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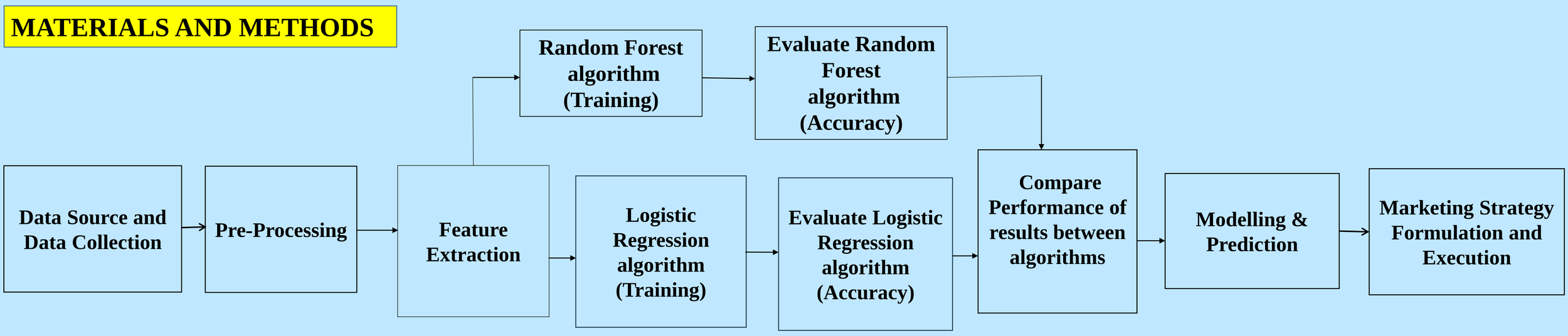
Improving Social Media Impact Prediction Accuracy for Marketing Strategy: Accuracy Analysis in Random Forest and Logistic Regression machine learning models

INTRODUCTION

- Social media has emerged as a pivotal tool for market analysis, offering real-time insights into consumer behavior and market trends. By harnessing social media data, businesses can gain a competitive edge by understanding consumer preferences, sentiment, and engagement patterns.
- This dynamic platform enables businesses to make informed decisions and adapt marketing strategies to meet evolving market demands effectively.
- The aim of this study is to separate Innovative Machine Learning (ML) algorithms to enhance the accuracy of predicting social media impact for marketing strategies, to identify the most effective predictive model for optimizing marketing decisions based on social media data.
- In this research study, Random Forest algorithm (RFA) is compared with Logistic Regression algorithm (LRA) to enhance accuracy.
- It has been demonstrated that Random Forest has proven to be accurate when compared with Logistic Regression.

Fig 1. Online Social Media Marketing Apps or Websites

MATERIALS AND METHODS



Social Media Impact Prediction Accuracy for Marketing Strategy

RESULTS

Table 1: Statistical Computations for Random Forest and Logistic Regression

	ALGORITHM	N	Mean	Std. Deviation	Std. Error Mean
ACCURACY	RF	20	93.90	1.744	0.390
	LR	20	84.35	2.641	0.591

Table 1 involve essential metrics such as mean, standard deviation, and mean standard error, with the accuracy level parameter employed in the t-test. additionally, statistical analysis reveals a significant distinction between the two algorithms, with a p-value of $p=0.025$ ($p<0.05$), emphasizing the social media influence for marketing strategy.

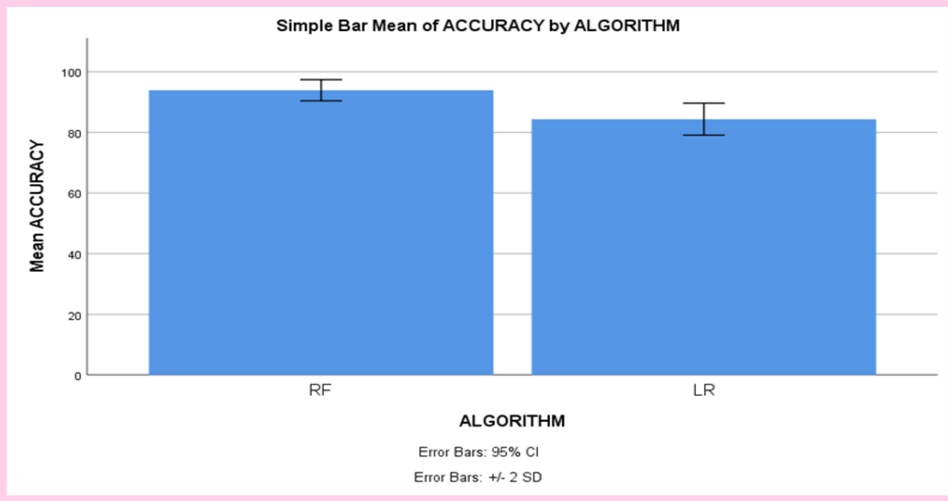


Fig 2. Comparative Error Analysis of Random Forest and Logistic Regression

DISCUSSION AND CONCLUSION

- Based on t-test Statistical analysis, the significance value of $p = 0.025$ (independent sample t - test $p<0.05$) is obtained and shows that there is a statistical significant difference between the Random Forest (RF) and Logistic Regression(LR).
- Overall , the accuracy of the Random Forest is 93.90 % and it is better than the other algorithms.

Random Forest(RF) - 93.90% Logistic Regression(LR) - 84.35%

- From the work , it is concluded that the Random Forest algorithm attains the high accuracy when comparing with other Machine Learning Algorithms in social media influence prediction accuracy for marketing strategy.
- Through real-time feedback, social media marketing has a substantial impact on marketing strategy, increasing brand awareness and boosting conversion rates.
- The effectiveness of customised campaigns, made possible by sophisticated audience analysis and precise predictive modelling methods, is what determines the relationship between higher brand recognition and business success.

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