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"MODELMART-AI" AN CENTRALIZED PLATFORM FOR MULTIPLE PROBLEMS

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ABSTRACT: In recent years, machine learning has been used to solve many types of real-world problems. Most systems, however, are built for one specific purpose, which limits their overall use. ModelMart-AI: A Centralized Platform for Multiple Problems is designed to bring different machine learning models together in one place so that users can easily access and use them. The platform currently includes models for predicting house rent, mobile phone prices, battery life for electric vehicles, diabetes risk, and more. Each model is trained on suitable datasets, uses proper preprocessing, and is made available through an easy-to-use Streamlit web interface. The design of ModelMart-AI makes it simple to add more models in the future, which can help it serve multiple fields such as real estate, healthcare, fitness, and automotive. This approach provides a single platform that combines different AI solutions in a practical and user-friendly way. The platform reduces the need to maintain separate applications for each use case, saving time and resources. It also encourages innovation by allowing new models to be added and tested without changing the main system.

KEYWORDS: Machine Learning, Prediction Models, Centralized Platform, Artificial Intelligence, Streamlit, Modelling Algorithms

INTRODUCTION

Machine learning (ML) and artificial intelligence (AI) are becoming an important part of many industries. They help in making predictions, automating processes, and improving decision-making. However, most ML solutions are developed for a single specific problem. This means that users need different applications or platforms to solve different types of problems, which can be time-consuming and inefficient. ModelMart-AI: A Centralized Platform for Multiple Problems is developed to solve this limitation. It is a single platform where multiple prediction and classification models are combined, allowing users to access them from one place. The main goal is to make it easier for people from different fields to use AI without having to set up separate systems for each problem. The platform currently contains a variety of models, including house rent prediction, mobile price estimation, battery life prediction for electric vehicles, diabetes prediction, workout recommendation, hydration level calculation, house buying capacity prediction, second-hand car price prediction, and iris flower classification. These models cover multiple sectors such as real estate, healthcare, fitness, and automotive. ModelMart-AI is built using supervised learning techniques and follows a modular design, which makes it easy to add new models in the future. The user interface is created using Streamlit, which allows users to interact with the models in a simple and friendly way. This design helps both technical and non-technical users to make use of AI-based predictions effectively.

II. LITERATURE SURVEY

In recent years, many researchers and developers have created machine learning models to solve specific real-world problems. For example, in the real estate sector, price prediction systems have been built using regression techniques to estimate house prices or rental costs based on features like location, size, and property type. While these systems can be accurate, they usually focus on one task and cannot be used for other purposes without major changes. In healthcare, predictive models have been developed for detecting diseases such as diabetes and heart conditions. These models use patient health records, test results, and lifestyle information to predict the risk of a disease. Such systems have shown good results but are often limited to a single medical condition. Several fitness and wellness applications also use AI to recommend workouts, monitor hydration levels, or track calorie intake. These applications are helpful but are often isolated from other predictive tools, meaning users need multiple platforms for different needs. From the above

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examples, it is clear that there is no widely available platform that combines multiple prediction models from different domains in one place. This gap in integration is the main motivation behind developing ModelMart-AI, which aims to bring different models together for easy access, usability, and future scalability.

EXISTING SYSTEM

The existing systems in the market focus on individual use cases. For example, a house rent prediction model will only predict rent and cannot provide health-related predictions. Similarly, a diabetes prediction system cannot be used to estimate car resale prices. This lack of integration forces users to use multiple applications for different needs, which is both time-consuming and inefficient. Additionally, most existing systems are designed for technical users and may require programming knowledge or complex installations. They are often built without a unified user interface, making it harder for non-technical users to operate them. There is also limited flexibility for adding new models or expanding to other problem domains without creating a completely new application.

PROPOSED SYSTEM

ModelMart-AI: A Centralized Platform for Multiple Problems is designed to address the limitations of existing systems. It integrates multiple prediction and classification models from different fields such as real estate, healthcare, automotive, and fitness into a single, user-friendly web application. The platform uses supervised learning models that have been trained on suitable datasets, with proper preprocessing techniques like label encoding and feature scaling applied where necessary. Each model works as a separate module but shares the same interface through Streamlit, making it easy for users to switch between them. The modular design allows developers to add new models without affecting the existing ones. This approach reduces development time for future features and ensures that users always have access to the latest AI solutions in one place. The proposed system also focuses on accessibility, allowing both technical and non-technical users to benefit from AI-powered predictions without specialized knowledge.

III. SYSTEM ARCHITECTURE

The architecture of ModelMart-AI is designed in a modular way so that multiple machine learning models from different domains can be integrated and accessed through a single platform. The system is divided into several layers, each performing a specific function.

User Interface Layer – This is built using Streamlit and serves as the front end of the application. Users can select the type of problem they want to solve, provide input data, and view the predictions generated by the models.

Application Layer – This layer acts as the controller for the platform. It handles the communication between the user interface and the machine learning models. Based on the user's selection, it routes the input to the relevant model.

Machine Learning Model Layer – Each model in this layer is trained to handle a specific prediction or classification task. The models are stored independently so that updates or additions can be made without affecting others. Examples include house rent prediction, diabetes detection, mobile price estimation, and more.

Data Processing Layer – This layer is responsible for preprocessing input data. It includes steps such as label encoding, normalization, and handling missing values. This ensures that the input is in the correct format for the selected model.
Data Storage Layer – Stores the datasets used for training and any historical data generated by the models. This data can be reused for retraining or improving the models.

Prediction Output Layer – After the model processes the input, the result is sent back to the user interface in a clear and easy-to-understand format

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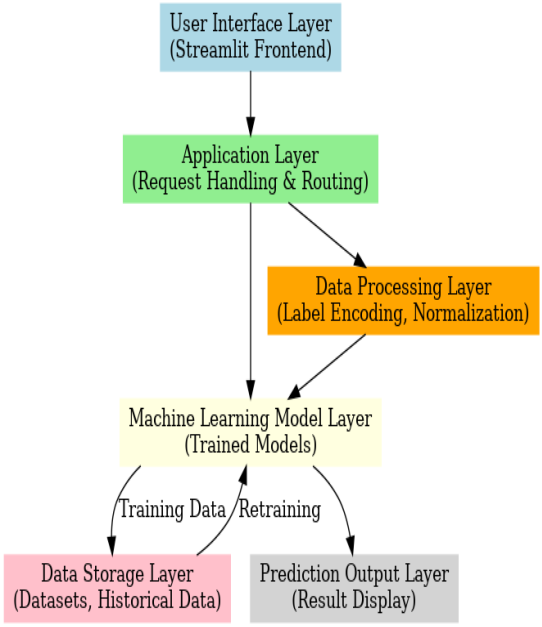

Fig 3.1 System Architecture

IV. METHODOLOGY

The methodology of ModelMart-AI explains the step-by-step process followed to build and run the platform. The goal is to ensure smooth integration of multiple prediction models under one interface while maintaining accuracy and usability.

Step 1 – Data Collection
Each model in the platform is trained on a dataset relevant to its purpose. For example, the house rent prediction model uses real estate data from Bangalore, and the diabetes prediction model uses medical datasets. All datasets are collected from reliable sources or generated to simulate realistic values.

Step 2 – Data Preprocessing
Before training, the data goes through cleaning and preprocessing. This includes handling missing values, converting text data into numerical form using techniques like Label Encoding or One-Hot Encoding, and scaling numerical features if required. This step ensures that the data is in a suitable format for machine learning algorithms.

Step 3 – Model Selection and Training
For each problem, a suitable supervised learning algorithm is chosen based on the type of output required. For regression problems, algorithms like Linear Regression or Random Forest Regressor are used, while for classification problems, algorithms like Logistic Regression, Decision Tree Classifier, or Random Forest Classifier are applied. The models are trained and tested using split datasets to check their performance.

Step 4 – Model Integration
Once trained, the models are saved and integrated into the platform. Each model is treated as a separate module that can be accessed independently through the application. This modular approach allows easy addition or replacement of models in the future.

Step 5 – Web Interface Development
The platform's user interface is developed using Streamlit. Users can select the desired model, input required values, and instantly receive predictions. The interface is designed to be simple so that both technical and non-technical users can operate it without difficulty.

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Step 6 – Prediction and Output Display
When a user inputs data and selects a model, the input is preprocessed, sent to the selected model, and the output is generated. The result is displayed in a clear and understandable format, often along with relevant suggestions or interpretations.

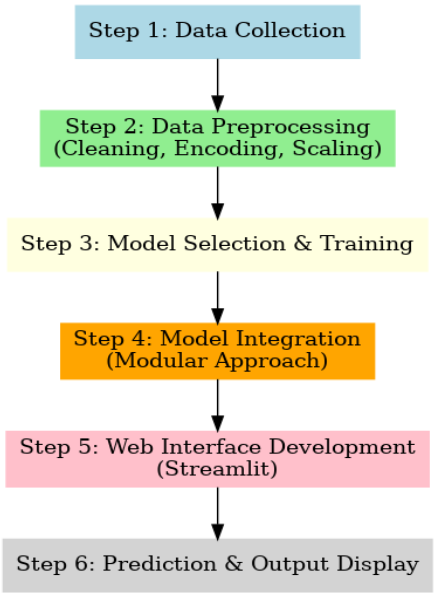

Fig 4.1 Methodology

V. DESIGN AND IMPLEMENTATION

The design of ModelMart-AI focuses on modularity, scalability, and ease of use. Each machine learning model is built as an independent unit that can be accessed through a single Streamlit interface. The implementation follows a clear workflow from data collection to prediction delivery.

Design:
The platform uses a modular architecture, where each model operates separately but is connected to the same interface. This allows updates or new models to be added without modifying the entire system. The design consists of:
Frontend: Built using Streamlit for interactive web-based input and output.
Backend: Python-based machine learning scripts for each model.
Data Preprocessing Module: Handles label encoding, scaling, and missing value treatment before sending data to the model.
Routing Logic: Determines which model to use based on the user's selection.

Implementation:
Dataset Preparation – Each dataset is cleaned, preprocessed, and split into training and testing sets.
Model Training – Different supervised learning algorithms are chosen based on the problem type:
1. Regression models
2. Classification models

Evaluation – Models are tested using accuracy, R^2 score, or other relevant metrics to ensure good performance.
Integration with Streamlit – Each model's input fields are designed in the frontend to match its features. The backend processes inputs, applies preprocessing, and runs the prediction.
Deployment – The platform is deployed locally or on a cloud environment so that users can access it through a web

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browser without installing separate dependencies.

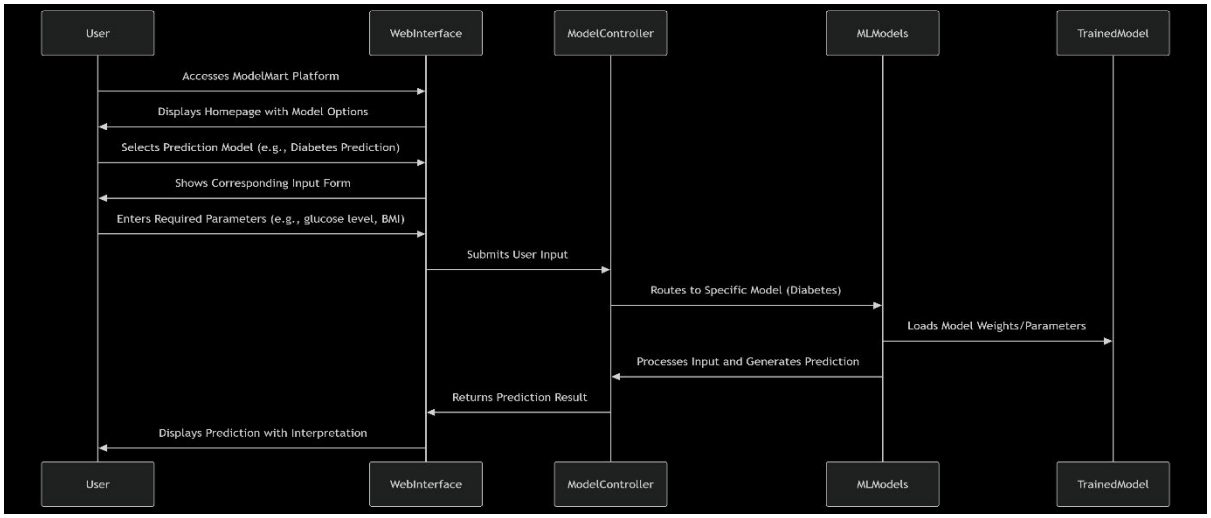

Fig 5.1 Sequential Diagram

VI. OUTCOME OF RESEARCH

The development of ModelMart-AI resulted in a centralized platform capable of handling multiple prediction and classification tasks from different domains. The system successfully integrates models such as house rent prediction, mobile price estimation, battery life prediction for electric vehicles, diabetes detection, and more into a single, user-friendly interface. Each model demonstrates reliable accuracy after being trained and tested on relevant datasets. The platform allows users to easily switch between models without needing to install separate tools or learn different interfaces. One of the major outcomes is the modular design, which makes it possible to add new models in the future without disrupting the existing ones. This flexibility ensures long-term scalability and adaptability. The use of Streamlit for the interface has made the platform accessible to both technical and non-technical users, thereby widening its applicability. Overall, the research has produced a robust, easy-to-use, and expandable AI-based solution that addresses the gap between single-purpose prediction systems and the need for integrated multi-domain platforms.

VII. RESULT AND DISCUSSION

The implementation of ModelMart-AI has shown promising results across different prediction and classification models integrated into the platform. Each model was trained and tested using relevant datasets, and performance metrics such as accuracy, precision, recall, and R^2 score were used to evaluate their effectiveness. For example, the house rent prediction model achieved a high R^2 score, indicating its ability to accurately estimate rental prices based on location, property type, and other features. Similarly, the diabetes prediction model produced strong classification accuracy, making it suitable for preliminary health assessments.

The unified platform design proved beneficial for usability, as users could access multiple AI solutions without switching between different applications. The modular approach also made it easier to update existing models or introduce new ones. During testing, the interface was found to be intuitive, allowing even non-technical users to perform predictions with minimal guidance. However, the results also revealed certain limitations. The accuracy of some models, such as mobile price estimation, was influenced by the quality and size of the dataset. In cases where data was limited or not fully representative, performance dropped slightly. This highlights the importance of continuously updating datasets and retraining models to maintain accuracy.

Overall, the results confirm that the system meets its goal of providing a centralized AI-powered solution for multiple real-world problems. The discussion emphasizes that with better datasets and periodic retraining, the platform's predictive performance can improve further, making it even more reliable for real-world deployment.

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VIII. CONCLUSION

The research and development of ModelMart-AI have successfully addressed the need for a single platform that can handle multiple AI-based prediction and classification tasks. By combining models from various domains such as real estate, healthcare, automotive, and fitness—into one centralized system, the platform provides convenience, scalability, and efficiency. The modular architecture ensures that each model works independently, making it easy to add, update, or remove models without affecting the overall system. The use of Streamlit for the user interface has made the platform highly accessible, enabling both technical and non-technical users to interact with complex machine learning models through a simple and interactive web environment. The results from the implemented models have shown that the platform can deliver reliable and accurate predictions when trained on quality datasets.

In conclusion, ModelMart-AI not only demonstrates the practical benefits of integrating multiple models into a unified system but also serves as a foundation for future expansion. With regular dataset updates, model retraining, and the addition of more diverse AI solutions, the platform has the potential to become a comprehensive AI service hub for multiple industries.

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