Sales Trend and Forecasting Using Data Mining Techniques

Submitted By:

Afzaal Javaid	**2017-CS-501**
Bilal Mahais	**2017-CS-508**
Khurram Mehmood	**2017-CS-517**
M.Arslan Sarwar	**2017-CS-528**

Supervised By:

Mr. Yaseen-ul-Haq

Date:

14/10/2020

Approval Form

This is to certify that Afzaal javaid Roll No. 2017-CS-501, Muhammad Bilal Roll No. 2017-CS-508, Khurram Mehmood Roll No. 2017-CS-517, M. Arslan Sarwar Roll No. 2017-CS-528, have successfully submitted the project proposal document for project named as: Sales Trend and Fiorcasting Using Data Mining Techniques, at the Department of Computer Science & Engineering, University of Engineering & Technology Lahore, Narowal Campus. It is supervised by Mr. Yaseen-ul-Haq and is accepted as final year project.

_____	_____
Project Supervisor	Internal Evaluation Panel Faculty of CS&E – UET
_____	_____
External Examiner	Chairman

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1. Abstract

To know the prediction and trend of sales within a specific time period has a huge impact on the progress of business and also helps a lot for taking right decisions on right time. For this purpose, there are many data mining techniques & tools for extracting key knowledge from a large amount of data-sets for the sake of forecasting. But the problem is that traditional forecasting systems are a little difficult to deal with large data sets and may not as much accurate as it should. So in this proposed project we will build a system which do comparative analysis of sales prediction by using latest and innovative tools & techniques for a much accurate and reliable sales trends and forecasting system which would be up to mark and will fulfill all the requirements of this modern era of industry.

2. Introduction

Almost 25% of the world's population has shifted to online shopping. E-commerce Giants having a huge stake in the industry use the resources at hand to overwhelm the smaller stores. This in turn neglects the small store owners of a fair market exposure. This project is capable of predicting and recommending productive ways to enhance sales of a store. Several data mining techniques will be used to perform a list of predictions and recommendations. There is currently no such application capable of accommodating small e-commerce stores with such credible information. So in this proposed project we will build a system which do comparative analysis of sales prediction by using latest and innovative tools & techniques. Furthermore, the store owners will get a visual representation of the results which can help in decision making. Here proposed project (sales trend and forecasting using data mining techniques) provides a platform for these store owners to utilize the data at their disposal to grow and expand their services above and beyond the need of the valuable customer. The proposed project will use critical data mining techniques to implement a series of predictions and sales trend. The provided data by user will be cleaned for a few known anomalies. Actions will be applied on this data set and certain results will be gained for each of the multiple actions. When the system is done with the actions, visualizations will be generated based on the results using some visualization tool. Moreover, the user will be offered a simple, streamlined and efficient user interface. This proposed project will not only help the store owners (user) to understand the nature of the sales but will also guide them to enhance it. Our proposed project will provide a service to the store owners via a simple web application hosted on cloud.

3. Literature Review

In 2018 Alfiah and his team [1] build a Data Mining System to Determine Sales Trends and Quantity Forecast using Association Rule CRISP-DM (Cross Industry Standard Process for Data Mining) model and it find patterns in sales.

In 2019 Aung and his team [2] developed a model for Customer churn prediction using association rule mining. This model deals with the customer churn analysis and Predicting the most profitable customer in the retail sales and marketing system.

In 2020 Panjawani and his team [3] build a prediction model on sales Using Machine Learning and he got the highest accuracy level of random forecast classifier with 83.86%, then for linear regression and followed by decision tree classifier it varied to 82.01% To 81.21% respectively for small data set.

Triayudi and his team [4] in 2020 implementing data mining techniques build a model to Predict Sales Using Time Series Method. The model was just for forecasting the sales on per month record has accuracy level of 99% using MAPE (Mean Absolute Percentage Error).

In June 2020 Afifi and his team [5] build a system that forecast short lifetime products using K-Means Clustering.

In 2020 VENGATESAN and his team [6] developed a model for sales prediction using data analytics techniques. They just applied time series analysis, no other methods to predict sales.

In 2020 Ramya and his team [7] developed An Advanced Sales Forecasting model Using Machine Learning Algorithm. They used only ARIMA Model (Auto regression integrated moving average.)

3.1. Zoho CRM

Zoho CRM is a website and according to their website, Zoho [1] benefits are as following:

- Zoho streamlines the operations of important sales
- Real-time exposure to important information
- Use social media to the maximum
- It's built into Google Apps and the Zoho suite
- Track Sales Feature
- Pulse Feature
- Sales Prediction Feature
- Not Free, Different Plans (Basic, Advance)

3.2. Smart Corp

SmartCrop [2] is an online service based software which provide prediction services like Demand Planning, Inventory Optimization and operational analytics.

Here’s what make smart demand planner work

- Automated Statistical Forecasting
- Multi-Level Group Forecasting
- Collaborative Planning
- Basic Plain=1000$/Month

3.3. Retention Grid

Retention Grid [3] basically analysis the customer base of a store and design marketing campaigns and ads for them which most probably is done manually. Nonetheless, it focuses on bringing customers closer to a business.

3.4. Clari

Clari [4] is a CRM platform having revenue operating framework which deploys Artificial Intelligence and mechanism to reveal all actively information collected in corporate industry such as advertisement, mobile, email, communications etc.

- Flexible Forecasting
- Deal Inventory
- Parallel Forecasting
- Improve Implementation: churn management.

4. Problem statement

` The E-commerce industry is in dire need of intelligent forecasting model of sales trends with highest possible level of accuracy. There is a need to develop a tool which predict sales and do the comparative analysis of sales prediction using data mining techniques.

5. Proposed Solution

Our proposed solution will provide single platform for user to predict the sales of the products, their trend in market and do comparative analysis of sales prediction using different data mining techniques.

Project Overview Statement Template

Project Title:
Sales Trend and Forecasting Using Data Mining Techniques

Project Manager: Muhammad Arslan Sarwar

Project Members: Muhammad Bilal, Khurram Mehmood and Afzaal Javaid

Name	Registration #	Email Address	Signature
Afzaal Javaid	2017-CS-501	2017cs501@student.uet.edu.pk	
Muhammad Bilal	2017-CS-508	2017cs508@student.uet.edu.pk	
Khurram Mehmood	2017-CS-517	2017cs517@student.uet.edu.pk	
M. Arslan Sarwar	2017-CS-528	2017cs528@student.uet.edu.pk	

Project Goal: To develop a tool which predict and forecast sales and do the comparative analysis of sales prediction using data mining techniques.

Project Success criteria: Sales prediction

Assumptions, Risks and Obstacles: Dataset

Organization Address (if any): University of Engineering and Technology Lahore (Narowal Campus)

Type of project: ■ Research ■ Development

Target End users: Store Owners

Development Technology: ■ Object Oriented ❑ Structured
Methodology:

Platform: ■ Web based ❑ Distributed
❑ Desktop based ❑ Setup Configurations
❑ Other

Approved By: Mr. Yaseen-ul-Haq

Date: 14/10/2020

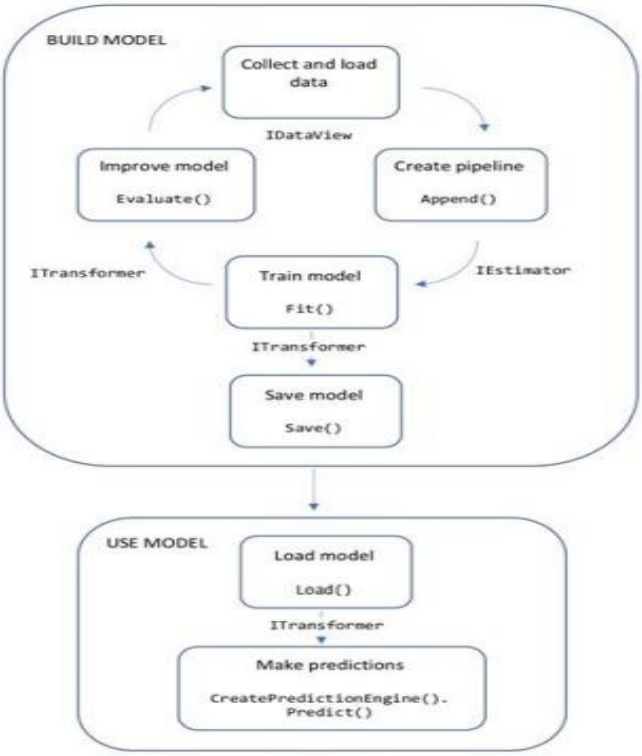
6. Objectives & Goals

- To design and develop an online sales trend and forecasting web application using data-mining techniques for e-commerce store owners.
- To develop a web based application only.
- To enhance the security and the cost efficiency of data storage on cloud.
- To enhance the sale.
- To make financial planning.
- Do comparative analysis of predicted sales.

7. Scope

Scope of our proposed project is that the store owner can predict and manage their resources cash flow according to the prediction and trends of the sales. This proposed model helps the store owner to save their unnecessary expenditures on products and their sales. In addition, it will provide the store owners to take right decisions on right time. This web based application will be easily accessible to any registered store owner. The registration packages will be affordable with the excellent services and support at the back end.

8. System Architecture



9. Tools and technologies

9.1 Tools

The tools we use in our project are:

- Visual Studio Code
- Chrome Developers Tools
- NPM (Node Package Manager)
- JRE (JavaScript Runtime Environment)

9.2 Technologies

We use MERN Stack [5] technology in our project. The MERN stack [6] is a JavaScript stack that's designed to make the development process smoother. MERN [7] includes four open-source components:

- MongoDB
- Express
- React
- Node.js

10. References

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