IMPROVING MEDICATION ADHERENCE: A STUDY ON THE DESIGN AND IMPACT OF PHARMACEUTICAL MOBILE APPLICATIONS

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Abstract: Nutan Pharma is a leading pharmaceutical company that focuses on advancing healthcare solutions that positively impact lives. The company's foundation is built on quality, efficacy, and accessibility in healthcare, with a focus on research and development. Through strategic partnerships with leading medical professionals, Nutan Pharma continues to push the boundaries of medical innovation. The company's mission is to ensure patient safety and well-being, with rigorous quality control measures and adherence to international standards governing every aspect of its operations. This commitment to patient safety and efficacy instils trust and confidence in its diverse portfolio of pharmaceutical products and therapeutic solutions.

Nutan Pharma also offers a range of wellness products and supplements, including vitamins, dietary supplements, skincare, and personal care products, to support overall well-being and enhance quality of life. The company places a strong emphasis on corporate social responsibility, recognizing its role as a steward of public health and well-being.

Nutan Pharma invests in healthcare infrastructure, education, and disease prevention efforts to create a brighter, healthier future for generations to come. In conclusion, Nutan Pharma is a beacon of excellence and innovation in the pharmaceutical industry, driven by a steadfast commitment to advancing healthcare solutions that improve lives.

Keywords: website: HTML, CSS, database

I. INTRODUCTION

In today's fast-paced world, efficient management of pharmacy operations is crucial for retailers, customers, and wholesalers alike. The pharmaceutical industry plays a vital role in providing essential healthcare products to the population, and an effective NutanPharam Portal is essential to streamline processes, improve inventory management, enhance customer service, and ensure compliance with regulatory standards. The NutanPharam Portal for retailers, customers, and wholesalers is designed to address the diverse needs of all stakeholders involved in the pharmaceutical supply chain. This project aims to develop a comprehensive software solution that integrates seamlessly into existing pharmacy operations, offering a range of functionalities to optimize efficiency and enhance overall performance. This report provides an overview of the objectives, scope, methodology, and expected outcomes of the NutanPharam Portal project. It outlines the challenges faced by stakeholders in the pharmaceutical industry and highlights the benefits of implementing an integrated software solution to overcome these challenges

Nutan Pharma is a leading pharmaceutical company that focuses on fostering health and well-being through innovation, integrity, and excellence. The company is dedicated to redefining healthcare solutions and focuses on addressing unmet medical needs and improving patient outcomes through a diverse portfolio of innovative medicines and therapies.

Nutan Pharma's success is attributed to its unwavering focus on quality and safety across all facets of its operations, from raw material selection to manufacturing and distribution channels. This commitment to quality instills trust and confidence in healthcare professionals and patients, as well as underscores Nutan Pharma's dedication to advancing public health worldwide.

II. LITERATURE SURVEY/RELATED WORK

The NutanPharam Portal project aims to address the complex needs of retailers, customers, and wholesalers within the pharmaceutical industry through a comprehensive software solution. The overarching objectives of the project include developing a user-friendly platform that streamlines pharmacy operations, automates key processes, and enhances overall efficiency. By integrating features such as inventory management, sales tracking, prescription handling, and reporting, the system seeks to optimize resource utilization and minimize manual errors. Furthermore, the PMS aims to improve customer service by offering personalized recommendations, online ordering options, and seamless prescription refills. Additionally, the project endeavours to ensure compliance with regulatory standards and maintain accurate records of pharmaceutical transactions to uphold industry best practices. Through collaboration with stakeholders and adherence to agile methodologies, the NutanPharam Portal.

- Develop a user-friendly platform that streamlines pharmacy operations. Automate key processes such as inventory management, sales tracking, and prescription handling.

- Enhance overall efficiency by minimizing manual errors and optimizing resource utilization.

- Improve customer service through personalized recommendations and convenient online ordering options.

- Ensure compliance with regulatory standards and maintain accurate records of pharmaceutical transactions.

- Collaborate with stakeholders and adhere to agile methodologies for effective project delivery.

- Achieve tangible benefits including improved operational efficiency, enhanced customer satisfaction, and better decision-making capabilities across the pharmaceutical supply chain.

III. PROPOSED WORK

The approach that was used in the design of the system is the incremental Model of System Development Life Cycle where the product being designed is implemented and tested incrementally. It is relatively cheap and is used for small projects. This methodology is most suitable for the project due to the project's future requirements which would require changes in the system (Muallem, Dogether, Al Assaf, Al Ateeq & Househ, 2015). This is further broken down in the use of:

1. JavaScript and Cascading Style Sheet tools for the web page components of the application

2. PHP as a server-side scripting language to compute records and information.

3. MySQL for database management and AJAX to bring web application features to the system.

> **Functional requirement**

1. The admin's privileges are role-based, thereby allowing for Role-based access control for security

2. Each user IP address is stored in the database for security

3. Users of the system are banned after a 4 failed authentication process

4. Users can view products out of stock but cannot card them to the cart

5. Each user has a unique identifier

> **Front End development**

The front end has been developed using HTML, CSS, PHP, JavaScript, and Bootstrap. We have made it highly user friendly so that any one is able to use it. We have displayed a helpline number in case anyone is facing any issue in booking a trip. We have created many modules one for admin another one for employee next for package another one for hotel and the last for customers.

> **Back End development**

The back end of the project is coded in Java. The major features of the back end of the project can be illustrated as under.

- No actual queries are used. Any database operation whatsoever is performed using SQL Data Source. Using them gives an added advantage of security, as the issues related with non-use of parameterized queries are already taken care of.

- Use of MY SQL tables instead of Data Grid Views so as to endure more first-hand exposure to manual binding of data to controls.

- Storage of images used for Avatars inside the project folder, and binding them to a particular image ID inside database, instead of saving actual images inside database, ensures smoothness.
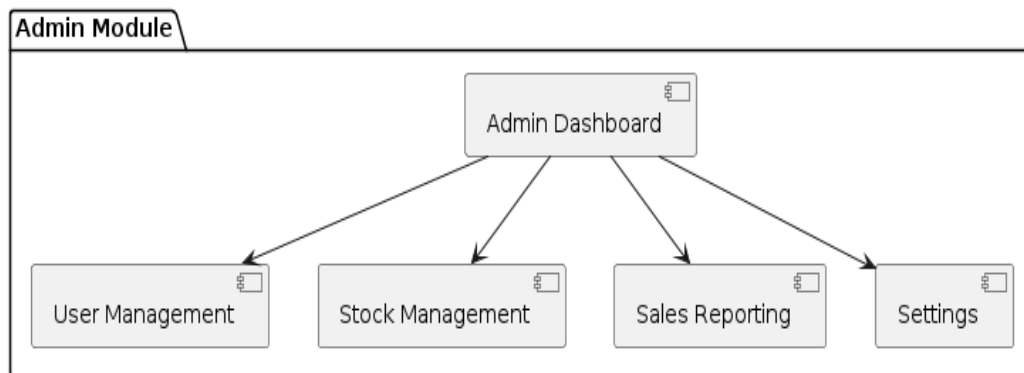
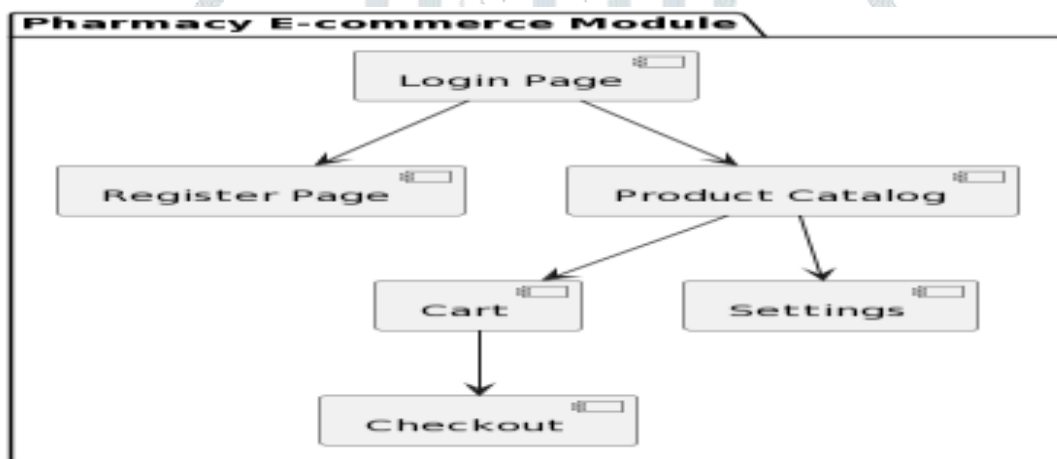## III. DATA FLOW DIAGRAM

Fig 1. Admin Dashboard

Fig 2. Modular Diagram on E-Commerce System

Fig 3. B2C System on Entire System

IV.PROPOSED RESEARCH MODEL

The proposed research model for Nutan Pharma aims to advance healthcare innovation by examining factors driving pharmaceutical innovation, market access, and sustainable development. The model will be based on a literature review that surveys existing research on topics such as drug discovery, clinical development, regulatory affairs, and market access. It will also examine trends in digital health, sustainability, and corporate social responsibility within the pharmaceutical industry.

The research objectives and hypotheses will include investigating the impact of digital health solutions on patient outcomes, assessing the effectiveness of sustainability initiatives in reducing environmental impact, and exploring the role of corporate social responsibility in enhancing brand reputation and stakeholder engagement. The methodology section will outline the research design, data collection methods, and analytical techniques employed in the model. The research framework will delineate the conceptual framework guiding the model, incorporating key variables, constructs, and relationships under investigation. It will draw upon theoretical perspectives from fields such as innovation management, health economics, and sustainability science to inform the analysis and interpretation of research findings.

The empirical analysis section will present the results of the research model, including findings from statistical analyses, qualitative interviews, and case studies. It will assess the validity of the research hypotheses and provide insights into factors influencing pharmaceutical innovation, market access, and stakeholder engagement within Nutan Pharma and the broader industry. The discussion and implications section will interpret the research findings in light of theoretical insights and practical implications for Nutan Pharma's strategic decision-making and future direction. The conclusion will summarize the key findings, contributions, and limitations of the research model, suggesting avenues for future research.

V. PERFORMANCE EVALUATION

The performance evaluation of Nutan Pharma is a comprehensive assessment of the company's performance, focusing on its operational effectiveness, financial health, customer satisfaction, and employee engagement. The evaluation is conducted about Nutan Pharma's mission and strategic goals, highlighting the importance of performance evaluation in assessing organizational effectiveness and identifying areas for improvement. The evaluation covers various aspects of Nutan Pharma's performance, including financial performance, operational efficiency, product quality, customer satisfaction, and employee engagement. Key indicators used to evaluate Nutan Pharma's performance include revenue growth, profit margins, production yields, regulatory compliance, and employee retention rates. Data collection and analysis methods are described, along with analytical techniques employed to derive meaningful insights into Nutan Pharma's performance strengths and weaknesses.

The financial performance evaluation assesses Nutan Pharma's financial health and stability, including profitability, liquidity, solvency, and efficiency. It also examines Nutan Pharma's operational efficiency assessment, examining production processes, supply chain management, and resource utilization to identify opportunities for streamlining operations and reducing costs. Quality assurance and regulatory compliance review evaluate Nutan Pharma's adherence to quality standards and regulatory requirements governing pharmaceutical manufacturing and distribution. Customer satisfaction and market performance analysis measure Nutan Pharma's performance in meeting customer needs and expectations, as well as its competitiveness within the pharmaceutical market. Employee engagement and organizational culture assessment evaluate Nutan Pharma's workplace culture, employee morale, and talent management practices. Factors such as employee satisfaction surveys, turnover rates, and professional development initiatives are assessed to gauge the effectiveness of Nutan Pharma's human resource strategies in fostering a positive and productive work environment.

VI. RESULT ANALYSIS

The Online Pharmaceutical Management System in its design aimed to limit individual personal usage. Being that the application is designed for pharmacies as a whole, as opposed to being tailored for individual use, the issue of abuse of drugs has already been diminished with the use of the application. Furthermore, only authorized personnel on the application are able to make the order of drugs from the drug manufacturers. All transactions made are stored in the system to allow record keeping. Findings made from this work show that the awareness and sensitization to the availability (conceptual or otherwise) of online pharmaceutical applications is minimal. Also, the use of these available applications (as discussed in the closely related works section) is also minimal. The administrator's dashboard allows only the administrator to add users to the system. All data are submitted to the administrator, along with all the relevant authentic documents. This feature prevents unauthorized users from ordering the drugs available and also controls the accounts available.

Recommendations

In view of the challenges associated with Online Pharmaceutical Systems, the researcher makes the following recommendations:

1. All the stakeholders must be computer literate and own a smartphone because the system is hosted online .

2. Awareness of the Online Pharmaceutical System should be made to sensitize people about the significance of the system.

3. The various regulatory bodies of the Pharmaceutical Industry should incorporate the use of the system into their regulations.

4. Benchmark research must be carried out by researchers to evaluate the performance of the system.

VII. CONCLUSION

The management system employs strict measures to protect the users from intruders or outsiders. One such measure is the inability of a prospective users to register on the platform without the permission of the administrators. To register on the platform, all necessary details such as name, address, tax documents, payment methods, and relevant licenses are sent to the administrator for proper verification. When the authenticity of these documents has been proven, the administrator then creates the account for the customer and forwards the details for login to the management system. Also, since the drugs purchased through the platform are for pharmaceutical purposes, and as such, are ordered in bulk, if a small quantity of drugs is ordered, the administrators are notified, who then confirms the order from the pharmacy to ensure that an intruder has not obtained their login details.

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