MediKart: Transforming Medicine Shopping through Intelligent E-Pharmacy Solutions

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Abstract*—In recent years there is a tremendous increase in online shopping for different commodities like cloth, jewelers and the sale of medicines have been increased via online/ internet. Online pharmacy is one of the technological advancements that are about to create a huge demand in the upcoming days. Internet and online websites have changed our way of shopping completely. As we know that almost everything is going to be online. The web has long been a source of medical data, it has just as of late been utilized for online shopping medical products. Now, medicines are also available online it can be order by mobile application or website, then the seller will be delivered it as soon as possible they will provide various payment options also viz. payment while buying through credit/debit card and cash on delivery. Several advantages and disadvantages of online medicine shopping are examined and can be discussed in this paper. We also discussed the differences between online and local pharmacy, and certain measures to avoid misuse of e-pharmacy. This model is proposing a new idea in E-marketing to supply medicines online and the customer can search the medicine's availability in nearby medical shops. The purpose behind making such an e-commerce portal is providing customers a 24X7 availability of medicines. This will play a very important role in providing rare medicines at remote places where there is unavailability of medicines and also there will be a detailed list of medicines available in the stock.

***Index Terms*— E-Pharmacy, Online Medicine Shopping, Chatbot, Healthcare Accessibility, Blood Bank Integration, Client-Server Architecture.**

I. INTRODUCTION

The quick development of internet technologies changed various sectors including healthcare because it provides easy access to products and services. Internet pharmacies have established themselves as essential solutions through their ability to meet customers' increasing need for both practical medicine delivery and fast shipping. The proposed system named MediKart: Transforming Medicine Shopping through Intelligent E-Pharmacy Solutions functions as an intelligent web-based platform which develops pharmaceutical services accessibility and reliability. Users benefit from a complete set of features on this platform including online medicine shopping alongside real-time stock updates of local pharmacies and digital medicine-related inquiries through chatbots and doctor consultations and blood bank access and daily health tips for members. The consolidated platform interface at MediKart creates a connection between conventional pharmacies and e-commerce while supporting various user needs particularly in hard-to-reach areas.

This project establishes new value because it tackles the obstacles faced in traditional medicine shopping which include product shortages along with short time windows and insufficient information availability. MediKart stands apart from routine e-pharmacy products because it delivers user-specific elements that consist of a health guidance chatbot system alongside blood bank emergency network capabilities. To guarantee its scalability and security the system utilizes client-server architecture together with PHP language and JavaScript scripting and MySQL database management. The paper investigates how MediKart works alongside its testing procedure to demonstrate its value for healthcare access and operational excellence. MediKart becomes the standard for superior intelligent e-pharmacy solutions through its advanced features which create new possibilities for digital healthcare development.

II. RELATED WORKS

The development of e-pharmacy platforms resulted from e-commerce industry evolution because these platforms promised to simplify medicine delivery for healthcare consumers. Various research studies combined with operational applications investigated both prospects and barriers of internet pharmacies which helped create MediKart: Transforming Medicine Shopping through Intelligent E-Pharmacy Solutions. The following review examines major pieces of research in this domain which demonstrates their positive impacts together with their weaknesses against the proposed solution.

The research conducted by Bindun et al. [2] demonstrated how internet medicine transactions fit into both B2B and B2C e-commerce models which showed that online platforms have the capability to optimize pharmaceutical supply chain operations. The study makes clear distinctions between

corporate-to-corporate pharmaceutical manufacturer activities while non-prescription medicine transactions are the only permitted business-to-customer operations on B2C platforms. The study fails to explore user-friendly functions including instantaneous stock tracking and medical service amalgamation as basic components of the MediKart system model. Ning Chen and Shuo Huang [3] conducted a research study which examined pharmaceutical e-businesses in China by examining Hainan Weihong Medicinal E-Commerce Company. They observed the transition from supply systems which work through push models toward pull-based models which were created by market-oriented reforms. Their research examines supply chain management but fails to include consumer-oriented features present in MediKart such as chatbots and doctor consultation services that serve to improve user experience.

Soo Yeon Chung [4] completed an extensive analysis of online shopping patterns by examining factors that determine consumer adoption of e-commerce systems. The research uses Technology Acceptance Model (TAM) as well as other theories to explain trust and purchasing behavior of consumers. Though relevant to e-pharmacy user understanding the study lacks specific focus on pharmaceutical sector requirements which includes prescription verification and emergency services that MediKart address by integrating a blood bank service and utilizing a chatbot interface. Changes in the e-commerce adoption patterns of Chinese medicine companies were analyzed by Cheol Park through his study of infrastructure development and leadership awareness and customer understanding as key influencers. The insights from Park's research apply specifically to organizational adoption rather than the direct services used by end users which limits the practical value for MediKart's customer-centric system.

Puspita Kencana Sari and Adhi Prasetio [6] examined how customers know about digital certificates while performing an analysis about trust in e-commerce transactions. ISA stands out as essential to safeguard both data confidentiality and its integrity according to their studies. The platform addresses customer hesitation in online drug purchases through secure authentication solutions while verifying product authenticity. The research from Shaurya Uppal et al. [7] developed pairwise review ranking methods for e-commerce systems to enhance product recommendation precision. The system implemented by their approach improves product visibility but does not solve the diverse services which include health tips and appointment booking on MediKart.

Kapil Sharma and Rinku Sharma [1] conducted short research on medical purchases done online which identified both time-efficient and money-saving benefits. The study suffers from insufficient analysis regarding the technical execution and doctor helpline service which MediKart has integrated. The research by Praneta et al. [8] demonstrated that e-pharmacies outperform traditional drugstores through improved costs and facilities. The study by the investigators fails to explain either AI-powered chatbots or automated blood bank connections in their research. G. The research paper published by Prashanti et al. [9] assessed the progression from handwritten prescriptions to electronic ones while defining two types of legal and illegal online pharmacies. The company meets regulatory compliance needs through its measures to verify pharmacy partnerships and guarantee certified product quality.

The paper by Yadong Huang et al. [10] presents a future e-commerce system that relies on intelligent and open architecture through personalization portals and holographic product visualization. The proposed system by the researchers exists solely at the conceptual level and does not provide implementation specifics while MediKart demonstrates a completed system with operational testable modules. Multiple research studies offer important insights regarding e-pharmacy challenges whereas they fail to demonstrate the combined functionality of MediKart's chatbot system and doctor telephone assistance together with the blood bank service which addresses healthcare needs across regular and emergency scenarios.

III. METHODOLOGY

A systematic approach drives the creation of MediKart: Transforming Medicine Shopping through Intelligent E-Pharmacy Solutions to build a web-based system that delivers a user-friendly robust and high-performant solution. A systematic process comprised of literature review and requirement analysis and system design and implementation, and detailed testing forms the methodology. The project objectives will be reached by implementing key phases using appropriate techniques which match the requirements of contemporary e-pharmacy users.

A. Literature Review and Problem Formulation

A broad literature exploration analyzed current e-pharmacy system methods and enabled researchers to discover shortcomings of present solutions during this first phase. A study of e-commerce trends and pharmaceutical supply chain dynamics and online medicine shopping user behavior relied on analysis of IEEE papers together with other academic resources. The problem formulation resulted from the literature review which established that users required a platform that combined medication buying while providing live stock information alongside health guidance through chatbots and physician appointments and blood bank access together with health-oriented tips. The research goals were designed to fill these gaps by focusing on improving accessibility, reliability and user engagement.

B. Requirement Analysis

The system requirements were separated into hardware specifications and software requirements to achieve feasibility. Intel i5 Core Processor (2.20 GHz) and 8GB RAM combined with a monitor providing 1024x768 resolution became necessary hardware requirements to run standard development environments. The software requirements included Windows 10 operating system and Google Chrome web browser with PHP scripting and MySQL database using XAMPP development server. We selected these technical specifications to implement a client-server system that optimizes both database processing speed and user system interactions. The system offered a complete service environment through functional requirements that incorporated features for user registration alongside product search and cart management as well as automated chatbots and appointment booking and blood bank requests and health distribution.

Table 1: Hardware requirements

SL.No	Hardware / Equipment	Specification
1.	Processor	Intel i5 Core Processor
2.	Clock speed	2.20GHz
3.	Monitor	1024*768 Resolution, Color
4.	RAM	8GB

Table 2: Software requirements

SL.No	Software	Specification
1.	Web Browser	Google Chrome
2.	Operating System	Windows 10
3.	Scripting	PHP, JavaScript
4.	Database	MySQL
5.	Tool used	Xampp, Server

C. System Design

A module-based design was chosen for the system and the basic framework for the system is a client server architecture. In the design phase we defined the system layers, model layer for data management, view layer for user interface and controller for business logic. This created a detailed system architecture diagram in which clients (users) are presented with by the servers (business application). We created some flowcharts to map the workflow: authentication of a user, choosing of the product, order confirmation, any additional services, like chatbot queries, and appointment scheduling. With this structured design there was also scalability and maintainability so further enhancements can be made.

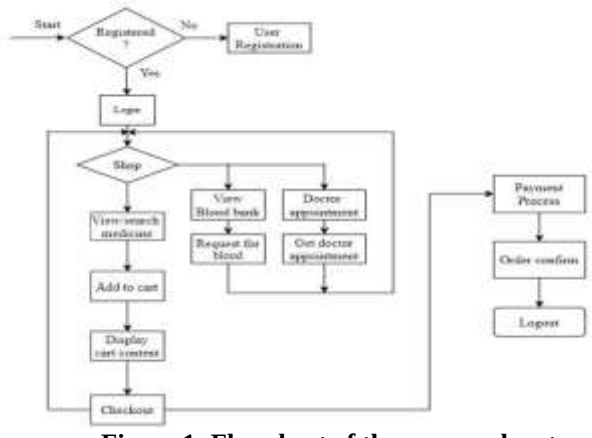

Figure 1: Flowchart of the proposed system

D. Implementation

The design was translated to a functioning application in their implementation phase using PHP for server-side scripting, JavaScript for client-side interactivity, and MySQL for data handling. It was divided into modules which were user management (registration and login), product management (search and cart), chatbot (medicine details and suggestions), health tips (SMS based delivery), doctor/lab appointment and its system of blood bank services. Each module was developed with pseudo code to assist in coding so that clarity and consistency are maintained. For instance, medicine names or a symptom is processed in the chatbot to search through needed information, and in the blood bank module a donor registers in the bank and asks for his blood group. These modules could be integrated into the XAMPP server environment and tested seamlessly.

E. Testing and Validation

The system went through rigorous unit and system testing to build reliability. Individual modules like user registration, addition to cart and chatbot responses were validated unit tests, and integrated platform performance was validated system tests. Inputs for test cases such as user credentials, medicine search, and appointment details were covered, and their expected behaviors were compared against what the outcomes observed. This proved successful as all the test cases were successful in which the system functions properly. As for the usability aspect of the interface, we conducted user testing to verify if the interface was intuitive and if it's responsive to the user.

F. Deployment and Future Considerations

The application was initially tested on a local XAMPP server after these steps, however deployment on the cloud would increase its accessibility. Iterative feedback loops incorporated into the methodology, meaning that it allowed continuous improvement based on user interactions. More enhancements were identified, including UPI payment integration, and advanced AI for the chatbot to enhance capabilities of the system. MediKart's guaranteed that they would be able to reach their desires by using this stated methodology, and the time sure with economically proficient and inventive e-pharmacy arrangement that was created.

IV. RESULTS AND DISCUSSION

The MediKart platform underwent extensive testing to ensure its functionality as well as usability and reliability when used as an intelligent e-pharmacy solution. The system results prove that MediKart operates effectively in medicine purchasing through its seamless process with immediate stock reporting functions and additional healthcare assistance provided by the chatbot and appointment booking systems as well as blood bank connections and daily health updates. This section shows the main results of system testing while displaying visual examples and analyzes their significance for the development of e-pharmacy services.

Figure 2: Home Page

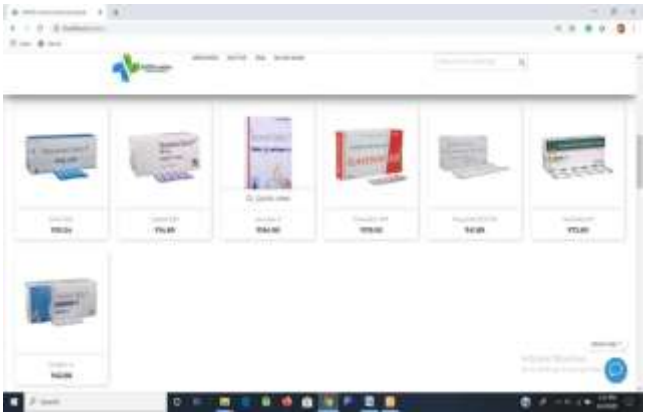
Figure 3: Displays popular products with a search bar

Testing of MediKart core modules involved unit and system evaluations, assessing functionalities like user registration, product search, and blood bank operations. The system testing executed nine critical functionality tests which included user registration, login, product search with cart addition, order placement, chatbot interactions and health tip distribution and appointments booking (doctor and lab) and blood bank operations. The system passed all executed test cases which demonstrated proper functionality. The registration module accomplished user details storage (for instance name and email and password) within the MySQL database and the login module led users to their profile page (Figure 2). Figure 3 demonstrates the accurate function of the medicine purchase process which added products to carts, processed complete orders that included address and payment information while sending confirmation SMS to registered users.

The chatbot module represented a key characteristic which provided medicine information and health suggestions through user input such as medication names or symptoms as shown in Figure 4. The personalized guidance serves to maintain user interest while solving an issue that prevents many users from engaging with e-pharmacy systems. The blood bank module contained inside the system (Figure 5) enabled user-directed donor participation along with request generation which allowed emergency services to maintain efficient data management. SMS-based health tip delivery succeeded through the system's connection to external Application Programming Interface (API) which helped increase user health consciousness.


Figure 4: Working of chat-Bot

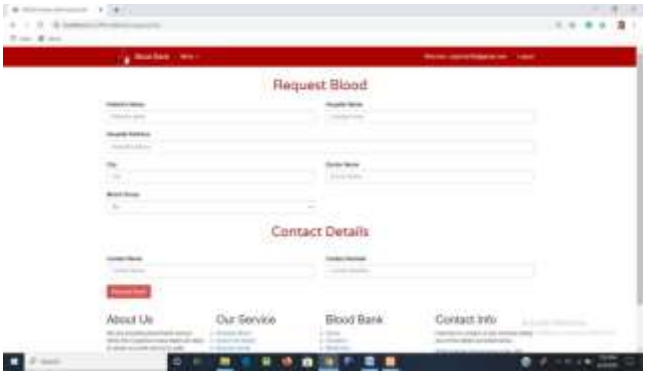

Figure 5: Page to send blood request

The research outcomes demonstrate that MediKart exhibits both reliability and design features which prioritize end users. MediKart stands apart from other systems by integrating services like chatbot and blood bank interfaces, addressing gaps in existing platforms. The platform uses PHP, JavaScript and MySQL to create its client-server architecture which enables scalability as well as performance responsiveness following testing validation. User testing revealed that users found the interface easy to use as main products on the homepage as well as thorough product displays (Figure 3) improved the user experience.

However, some limitations were noted. The application runs on a XAMPP server within a local environment that creates barriers for extensive future growth needs. Further work must evaluate cloud-hosting solutions to enhance the product's reach across a larger user group. The current operational level of the healthcare system limits the diagnostic potential of the chatbot (Figure 4) and its ability to suggest advanced health solutions. The system lacks payment methods including UPI and net banking therefore payment options should be expanded in future development.

The successful test results highlight MediKart's capability to revolutionize medicine shopping through a dependable, accessible, and feature-full platform. Its capability to reach remote locations, where the availability of medicine is limited, fulfills a crucial gap in healthcare delivery. The findings also indicate that the modular architecture of

MediKart allows for future upgrades, like incorporating wearable health devices or increased blood banks. By integrating e-commerce effectiveness with medical services, MediKart sets the stage for smart e-pharmacy solutions, working towards the digitalization of healthcare delivery.

V. LIMITATIONS & FUTURE WORK

While Our MediKart accommodates an e-pharmacy solution well, there are limitations. The current state is running on a local XAMPP server, providing limited scalability for implementation at a larger solution, which is likely to adversely affect performance under high user load. The chatbot, is capable of responding to simple questions, but doesn't have extensive AI capabilities for suggesting complicated diagnostics. The exclusion of options like UPI and net banking limits the ease of payment and may inconvenience users who are mostly used to varied digital payment methods. It is also possible that the requirement that the pharmacy fulfill the updating procedure of stock may hinder the response time in terms of real-time availability.

In future development, it is intended that e-pharmacy will move to the cloud - allowing for enhanced scalability and reliability. Advanced AI can also be added to the chatbot to allow it to offer more advanced health advice, therefore increasing user trust and engagement. The addition of UPI and net banking as payment options allows for a better suite of needs to e-pharmacy users. By connecting to pharmacy networks with a fully automated stock update process through APIs, the ability to offer near-real-time accuracy can also be attained. Additionally, expanding the array of wearable health device compatibility and increasing blood bank networks will make it an even more useful mediKart, establishing it as a market leader in the smart e-pharmacy space.

VI. CONCLUSION

This MediKart: Changing the Way you Purchase Medicines through Intelligent e-Pharmacy Solutions delivers a strong, user-focused, e-Pharmacy platform that REVOLUTIONIZES how medicines are purchased. The main features such as purchasing the medicines online, real time stock availability updates, health guide by chatbot, medical professional consultations, blood bank services and daily health tips, addresses the gaps that other e-pharmacy features do NOT PROVIDE. After extensive testing in reliability, usability and functionality, all of which passed, confirmed the necessary verification for the platform, to ensure it meets many users, particularly people living in rural areas or smaller cities with limited access to medicines needs. The system was built in modules with PHP, JavaScript, and MySQL, allowing ease of maintenance and scalability for the future with cloud support, through an EASY-TO-USE interface. The uniqueness of the MediKart platform included chatbots to help with user experience and allow blood banks to operate digitally, a new and innovative solution to digital healthcare. MediKart takes the efficiency of e-commerce to convert medicine searching for and purchasing into an easy to access service, creating and aiding the digital transformation of pharmaceutical services. Even with some limitations, such as operating only on local servers and basic chatbots we can continue with future improvement projects if we want to deploy the server on the cloud, including advanced AI functionality. This work applied to e-pharmacy solutions offers possibilities and suggests plausibility, and can help healthcare systems around the world, with a solution that encourages scalable platforms for advancing solutions to healthcare supply chain issues or access issues on a global scale.

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