

Enhancing Social Media Influence Prediction Accuracy for Marketing Strategy Through Comparative Analysis of Random Forest and Artificial Neural Network

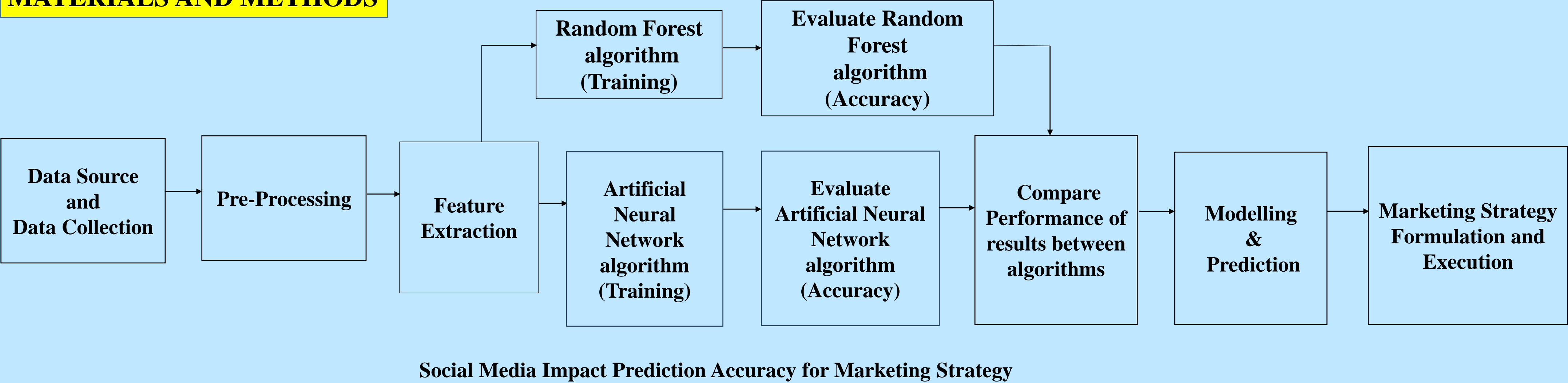
INTRODUCTION

- Due to its ability to provide current information on consumer behaviors and industry trends, social media has become an essential instrument for market analysis. Enterprises may acquire a competitive advantage by leveraging social media data to comprehend the inclinations, attitudes, and interaction trends of their customers.
- Businesses may make well-informed judgements and modify their marketing plans to successfully satisfy changing consumer expectations thanks to this dynamic platform.
- The aim of this study is to separate Innovative Machine Learning (ML) Classifiers to determine which predictive model is most useful for optimizing marketing decisions based on social media data, and to assess the accuracy of social media impact predictions for marketing initiatives.
- In this research study , Random Forest algorithm (RFA) is compared with Artificial Neural Network algorithm (ANN) to enhance accuracy.



Fig 1. Social Media Marketing

MATERIALS AND METHODS



RESULTS

Table 1 Statistical computations for Random Forest and Artificial Neural Network

	ALGORITHM	N	Mean	Std. Deviation	Std. Error Mean
ACCURACY	RF	20	93.90	1.744	0.390
	ANN	20	64.75	4.822	1.078

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 $p=0.036$ ($p<0.05$), emphasizing the social media influence for marketing strategy.

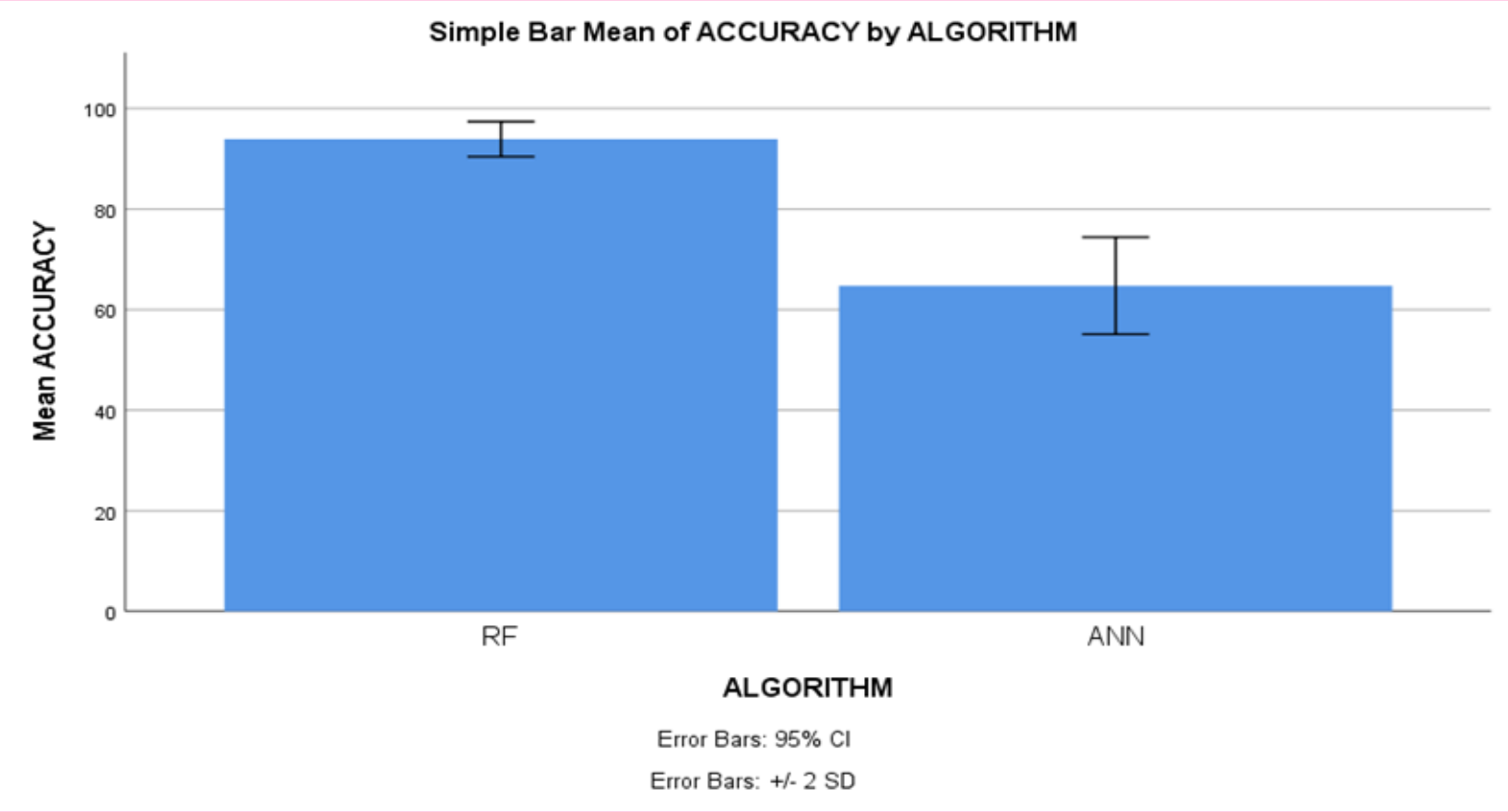


Fig 2. Comparative Error Analysis of Random Forest and Artificial Neural Network

DISCUSSION AND CONCLUSION

- Based on t-test statistical analysis, the significance value of $p = 0.036$ (independent sample t - test $p<0.05$) is obtained and shows that there is a statistical significant difference between the Random Forest (RF) and Artificial Neural Network (ANN) .
- Overall , the accuracy of the Random Forest is 93.90 % and it is better than the other algorithms.

Random Forest(RF) - 93.90% Artificial Neural Network (ANN) - 64.75%
- 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.
- In order to maximize the fetch time and increase the accuracy bulk data is complicated.
- Future Scope: Investigating hybrid models that combine Random Forest and Artificial Neural Network techniques to enhance social media influence prediction accuracy represents a promising avenue for advancing marketing strategy optimization efforts.

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