



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, Issue 3, March 2023

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423

 9940 572 462

 6381 907 438

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Predictive Analysis in E-Commerce for Customer Behaviour and Demand Forecasting

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ABSTRACT

The project entitled “Predictive Analysis in E-Commerce for Customer Behaviour and Demand Forecasting” is a web based application which has been designed using ASP.Net 2013 as front end tool and MS SQL Server 2012 as back end tool. In the present project, Predictive analytics is a set of technologies and approaches to working with historical data collected from the online sources as secondary data. The present software is mainly used to make future predictions by analysing the historical dataset of about online purchases made by various customers in multiple times. To create future predictions, the proposed system analyses a dataset and uses machine learning methods such as the K-Nearest Neighbour algorithm and the Nave Bayes Classifier algorithm. This demand forecasting serves as the foundation for a number of processes, including warehousing, shipping, pricing forecasting, and, most crucially, supply planning, which attempts to fulfil customer demand and requires information on client expectations. The major purpose of the project is to look at various e-commerce customer behaviours and forecast demand for better supply chain management. This project will be more useful in determining the needs of the consumer. Through a rigorous evaluation of the data sets, we can establish the customer's requirements. The suggested system requires a significant amount of time to examine the dataset. To test the KNN algorithms and the Nave Bayes Classifier, a genuine historical dataset is supplied. Accuracy in determining client buying behaviour and projecting demand.

I. INTRODUCTION

Predicting client buying behaviour is both fascinating and difficult. Meeting this obstacle in the e-commerce setting necessitates dealing with a slew of issues not seen in traditional industry. E-commerce websites have embraced the technology of recommender systems. Using Mean Ranking Analysis, Nave Bayes Classifier, and K-Nearest Neighbor algorithms, this study aims to provide a prediction framework for client purchasing behaviour in the e-commerce environment. To begin, product connections are studied and exploited in order to predict client motives, i.e., to create a candidate product collection. Following that, client preferences for product characteristics are discovered and utilised to determine which prospective items are most likely to be purchased. This research looks at three different types of product characteristics and provides methods for detecting client preferences for each of them. When a product purchased by a specific customer is entered into this historical dataset, the computer may return the top n goods that that client is most likely to purchase in the future. Experiments on a real dataset reveal that consumer preference for certain product attributes has a significant effect in decision-making and beats baseline techniques significantly.

II. LITERATURE SERVEY

1. Predictive Analytics, How is it Beneficial in ecommerce Retail.

Author-[Ankita Tanna](#), Supriya Bajaj

Year-2020

Predictive analytics is a type of advanced analytics utilized in order to predict future trends, customer behaviour and activities based on the former and current data. Various techniques utilized for this process are automated ML algorithms, data mining, AI tools, and predictive modelling. For an online store owner, a merchant needs to use all the data available and finely analyse the demand and supply chains to continue offering impeccable customer experience.

2. Predictive Analytics for Predicting Customer Behaviour

Year-2019

Author-[Asniar](#); [KridantoSurendro](#)

The development of the internet has caused digitalization of data which opens up big data opportunities. Digital data in large numbers leaves traces of what customers see, what they read, their involvement and behavior, judgment, about their interests

and preferences so as to provide a large amount of data that can be mined for learning experiences. The big data value lies in the results of analysis and predictions or actions taken from the results of the analysis and prediction.

3. Sales Prediction and Product Recommendation Model through User Behavior Analytics

Author - Xian Zhao and PanteaKeikhosrokiani

Year -2021

The COVID-19 has brought us unprecedented difficulties and thousands of companies have closed down. The general public has responded to call of the government to stay at home. Offline retail stores have been severely affected. Therefore, in order to transform a traditional offline sales model to the B2C model and to improve the shopping experience, this study aims to utilize historical sales data for exploring, building sales prediction and recommendation models. A novel data science life-cycle and process model with Recency, Frequency, and Monetary (RFM) analysis method with the combination of various analytics algorithms are utilized in this study for sales prediction and product recommendation through user behaviour analytics. RFM analysis method is utilized for segmenting customer levels in the company to identify the importance of each level. This study offered a very practical and useful business transformation case that assists companies in similar situations to transform their business models.

III.EXISTING SYSTEM

In order to predict the customer behaviour and demand forecasting, there are a numerous data mining algorithms available to evaluate the preference and interests measurements in buying products in e-commerce websites. But many of the algorithms limited the search with limited demographic variables of the customer. So, the accuracy of listing products to the customer may or may not fulfilled certain times. In order to increase the accuracy of the results, the data mining algorithms should cover more demographic variables of the customer.

Drawbacks of the Existing System

1. Failure in measuring the Customer wise purchase behaviour and demand forecasting.
2. The data is not genuine to test the algorithms and to find out the accuracy of the result.
3. Less demographic variables available to test the data.
4. Less ranking analysis are available.
5. More time consumption in the existing tools.

IV.PROPOSED SYSTEM

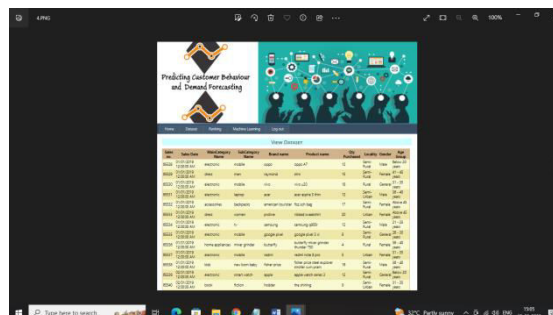
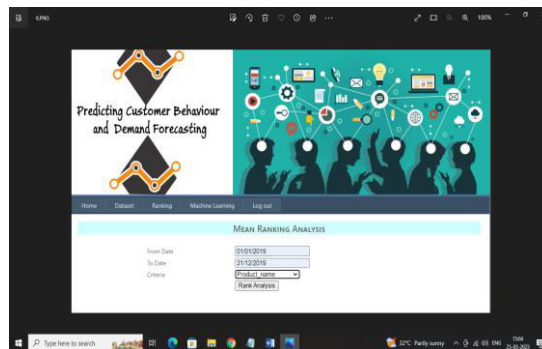
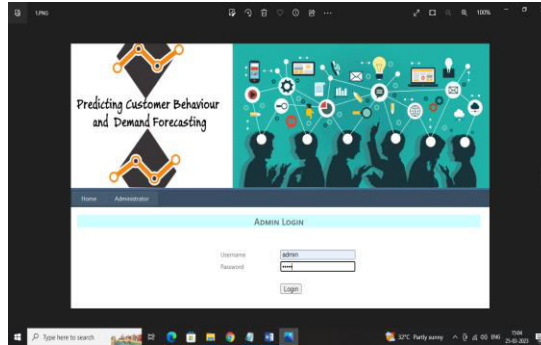
The current Predictive analytics project is mostly used to create future predictions by examining a history dataset of online purchases made by a variety of clients over a period of time. The suggested system analyses a dataset and applies machine learning methods such as the K-Nearest Neighbour algorithm and the Nave Bayes Classifier algorithm to make future predictions. This demand forecasting acts as the foundation for a variety of operations, including warehousing, shipping, pricing forecasting, and, most importantly, supply planning, which tries to meet consumer demand and necessitates data on client expectations. The project's main goal is to examine diverse e-commerce customer behaviours and forecast demand for optimal supply chain management. This project will be more beneficial in identifying the customer's wants. We can determine the customer's requirements through careful examination of the data sets.

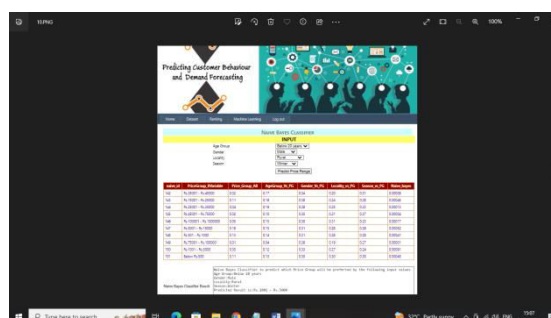
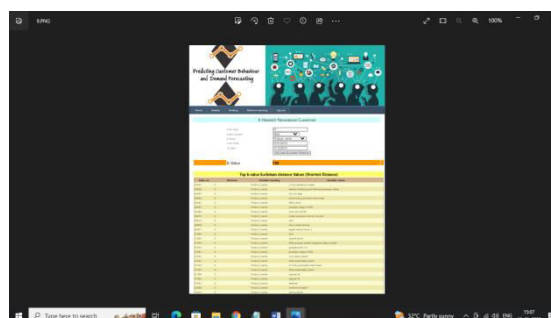
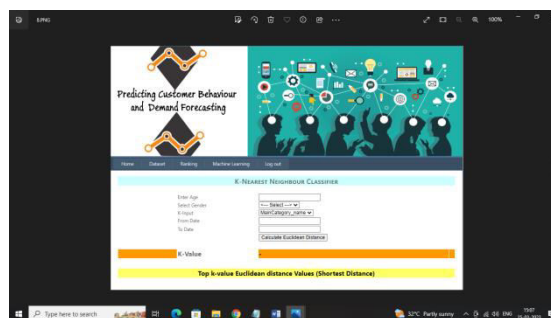
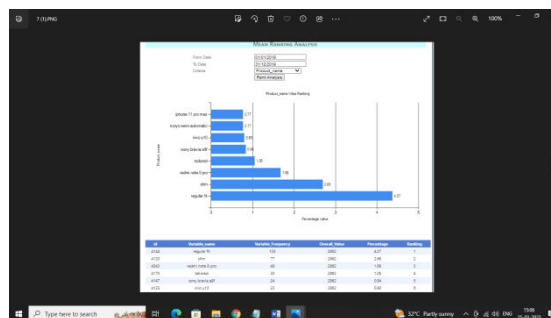
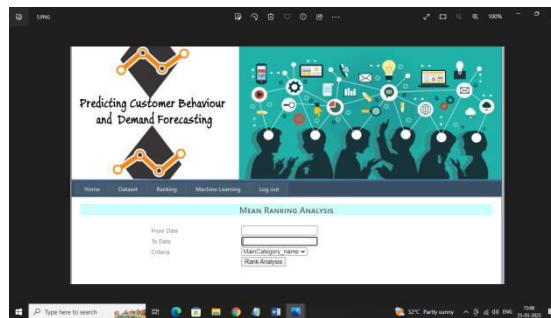
Advantages of the Proposed System

1. Very time consumption required to evaluate the dataset.
2. Genuine Historical dataset are available to test the KNN algorithms and Naïve Bayes Classifier.
3. Accuracy in measuring the customer wise purchase behaviour and demand forecasting.



V.RESULTS







VI.CONCLUSION

The project, "**Predictive Analysis in E-Commerce for Customer Behaviour and Demand Forecasting**" is a web-based application which deals with past data gathered as secondary data from web sources. The current programme is mostly used to create future predictions by examining a history dataset of online purchases made by a variety of clients over a period of time.

Machine learning methods such as the K-Nearest Neighbour algorithm and the Nave Bayes Classifier algorithms can be used in the proposed project to make future predictions. Predicting consumer behaviour in the context of e-commerce is becoming increasingly important as people shift from visiting physical businesses to purchasing online. For demand forecasting, predictive analytics may be used to anticipate user intentions toward a given product or category on an e-commerce website. Forecasting is critical to management's day-to-day operations. It is a valuable and required tool for planning, and planning is the foundation of successful operations. This demand forecasting acts as the foundation for a variety of operations, including warehousing, shipping, pricing forecasting, and, most importantly, supply planning, which tries to meet consumer demand and necessitates data on client expectations.

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SJIF Scientific Journal Impact Factor
Impact Factor: 8.118



ISSN INTERNATIONAL
STANDARD
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