



# An Implementation of Business Forecasting using Big Data Predictive Analysis

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## Abstract

*The Big data introduces many of the significance after the perceptions it creates when it is evaluated for finding patterns and for deriving similar words for the data, creating verdicts and eventually replying to the world with business intelligence. Many corporations are moving towards predictive analytics to build the relationship with customers, enhance processes and condense operational costs. Predictive analysis is usually used to forecast future probabilities which can arise in future for business. We can make the business strategy for the predictive models of different data present in the knowledge base in the mandate to build up a good customer's relationship and relevant products, sales analysis and financial strategy for the company growth. Some of the common methodologies, including data mining, mathematical modelling and machine learning help to figure out some facts for the business forecasts. In this paper work, we are presenting an approach to implementing Business forecasting application which can be used as user-friendly tool for the Predictive analysis. In our approach, we are simplifying the complexities involved using Standard Advanced Predictive Analysis Tools which requires advanced skills and expertise to use in Business Forecasting.*

**Keywords:** Big Data, Predictive Analysis, Business Forecasting, Visualization Tools, Data Mining.

## Introduction

In the present world, the development of business and economic growth has raised the amount of data usage over the internet and also it has been over exploited with its size. As an arrival of new data technology the information is to be clustered in different places for managing and operations. After the stable release of big data, many companies preferred and started to manage and collect their huge amount of data in the cloud storage for getting better business strategies and consumer behaviors. Big Data plays a vital role in increasing of the performance of highly reputed organizations and startup organizations which are looking for a competitive advantage in a big business world. In the current section, we will be conversing about the issue of big data with the four proportions of big data and analyze of the complexity in the execution of the system<sup>1</sup>.

Every day, we use many devices to create large amounts of data for example, searching online, visiting of online shopping portal for making purchases of the products and also making transactions in the shopping portals, reading data from sensors, using social media platform to connect with our friends also the usage of the location-based system which points our location using the GPS services. All the data are collected and stored in several databases technology which forms as the Big Data.

In this research paper, we will analyze about the sales and increase in a number of production of goods in stores and what are the key factors to building up the better customer's

relationship. When the store owners want to filter out the related data from their data set of past and historical data they can easily filter it out or we can provide a data cleansing for getting the analysis of the data.

Predictive analytics is the methodology of using the historical data and information's to forecast the future trends. Statistical models and the machine learning algorithms are used for identifying the patterns from the historical data. The initiation of big data analytics leads to the new reformation of the data-driven strategies for businesses to interact with the consumer regarding the ideas. So, that the different retailers of the online shopping portal and the online business company can analyze the tremendous amount of the data generated from Electronic Data Interchange (EDI) to better understand the consumer behaviors. This distinctive perception may lead to follow up good customer service, business strategy and deliver user-friendly facilities to customers<sup>2</sup>.

The paper is described below in different section as follow. In section 2 of the paper, we will discuss the correlated research done for predictive analysis and similarly carry further details about implementing the system and architectural design is discussed in section 3, we will propose the system design and some data prediction methodology along with the filtering algorithms. In Next section the discussion on the consumer behavior along with their transactions from different stores. At

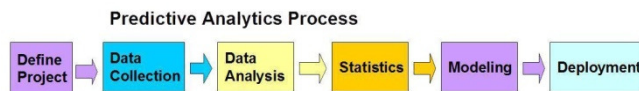
last section, the prediction of sales are determined besides with the ease of work with less complexity.

## Materials and Methods

**Introduction to Predictive Analysis:** From last few years, the predictive analysis has become a great visualization tool for forecasting and analysis of business strategies for the growth of the business. Analyze the existing data stores to make a variety of predictions, such as where you might need more storage or how to make customers attract towards your store and increase the sales and revenue.

Many tools promised to make predictions but, in reality, tend to do more of a historical and past analysis of data at a present time. In Uyoyo Zino Edosio proposed a paper that big data holds a key value for the forecasting of the business and discovering the consumer activities also with its exceptional challenges.

The research shows that leading complications in big data analytics are to train the users to handle and operate the system, which are followed by secure constrictions. Most of the users are worried about how to keep their personal information in the database with secure encryption of the data. In spite of all these major challenges, many companies are rising towards the implementation of big data in different approaches.



**Figure-1**  
**Process of Predictive Analysis**

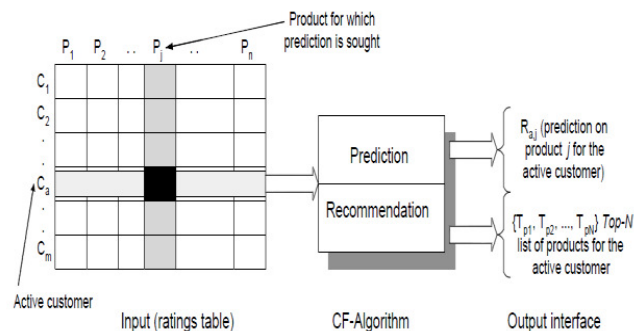
Big Data Analytics can be used as a basis for improving values for organizations by utilizing various business parameters. Besides this, we will utilize the case studies and also the paper aims about ways to finding that big data analytics supports conception, perfection, and development of numerous business facilities to grow user understanding for the organization. It's most significant role to optimize the usage of the data<sup>3</sup>.

The present research work deals with the detailed description of big data's predictive analysis working and analyzes the forecasting issues faced by the enterprises on their way to adopt big data technology for the contentment of their business need and for making some relevant decision<sup>4</sup>. An efficient and integrated solution for big data predictive analysis is proposed by performing the comparative analysis of existing solutions for big data challenges and also forecasting of the business growth and revenue in terms of business. The effective approach to avail business forecasting services is to NOSQL model for scrabbling infrastructure as per business requirements by providing the required data to business Owner<sup>5</sup>.

**Methodology:** The proposed solution will mainly focus on predictive analysis and also the data mining of the required data from the collection. The user will have their stores and past/historical data of their stores from previous transactions which will provide a user with a more predictive way that how to increase the sales and production of products. Two main algorithms are mainly preferred to maintain the recommended system of data mining:

**Collaborative filtering:** One approach for making the collection of the stores and products endorsement based on the past revenues and historical data. Collaborative filtering methods are based on the collection of huge datasets and analyzing large clusters of information on the users behaviors, actions or preferences and predicting what the users will suggest and like according to their usage of the product and stores they will predict about the future records.

The main feature of the collaborative filtering does not depend upon the machine learning contents and it is also capable of precisely recommending different sets of items such as image, videos for the better communication of data between the user and the vendors. The main focus of the collaborative filtering algorithm is the measuring of user or item comparison in the recommended systems and clusters of information that helps to suggest a better strategy for the different business peoples.



**Figure-2**  
**Collaborative Filtering Method**

**Cluster analysis** is a process of assembling a set of objects so that objects in the similar group called a cluster are more to each other than to those in other groups. Data mining is used in performing the statistical data analysis methods which can be used in various different fields like machine learning and bioinformatics.

## Results and Discussion

In result, usage of the different data sets and collection of the many stores, products, an online portal for analysis of the data for a better result. Using the Big Data which is collected are minified using the filters and to develop the high performance concurrent program which do not depend on the mainstream

multiprocessing method we can use the event driven programming language for the better performance of the system we can use node.js which is much more flexible and ease to install and use for the server-side scripts. Consumer behavior can be easily predicted by vendors online with less cost in the production.

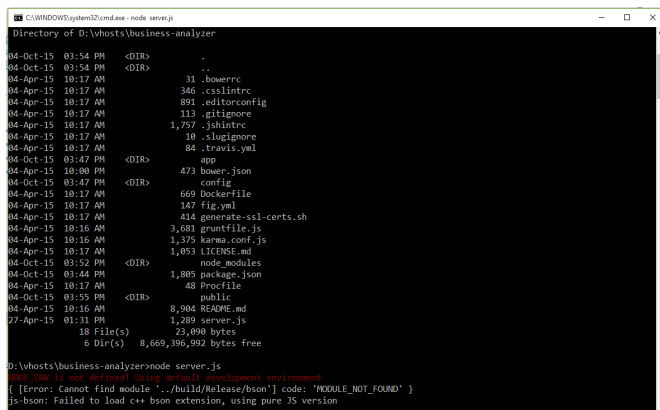


Figure-3

Backend project structure using Node.js (MEAN Stack)

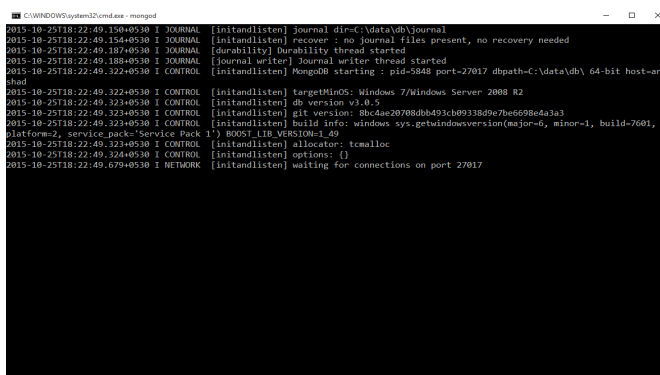


Figure-4

Mongo DB Service for storing training samples as Mongo Collections to Simulate Big data source running on default port 27017

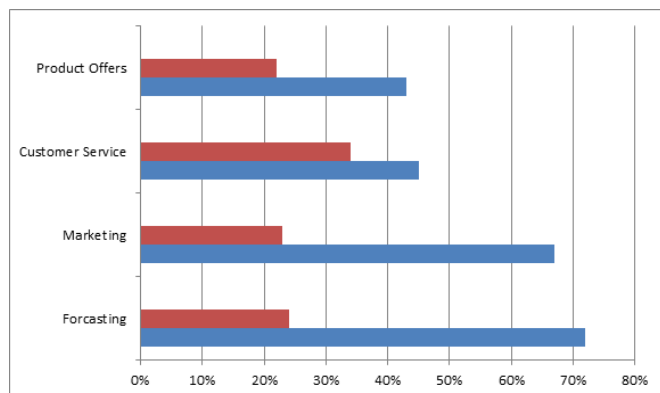


Figure-5

Graph from recent survey made by Online Vendors

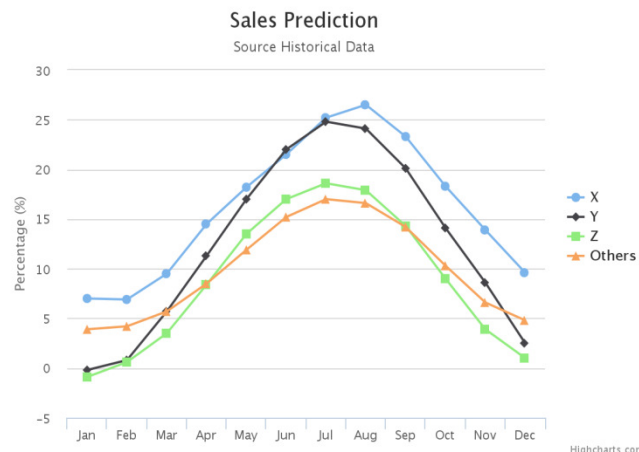


Figure-6

Showing the sales prediction of different Stores

**Discussion:** In brief, we can say that predictive analysis works on the patterns of usage of data from different possible sources and predicting the nearby events. The implementation of the system is much more complex and costlier that's the reason why it's less familiar among the online vendors. It is the platform that provides the vendors to easily keep a track of all the previous transactions of different consumers that help them to make a better forecast of their sales.

## Conclusion

In this research work, we are presenting an approach to implementing Business forecasting application which can be used as easy to use Predictive analysis tool using Node.js in the backend along with MongoDB as our data source which will be of less memory space and will accomplish more effective and fast on comparing with the other data objects. In our approach, we are simplifying the complexities involved using Standard Advanced Predictive Analysis Tools which requires advanced skills and expertise to use in Business Forecasting. The main objective of this research is to provide the predictive analysis of the historical data and suggesting the new business strategies also providing the user-friendly data presentation using some graphs and solving all the problems faced by the different online vendors.

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