

Prediction of Future Car Demand in the Market using Data Mining Techniques

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Abstract - Data mining procedures provide society to research and employ the large amount of data. Data mining process determines useful information from the hidden data, which can either be used for future expectation. There are many realizations of applying data mining techniques to countless areas like marketing, medical, financial, and car manufacturing and many more. Data mining analysis assisting provided that car market with more precise prediction of car (vehicle) sales demand in future. Some improved sales prediction methodologies for the automobile market used to convey vastly truthful predictions. Vehicle sales prediction consists of slow turn analysis and launch analysis from the data, which is collected from past year on yearly, quarterly, or monthly bases. By this factors finding out customer's interest and buying patterns. Car manufacturers can detect the targeted customers and build the relationship to grow up automobile market and attract new customer by applying data mining techniques. In a one word detection of appropriate pattern from database is recognize as a datamining.

Keywords: Automobile market, Car manufacturing, Data mining, Future Expectation, Launch analysis, Prediction, Slow turning analysis.

I. INTRODUCTION

Data Mining is a technique, which extracts knowledge from the past, historical data, which consist of countless steps such as combination of data from several databases, data warehouses, pre-processing of the data. Data mining analysis techniques provide solution to the automobile industries. To extract suitable pattern from past data is possible through data mining techniques such as clustering and association. Which can be helpful to discover meaningful pattern for upcoming expectation. To produce groups of associated patterns and delivers a way to get global rules of dependent variables possible through clustering with association such type of analysis is called Market Basket Analysis.

The benefit of two analysis will be identified such as launch analysis and slow turning analysis. These techniques will helpful to automobile manufacturers for conclude the answers for such queries like, which vehicle models sell grow up during a specific season, festivals and which model sell down? Which vehicle selected by a specific gender? Which vehicle model sell with some precise accessories or which is without accessories? This type of inspection provide precise prediction of future car market demand.

Launch analysis offer metrics for launch of a new product, which is useful to inventory manager as the suggestion of upcoming customer demand or customers' concern of newly launched vehicle with fresh volume. Slow turning

analysis acknowledged which vehicle models sell slower. Various data mining techniques such as, association, classification, clustering and prediction implement for knowledge detection from large amount of historical data. From that, predict future market of automobile industries to observe customers interest, vehicle model demand and buying pattern.

II. LITERATURE REVIEW

In this section, briefly evaluate the previous studies on sales forecasting and numerous standard prediction models.

1. Using analysis methods launch / slow turn analysis, analysed data are used for predicting car sales and planning car production to meet customers need, which vehicle model do not sell faster what the reason or drawback is in the particular vehicle model which leads to slow turn, which vehicle model stays in stock for longer time. [1]
2. Data mining is a computer-aided process to analyse a patterns from large amount of data. Data mining extracting the applicable patterns from database. Major data mining techniques like association, classification, clustering and prediction used for knowledge discovery from large amount of past data. Such techniques helpful in market based data analysis applications. An information systems and database consider data mining is most significant frontiers. [2]
3. The aim of using time series analysis algorithm to detect time dependent data or past data by statistical

technique and model to spawn prediction for future. In this paper, get estimation by evaluating recent time series forecasting data, which apply on weka. Data mining technique have been effectively shown to produce high forecasting data helpful to find customer-buying pattern. [3]

4. Car sales prediction require customer knowledge about which car can be rated as the best preference according to the customer data finding out using machine-learning algorithm. From various sources data can be gathered about car sales like horsepower; model, width, fuel type, height, price, city-mileage, highway-mileage even various features that effect the vehicle sales. Independent variable not require in vehicle sales. Using machine learning algorithms such as linear regression get specific and accurate result or prediction.[4]
5. Observation from this paper to provide proposed data mining solution for automotive market with launch and slow turning analysis, a study on the data mining techniques established in car market area. Based on DCX case study database to be mine, discover the knowledge and adopt a technique to improve important analysis in automobile market. [5]
6. According to this paper, there is huge capacity market for cars but new model selected via new technology or new facility to be used but obviously, slowdown is one of the possibility for entrepreneurs. By undertaking studies new scope, innovation, nee technology is required. Automobile manufactures offer encouragement to the customers for buying car. It may produce more reason or choice for the customer and rise sales. [6]
7. According to this paper to perform general analysis of the Indian e-commerce market using data-mining method for prediction of demand of any product. From Real-world data e-commerce websites are stately for analysis .The impact of the real-world factors on the demand and the variables are also analyzed. Through the analysis results find highly accurate prediction with the planned approach even with the impacts of varying customer behavior and market factors. For more analysis of the market and launch of new products results of analysis are represented graphically. [7]
8. According to this paper sales prediction analysis done through machine learning strategy. Predictive models is use to improve future sales predictions to make a decent decision on whether to shop for the product. This analysis produce huge number of views which is tough and monotonous for product manufacturers. The forecasting care of each consequence is evaluated with the Root Mean Square Error (RMSE). From analysis found that the best model is Random Forest Algorithm, which shows greatest precision in forecasting and in future sales prediction. [8]

III. LAUNCH / SLOW TURN ANALYSIS

Launch analysis provide basic idea of new production plan to define customer interest, which compare with their own production plan. Through the analysis, manufacturers analyse whole interest of

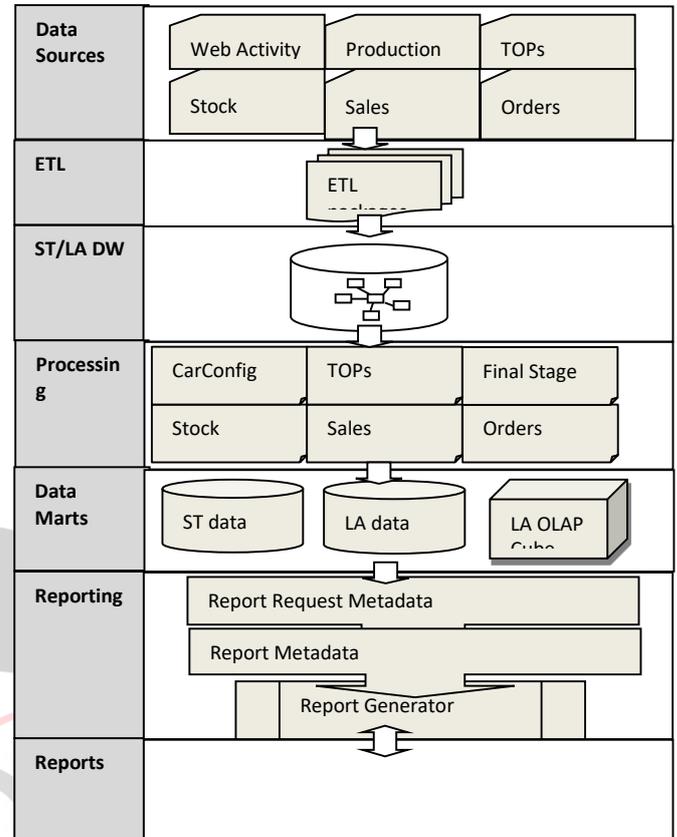


Figure 1 : Slow Turn/Launch Analysis Pipeline [5]

the customer and confirms that there must be decent production and requirement of fulfilled customer demand and rise selling. Launch / Slow turn analysis offer, which are the features to be included in the new vehicles, which a customer looks for as well as actual requirement of the customer and what they

gets. Through the knowledge, forecast customer-purchasing pattern, and provide early idea for new vehicle launch, sales and inventory vision.

Objective of Slow Turn Analysis is to identify the vehicles at dissimilar levels of the vehicle outline order and finding out some answers from basic questions like, which model do not sell faster in the respective vehicle?, which leads to slow turn?, Which vehicle model, body type selling faster or slower? Studying slow turning analysis manufacturer get an idea of such issues, defining slow or fast turning options or option mixtures.

IV. DATA MINING TECHNIQUES

From various data mining techniques like to implement or used in automobile future demand prediction include, association, classification, clustering and prediction for knowledge detection from historical data.

Association

Association is one of the best-known data mining technique. In association, a pattern is learned based on a relationship of a specific vehicle model on other model in the same transaction. Data mining association technique is preferred in Automobile sector to identify which vehicle model that customers frequently purchase with some specific type of accessories together. According to this data, manufacturers can have equivalent marketing promotion to sell more products to fulfil customer demand and to make more profit. [2]

Classification

Some mathematical techniques such as decision trees, linear programming, neural network and statistics used in classification for developing software to learn how to categorize data items into groups. Apply classification application to predict current customer interest or customer demand for vehicle model. In such case we divide past car saling data into group like faster saling model (demanded or in waiting), slower saling model. Then apply in to the classification software to classify the vehicle model, which is more demanded in market. [2]

Clustering

“The process of forming objects into groups whose properties are parallel in some mode” is a clustering

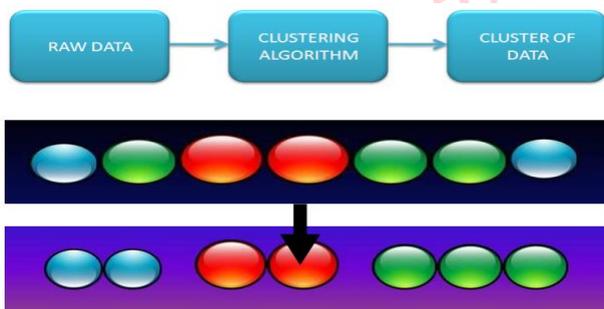


Figure 2: Clustering [2]

technique of data mining. Cluster is a collection of objects, which are “similar” between them and are “different” to the objects set in to other clusters. [2]

In Automobile Market Clustering & future prediction are the necessary components. To discover interesting patterns from historical data Clustering frequently used as a data mining technique. For advanced planning and optimization process need clustering to provide benefit in business such as shrink unnecessary inventory or attention on target pattern. To increase the efficiency and accuracy of data mining clustering is best way.

Prediction

To discover relationship between dependent and independent variable prediction as a datamining technique is used. Sales, stock prices, product growth as real world problems are not easily predict, for that require multiple

predictor variables because it depend on complex iterations. Decision tree is more complex technique which is require for forecasting. Form past sales data and profit or loss data one can predict profit for future sales or demand. Such as sale is an independent variable but profit could be a dependent variable.

V. CONCLUSION

The well-known fact for automobile industry, to take precise decision and define strategy planning for vehicle sales use data analysis and research using data mining techniques. Data analysis and result interpretation provide business key idea to the automobile sector to improve product manufacturing to meet customer’s need. To overcome marketing challenges predictive analysis, proper survey, to pick up right stock at right time, use historical data to predict future outcomes are helpful to fulfil target sales. Launch / slow turn analysis identify accurate result to purchase a vehicle in near future from market demand forecasting, market breakdown, enhancing on line interaction culture. According to mining information, determine consumers to buy their own dissimilar business era, mining techniques helps to discover the patterns to adopt the future trends in businesses to grow or generate more profit. Based on the gained data classifying several perceptions into the market scenario, which can be used for rising efficient marketing approaches and providing decision-making guidelines for the renovated products.

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