Asian Journal of Managerial Science
ISSN: 2249-6300 Vol. 9 No.1, 2020, pp. 18-24

Need of Business Analytics and Prediction Modeling in Retail Marketing in Indian Context

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Abstract - **In the digital era, Indian Retail market growing fast than ever and creating stiff competitive business environment. So, analyzing customer behavior, buying pattern and the ability to customize the products to meet demand targeted customer in time has become more important. Therefore, analyzing, diagnosing and channelizing customer data for the benefits of customer as well as the business growth is important to survive in industry for long run. International retail players are already using effective customer analytics systems or big data analytics software's for each and every stage of the retail process starting from market study of current trends, customer purchasing behavior, sales and demand forecasting through predictive analytics, product optimization, offers and promotions and many more. After all, identifying the targeted customers interested in a specific product line by the analysis of purchase history, customer demographics and finding out effective medium to reach them through Omni-channel marketing strategies is the core of customer analytics. This paper is an outcome of a descriptive research on the retail industry in India and the application of customer analytics to shape the retail industry's business strategy.**
Keywords: **Customer Analytics, Business Analytics, Retail Analytics, Marketing Strategy.**

I. INTRODUCTION

Analytics is considered as the interpretation and extraction of meaningful patterns in data. Business analytics is making the great hype in recent past both in academics and corporate world. It has been discussed and explored in many global conferences, research and survey reports. The promise of redesigning the core processes of business in the early 1990's has come into effect by the usage of business analytics methodology and effective application by global market leaders and its followed by others in late. The amount of data generated by the social media, web portals and various types of devices used for digital equipment web portals per day in fact per hour generation is huge like ocean. So to deal with such voluminous data and extracting useful meaning out of it has given birth to latest technologies like data mining, Big Data analytics which uses non-traditional ways of dealing with modern data. Big data has been characterized in terms of volume, variety and velocity (Laney, D. 2001). Deriving a meaningful data model after extracting the vital information from the customer data is the strategy for business. The results of diagnosis of the data could lead to value addition for various aspects of the business starting from market analysis, sales management, marketing & research, customer service, internal operations management, demand forecasting, inventory management and in turn enables the firms to analyze the information coming from various online sources like emails, Ad Sense analytics, transactional data from point of sale (POS) and sensor data. Therefore, retail industry can be benefitted by collating these data for sales and demand forecasting, also reaching the targeted customers with suitable offers and promotions.

II. BUSINESS ANALYTICS AND ITS RELEVANCE IN RETAIL INDUSTRY

The term business analytics is often employed to refer to the collection, storage, analysis, and interpretation of data to make better decisions and improve organizational performance (Davenport T. H.,2006). The expected outcome of business analytics, especially within the context of complementing traditional business research, is the discovery of new relationships (e.g., correlations) that emerge from large and feature-rich data, which can then be used to develop new theories for further statistical analysis and testing (Dursun Delena and Hamed M. Zolbanin, 2018). In this digital era, organizations are adding strength to their decisions making process by the help of analytical reasoning and decision support systems.

A significant proportion of high-performance companies have high analytical skills among their personnel (Davenport et al., *2007).* On the other hand, many retailers do not perceive this potential gain and they do not invest in customer analytics at an economically appropriate level (Frank Germannet al., 2018). As per MIT Sloan Management Review, it's observed that there is a striking correlation between an organization's analytics sophistication and its competitive performance (Davenport T. H., 2006).

Striving for continuous improvement on the business models, adoption of analytical tools can boost the business growth. The biggest obstacle to adopting analytics is lack of know- how about using it to improve the business performance (Davenport T. H., 2006). Business Analytics as a system uses various mathematical algorithms, statistical, operations research methods to analyses customer data and

provides inputs to business in terms of decision support system. In recent days, Business Analytics & Customer Analytics has been used across the industry like retail, E-commerce, Banking, Healthcare, for strategic innovation, operational and decision-making processes across various continuous improvements on performance. In this paper, focus is given on retail industry for Indian market.

III. RETAIL MARKET IN INDIA

Organized retail in India accounts for 8 per cent of an approximately 600 billion USD dollar market. Compared to the size of other South East Asian markets, this figure indicates the tremendous scope for growth for organized retail in India, both in terms of penetration as well as predicted CAGR till 2020 (PwC, 2018). Backed by robust economic growth and rising household incomes, consumer spending in India is expected to touch $3.6 trillion (about Rs.240 trillion) by 2020, increasing India's share in global consumption to 5.8 per cent—more than twice its current levels.

By 2020, India's retail sector is expected to double to $1.1-1.2 trillion from $630 billion in 2015 at a compound annual growth rate (CAGR) of 12 per cent, said a joint report released by lobby group Ficci (Federation of Indian Chambers of Commerce and Industry) and consultancy Price water house Coopers (source:https://www.livemint.com/Industry/rodjkB7vyBRLgTu0OMqHFM/Indias-retail-marketexpected-to-double-to-36-trillion-by.html).

The report's projections indicate that the average household income in India will triple to $18,500 in 2020, from $6,400 in 2010—acting as a major driver in retail growth and leading to evolution of new consumer segments(source:https://www.livemint.com/Industry/rodjkB7vyBRLgTu0OMqHFM/Indias-retail-market expected-to double- to-36-trillion-by.html).As per PWC analysis (in figure-1), Indian e-tailing market size is expected to be 842 billion USD from 14billion USD in 2015 which shows an exponential growth in e-tailing market.

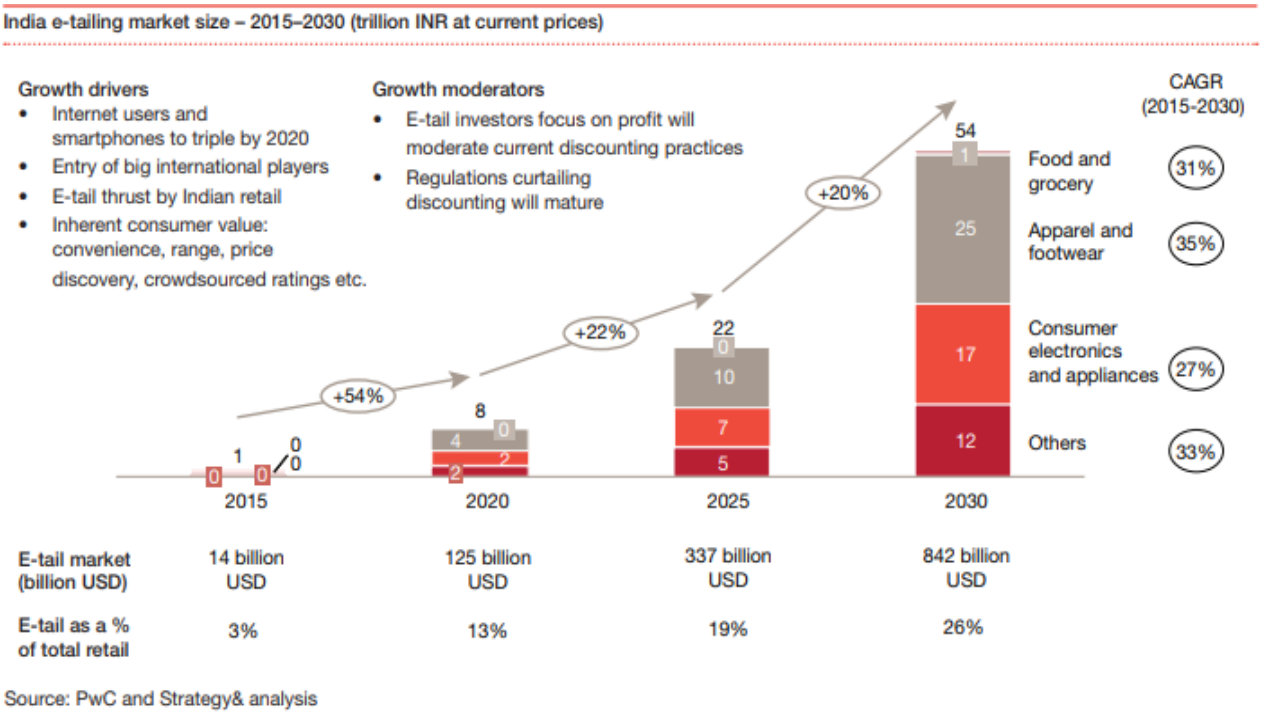

Fig. 1 Indian E-Tailing Market

IV. SUCCESSFULL INDIAN RETAILERS

In Indian retail market, there are several successful retail companies out of which many has handful of branches throughout India and growing big. Ranging from departmental stores, Hypermarkets, Supermarkets, Specialty stores to cash and carry stores, these retailers has gained their customer base through their own marketing strategies. Yet, most of the SMEs don't use an effective business analytics or customer analytics system For their business growth as the ROI for such a system is not explored yet. Previous research has proved that retailers are benefitted by the deployment of business analytics systems (Frank Germann et. all, 2018). Pantaloons, Titan Industry, Reliance Retail, Shopper Stop, Crossword, Croma and Metro Cash & Cary India are leading retailer having successful run in Indian Retail Industry (Please refer Table I table-successfull retail stores).

TABLE I SUCCESSFULL RETAIL STORES

Departmental stores	Specialty stores	Cash and Cary stores ash and Cary stores
Pantaloons has 282 stores across India by Q1 FY18-19(http://www.abfrl.com/docs/investors/announcements/ABFRL_Press-Release-_August_01_-2018.pdf)	Titan Industry is leading player in this segment with 496 World of Titan showrooms (Net 10 addition in Q1 FY'19). 173 FASTRACK showrooms (Net 7 additions in Q1 FY '19)(https://www.titancompany.in/sites/default/files/Q1%20FY%2018-19%20Investor%20Presentation.pdf)	METRO Cash & Carry India offers close to 7,000 world-class products across a multitude of categories low wholesale prices. METRO Cash & Carry operates in 25 countries over 750 wholesale markets with about 108,000 employees worldwide.(https://www.metro.co.in/about-us)
Currently, Shoppers Stop has a footprint of 83 large stores spread across 38 cities in the country along with an e-commerce website, m-site and mobile application. (https://retail.economictimes.indiatimes.com/news/apparel-fashion/apparel/shopper-stop-posts-q2-profit-at-rs-13-2-cr/66380322)	Croma has 112 stores across India for consumer electronics segments.(https://www.croma.com/about-croma)	Reliance Retail opened the first Reliance Market in 2011 for cash & carry segment and since then Reliance Market has grown rapidly with 46 stores serving over 2.5 million member partners.(https://relianceretail.com/reliance-market.html)
Reliance Retail operated 9,907 stores with an area of over 20.6 million square feet and 514 petro outlets as of 31st December 2018(http://www.ril.com/getattachment/b35911ba-d32f-4520-bcd9-6c82baaa7601/Q3-(FY-2018-19)-Financial-and-Operational-Perf-(1).aspx)	Crossword, with 90 stores across India in books and gifts segment.(https://www.crossword.in/about_us)	

V. TRENDS OF CUSTOMERBEHAVIOUR IN RETAIL INDUSTRY

There were times where people are skeptical to shop online with the fear in heart for the fraudulent transactions. In this digital era, the recent trends of online shopping have found more focus within young generation with fast growing usage of mobile internet. With growing interest in internet marketing in India, ecommerce major players like Amazon and Flip kart has captured the maximum market share in India.

Following the trend, many other consumer goods are focusing on multi-channel marketing in the form of online and social media channels. In a research it is observed that about 650 million people are expected to be online by 2020 and among them 250 million will be shopping online - spending more than $50 billion. Interestingly, at least $5 billion of this expenditure is expected to be on packaged consumer goods (source:https://www.livemint.com/ Industry/ rodjkB7vyBRLgTu0OMqHFM/Indias-retail-market-expected-todouble-to-36-trillion-by.html).

In today's digitization era, customers in the retail industry have access various source for analyzing products online and conversion rate online enquiry to actual purchase is convincingly moderate. Hence, in case of retail, a customer in this fast forward age is not only impatient but also in the need of the getting an excellent level of service satisfaction. Like the customer compare and analyze similar products of various companies to make informed purchase of their, companies also does the same to analyze the customer data in order to find out the need, taste of their targeted customer and this process evolves rapidly. With the stiff competition among the various retail majors to grab the attention of majority customers, companies use the customer analytics to compile the customer behavior data and lunch the product accordingly to satisfy the need of their customers. With the help of Market Basket Analysis, companies understand their customer and process of realizing the margin through various functions.

The customer analytics help the organization to figure out those components related to promotion, personalized offers, likes and dislikes of customer. Apart from marketing strategy, Analytics also can provide insights to the demand & supply forecasting, potential buyers, optimal pricing and effective stock strategy which potentially can help to grow the business significantly after subsequent use of the analytics. To know the customers, want and need and fulfilling it in appropriate time is the simple strategy of retail business and organizations can leverage the power of analytics to achieve it efficiently.

VI. APPLYING BUSINESS ANALYTICS IN RETAIL INDUSTRY

Business Analytics plays a vital role for retailer to achieve the goal of knowing their customers. Portable devices like tablets and mobile have a vital role in the most hyped Internet of Things (IoT) ecosystem, and retail industry shall be leveraging analytics to collect the instant and valuable customer data that comes from these devices. Once the costumer agreed to "opt in," retailers can exercise to learn

from the data by interaction of these devices and connect with a brand. There are various instances of such experiments that can be implemented by business analytics systems which helps the retail organization. Few such examples are mentioned below.

1. Which specifics products are most browsed or shown interest in buying?
2. How many products are not actually purchased even after browsed several times?
3. How often the customer places the orders for those items? Is there any buying pattern that can be analyzed further?
4. Can there be automated reminder system implemented for those customers who makes repeated purchases.

Business Analytics empowers the retailers to analyze and explore the patterns from the customer data collected from different sources and accordingly adjust their value offerings to their target users to enhance the customization, convenience and ease of online shopping. There is no doubt about the volume, variety, velocity and value of retail data that is growing day by the day, which makes the retail players to elevate their value offerings to match the dynamic consumer demand. Consumers shuffle between the fast-growing e-retailing and the physical stores, difference would be a customized experience for the specific consumers that attract them. With evolving digitization everywhere, Indian retail market having technology paving its way deep into the sector, there are no options other than to transform or else perish. The traditional brick and mortal retail stores are left with no choice but to adapt the change and reform their strategy to retain the existing customer while attracting new customers by analyzing, understanding the customer's need and fulfil the demand in appropriate time.

VII. INTEGRAL AND IMPORTANT COMPONENTS OF RETAIL ANALYTICS

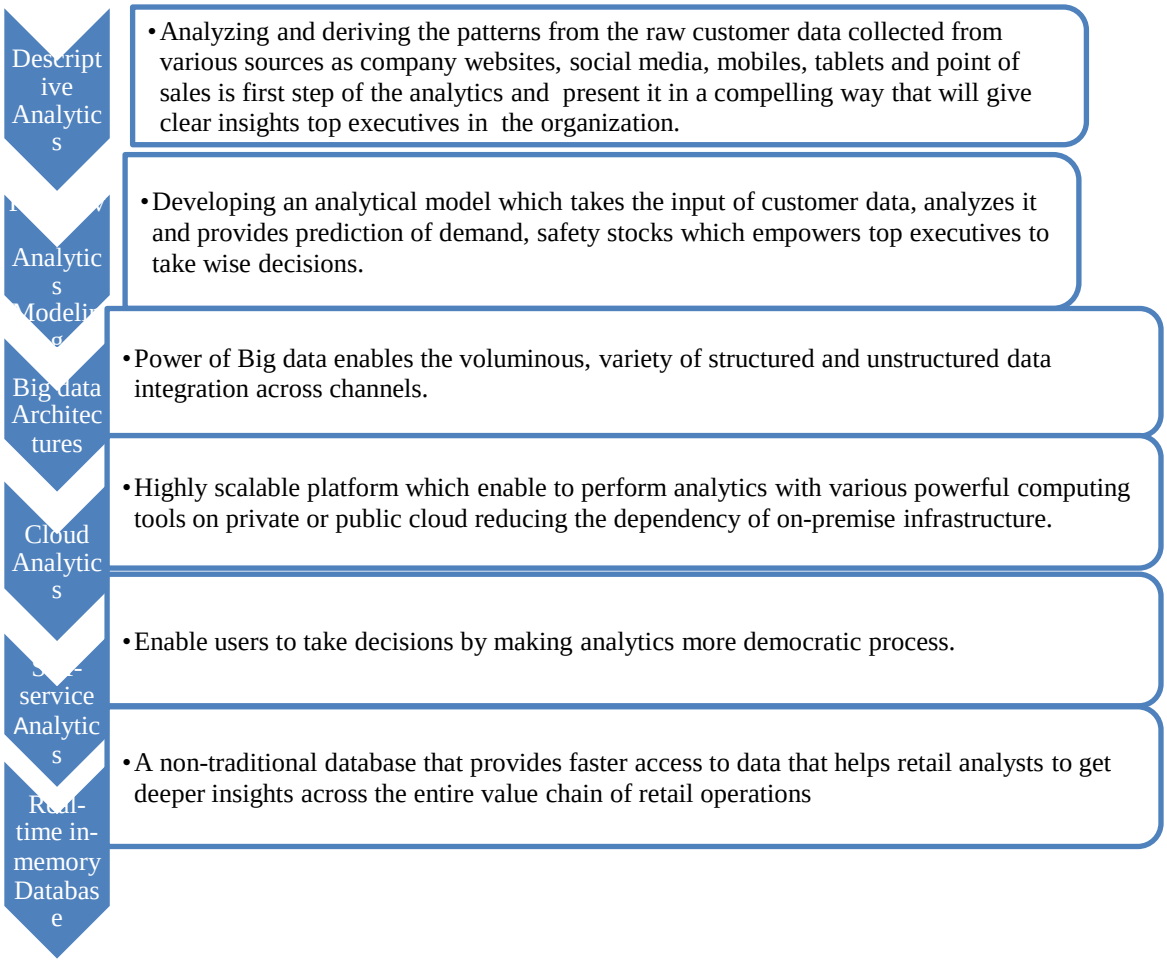

Fig. 2 Integral Components of Retail Analytics

For a successful retail analytics strategy, crucial components of Retail Analytics are Descriptive analytics, Predictive Analytics Modelling, Cloud Analytics, Big data Architectures, Self-service Analytics and Real-time in-memory Database (Retail-Report-2018). In Figure 2, these components are explained briefly.

VIII. CONCEPTUALFRAMEWORK OF RETAIL ANALYTICS

The Retail Analytics framework can help retailer to develop strategy for their business. It mainly uses four components as In-store operations & Merchandise Analytics, Customer analytics, Marketing analytics and Demand & Supply Analytics (as explained in Figure 3).

A. Customer Analytics

Analysis of customer demographic information, customer purchase behavior and using the same to identify the target audience is one of the most important steps of the retail analytics. Customer analytics provides this vital information to retailers and help to gain larger customer base.

B. Marketing Analytics

Marketing analytics provides deep insight to customer and help retailer to meet customer demand &ensure loyalty by performing analytics with the data from various source like social media, point of sales(9POS) and customer relationship management (CRM). It can help in optimizing the performance of the multichannel marketing and can provide vital information for an effective product pricing decision.

C. Demand & Supply Analytics

Demand & supply analytics uses various advanced solution like Global Positioning system (GPS), fleet management systems for end to end order tracking and smart inventory management system for effective stock keeping.

D. Ins-store operation & Merchandise analytics

Store operation and Merchandise analytics helps retailers to gather information of customer by collecting customer data from the sensors that are placed in various parts of the store. Using Internet of Things (IOT) enabled sensors, cameras, it analyses the customer's movements & buying behaviour and provide crucial inputs like appropriate stock keeping, proper placing of products by applying sophisticated analytics.

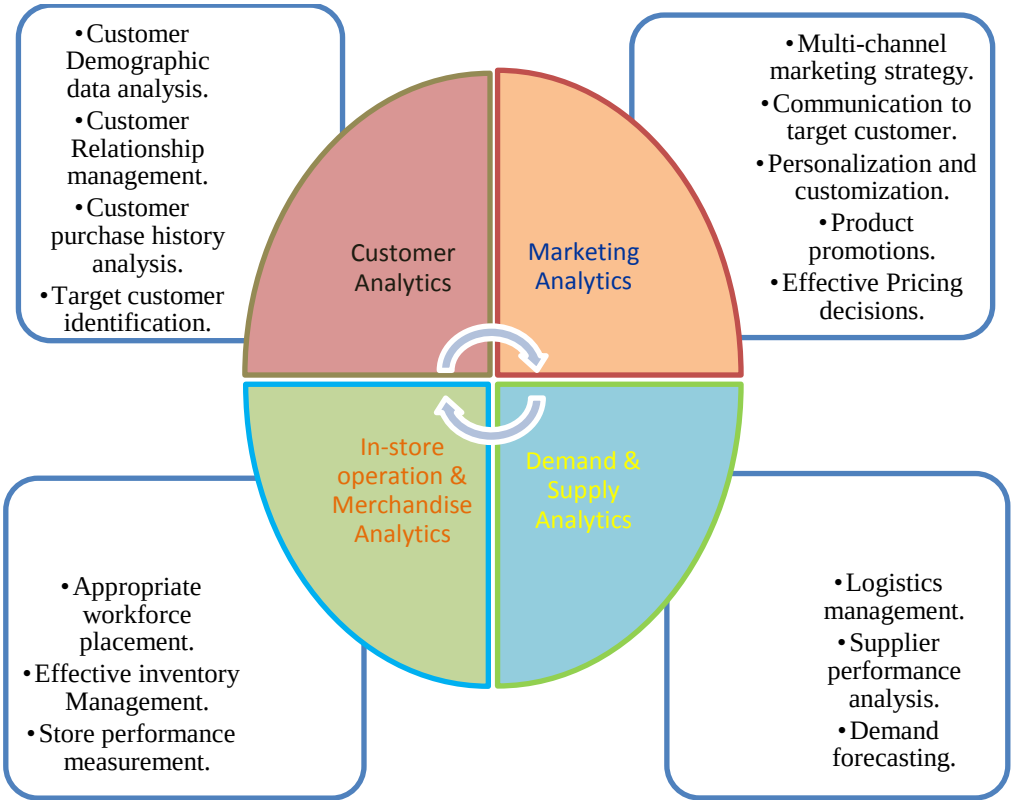

Fig. 3 Conceptual Framework of Retail Analytics

IX. PREDICTION MODELS OF RETAIL ANALYTICS

There is rising need of prediction models to support important decision making for business growth especially in retail market where organizations have access to large customer data which is fuel to the analytics engine of prediction modelling.

Each of these models has importance to develop a smart and effective prediction modelling for retail analytics1 (as shows in Figure 4).

A. Data pre-processing

Before using the retail data for modelling, it has to be processed. The data collected from various sources such as web portals, social medial sites, mobile & tablets and point of sales (POS) must be processed.

B. Customer Segmentation Model

Customer segmentation is about profiling customers based on customer demographic information, browsing behavior and buying behavior.

It further uses clustering techniques to group customer of similar behavior based on their profiles.

C. Market Basket Analysis Model

Market basket analysis model allows retailers to gain insight into the product sales patterns, analysis of historical sales records, identifies products that are purchased together and provides recommendation of co-occurrence of the products.

It is typically an "if then analysis" which predicts the customer buying different product as a combination, hence helps retailers for effective pairing of products for promotions and offers.

D. Price Sensitivity model

The Price sensitivity involves various components of customers purchase decision such as what price the customer tends to perceive the product is expensive, too expensive, inexpensive and too in expensive.
Price sensitive model helps retailer to effectively mark price tag that attract customer.

E. Inventory-Based Suggestion model

The Inventory-Based Suggestion model keeps tracks of the products and makes real-time recommendations based on the combinations of customer's preference and available stocks, hence helping the retailers clear the inventory while satisfying the customer's need.

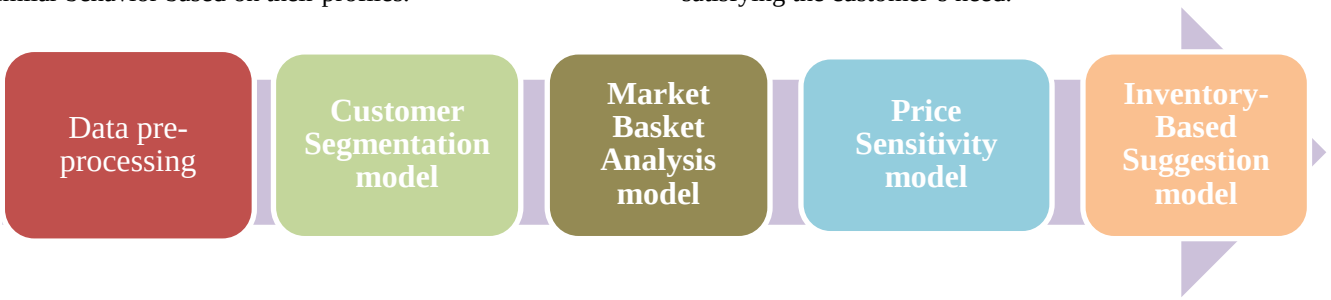

Fig. 4 Prediction Models of Retail Analytics

X. CHALLENGES IN RETAIL ANALYTICS

Many international and national retailer players have already implemented business analytics across all operations of their business. It sounds exiting to use business analytics for processing huge volumes of customer data which can help to improve the revenue generation of the organization the with decision support systems.

However, most of the Indian retailers haven't the explored the benefits of business analytics and big data system for their business as there are many challenges involved to establish a business analytics system especially for SMEs where profitability of implementation of such systems are unexplored. Since Big data enabled business analytics systems are high end analytics systems, it needs a team specially trained professional to operate it. Since these systems integrate data from various sources, the security, privacy and liability issues of such systems needs to be taken care.

XI. CONCLUSION AND IMPLICATIONS

In the digitization era, it is obvious that retailers to get most benefits of implementation of retail analytics based system whose analytics engines runs on the data from various sources such as web portals, chat-bots, social networking sites, point of sales (POS) and GPS enabled smart phones& tablets. Usage of various Predictions of models, better risk assessments, and better communication to the target audience and effective inventory management system can help organization to ride through greater heights of success. Research has proven that usage of such analytics system can help the retail organization to gain profitability.

The volume, variety and velocity in which the data is getting collected, can really provide some meaningful insights on the customer's preference for the products, recent shopping trends and the predictions based on the collected data. Hence more Indian retailers should deploy business analytics system to gain the profitability and business growth by the help of analytics-based decision-making support systems. This research suggests that Indian SMEs in retail space will be benefited by the implementation of business analytics to see greater profitability.

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