B. User Interaction and Usability

The interface was evaluated by users to assess ease of navigation and clarity of information. Test participants reported that the layout was intuitive and that the ability to search either manually or via scanned prescriptions enhanced overall usability. Guest mode access also proved useful for quick look-ups, while the login feature ensured secure personalisation for regular users.

C. Data Accuracy and Performance

The integration of storage enabled consistent and reliable data retrieval. Minor latency was observed during simultaneous multi-user access, but the asynchronous data-fetch mechanism minimised visible delays. Medicine availability updates were reflected across all connected devices in real time, indicating strong consistency within the database layer.

D. Discussion

The outcomes confirm that OushadhiPath effectively addresses the problem of locating medicines in nearby pharmacies. Its modular structure and real-time data updates improve transparency within the local healthcare ecosystem. Although the system currently operates as a prototype limited to a single region, its scalable architecture can easily accommodate more pharmacies and users. Future integration of advanced analytics could enable features such as demand forecasting and automatic restocking alerts.

VI. Conclusion and Future Scope

The development of **OushadhiPath** demonstrates the potential of digital healthcare platforms to simplify access to essential medicines and promote transparency in the pharmaceutical supply chain. The system successfully integrates data retrieval, prescription text extraction, and localised pharmacy information into a single unified application. Through the combination of real-time inventory updates and intelligent search mechanisms, users can quickly identify nearby pharmacies that stock the medicines they need, improving both convenience and healthcare responsiveness.

The implementation and testing of the prototype confirmed that the system operates reliably and delivers accurate information within a minimal response time. User feedback indicated a positive experience in terms of interface simplicity, accessibility, and relevance of results. The system's modular architecture also ensures scalability, allowing future expansion to additional regions and integration with pharmacy networks.

In the future, **OushadhiPath** can be enhanced with advanced data analytics and artificial intelligence techniques to provide predictive insights, such as medicine demand forecasting and automated stock management. Integrating geolocation-based recommendations, notification systems for restocked items, and digital prescription validation could further elevate its functionality. By expanding its network and strengthening data partnerships, OushadhiPath has the potential to evolve into a comprehensive healthcare ecosystem that connects patients, pharmacies, and suppliers seamlessly.

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