**DECLARATION BY THE CANDIDATE**

I hereby declare that the project report entitled “**Medwise-Disease Detection**” submitted by me to Devang Patel Institute of Advanced Technology and Research, Changa partial fulfilment of the requirement for the award of the degree of **B.Tech** in Computer Engineering, from U & P U. Patel Department of Computer Engineering, DEPSTAR is a record of bonafide CE367 Project-IV carried out by me under the guidance of **Prof. Premal Patel**. I further declare that the work carried out and documented in this project report has not been submitted anywhere else either in part or in full and it is the original work, for the award of any other degree or diploma in this institute or any other institute or university.

Probin Bhagchandani(22DCE006)

Shivaansh Dave (22DCE017)

Japan Kachhiya (22DCE040)

Vraj Shah(23D2DCE150)

Prof. Premal Patel

Assistant Professor

Department of Computer Engineering

DEPSTAR,Charusat University

Changa.

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# ABSTRACT

Medwise is designed to assist in early disease detection and risk assessment, focusing on diabetes and pneumonia prediction. The system leverages machine learning to analyze patient health parameters for diabetes prediction and deep learning models for pneumonia detection using X-ray images. It provides real-time analysis with probability scores and insights, enhancing early diagnosis and proactive healthcare. The platform ensures scalability and efficiency, allowing seamless user interaction through an intuitive interface. The technology stack includes Python for model development, Firebase for data management, and cloud-based infrastructure for reliable processing. Future enhancements aim to expand disease detection capabilities, integrate wearable health devices, and improve AI explainability. The system is designed to support healthcare professionals with data-driven insights, improving diagnostic accuracy and patient outcomes. By leveraging advanced healthcare technology, Medwise aspires to provide an accessible and intelligent solution for disease prediction and preventive care.

# ACKNOWLEDGEMENT

I, the developer of "Medwise" a comprehensive disease detection application, with immense pleasure and commitment, would like to present this project assignment. The development of this project has provided me with a wide array of opportunities to think critically, implement solutions effectively, and interact with various aspects of web development and emerging technologies.

I hereby take this opportunity to express my heartfelt gratitude to several individuals who generously extended their valuable time, support, and cooperation in developing this project.

I express my deep sense of gratitude towards our Head of the Computer Engineering Department, Dr. Dweepna Garg, for their unwavering support and guidance throughout the entire duration of this project. I am profoundly thankful to my project guide, Prof. Premal Patel, whose expert advice, insightful feedback, and encouragement were instrumental in the successful completion of this project. Their support prompted me to work diligently and adopt new technologies, which significantly enhanced the quality of my work.

Thank you,

Probin Bhagchandani (22DCE006)

Shivaansh Dave (22DCE017)

Japan Kachhiya (22DCE040)

Vraj Shah (23D2DCE150)

# CHAPTER 1: Project Definition

**Project Definition**

**Description**

Chronic diseases like diabetes and pneumonia significantly impact global health, often going undiagnosed due to limited access to early detection tools. Timely diagnosis and risk assessment are crucial for effective disease management and improved patient outcomes. Medwise is designed to provide an intelligent and accessible solution for disease prediction using machine learning and deep learning models. The system analyzes patient health parameters to predict diabetes risk and processes X-ray images for pneumonia detection. With real-time analysis, probability scores, and user-friendly insights, Medwise empowers individuals and healthcare professionals to make informed decisions. The platform aims to enhance early diagnosis, streamline healthcare accessibility, and improve overall patient care.

# CHAPTER 2: Description

Project Objectives:

* Provide accurate disease predictions by leveraging machine learning for diabetes risk assessment and deep learning for pneumonia detection.
* Deliver real-time analysis with probability scores, risk factors, and visual insights to enhance medical decision-making.
* Ensure accessibility through a user-friendly interface, enabling both patients and healthcare professionals to input data and receive instant results.
* Improve healthcare efficiency by integrating with medical databases and wearable health devices for continuous monitoring.
* Enhance disease awareness and early diagnosis through AI-driven explanations, empowering users with actionable health insights.

This project’s innovation lies in its use of advanced AI models to create an accessible, efficient, and scalable disease prediction system, aiming to improve early detection and healthcare outcomes.

# CHAPTER 3: Software and Hardware Requirements

# Software and Hardware Requirements.

**3.1 Hardware Requirements**

Processor: Any modern processor capable of running a web browser.

RAM: 4GB or more for optimal performance.

Hard Drive: No specific requirement, as the application is web-based and does not require local storage.

Display: Any monitor or screen with a resolution of 1024x768 or higher.

**3.2 Software Requirements**

Operating System: Compatible with Windows, macOS, and Linux distributions.

Programming Language: Python for model development and backend processing.

Development Tools: Jupyter Notebook, Visual Studio Code, or PyCharm for coding and debugging.

Database: Firebase for real-time data management and storage.

Frameworks and Libraries: TensorFlow/Keras for deep learning, NumPy and Pandas for data processing, and Flask/Django for backend API development.

Deployment Environment: Can be hosted on cloud platforms such as Google Cloud or AWS for scalability and accessibility.

# CHAPTER 4: Major Functionality

# Major Functionality

1. Disease Prediction System

Enables users to input medical data such as glucose levels, BMI, and X-ray images to receive disease predictions. The system processes these inputs using trained models to detect diabetes risk and pneumonia presence, providing users with timely health insights.

2. Real-Time Health Analysis

Delivers instant predictions with probability scores and key risk factors, allowing users to assess their health status quickly. The system generates visual reports and explanations to support better understanding and informed decision-making.

3. User-Friendly Interface

Designed for both patients and healthcare professionals, the platform offers an intuitive and accessible interface for inputting medical data and viewing results. Simple navigation ensures ease of use for all users, regardless of technical expertise.

4. Health Data Management

Allows users to maintain a history of their medical records, enabling continuous monitoring and trend analysis. This feature helps track changes in health over time and facilitates better diagnosis and treatment planning.

5. Scalability & Performance

Optimized for handling multiple users efficiently, ensuring fast response times even with increasing data loads. The system is designed to maintain accuracy and reliability under varying conditions, supporting future expansions such as multi-disease prediction.

# CHAPTER 5: Flow Chart

# Flow Chart

# 

**Preparations for the project:**

**Process 1: Learning about Technology** This phase involves understanding the project's core concepts and objectives, studying relevant technologies and reviewing existing real estate platforms for inspiration.

**Process 2: Analyzing the Requirements** In this chapter, user needs and project requirements are identified. Market research and competitive analysis are conducted to finalize the project's specifications and features.

**Process 3: Designing the Project** This stage focuses on creating prototype designing for the key pages, and refining the designs based on feedback to ensure an intuitive and engaging user experience.

**Process 4: Implementation and Coding** Here, the development environment is set up, core functionalities (such as Property Search and View Properties) are developed, and Property Details are integrated with a responsive design.

**Process 5: Testing and Validating** The final phase involves conducting unit and integration testing, followed by user testing to gather feedback and make final adjustments, ensuring the project is user-friendly.

# CHAPTER 6: Screenshots of your project output

# Application Screenshots:

# CHAPTER 7: Limitations of project

# Limitations of project

1. Dependence on Internet for Certain Features

While the system processes some medical data locally, features like real-time updates, cloud-based storage, and integration with external medical databases require an active internet connection. Limited connectivity may affect accessibility in remote areas.

2. Accuracy of Disease Prediction

The model’s predictions rely on trained machine learning algorithms and available datasets. However, variations in patient data, incomplete medical history, or unforeseen health factors may impact prediction accuracy, necessitating further clinical validation.

3. Limited Disease Scope

Currently, Medwise is designed to detect only diabetes and pneumonia. While future enhancements aim to expand its diagnostic capabilities, the system is currently restricted to a narrow set of diseases, limiting its overall applicability.

4. Reliance on Image Quality for Pneumonia Detection

The accuracy of pneumonia detection depends on the quality of uploaded X-ray images. Low-resolution or unclear images may lead to incorrect predictions, requiring manual verification by healthcare professionals.

5. User Awareness and Interpretation Challenges

Patients with limited medical knowledge may struggle to interpret probability scores and health risk assessments accurately. Misinterpretation of results without professional guidance could lead to unnecessary anxiety or incorrect self-diagnosis.

6. Regulatory and Ethical Considerations

The system handles sensitive medical data, necessitating strict compliance with healthcare regulations like HIPAA and GDPR. Ensuring data privacy, ethical AI use, and secure patient information management are critical challenges that require continuous monitoring and updates.

# CHAPTER 8: Outcome

# Outcome

1. Improved Early Disease Detection

Medwise enhances early diagnosis of diabetes and pneumonia by leveraging machine learning models, enabling timely medical intervention and reducing the risk of complications.

2. Faster and More Accessible Health Assessments

Users receive instant probability scores and risk assessments, allowing them to make informed decisions about their health without waiting for traditional diagnostic procedures.

3. Integration of AI in Healthcare

The project demonstrates the potential of AI-powered medical diagnostics, highlighting the role of deep learning in analyzing X-ray images and predicting disease risk with high accuracy.

4. User-Centric and Accessible Design

The platform is designed for ease of use, ensuring that both healthcare professionals and individuals can input data effortlessly and understand the results without requiring technical expertise.

5. Challenges in Data Accuracy and Model Reliability

The project underscored the importance of high-quality training data and ongoing validation to improve prediction accuracy and minimize false positives or negatives in disease detection.

6. Future Scope for Multi-Disease Prediction

Medwise lays the foundation for expanding AI-driven diagnostics to cover a wider range of diseases, demonstrating scalability and the potential for integration with wearable health devices and telemedicine services.

# CHAPTER 9: Future Enhancement

# Future Enhancements

1. Expansion to Multi-Disease Prediction

Medwise aims to extend its capabilities beyond diabetes and pneumonia, incorporating AI models for detecting additional diseases such as cardiovascular conditions and respiratory infections.

2. Enhanced AI and Deep Learning Models

Improving machine learning algorithms with more diverse and extensive datasets will refine prediction accuracy, reducing false positives and negatives in diagnosis.

3. Integration with Wearable Health Devices

Future updates will enable Medwise to connect with wearable health trackers to continuously monitor vital signs and provide real-time health insights.

4. Telemedicine Support for Remote Consultations

Adding telemedicine features will allow users to consult with healthcare professionals directly through the platform, ensuring timely medical guidance based on AI-generated health assessments.

5. Personalized Health Recommendations

Implementing AI-driven personalized health advice based on patient history and risk factors will help users manage their conditions more effectively.

6. Mobile Application Development

Expanding Medwise to a dedicated mobile application will enhance accessibility, enabling users to input health data and receive predictions on the go.

7. Multi-Language Support for Accessibility

Incorporating multilingual capabilities will ensure that non-English-speaking users can access and understand their health assessments effortlessly.

8. Improved Data Security and Compliance

Strengthening data encryption and adhering to healthcare regulations (such as HIPAA and GDPR) will ensure user privacy and secure handling of sensitive health information.

# CHAPTER 10: Conclusion

# CONCLUSION

The development of Medwise has been an insightful and transformative journey, allowing us to explore the complexities of AI-driven disease prediction and its impact on healthcare. Throughout this project, we have gained invaluable knowledge on integrating advanced machine learning models to provide reliable and accessible health assessments.

Working on Medwise has strengthened our ability to design user-centric healthcare solutions while addressing real-world challenges such as predictive accuracy, data security, and usability. By implementing AI-based disease detection, we have deepened our technical expertise and problem-solving abilities, ensuring that the system provides meaningful support to users seeking early diagnosis and better health management.

Collaboration with mentors and healthcare professionals has played a crucial role in refining our approach. Their insights and constructive feedback have guided us in optimizing our prediction models, improving system reliability, and ensuring ethical considerations in handling health data. This project has reinforced the significance of continuous learning, iteration, and responsiveness to user needs in healthcare innovation.

Reflecting on our journey with Medwise, we take pride in the progress made and the potential impact of our solution in early disease detection.

This experience has not only enhanced our technical and analytical skills but has also fostered a deeper commitment to leveraging technology for healthcare advancements.

Looking ahead, we are eager to build upon the foundations established through this project, expanding Medwise with additional disease detection capabilities and integrations with wearable health devices. The lessons learned during this development process will undoubtedly guide us in future endeavours, inspiring us to create innovative solutions that bridge the gap between technology and healthcare accessibility.

# REFERENCES

<https://docs.flutter.dev/>

<https://pub.dev/packages/flutter_local_notifications>

<https://www.cometchat.com/docs/extensions/flutter-push-notifications>

<https://www.courier.com/guides/flutter-notifications>

<https://pub.dev/packages/google_maps_flutter>

<https://fluttergems.dev/geolocation-maps/>

<https://www.youtube.com/watch?v=VPvVD8t02U8>

<https://www.youtube.com/playlist?list=PLr7P7lMIUTuukkflWTYrPgTwueG-BoUHN>

<https://www.youtube.com/playlist?list=PL9n0l8rSshSmNoWh4KQ28nJn8npfMtzcs>

<https://console.twilio.com/>

<https://developers.google.com/maps/documentation/javascript/get-api-key>