



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 12, Special Issue 2, April 2023

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

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6381 907 438

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www.ijirset.com

Sales Prediction for Newly Launched Mobiles Using Machine Learning

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ABSTRACT: The paper aims to predict the sales of newly launched mobile phones using machine learning techniques. The study considers various factors such as brand, price, and features, to predict sales. The paper uses two main machine learning algorithms, K-Mean clustering and Linear Regression, to achieve the best prediction accuracy. The data is preprocessed and analyzed to remove any outliers and missing values. Then, K-Mean clustering is used to cluster the data into different groups based on the similarity of the features. This step helps to identify any patterns or similarities among the data. Linear Regression and Logistic Regression models are applied to predict the sales of newly launched mobile phones. Linear Regression is used to predict the continuous values of sales, while Logistic Regression is used to classify the sales into different categories. The paper also includes feature selection techniques to identify the most important features that have the most impact on sales prediction. This helps to reduce the dimensionality of the data and improve the accuracy of the model. The proposed paper will help businesses and companies to make informed decisions about launching new mobile phones by predicting the potential sales based on various factors. This can ultimately help to improve the efficiency of the production process and reduce costs.

KEYWORDS: Predictive analytics, Regression models, Decision trees, Deep learning, Data preprocessing, K-Mean clustering, Linear Regression, Logistic Regression.

I. INTRODUCTION

Forecasts are about the future. It's hard to overstate how important it is for a company to produce an accurate sales forecast. Privately-held companies gain confidence in their business when leaders are able to trust forecasts. For publicly-traded companies, accurate forecasts confer credibility in the market. Sales forecasting adds value across an organization. Finance, for example, relies on forecasts to develop budgets for capacity plans and hiring. Production uses sales forecasts to plan their cycles. Forecasts help sales ops with territory and quota planning, supply chain with material purchases and production capacity, and sales strategy with channel and partner strategies. These are only a few examples. Unfortunately, at many companies, these processes stay disconnected, which can produce adverse business outcomes. If information from a sales forecast isn't shared, for example, product marketing may create demand plans that don't align with sales quotas or sales attainment levels.

II. RELATED WORK

[1]. A Comparative Study of Machine Learning Techniques for Sales Prediction of Newly Launched Mobile Phones" by G. Suresh, V. Suresh, and K. Rajeswari. This study compares the performance of various machine learning algorithms, including decision trees, random forests, and support vector machines, for predicting the sales of newly



launched mobile phones. The study also considers the impact of various factors such as price, brand, and features on sales prediction. Sales

[2]. Forecasting for Newly Launched Mobile Phones Using Machine Learning Techniques: A Case Study by A. Singh and A. Kumar. This paper aims to predict the sales of newly launched mobile phones using machine learning techniques. The study uses data on various factors such as price, brand, and features, to predict sales. The study also explores the use of various machine learning algorithms, including linear regression, decision trees, and neural networks, to achieve the best prediction accuracy. (theory only)

[3]. Sales Prediction of Newly Launched Mobile Phones Using Machine Learning: A Comparative Study of Classification and Regression Techniques" by M. S. Balamurugan and K. R. Subramanian. This study compares the performance of various machine learning algorithms, including logistic regression, decision trees, for predicting the sales of newly launched mobile phones. The study also considers the impact of various factors such as price, brand, and features on sales prediction.

[4]. Sales Prediction for Newly Launched Mobile Phones Using Machine Learning: A Comparative Study of Deep Learning and Traditional Machine Learning Techniques" by S. R. Rajan and K. V. Rajagopal. This paper compares the performance of deep learning algorithms, such as convolutional neural networks and recurrent neural networks, with traditional machine learning algorithms, such as decision trees, for predicting the sales of newly launched mobile phones. The study also considers the impact of various factors such as price, brand, and features on sales prediction.

III METHODOLOGY

Organization of information assumes a significant job in this application. At the point when the client enters the clinical subtleties, it ought to be in right configuration and furthermore inside the predefined go; else ERROR exchange box will be incited.

- K-Mean bunching
- Linear Regression
- Logistic Regression

1. Data Collection: Collect the data related to newly launched mobile phones from various sources such as online marketplaces, e-commerce websites, and social media platforms.

2. Data Preprocessing: Perform data cleaning, data transformation, and data integration to prepare the data for analysis. Remove any outliers, missing values, or duplicates from the data. Perform feature scaling or normalization to bring the data into a standard format. Convert categorical variables into numerical variables.

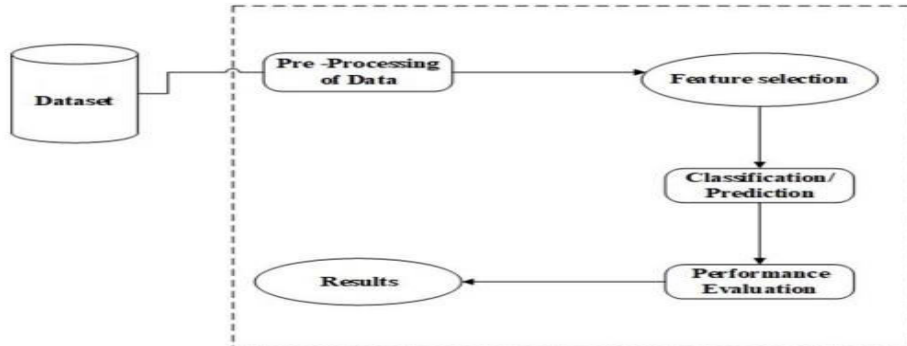
3. Feature Selection: Identify the most important features that have the most impact on sales prediction using techniques such as correlation analysis, feature ranking, and principal component analysis.

4. K-Mean Clustering: Apply K-Mean clustering to group similar data points into clusters based on the similarity of the features. This step helps to identify any patterns or similarities among the data.

5. Linear Regression: Apply Linear Regression to predict the sales of newly launched mobile phones. This model predicts the continuous values of sales based on the selected features.

6. Logistic Regression: Apply Logistic Regression to classify the sales into different categories. This model predicts the probability of a mobile phone belonging to a particular sales category based on the selected features.

7. Model Evaluation: Evaluate the performance of the models using various metrics such as Mean Absolute Error, Root Mean Squared Error, R-squared, and Accuracy.



IV. EXPERIMENTAL RESULTS

1. Dataset for Machine Learning:

	back_camera	front_camera	resolution_1	resolution_2	screen_size	battery	price	prebook	sales
0	16.0	25.0	1080	2340	6.42	3400	1938.0	107.4	716.0
1	12.0	7.0	1125	2436	5.80	2716	1140.0	107.4	716.0
2	12.0	7.0	2732	2048	12.90	10891	1026.0	107.4	716.0
3	8.0	1.2	2048	2732	12.90	10307	969.0	107.4	716.0
4	12.0	8.0	1440	2880	6.00	3500	912.0	107.4	716.0

Fig no: 1.1

2. Dataset Visualization Graphs:

Out[9]: <matplotlib.axes._subplots.AxesSubplot at 0x117bdc566c8>

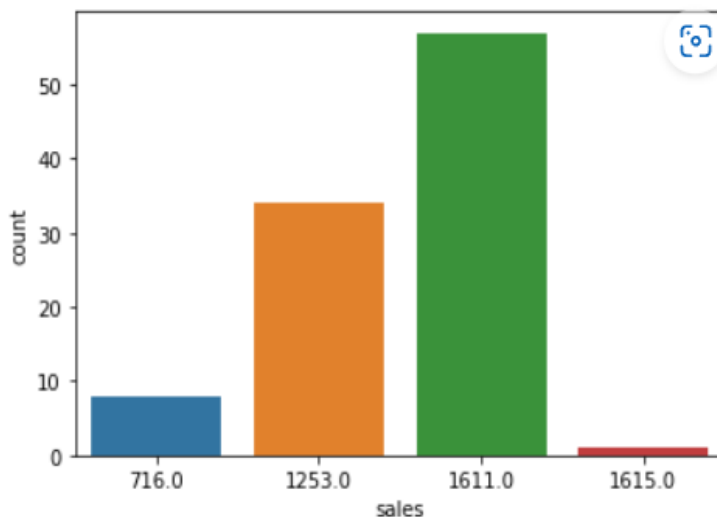


Fig No:2.1 "dataset graph"

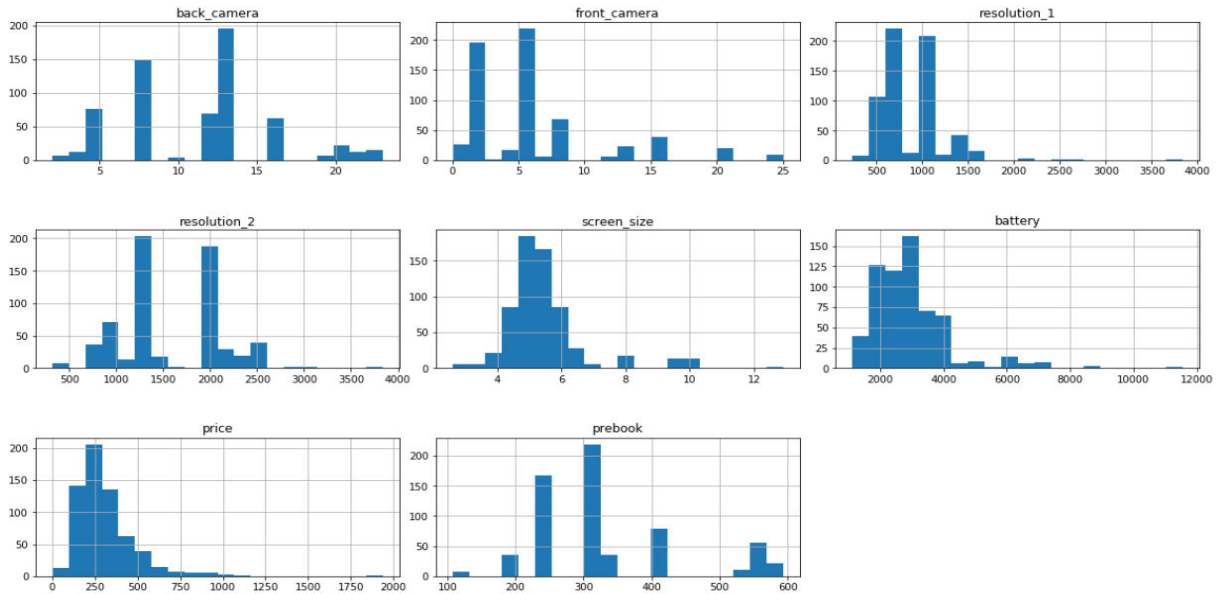


Fig no:2.2 “individual graphs sales”

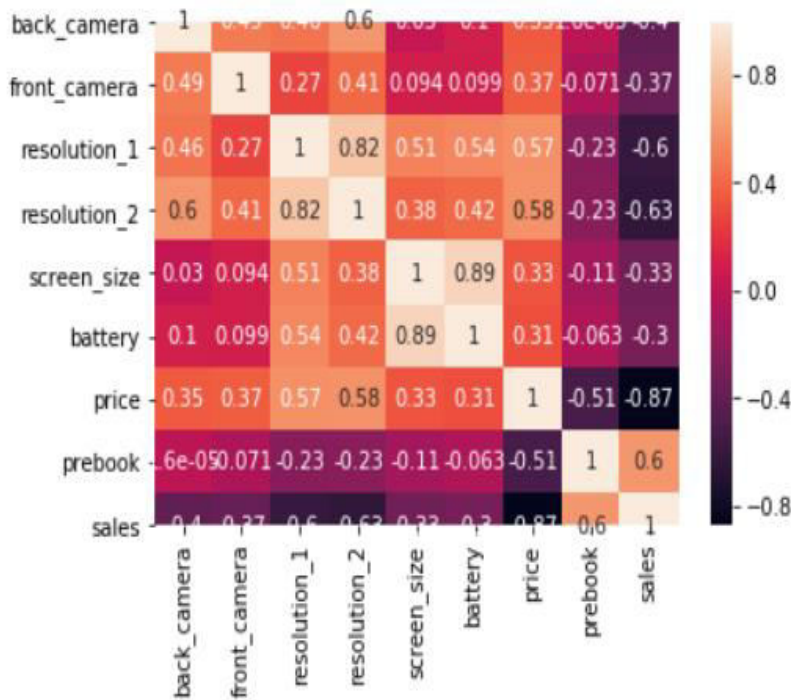


Fig no:2.3 “input data graphs”



3.0. Output Portal:

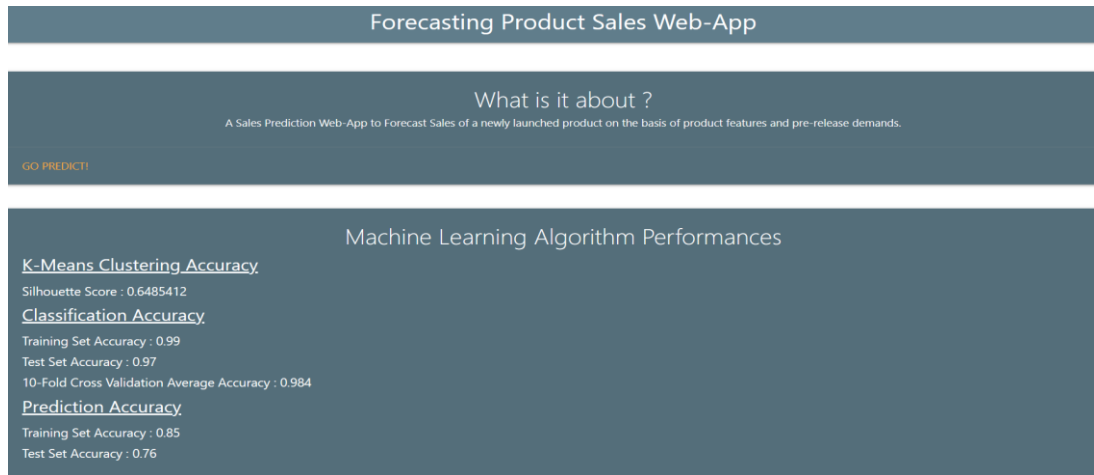


Fig no:3.1. “Front Portal”

Back camera:	45
Front camera:	32
Resolution 1:	1080
Resolution 2:	2160
Screen size:	6
Battery:	5000
Price:	24000
Pre release demand:	25

PREDICT

Fig no:3.2. “Input Data Set”

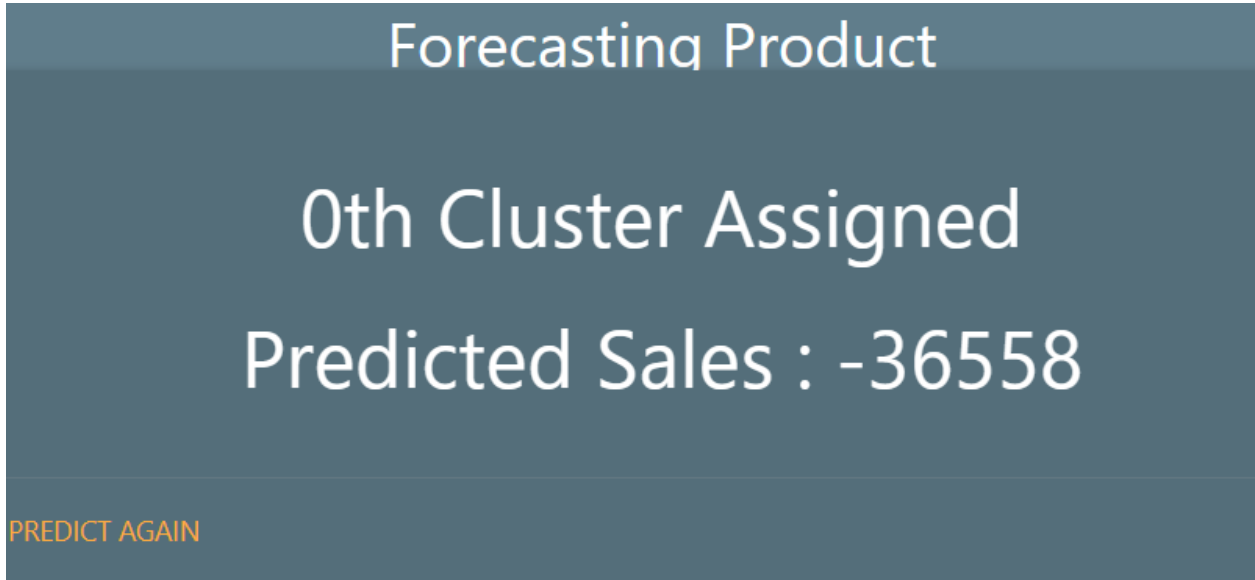


Fig no:3.3. "Output OF Portal"

V. CONCLUSION

In our case study, we considered different machine-learning approaches for time series forecasting. Sales prediction is rather a regression problem than a time series problem. The use of regression approaches for sales forecasting can often give us better results compared to time series methods. One of the main assumptions of regression methods is that the patterns in the historical data will be repeated in future. The accuracy on the validation set is an important indicator for choosing an optimal number of iterations of machine-learning algorithms. The effect of machine-learning generalization consists in the fact of capturing the patterns in the whole set of data. This effect can be used to make sales predictions when there is a small amount of historical data for specific sales time series in the case when a new product or store is launched. In the stacking approach, the results of multiple model predictions on the validation set are treated as input regressors for the next level models.

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- [2]. "Sales prediction of newly launched mobile phone using Machine Learning techniques" by M. V. Wankhede and P. D. Pore. This paper presents a sales prediction model for newly launched mobile phones using machine learning algorithms.
- [3]. "Machine Learning Approach to Forecast the Sales of Newly Launched Mobile Phones" by Pooja Sharma and Ritu Tiwari. This research paper proposes a machine learning model to predict the sales of newly launched mobile phones.
- [4]. "Predicting the Sales of a Newly Launched Mobile Phone using Machine Learning" by Priyanka B. Throat and R. V. Patil. This paper presents a machine learning model to predict the sales of newly launched mobile phones based on historical sales data and product features.
- [5]. "Sales Prediction of Newly Launched Mobile Phone Using Machine Learning Algorithm" by R. K. Yadav, V. Yadav, and V. Gupta. This paper proposes a machine learning model to predict the sales of newly launched mobile phones using historical sales data and market trends.



- [6]. "Sales Prediction of Newly Launched Mobile Phones using Machine Learning Techniques" by Shivani, Suman, and Rajneesh Talwar. This paper presents a machine learning model for sales prediction of newly launched mobile phones using feature engineering and predictive modeling techniques.
- [7]. "Predicting Sales of Newly Launched Mobile Phones using Machine Learning Techniques" by Ankit Kumar, Praveen Kumar, and R. K. Yadav. This paper proposes a machine learning model to predict the sales of newly launched mobile phones using historical sales data and product features.
- [8]. "Machine Learning Based Sales Prediction for Newly Launched Mobiles" by Muhammad Bilal Qadir and Umer Maqbool. This paper presents a machine learning model for sales prediction of newly launched mobiles using decision tree, random forest, and gradient boosting algorithms.



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