CHAPTER 6
CONCLUSION
6.1 Summary & Conclusion

According to all analysis, the sales data research helps to understand the thinking of consumer and the behavior of consumer before, during and after purchasing time period. From this analysis, the retention of consumers for the super stores has been done by providing products according to their needs and habits. This study is very much helpful in giving idea regarding consumer’s mindset. And this mind reading process influenced the decision making of the consumers. There are so many options available in the market for consumers to change their mind and living habits to fulfill their demands. This makes the products life shorter. So, if the product is not popular enough, than it was not able to sustain in the market. Hence, fastest studying of consumer behavior was necessary.

Nowadays, most of the consumers preferred environment friendly products. So, the super stores must be upgraded according to the new products available which are environment friendly. The shop keeper or owner of the store must update their store according to the new market trends or changes for improving their consumers. Actually for understanding consumer behavior, the shop keeper must understand the consumer’s inner psychology by their likings and past purchases. This psychology is depended on various factors like social, personal, cultural and psychological. Social factors include the opinion from peer group or family members. Here, the word of mouth publicity influences the consumer behavior. The status and role model for the consumer is also considered in social factors. Next personal factors include economic condition, personality, change in life and age. The change of life may be marriage, childbirth, etc. This personal factors change the tastes and preferences of the consumer. Cultural factors include the Indian culture which according to various festivals or traditions. This affects the marketing strategies by giving heavy discounts and offers. Last but not the least is psychological factors. These factors include human mental ability which affects the behavior that is motivation, experience, perception, beliefs, attitude, etc. By considering all these factors, the owner of the super store must be kept their eyesight on the consumer’s activities from searching, choosing, using and even
destroying of an item. Because buying process begins very much before the actual purchasing and ends with so many consequences for a long time.

In the past times, when no super stores were in existence, the consumers need to go to different places for purchasing different products. But today’s time period, men and women all are working. So, they required a place where everything available under one roof, which saves the time. This is the reason behind existence of super store. These super stores give huge amount of discounts or offers on the daily routine items, because they shopped all those items in bulk from the manufacturer. Also the shop keeper must build up some strategies which activate consumer interest and generate circumstances that activate a need. This thing is required for schemes announced by the shop keeper.

In the research, the comparison between different items have been done according to price, quantity sold, weight, etc. to find most sold item. All these research is fruitful to marketers for developing new products and marketing plans and also for changing the existing things. For gaining more profit, it is required to study the consumer’s preferences. But for different consumers the behavior and demand is different, which may be depended on the climate, status of people, caste, religion, etc. Tastes, needs, media habits, life styles, preferences and pattern of shopping of the consumer are constantly changed, for which the product makers and shop keeper must maintain the track and cope up with it. Then only they kept at top position and ahead of all other competitors’. According to marketers, there are four factors which affect consumer’s behavior: Price, Product, Place and Promotion. Decision making of consumer is depended on these four factors, with the criteria need of product, searching of product, past purchase of product and evaluating & prioritizing process. As the last process, decision has been made by finalizing which product satisfies the necessities in the best way. The owner of the super store must kept watch on after purchase satisfaction. Because if the consumer dissatisfied with the purchased product, he/she can either left the product or move out to different store. The owner must think about the repeat buying possibility.
The main aim of the research is to do prediction about consumer behavior and find out products buying patterns in the future. For this, various data mining techniques were applied to find out fruitful knowledge from the sales data. This sales data have been collected from the retail market in INDIA. In the retail market, there are different retail formats available. From which, the conducted research was only for super stores, where various products are available under one roof. In this research, all item groups and items were not taken only selected fast moving items have been selected for the analysis. There were no wholesale transactions data and the sales data not taken from the whole country INDIA, but from only South Gujarat region. The research has been carried out with the help of data mining tool: Weka. In Weka, there are various techniques available for knowledge gaining like Clustering, Classification, Association, etc. The collected data has in different file formats, which have been converted into required format that is understandable by Weka data mining tool. These data also need to clean for removing missing data, noisy data and duplication. The Weka tool also has Pre processing facility to process the data before mined. After pre processing the data, different data mining tasks have been performed on data according to research objectives. In this conducted research, some objectives were decided and hopefully achieved them at some extent. So according to those objectives the conclusion is as follows:

a) To study the pattern of selling products according the segments.
   In this objective segment means the item groups like AGARBATI, BATHSOAP, COSMETICS, DETERGENT, FOOD, SHAMPOO, SOFTDRINK, TEA and TOOTHPASTEPOW. To find the pattern of selling products in those groups, at first the patterns of groups have been analyzed. This analysis has been given the most sold item group from the all groups which have been taken in the research. The total number of transactions for each item group have been taken, which has given the conclusion about the group with highest selling items. The research said that the item group FOOD is the highest selling item’s group. That covers almost 50% part of selling which is 43.11% of total selling.
The status of other item groups with more selling from the super store according to percentage count >25% is DETERGENT, SHAMPOO, BATHSOAP, TEA, and COSMETICS in descending order that is highest to lowest form. TOOTHPASTEPOW, AGARBATI and SOFTDRINK are the lowest selling item groups of super store.

To find exact buying pattern of consumer according to item groups, association has been done for item groups. This gives important rules of association which does not gives any selling pattern with the lowest percentage count item groups. From the association rules, two useful patterns have been achieved that are TEA $\rightarrow$ FOOD and COSMETICS $\rightarrow$ SHAMPOO. This has been given the correlation between different item groups.

These rules have been helpful in impulsive buying of consumers. If the rule is X $\rightarrow$ Y, than the shop keeper put X closer to Y, for improving profit. Also put low selling item group with the nearby place to higher selling item group. The shop keeper or manufacturer also offer the lower selling item as free item with higher selling item, to increase the liking towards the lower selling items among consumers.

b) To find and analyze the association and correlation between selling of products in the same segment and different segments.

The first objective is about correlation of different item groups, but in the second objective the outcomes are about correlation of different items in the same item group and in the different item groups. The analysis has been done on the 90 different items of the super store which are fast moving means more sold items in the store.

The top 3 maximum sold items from the super store are Clinic Plus Shampoo, Tata Salt and Ariel Detergent Powder in order of selling. If considered each item group than the maximum sold item from each group are respectively for AGARBATI $\rightarrow$ ThreeInOneNani, BATHSOAP $\rightarrow$ LifeBoy500g, COSMETICS $\rightarrow$ ParachuteB250ml, DETERGENT $\rightarrow$ ArielPouchPw18g, FOOD $\rightarrow$
TataSalt1kg, SHAMPOO $\rightarrow$ ClinicPlusStrip, SOFTDRINK $\rightarrow$ RasnaOrange32gl, TEA $\rightarrow$ VaghBakri250g and TOOTHPASTEPOW $\rightarrow$ Colgate100gm.

After finding most frequent item in each group, the association of items in the same item group has been achieved. For each item group, the facts revealed were:

- In the first item group AGARBATI, the lowest selling items are not in the rules. The rules generated with only higher frequency items. Two items Panchavati and ThreeInOne sold together so many times from this group. This has been revealed the hidden fact about buying pattern of the items with the same purpose, sold together.

- For the BATHSOAP group, the derived rules said that the pair of brands Lux and Lifeboy and also the triplets Lux, Lifeboy and Detol sold in the same transaction. Hence, prediction is the consumer selects more than one brand at the same time. The shop keeper uses this fact for price related changes in the items. That changes may be increasing one product price and decreasing other product price as well as vice versa. Rules also has given the fact about the brand Lux which is actually not the most sold item but is in most of the association rules with may be different weights.

- The COSMETICS group was not give much more fruitful information from the association rules but revealed the fact of weight. The consumer may bought the same group and same brand items but with the different weight at the same time.

- In DETERGENT group, ZFREESCRUBBER is as a complement item with the soap. It was not the most frequent item in the group but it was in the almost all rules for this group. This proves that it is more required with the other products, but not bought more individually. It is closely associated with Vimbar soap. The shop keeper package ZFREESCRUBBER with Vimbar soap to boost up the selling of Vimbar.
• From the group FOOD, the generated rules said the facts about Uttam Rava and Uttam Maida, that the people bought both items together all the times, may be as impulsive buying habit. Same way some of the biscuits like ParleG, Krackjack, Monaco, also bought together.

• The SHAMPOO group revealed the facts regarding family members’ habit which is the reason behind shopping of different brand’s shampoo at only one visit of the store. The ClinicPlus shampoo was the most frequently sold shampoo from the store.

• The SOFTDRINK group is with low frequency but gives the fact about popularity in the market. Rasna and Real both are popular brands which appeared most in the rules.

• TEA group gives the fact of interrelated items which are TEA and TEA MASALA.

• TOOTHPASTEPOW group provides the information about different weighted items of the same brand Closeup, sold together. The other brands like Cibaca and Colgate, also sold with Closeup.

The next analysis in this objective is about finding association between different items in different item groups. The rules achieved with importance are:

- Vimbar \(\rightarrow\) ZFREESCRUBBER
- UttamMaida \(\rightarrow\) UttamRavo
- Tide \(\rightarrow\) Ariel
- Tea \(\rightarrow\) Any Brand Biscuits
- Tea \(\rightarrow\) Gay Chap Besan
- Tea \(\rightarrow\) Uttam Maida
- Tea \(\rightarrow\) Uttam Rava
- Tea Masala \(\rightarrow\) Tea
- Gay Chap Besan & Soda \(\rightarrow\) Salt
- Gay Chap Besan & Soda → Uttam Maida
- Uttam Maida & Soda → Uttam Rava
- HairDie → Any brand of Shampoo

All these rules helpful to the consumer for putting correlated items together, packaging those items, advertising those items, etc.

c) **To find and analyze patterns of products selected by the consumer in the seasonal period.**

For seasonal analysis, at first season means the quarterly division of WINTER, SUMMER and MONSOON. According to that, the shopkeeper declared seasonal sale like MONSOON Dhamaka, SUMMER Bonanza, etc. Seasonal promotions may be offered during some event throughout the year. As a promotional offer, some discounts or schemes can be applied on the products of super store. The event of the year is specific holidays like Diwali, Christmas, Navratri, etc. or school / college opening time, etc.

The main advantage of this analysis is to attract consumers at a beneficial time period. This helps in conversion of the one-time consumers to regular consumers. Basically offers are given according to the holidays because it plays vital role in improving business. These holidays are of three types: Standard Holidays like Diwali, Valentine Day, etc., Annual Events like Back to school and Non Traditional Holidays. Offers are not given at all the holidays or events. If given than it affects the profit of the super store. Offers are given only at the time when they are most effective. These promotional offers provide the way for boosting up sales of the super store by providing more visibility of the product among consumers. As an outcome, it gives the most selling products in the particular season.

To find out seasonal effects on different products of super store, the shopkeeper must view the past shopping history of the consumers in particular seasons. This study of seasonal effects helps the shopkeeper to find out most sold and less sold items in the specific season. Using that information, the owner must maintain the
stock of more sold items and if some items were less sold in the particular season, than clear that item’s stock by giving discounts or schemes in previous season.

By counting support count of each item group, easily the most frequent item group can be achieved in particular seasons. Normally on item group there is no so much effect of the season overall because top 3 item groups in all season remains same which are FOOD, DETERGENT and SHAMPOO. Only in MONSOON the place of DETERGENT and SHAMPOO has been interchanged. The reason behind this may be people were less like to wash their cloths in MONSOON which decreasing the demand of DETERGENT.

But for each item group if comparison has been done according to all seasons simultaneously, than the effect has been noticed. In the MONSOON season, there was highest selling of many item groups but overall selling is less in MONSOON compare to other season. In the WINTER season, the TEA and DETERGENT group are highest profitable groups with 41.18% and 40.32% and in the SUMMER season, the maximum selling i.e. 46.59% is of SOFTDRINK group which is sold less in WINTER. All these are predictable outcomes which displayed human normal behavior.

According to all these analysis, the shop keeper can declared offers for low frequency item groups in the relevant season for increasing selling. The shop keeper must manage the stock according to the selling in the super store.

After finding facts regarding different item groups, the analysis has been done on different items which also given the essentials of some products in specific season. As a result, the product → season analysis given as :

- Any brand Softdrink → SUMMER
- Panchavati & ThreeInOne Agarbati → MONSOON
- LifeBoy Soap → Summer
- Gay Chap Besan → MONSOON
- Any brand Biscuits → MONSOON
- Any brand Tea → MONSOON
• Any brand Shampoo → SUMMER

Some products like ClinicPlus Shampoo and TataSalt have no effect according to season because they are at top position in all season.

After finding individual frequent items, the association has also been done for better results. Two rules FOOD → DETERGENT and vice versa, achieved in all season. That has been given the hidden judgment about FOOD group and DETERGENT group, which are sold together. The shop keeper actually doesn’t care about placement of products of these two groups but using this fact, he/she can put closer the items of those groups.

The next rule about TEA and FOOD group with more percentage in MONSOON, which gives predictable reason, FOOD items are complement of TEA. One more rule gives, not known facts, which is TEA → DETERGENT. The results shows that the item groups FOOD, TEA and DETERGENT are strongly correlated with each other. Same way, from the rules, BATHSOP, DETERGENT and SHAMPOO are also closely associated item groups. According to all these rules, the shop keeper can change the store layout and arrangement is in the way which increasing the profit of super store.

For different items strong association achieved in different season as :

• RealLitchiJuice & RealMixFruitJuice → SUMMER
• UttamRava & UttamMaida → WINTER
• ClinicPlus & Any other brand of Shampoo → SUMMER
• Two brands of Tea → MONSOON
• Any brand of Tea & Biscuits → WINTER

Hence, season wise analysis of products helpful for finding interested and not interested products in the specific season.

d) To find and analyze patterns of products selected by the consumer in the particular time period.
Any consumer selects the best time for the shopping according to his/her schedule. The time period has been divided into four parts: MORNING, AFTERNOON, EVENING and NIGHT. But most of the super stores do not remain open for 24 hours, they remain closed during the NIGHT hours. The research was taken only for three time periods: MORNING, AFTERNOON, and EVENING.

The product pattern according to time period may vary for quick & unplanned shopping and planned shopping. But for both shopping, the main goal of the shopkeeper is to attract the consumer to buy more products. Super stores must have knowledge about the people's spending and shopping habits. The time period wise analysis is necessary to find out peak hours for the super stores, which gives maximum benefit to the super store. During these hours, maximum people are there in the super stores. So, the manager has to take care that no person has been un-attendant, more attention towards the interested people, gain the consumers' attention towards offers or discounts, etc.

The analysis said that highest selling—54%—was registered during the AFTERNOON hours that are between 12 to 5. And the lowest selling was recorded in the EVENING time period. So, the rush hours in the store is considered as AFTERNOON hours.

Season wise also time period analysis is different. According to the season, in WINTER, there is the highest EVENING transactions i.e. 41.91% and lowest MORNING transactions i.e. 34.56%. The reason may be very much cold in the MORNING time period in WINTER. In SUMMER season, at EVENING time period, there are highest transactions because in this time there is some release from the hot environment. But in AFTERNOON time period of SUMMER season, has lowest transactions i.e. 29.19%. In MONSOON season, highest transactions 33.89% have been recorded in the MORNING time period and lowest transactions 21.52% in EVENING time period. If collectively taken analysis WINTER AFTERNOON is the best time for grocery shopping and MONSOON EVENING is the time with the lowest shopping.
For different item groups, seasonal analysis said that in MORNING time period, FOOD, SHAMPOO, DETERGENT, BATHSOAP and TEA taken the top positions in order. For the TEA group, its selling is 30.54% in MORNING and 26.88% in AFTERNOON, which gives the fact of higher demand of TEA in MORNING. In EVENING, the demand of BATHSOAP and SHAMPOO is less according to support count percentage. In all time period, FOOD items were sold the most and SOFTDRINK was less. The AGARBATI and TEA sold most in the MORNING time period may be as spontaneous buying. BATHSOAP, SHAMPOO, COSMETICS and TOOTHPASTEPOW group items sold maximum in AFTERNOON time period.

After item group analysis, if considered analysis of different items, in MORNING time period, ClinicPlus Shampoo, Ariel Detergent and VaghBakri Tea are the most sold items with 790, 479 and 444 transactions respectively. In AFTERNOON time period, ClinicPlus Shampoo, TataSalt and Ariel Detergent are maximum sold items with 1332, 717 and 685 transactions respectively. At last in EVENING time, TataSalt, WheelBlue Soap and ClinicPlus Shampoo are maximum sold items with 615, 421 and 398 transactions respectively.

After individual analysis, the association also found for products season wise. These association rules also have been given the same facts like individual analysis but in the form of rules with support count.

First the rules with item groups are discussed. TEA, BATHSOAP, SHAMPOO, DETERGENT are the groups in maximum rules means in maximum shopping this groups’ products bought together. This defines the fact of emergency demand raised in the morning time period. In AFTERNOON time period, association rules DETERGENT and SHAMPOO are most appeared groups. Actually in EVENING transactions are less but still DETERGENT, FOOD and TEA groups sold in that period.

For different items, the rules made are, at first ZFREESCRUBBER → Vimbar is the most associated rule in all the time period, so there is no effect of time period
on this two items. The item group SHAMPOO most sold in MORNING and AFTERNOON time period, in which Dove, Vatika, Pantene, Sunsilk, Head & Shoulder brands of shampoo most sold with the accordance of ClinicPlus shampoo. As the rules said, this ClinicPlus shampoo also sold with items like Agarbati, Parachute and Colgate at the same time. Uttam Rava, Uttam Maida and different brands of biscuits most sold in all time periods. Items of AGARBATI group also sold more in EVENING time period.

According to these analysis and pattern finding in particular time period, the shop keeper must maintain proper stock of products and manage more people to handle consumers in busy hours.

e) **To find and analyze patterns of products in the clusters according to the price.**

The price affects the products selling in less or more manner. This objective describes about the selling pattern of products with respect to price of product. The price factor when increases effects on the sales volume of the super store. It also affects the demand of consumer. Price of the product is not matter if the product is popular enough. Price factor also reflects according to competition, the consumer’s prospective and price flexibility. It is also affected by how many the consumers willing to pay some amount for a quality product.

For doing cost wise analysis, of each item group, perform cost and total selling analysis which revealed the facts for different groups like :

- In the AGARBATI group, the fact revealed is that consumer doesn’t prefer those items with lower price. The most sold items of this group were with highest prices, are Panchavati Nani and ThreeInOne Nani. Hence, the consumer’s bought the items according to choice not as the price.

- For the BATHSOAP category, the analysis said that the consumer doesn’t consider the brand but shop according to the buying habits. Highest
transactions recorded of Lifeboy 500gm and Lux 240gm which gives the fact of different weights of soap preferable at the same time.

- In the COSMETICS group, with different brands, the hair oil with lower price i.e. Parachute, sold more in compare to hair oil with higher price i.e. Almond Drop. So, here may be price factor effects or the popularization of brand effects.

- In DETERGENT group, there are items like soap for cloths, detergent powder and soap for utensils. If compared soap for utensils, two soaps Vimbar and Bartan are there, in which Vimabar is with higher price but sold more, may be because of popular brand name. In the case of detergent powder, the transactions of small packets are more than bigger packets.

- For SHAMPOO group, there are so many brands of shampoo available. But ClinicPlus is the most sold item in this group among other brand shampoos. Still it is the lowest priced item. Hence, here the popularity of the brand matters to the consumer.

- In the matter of SOFTDRINK group, it is easily said that the flavor of juice that the people like more, is the most selling product. Also the capability to make how much quantity of juice is also matter for the people when buying.

- For the TEA group, the fact appeared is the people like to buy average weighted items.

- The TOOTHPASTEPOW group gives the same fact of popularization of product in the market.

The month wise profit analysis of super store said the facts of different months with highest and lowest selling. From this analysis, in the JANUARY maximum selling is recorded and in JUNE there is lowest selling.
Vasudhara Ghee and Vagh Bakari Tea highest peak items in many months. Lifeboy and Detol soap is most profitable item in the month of MAY to make protection from humidity and hot airs. The highest TEA demand is in JAN month which is of WINTER season and lowest in SUMMER season months. Gay Chap Besan is highly demanded in MONSOON season because of more liking of eating “Bhajiyas” in MONSOON. So, there is direct relation between the month and the product bought in that particular month.

This month wise analysis helpful to the shop keeper, for declaring offers and schemes in particular month for improving profit of super store.

f) To study the behavior of consumer and proper arrangement of products according to the buying patterns.

After analyzing all above objectives, this analysis tells the results of them. It is about different buying patterns and according to that arrangement of products. It also predicts the human behavior in the super store.

The human behavior of different person judge by seeing the criteria:

- Liking of different FOOD items
- Attracting towards discounts & offers
- Buying of different brands items of same group
- Buying of items with same brand but with different weights
- Buying of particular group of items in particular season or time period: TEA → WINTER, SOFTDRINK → SUMMER, etc
- Variation of selling according to season
- Preferable time period for shopping
- Sudden demand of specific item at specific time period
- Buying of correlated items like TEA → FOOD items (biscuits, GayChapBesan, etc), TEA → TEA MASALA, HAIRDIE → SHAMPOO of any brand, etc.
- Cooking habits according to buying
- Impulsive buying of some products
• Prefer ability of products according to brand popularity
• Liking of flavors
• Characteristics of products, etc.

According to products buying patterns the store layout can be managed by the shop keeper as:

• Putting low selling items with high selling items to increase selling
• Giving discounts and offers
• Placing of items with discount at center or front in the store
• Packaging two items in one packet
• Maintaining stock of items in particular season
• Announcing sale according to season
• Clearing the stock according to season
• Changing the location of products
• Setting the working hours of employees
• Analyzing the sell in different month
• Putting correlated items at nearby places
• Placing some of impulsive buying products close to bill counter, etc.

This all are the results as conclusion given by the research analysis. All these will be helpful to shop keeper, owner of the super store, workers in the store, manufacturer, marketers and consumers in many different ways.

Before doing this research work, the review of old work has been done. From that reviews some of the work is there which required improvement and this conducted research overcome all that remaining work and fulfilling the gap.

There are those old researches in comparison with the conducted research are given as follows:

**Swamy K. R., Babu G. H. and Venkatasubbaih R.** have been done the research of online shopping data of 60 students. They have found the frequent pattern of
products from this data set. Here, they only have generated association rules with Weka tool for the whole data set. The authors have not classified the data according to some classes though Weka can give the facility of Classification. In this conducted research, the classification of sales data has been done according to Season : WINTR, SUMMER and MONSOON and according to time period : MORNING, AFTERNOON and EVENING. Also the combined class of season & time period has also been taken for analysis. After this classification, the association rules have been generated for classified data. This classified data can give different products pattern for particular season and time period. It is very much useful to find out seasonal and time related effects on shopping. This will predict the consumer behavior in particular time.

Sabitha B., Bhuvaneswari N. G., Annapoorani G. and Balasubramanian P. have done both association and classification process on the collected wholesale shopping data. But the classification done in Tangra tool according to time period only that is in Morning time and Evening time. Hence, the shopping patterns in particular time period have been generated. However, the classification regarding different season has not been done. Because the patterns for the time period may be vary for different season. So, in the conducted research the season wise patterns has been found and also the study have been presented the facts of various time period : MORNING, AFTERNOON and EVENING, in different season. Seasonal affects tells the shop keeper to plan sale or to give offers on different products.

Nandi D. has performed the research for impulsive buying habit of consumer. Whether or not the consumer needed the product but he/she bought that product. This research has been conducted in the form of questionnaire and responses of 200 consumers have been recorded. The association has been found but for the impulsive buying patterns. This association was related to different characteristics of product. Hence, in this conducted research, the main factor considered for association was date and time of product selling. Also the association has been found according to product group. This analysis has given the perfect patterns of product in various time periods. Also the group analysis has given the scenario of
maximum and minimum sold product group from the super store. So, the shop
keeper put attention on lowest selling group in the store to increase their selling.

**Dr. Kumar V. and Chadha A.** have been analyzed the student’s data and found
association rules based on Graduate and Post Graduate courses. The authors have
been used the Tangra tool for doing association and according to that deciding the
performance of the students. Main attribute taken for analysis is the course is of
Graduation or of Post Graduation. No other sub type has been considered. So,
multiple class analysis has not been done. In the conducted research, the collected
sales data have two main information as attribute, that are date and time of
transaction. From this information, two classes have been generated, one for
season and another for time period. Hence, here multi class classification has
been possible which gives more precise association rules according to time period
in each season. This is helpful for the owner of the store to maintain proper stock
in particular season and time period.

**Hilage T. A and Dr. Kulkarni R. V.,** have compared three different techniques
of association rule mining by taking the large data set of shopping data. In this
research, the generalized study has been done for all the sales data set. But if
some classification has been performed, the outcomes may be changed. In the
conducted research, classification has been done for the season and time period,
hence various facts regarding shopping according to season and time period have
been revealed. These facts will be useful for the shop keeper in proper
arrangement of products in the super store. This will clear the point of stock
management in different time periods.

**Prasad P. and Dr. Malik L. G.,** both the authors have applied Apriori algorithm
for finding frequent patterns of products. They were also developed an
application for user friendly interface of Apriori algorithm in Visual C#. This
analysis has been done on retail transaction data. For small data set, Apriori
algorithm gives proper outcome. But if the large data set has been taken, the
speed of the algorithm affects. The candidate generation of Apriori algorithm
takes more time and it may be hang out the system, with larger data set. There is
better option available for association rule mining. It is FP-Growth algorithm for finding association rules where no candidate generation taken place. Hence, the speed of FP-Growth is faster than Apriori algorithm. It is working on the larger dataset with very much ease. In the conducted research, FP-Growth algorithm is used for finding correlated items in the same transaction. This has also been applied on the classified data.

**Dr. Rajagopal S.** has covered the concept of clustering on consumers with different parameters. This is helpful for finding profitable consumers of the store. The analysis only has been only found the clusters according to various criteria. But no association has been done on the retail data. Association is required to find associated items from the past transactions records. This information is necessary for finding one to one and one to many relationship between different products. In the purposed research, the association has been applied on the retail sales data of super store which is actually billing data. This association has been performed on generalized data as well as on the classified data. These classes have been prepared for different season and time period. Collectively two classes have also been taken for finding the association rules.

Therefore, after concluding all the objectives of the research and comparing and improving the old literatures through the research work, there are so many facts derived which will be helpful to the society. It will be useful in future for longer products life, understand consumer priorities, study environmental changes, change in life style, adapting future technology, etc. By understanding all those things, the consumer behavior can be predictable.

This study also gives the facts about different factors which are necessary for attracting the consumer for buying specific items. The behavior analysis of consumers habits help to make decision regarding super store. The consumer’s likeliness is most important factor because it expands the group towards the particular product. This is because word of mouth publicity is the better thing to convince people. The psychology, traditions, past habits and economical status influenced the behavior of consumer.
There are three types of consumers in India, which are Aspirants, Climbers and Elites. Hence, the different items suggested according to the consumer type. For understanding, the consumers are of which type, the manufacturer and super store owner must be close with them and study their requirements and needs. Then only they sustain in the market. Most of the consumers are smart enough and have the knowledge for different brands and items of those brands. But the marketing strategy, advertisements and features of particular brand must be good enough that attracts the consumers and at last win the race. Normally consumers find out some features in the specific product according to their requirement. For example, the consumer wants almond extracts in hair oil, than he/she must buy the Almond Drop Hair Oil.

Hence, for the satisfaction of the consumers, the marketers and shop keepers must do the things like arranging proper store layout, making more attraction of products, changing the designing of the products, modifying the beliefs about the products, also modifying the beliefs about the competitors products which products are not there in the super store, applying schemes or discounts or offers with the products, paying attention to the neglected features or characteristics, declaring sales during the event or specific time period, advertising the products, identifying consumers those leaving the products, recognizing the profitable consumers and products, understanding consumer responses, etc.

### 6.2 Recommendations

Recommendations describe the solutions what will be implemented in the future according to the outcomes of the research. The recommendations given below suggested related with the research analysis in the retail industry:

(a) From Item Group wise and Item wise analysis, the most sold and less sold item groups and items were filtered out. According to this, the shop keeper of the super store will also take care about the less sold items. So, he/she will apply any discounts or schemes for increasing the selling of less sold items.
(b) The association of different items and item groups can be helpful in designing store layout to the shop keeper. The shop keeper will organized the items according their buying pattern. Two or three associated group items will be placed at the nearer places to improve profit of the store.

(c) The seasonal analysis will be useful for finding out the most preferred items in particular season. That fact will be important for the shop keeper in declaring offers or discounts or sales during particular season.

(d) For the shop keepers, the decision making regarding stock management for the particular item in different season, will become easy using seasonal analysis. This will develop the scenario for the drop out items in the particular season and also for the most recommended items in the particular season. They can declare stock clearing sale according to the season.

(e) Time period wise analysis will give the idea about peak hours in the super store. From the outcome of this analysis, the shop keeper will decide the hours when more attendants will be required in the super store.

(f) Price is the major factor for any item. It directly or indirectly affects the selling of items. This affect may be positive or negative effects. According to the effects, the shop keeper will announced price discount or other efforts, for raising the demand of the particular item.

(g) The shop keeper will develop marketing strategy with aim of satisfying consumers according to the priorities and preferences they have for the product.

6.3 Future Scope

After dong all the research work, there are still some factors which were left out and not taken as a part of analysis. All these facts may be achieved in the future as a further research work. Some of facts which are not considered are:
(a) In the research work, the age of the consumer was not taken. But the age factor, also directly affect the choice of the consumer and according to that the consumer behavior may be changed. The child, teenagers, younger people and older people all have different shopping habits. So, if this age factor will be considered as the main attribute of the consumer, it directly affected the consumer behavior.

(b) Same way, other factors like job status, income of the consumer, family background, etc. were not taken in consumer’s personal information. So, these criteria were not applied when finding buying habits of the consumer. This all factors are important one which directly or indirectly affects the behavior.

(c) As a product detail, the research was not considering the point that is, the product is branded or not. The manufacturing company of the product not taken as the main attribute, which also changed the shopping pattern of the consumer. In future as a core attribute, the manufacture will be taken.

(d) There are so many schemes, discounts or promotional offers applied on the product time by time. But for the research, any discount or scheme criteria was not taken. These marketing schemes directly influence the buying behavior of the consumer. But till now the research have been done on the sales data without any scheme applied.

(e) This research also not specific to the weekend days or holidays. The bill date was taken as the main attribute but without considering the detail about, the shopping done on SATURDAY / SUNDAY or on any holidays like DIWALI, CHRISTMAS, RAKHI, HOLI, etc. All these days were working holidays and may be at that period of time, there is rush in the super store. There may some sale or offers in the store. All these affect the sales transaction data. Hence, in future this can be taken into consideration.
6.4 Limitations of research work

The research is limited to some scope. That means there are some boundaries when doing research. These boundaries are taken as limitation of the research. When following the boundaries, there are some areas or facts which were being untouched. The following points describes those facts:

(a) In this research, the main focus on the retail data of South Gujarat region for analysis. So, other regions of Gujarat that are north, west and east region, being untouched. Hence, this analysis has not giving the prediction regarding those regions.

(b) Also this research is not for the whole country i.e. INDIA or other states of INDIA. So, the retrieving outcomes are not helpful for comparison between different states of INDIA.

(c) The type of area for the consumer, where he/she belongs to, is also not taken as an important factor which affects product’s buying behavior. This type may be urban, semi-urban, rural, etc.

(d) Throughout the research, the information regarding consumer’s knowledge was not considered. The knowledge of the consumer is also the big factor which affects the buying behavior. This knowledge decided with the consumer’s education status or experiences.

(e) The wholesale transactions were not considered in the analysis. This research is only for the individual transaction by the consumer, not for the wholesalers. Therefore, some big transactions from super stores were not taken as a part of research analysis.

(f) As the product information, in the conducted research, all groups of product were not taken. Here, the product groups like books, dairy products, electrical products, flowers, frozen foods, fruits, vegetables, cloths, utensils, medicines,
toys, etc. were not taken in the research work. The research is limited to the
groups like AGARBATI, BATHSOAP, COSMETICS, DETERGENT, FOOD,
SHAMPOO, SOFTDRINK, TEA and TOOTHPASTEPOW.

(g) Same way for the research, only fast moving items were taken as input. So,
this research is not for all the items in the super stores.