International Journal of Engineering Technology and Management Sciences
Website: ijetms.in Issue: 3 Volume No.8May - June – 2024
DOI:10.46647/ijetms.2024.v08i03.043 ISSN: 2581-4621

Drug Recommendation System based on Sentiment Analysis of Drug Reviews using Machine Learning

Dr. K. Srinivasa Rao[1], Chagalamarri Navitha[2], Anchala Niharika[3], Gurramkonda Umar Farook[4], Bikka Jaswanth Kumar[5]
[1]Professor, Department of AI&ML, KSRM College of Engineering(A), Kadapa(A.P), 516005, India
[2,3,4,5]IV B.Tech. Students, Department of CSE, KSRM College of Engineering(A), Kadapa(A.P), 516005, India

Abstract
Since the coronavirus has shown up, the accessibility of legitimate clinical resources is at its peak, like the shortage of specialists and healthcare workers, lack of proper equipment and medicines etc, The entire medical fraternity is in distress, which results in numerous individual demise. Due to unavailability, individuals started taking medication independently without appropriate consultation, making the health condition worse than usual. The predicted sentiments were evaluated by precision, recall, score, accuracy, and AUC score. The results show that classifier Linear SVC using TF-IDF vectorization outperforms all other models with 93% accuracy.

Keywords: Drug, Recommender System, NLP, Machine Learning, Bow, TF-IDF, Sentiment analysis.

1. INTRODUCTION

With the number of coronavirus cases growing exponentially, the nations are facing a shortage of doctors, particularly in rural areas where the quantity of specialists is less compared to urban areas. A doctor takes roughly 6 to 12 years to procure the necessary qualifications. Thus, the number of doctors can't be expanded quickly in a short time frame. A Telemedicine framework ought to be energized as far as possible in this difficult time. Clinical blunders are very regular nowadays. Over 200 thousand individuals in China and 100 thousand in the USA are affected every year because of prescription mistakes. Over 40% of medicine, specialists make mistakes while prescribing since specialists compose the solution as referenced by their knowledge, which is very restricted. Choosing the top-level medication is significant for patients who need specialists who know wide-based information about microscopic organisms, antibacterial medications, and patients. Every day a new study comes up with accompanying more drugs and tests, accessible for clinical staff every day. Another disadvantage is that the process of submitting credentials and verifying documents by other parties is time-consuming and inconvenient. Companies often spend a lot of time verifying degrees and certifications in hard copy before hiring. The ease of paper fraud has led to many cases of academic fraud. Our goal is to solve the above problems through blockchain implementation.
Clinical blunders are very regular nowadays. Over 200 thousand individuals in China and 100 thousand in the USA are affected every year because of prescription mistakes. Over 40% of medicine, specialists make mistakes while prescribing since specialists compose the solution as referenced by their knowledge, which is very restricted.

1.1. Domain description

Machine learning is a subset of artificial intelligence (AI) that focuses on developing algorithms and techniques that enable computers to learn from data and improve their performance on a task without being explicitly programmed. In traditional programming, a human programmer writes specific

International Journal of Engineering Technology and Management Sciences
Website: ijetms.in Issue: 3 Volume No.8May - June – 2024
DOI:10.46647/ijetms.2024.v08i03.043 ISSN: 2581-4621

instructions for a computer to follow. In contrast, in machine learning, algorithms are trained on large amounts of data, and they learn patterns and relationships from that data to make predictions or decisions.

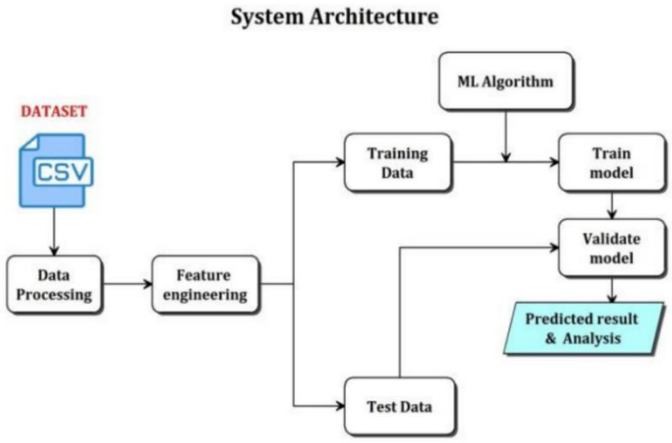
1.2. Importance of Machine Learning

Human beings, at this moment, are the most intelligent and advanced species on earth because they can think, evaluate, and solve complex problems. On the other side, AI is still in its initial stage and hasn't surpassed human intelligence in many aspects.

2. ARCHITECTURE OF THE MODEL

The dataset used in this research is the Drug Review Dataset (Drugs.com) taken from the UCI ML repository [4]. This dataset contains six attributes, name of drug used (text), review (text) of a patient, condition (text) of a patient, useful count (numerical) which suggests the number of individuals who found the review helpful, date (date) of review entry, and a 10-star patient rating (numerical) determining overall patient contentment. It contains a total of 215063 instances.

FIGURE 2.1 System Architecture



2.1 Proposed solution

A recommender framework is a customary system that proposes an item to the user, dependent on their advantage and necessity. These frameworks employ the customers' surveys to break down their sentiments and suggest a recommendation for their exact needs. In the drug recommender system, medicine is offered on a specific condition dependent on patient reviews using sentiment analysis and feature engineering. Sentiment analysis is a progression of strategies, methods, and tools for distinguishing and extracting emotional data, such as opinions and attitudes, from language. On the other hand, Featuring engineering is the process of making more features from the existing ones; it improves the performance of models

2.2 Data flow Architecture

DFD illustrates the flow of information through the system and the various changes that alter it. This method usesgraphics to show how information flows and the changes made to data as it goes from input to output. Another name for DFD is a bubble chart. Any level of abstraction can be utilized to portray a system using a DFD.

International Journal of Engineering Technology and Management Sciences
Website: ijetms.in Issue: 3 Volume No.8May - June – 2024
DOI:10.46647/ijetms.2024.v08i03.043 ISSN: 2581-4621

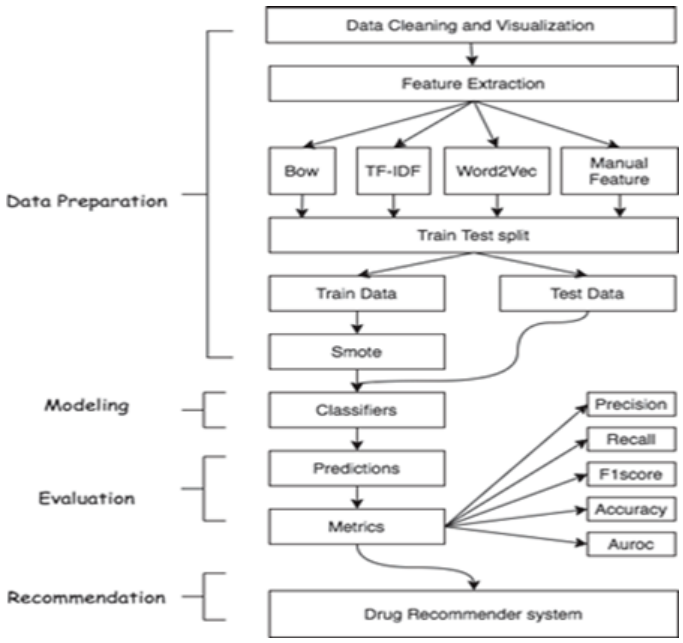


FIGURE 2.2 DFD Architecture

3. RESULT AND DISCUSSION

3.1 DISCUSSION

The results procured from each of the four methods are good, yet that doesn't show that the recommender framework is ready for real-life applications. It still needs improvements. Predicted results show that the difference between the positive and negative class metrics indicates that the training data should be appropriately balanced using algorithms like Smote, Adasyn [24], SmoteTomek [25], etc. Proper hyperparameter optimization is also required for classification algorithms to improve the accuracy of the model. In the recommendation framework, we simply just added the best-predicted result of each method. For better results and understanding, requires a proper ensembling of different predicted results. This paper intends to show only the methodology that one can use to extract sentiment from the data and perform classification to build a recommender system.

3.2 Result

These Paper Results Predict Customer Satisfaction with the Drug. This Project Shows The Exact Sentiment Analysis of Drug Reviews using Machine Learning. software results encompass the outcomes, outputs, and overall performance of software applications or systems. They are evaluated based on factors such as functionality, accuracy, performance, user experience, scalability, interoperability, security, and maintainability. By delivering high-quality results, software can effectively fulfill its intended purpose and meet the needs of its users.

CONCLUSION

In conclusion, the development of a Drug Recommendation System based on Sentiment Analysis of Drug Reviews using Machine Learning offers significant promise in enhancing healthcare outcomes. By leveraging advanced algorithms, this system can effectively analyze the sentiments expressed in drug reviews to provide personalized recommendations to patients. Reviews are becoming an integral part of our daily lives; whether go shopping, purchase something online, or go to a restaurant, we first check the reviews to make the right decisions. Motivated by this, in this research sentiment analysis of drug reviews was studied to build a recommender system using different types of machine learning classifiers such as Logistic Regression, Perceptron, Multinomial Naive Bayes, Ridge classifier, Stochastic gradient descent, Linear SVC, applied on Bow, TF-IDF, and classifiers such as Decision Tree, Random Forest, Lgbm, and Catboost were applied on Word2Vec and Manual features method.

DOI:10.46647/ijetms.2024.v08i03.043 ISSN: 2581-4621

REFERENCES

[1] S. Fox and M. Duggan. Health online 2013. Pew Internet and American Life Project. http://pewinternet.org/Reports/2013/Healthonline.aspx, 2013.
[2] X. Guo, J. Lu, Intelligent e-government services with personalized recommendation techniques, International Journal of Intelligence Systems,2007,401–
[3] T. Lee, J. Chun, J. Shim, S.-g. Lee, An ontology-based product recommender system for B2B marketplaces, International Journal of Electronic Commerce, 2006,125–155.
[4] J.B. Schafer, J. Konstan, J. Riedl, E-commerce recommendation applications, Applications of Data
Mining to Electronic Commerce, Springer, US 2001, 115–153.
[5] O.R. Zaiane, Building a recommender agent for e-learning systems, Proceedings of 2002 International Conference on Computers in Education, 2002, 55–59
[6] T.Hung-Wen, S.VonWun,A personalized restaurant recommender agent for mobile e-service, 2004 IEEE International Conference on e-Technology, e-Commerce, and e-Service. EEE, 2004, 259–262.
[7] Popescu AM, Etzioni O (2005)Extracting product features and opinions from reviews. Proceedings of the conference on human language technology and empirical methods in natural language processing. Association for Computational Linguistics, pp: 339-346
[8] Mei Q, Ling X, Wondra M, Su H, Zhai C (2007) Topic sentiment mixture: modeling facets and opinions in weblogs. Predictive Modeling of Web Users, pp: 171- 180.
[9] https://www.livewell.pk/ [Accessed on: August 2017].
[10] Aronson AR (2001) Effective mapping of biomedical text to the UMLS Metathesaurus: the MetaMap program. In: AMIA annual symposium proceedings. Washington DC: American Medical Informatics Association, pp: 17- 21.