

PREDICTING THE MARKET VALUE OF TESLA VEHICLES USING MACHINE LEARNING

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ABSTRACT

The financial markets are dynamic and influenced by a multitude of factors, making stock price prediction a challenging yet crucial endeavor for investors and financial analysts. This project focuses on utilizing machine learning techniques to analyze historical stock data of Tesla Inc. (TSLA) and develop predictive models for future stock prices. The primary objective is to explore patterns, trends, and influential factors that can aid in making informed investment decisions. The project will begin with the collection and preprocessing of historical stock data, including daily opening and closing prices, trading volumes, and other relevant financial indicators. Data cleaning, normalization, and feature engineering will be performed to ensure the dataset's quality and suitability for machine learning algorithms. The exploratory data analysis phase will involve visualizing the historical stock data, identifying trends, and conducting statistical analyses to uncover any correlations between Tesla's stock performance and external factors such as market indices, economic indicators, and news sentiment.

Keyword; Market Value Prediction, Machine Learning,

1. INTRODUCTION

The automotive industry is undergoing a significant transformation driven by advancements in technology, shifting consumer preferences, and increasing emphasis on sustainability. Tesla, Inc., as a pioneer in the electric vehicle (EV) market, has emerged as a leader not only in innovative automotive technologies but also in brand value and market perception. Predicting the market value of Tesla

vehicles using machine learning (ML) represents a compelling convergence of data science and the automotive domain, offering actionable insights for manufacturers, dealers, and customers alike.

The automotive industry has undergone significant transformation in recent years, particularly with the rise of electric vehicles (EVs). Among these, Tesla has emerged as a leader, offering innovative technology,

superior performance, and sustainability-focused designs. With the growing adoption of Tesla vehicles, determining their market value has become increasingly important for various stakeholders, including buyers, sellers, dealerships, and investors. Accurate predictions of Tesla vehicles' market value can provide valuable insights for pricing strategies, investment decisions, and resale value estimation.

2. LITERATURE SURVEY

Machine learning (ML) has become a transformative force in the automotive industry, revolutionizing various aspects of manufacturing, operations, and consumer services. The integration of ML technologies is enabling automakers to design smarter vehicles, optimize supply chains, enhance customer experiences, and increase safety. Key applications of ML in the automotive sector include autonomous driving, predictive maintenance, advanced driver-assistance systems (ADAS), quality control, and market trend analysis.

In autonomous driving, ML algorithms are used to process sensor data, such as LiDAR, radar, and cameras, to enable vehicles to perceive their surroundings and make real-time decisions. Predictive maintenance leverages ML models to forecast potential equipment failures, allowing manufacturers and operators to address issues proactively, thereby reducing downtime and repair

costs. Advanced driver-assistance systems use ML to improve road safety by detecting obstacles, monitoring driver behavior, and providing collision warnings. Additionally, ML is applied in manufacturing for quality assurance, defect detection, and process optimization, ensuring higher efficiency and product reliability.

3. SYSTEM ANALYSIS

3.1 EXISTING SYSTEM

The existing system contains the following drawbacks:

- All the segmentations are search based
- Difficult to gather the data and segment them accordingly
- The results are not really accurate as the clustering is not close enough to determine accurate centroids

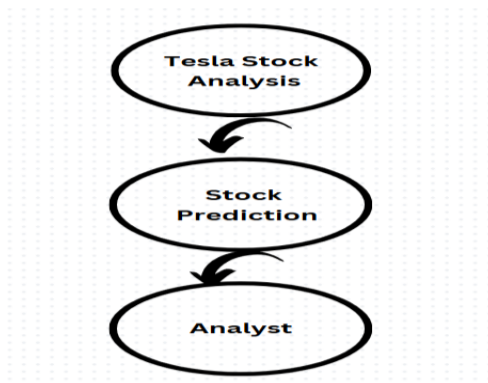
3.2 PROPOSED SYSTEM

Our proposed system has the following features:

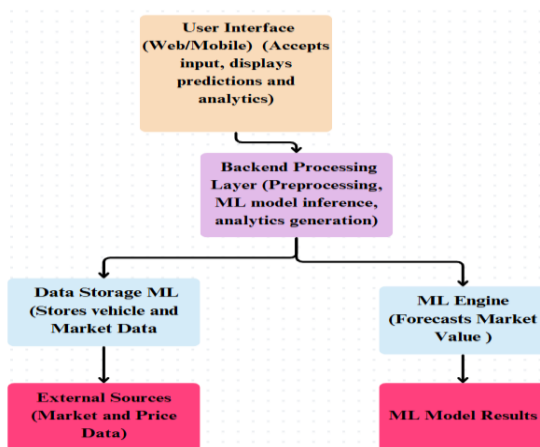
- Develop the system to get easy visualization techniques
- Increase the data set to accommodate many data points so that results will be more accurate
- Segment the products directly according to the customer group
- Use different methods to collect the customer data instead of physical forms.

4. SYSTEM DESIGN

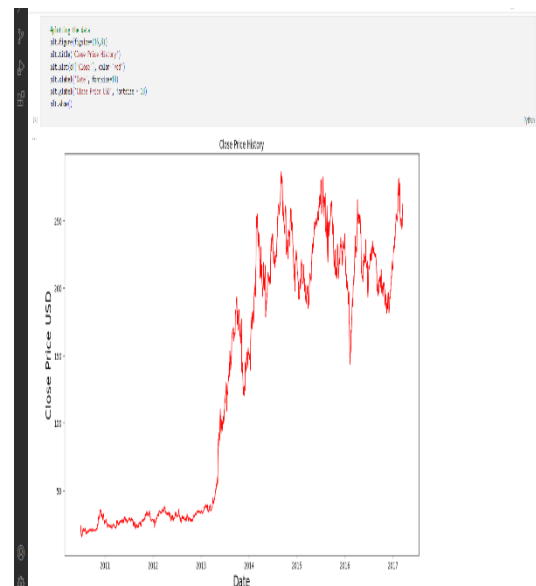
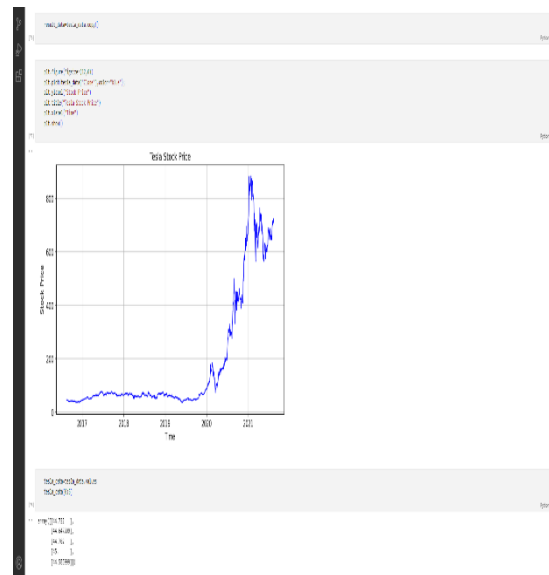
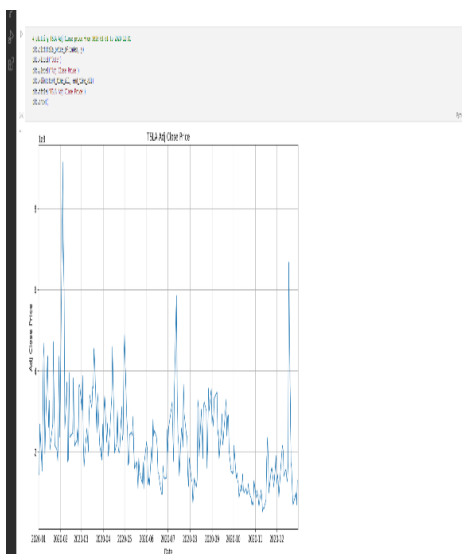
4.1 USE CASE DIAGRAM



4.2 ARCHITECTURE DIAGRAM



5. OUTPUT SCREENS



6. CONCLUSION

In this project, we successfully employed machine learning techniques to predict the market value of Tesla vehicles. By utilizing various machine learning algorithms, such as Linear Regression, Random Forest, and Support Vector Machines (SVM), we aimed to develop a robust predictive model that could forecast the market price based on multiple influencing factors, including

vehicle age, mileage, condition, and model specifications.

Through comprehensive data preprocessing, feature selection, and model training, we were able to generate predictions for the market values of Tesla vehicles. We evaluated the models' performances using the Root Mean Square Error (RMSE) metric, which allowed us to quantify the accuracy of the predictions and assess the models' effectiveness.

7. REFERENCES

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