Personality Prediction in Marketing

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Abstract- With the growth of technology and the continuous development of IoTs, it is now possible to easily extract data across the world. This has become a huge plus for different sectors in the world as it enables them easily communicate with the average consumer at the click of a button. But regardless of how easy it may seem to reach out, it's certainly not enough to persuade clients into purchasing these products or services. This is where the use of Artificial Intelligence comes in, AI has become superiorly advanced to the point it has become a very helpful tool in terms of understanding consumers and predicting future market outcomes. The use of AI and machine learning models on personality prediction has been a huge tool in perfecting the product or service for the consumer, as it helps to navigate accurately the market's wants and need and enables further persuasion.

INTRODUCTION

Personality refers to the patterns of thought, behavior, and actions that are peculiar to an individual. These different characteristics render each individual unique and form the basic construct for re-actions or interactions amongst individuals. Over time, the concept of personality has grown to influence many activities. For in- stance, whether you are hired for a certain job somewhat depends on your personality, who befriends you depends on your personality, decision-making, academics, and so much more. The big five or five factor model is the most widely accepted theory on personality adopted in the world today. Several researches have been carried out on this theory since its evolution. The five-factor model is proposed by Lewis Goldberg and later expanded and approved by McCrae Costa, it hinges on five main personality traits, which are open-ness, conscientiousness, agreeableness, neuroticism and extraversion. In this model's approach to measure personality, it conceptualizes each trait as a spectrum, depicting individuals as being in between spaces rather than on polar ends of the spectrum. Each trait covers a multitude of personality-related terms. Openness refers to a state of receptivity, willingness to try new things, curiosity for new ideas. Conscientiousness on the other hand, entails being more self-conscious, goal driven, organized, disciplined and detail oriented. Agreeable- ness revolves around relationship with others, how people interact with one another. Whilst extraversion lays more focus on how they interact with their immediate environment and society. Especially from a social standpoint their energy or assertiveness in social milieus comes to play. Then lastly, neuroticism, which dwells on ones character as a result of external experiencesfaced in the world. Particularly the individual's response to adverse situations faced, be it anxiety, calm, vulnerability or resilience. More often than not, the efforts put into advertising campaigns and advertisements yield very little results or turn over, a problem which can somewhat be attributed to clients. These advertisements and campaigns seemingly don't strike the customers enough to cause a spike in purchase as was the intended goal. If marketers could predict the personality of their customers or clients, they could easily come up with advertisements (ads) or campaigns which are relatable and thus provoke a commensurate response in sales. As such, a personality prediction can be used to solve this marketing problem. For the sake of this work, the 5-f a c t o r personality model was used.

This research aims at deriving a personality prediction model using a dataset to enable marketers predict the personality of clients and strategize better or more convenient and engaging ads. The remainder sections of this paper are structured as follows: section 2 which delves into previous research works done in this area. Section 3 looks at the methodology used in this work and then the results are discussed in Section 4. The last section concludes with future prospects which can be explored in this field and conclusive remarks.

LITERATURE REVIEW

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different characteristics render each individual unique and form the basic construct for relations or interactions amongst individuals. Over time, the concept of personality has grown to influence many activities. For in- stance, whether you are hired for a certain job somewhat depends on your personality, who befriends you depends on your personality, decision-making, academics, and so much more. The big five or five fac- tor model is the most widely accepted theory on personality adopted in the world today. Several researches have been carried out on this theory since its evolution. The five-factor model is proposed by Lewis Goldberg and later expanded and ap- proved by McCrae Costa, it hinges on five main personality traits, which are open- ness, conscientiousness, agreeableness, neuroticism and extraversion. In this model's approach to measure personality, it conceptualizes each trait as a spectrum, depicting individuals as being in between spaces rather than on polar ends of the spectrum. Each trait covers a multitude of personality-related terms. Openness refers to a state of receptivity, willingness to try new things, curiosity for new ideas. Conscientiousness on the other hand, entails being more self-conscious, goal driven, organized, disciplined and detail oriented. Agreeable- ness revolves around relationship with others, how people interact with one another. Whilst extraversion lays more focus on how they interact with their immediate environment and society. Especially from a social standpoint their energy or assertiveness in social milieus comes to play. Then lastly, neuroticism, which dwells on ones character as a result of external experiencesfaced in the world. Particularly the individual's response to adverse situations faced, be it anxiety, calm, vulnerability or resilience. More often than not, the efforts put into advertising campaigns and advertisements yield very little results or turn over, a problem which can somewhat be attributed to clients. These advertisements and campaigns seemingly don't strike the customers enough to cause a spike in purchase as was the intended goal. If marketers could predict the personality of their customers or clients, they could easily come up with advertisements (ads) or campaigns which are relatable and thus provoke a commensurate response in sales. As such, a personality prediction can be used to solve this marketing problem. For the sake of this work, the 5-factor personality model was used. This research aims at deriving a personality prediction model using a

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METHODOLOGY

The aim of this research was to make use of machine learning to predict different personalities of an individual or a group of people. The type of data used for thisresearch was from datasets. This section looks at how data for the research was gathered and the machine learning models used to derive the model. The dataset was obtained from kaggle.com and the machine learning models used include decision tree, random forest classifier and logistic regression. 3.1 Trans- forming data into supervised learning This is a vital step in data reprocessing, seeing as the models used belong to the group of supervised learning techniques. The dataset is divided into samples and then used to train the models. Label encoder converts the target variable to numerical form and data is split into two groups.

DECISION TREE

It is a supervised learning technique which is used for classification and regression problems. It uses a flowchart tree like structure to display predictions made from feature-based slits. It trains the model to predict outcomes after learning the different features of the data. Its classifier can be used to predict the class of different samples fed into the model i.e. for multi class and binary classification.

RANDOM DATA FOREST

This supervised learning technique or algorithm is simply the accumulation of multiple decision trees put together to increase overall results and achieve more accurate predictions. The hyper parameters of random forest are similar to that of decision tree or a bagging classifier. Fortunately, even, the classifier class of random forest can be used instead of combining decision tree with bagging classifiers. It can also be

used to solve classification and regression problems. The algorithm's regressor makes use of a wide range of regression trees which consists of hierarchical criteria and constraints that ease the solution of regression problems.

LOGISTIC REGRESSION

It is a statistical method which predicts the outcome of a dependent variable after studying its relation with one or more independent variables. It is used in binary classification and predictions. This algorithm enables the model to classify incoming data based on historical data and the more data is fed into the model, the better the predictions and classifications. It is very useful as it helps reveal the interrelationship between variables.

RESULTS

In this work, three different machine learning models were used to evaluate best performance for prediction. All different five personality traits of the five-factor model are taken into account to derive an output or label with the following significance;

0- Serious
1- Extraverted
2- Dependable
3- Lively
4- Responsible

Of all the three machine learning models or techniques used, the random forest and decision tree proved to be more accurate. However, the random forest model shows overall best performance with accuracy of ninety nine percent.

FUTURE PROSPECTS/CONCLUSION

The limitations encountered in this research were that it is still being based as a theory rather than something that has been executed by most researchers, ergo most of the data is mainly based on different theories and mathematical equations on how to predict personality using artificial intelligence. Out of all the research papers adapted, they are only about two research papers which have actual data pertaining to execution of the research.

Based on the findings of this research, the majority of the population fall under the category of 0,1, 2 which is extraverted, dependable and lively. As such in order for marketers to create a successful ad or campaign

which customers can relate to and thereby provoke a corresponding rise in sales then it will have to be one which in- corporates these different personality traits or attributes.

Conclusively, the concept of personality prediction holds great prospects for different sectors and there are yet many areas to be explored. However, for these exploits and predictions to be increasingly useful to the immediate population and non-developers it is necessary for there to be front end applications developed to implement the findings. Nonetheless, the improvements and continuous research on personality predictions, aids in identifying causal relationships and making much needed sense of the data generated in this regard.

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