



Retail business deal in Products, products to be sold to Customers. Customers in this business are targeted to be end-consumers who buy not to resale. However if the business outlet is big, which usually is the case, and then the customers could even be very small traders who stock stuff at a much lower scale.

Retail business deals with Vendors small vendors who sell wares they produce or gather from direct peasants in very small quantities. They get the products from the points of production, cannot stock as they cannot afford storing facilities, and yet sell it to stockists. Retail outlets actually work as stockists vis-à-vis the collectors or small producers. Thus retail outfits have a buyer relationship with respect to the producers or small couriers and have a seller relationship with the end customer. Stock taking, preserving, categorizing, monitoring quality, organizing and disposing the sale process are the activities Retail outfits carry through.

Collecting materials directly from producers and/or production centers is a challenge that requires fast collection, very effective categorization, organizing to suit a very effective retrieval and fast disposal requires a scientific supply chain and demand chain management along with the appropriate and optimum value chain categorization and stocking.

Retail business is therefore a complex matrix of relationship algebra with Customers, Vendors, Storage space where PRODUCT is at the center-stage. The challenge however is in the fact that Product here means a set of products, where the set is fleeting! To a retail business the set of Products has different elements depending on season, on geographical, cultural and demographic space. Comparison and study of the performance of the product, its profitability, return per unit, saleability becomes very difficult because the individuals products in a packet differs. Even within the same type of food grain or consumable items the exact same type changes from one season to the other, viz, the different types of rice may not be acquired from one period to the other. The challenge is how to group these products for a meaningful comparison study.

Business Analytics has to drill down to the price and consumer behavior vis-a-vis individual products to figure out which is the best price the consumers are willing to pay as a sustainable buy. Prices of agricultural products change with season, with natural disasters, with sudden demand hike in festivals or in hearsay and/or with man-made supply mechanisms. Business analytic would look into the effects of these changes and would like to predict a stock pattern for optimum usage. The economic order quantity or reorder level cannot be so automatically or mathematically determined because unlike the manufacturing case, the next turn of reorder may not find the product in the natural market in the amount sought. Natural products or primary products appear in the market in a very short period of time. Hoarding or stocking them in the peak period to manage the lean period needs cold storage and good stocking, however the freshness is compromised in food items or in cottage produces. This compromise may not be appreciated and translated into price offers by the end customers. Thus any product duration, its stay in the market is constrained by the naturality and the related consumer behavior. Business Analytic thus has to properly categorize and group products as per definitions and nomenclatures that are not standardized. This challenge limits the comparison study across broad ranges of geography, demography and culture. The comparison knowledge artifact of one outlet or outfit of any multi-facility, multi-product department stores may not be mapped with those of the others.

Unlike Manufacturing or service sectors the vendors here are not fixed, they vary as fleeting as the producers do. Retail outfits do not have backward integration of production points where they can directly control the name, amount and quality of the products. Sundry Vendors do not give a vendor behavior pattern controllable, monitorable and wait for any quality certification.

Data Analytics can therefore be effectively done as an intra-outlet management in figuring out profitability with respect to time and return on investments on groups or categories of products. Any smart drilling down would need innovative naming of the groups known and understood only to individual firms.



## What we get in the market?

Retail management being a challenging field as it is in regard to the data analysis as we have found, has seen in the market space innumerable solutions, all in the name of Business intelligence, none of them however mitigates the already complex problematic. In actuality, the pressure of the solution aggravated the pressure of complexity of the problematic. The various solutions in this space may be grouped as

- Market Basket analysis [MBA]
- ANOVA analysis
- Aggregate analysis
- Product profitability analysis
- Shop profitability analysis
- Special promotion campaign efficacy analysis

We will spend a little time in each case to point out that none of these gives an elegant solution.

**Market Basket Analysis [MBA]** is however the best of the inventions in this space. Every transaction per customer at any point in time is a package with a specific identity. This enables to strike an association of the different products a customer goes for. As an example a very creative consumer behaviour is fathomed when a customer buys products when (s)he buys main items, like what does she buy with meat or with the main dish? - this is a question the industry always wanted to know, the follow up question would be how much of an associative product is brought with a main product and then go for the aggregate and the average- this will give the business analysts and idea of how much say of potato need to be stocked if there is a sudden surge of meat demand due to say some kind of an occasion. Many different algorithms are in the market trying to measure the comparative relative weights of products in associations with some specified “main products”.

In this regard we must assert that the point-of-sales data at the transaction level can provide the best value and any kind of modelling would actually bulldoze these nuances. Data analytics as opposed to Business Analytics through normal OLAP based business intelligence tools are not addressing the problematic. Packets or baskets are physical realities that may and can be aggregated over consumers, sundry or repeat ones. They can however be conceived and created without the consumer oriented gaze but again through an aggregated measure viz, how much potatoes are sold in a week and map that to the amount of meat sold- the assumption here is however a little romantic- that people who consume meat also would concomitantly consume potatoes- this again is arguable. But to cut the complexity many retail outlet owners take recourse to some assumptions in consumer behaviour which they augur with what they call empirical experience. Empiricization of this sort brings down the value of reality in the actual transaction data set- we may call these as “reading in of pre-conceived knowledge artefacts in the data set”.

Market Basket analytics however has to deal in a huge number of data set and needs to be disentangled at the point-of-sale through algorithms built in to the ERP system. This can give us the data measure of the associative values of products with respect to some prime products. Which product is prime is again a complex assumption based or empiricism based knowledge and cannot be accepted without any debate. The internal handling of the data becomes rather complex adding on to the ready reckoning of the data. Yet, MBA is the most advanced and creative solution in finding out the consumer behaviour in retail industry and any fast ad-hoc self-serving data analytics tool can offer wanders.



**ANOVA analysis** that is the analysis through measurement of variation within a group and outside a group is inherited from manufacturing industry. In retail the ingress raises more questions than it solves. What constitutes a group? Would this categorization be based on natural variety like different types of rice or different types of cereals or different types of meats? Or would it be a grouping on a pre-conceived packet modelled on the class? Many firms conceive a packet with mid-ranging products which middle class buyers would buy. There is no point in putting a rice worth \$3 per kg with a rice worth less than a dollar per kg in the same group. But firms are there too who find worthwhile in grouping them too. So what is “in-group” to some firm may be “outside-group” to the other firm and obviously therefore these two data from the two outlets cannot be compared. Analysts in any one firm may use ANOVA but have to “read in” many empiric ideas.

In any case Data analytics tool would solve this requirement no less effectively than any Business analytics tool based on OLAP.

**Aggregate analysis** is the most popular technique used in this industry. This has been effective because drilling down to more atomic details becomes more uncertain and obscure. It is much easy or some kind of a compromisingly value-indicative if products of same type are grouped and their sale and procurement is measured in bulk as one unit, e.g. the performance of Rice as one product [which is never the case] in one week with respect to the next or previous. The performance in terms of revenue earning [depending on sale] or profitability [depending on sale and procurement] and then combining it with the turnover gives a good enough insight into the rate of future procurement and yet obscures deeper meaning of which particular rice pattern have fared better as compared to the others. Add to these the complexity of the challenge of the availability of one particular rice variety throughout the year. This obscurity embedded in the supply pattern of the product influences analysts to take a less rigorous track of aggregate analysis.

Data analytics tools that directly extract data from the transaction point and provides answers in the same system provides equally powerful analysis insights as an OLAP tool would give, and then its transient nature or on-demand preserving nature would show any changes in the transaction data set directly into the dashboard on real-time.

Ideal-Analytics [IA] - the product does have a unique advantage of using independent data sets in even differing formats where in relationship can be established on the fly so that the fact of one data set may be measured against dimensions of another dataset. That relationship does not have to be preserved.

**Product profitability analysis** is the only method that goes down to the atomic level, but that again poses a little challenge as the profitability derived figure might undergo a change for one product due to a reason while for the other product it is not corroborated, the differences in the cause might render the aggregate profitability of a group of products meaningless and yet would be used and inferences drawn. Business acumen and exogenous causes or explanations creep in that actually cannot be built in the data model. So product profitability is good so far as individual products are considered for a short period in time and loses its significance over cross products or over longer periods. Product profitability has to be conjoined with the product revenue that means with the measure of how much of that product is being sold. Profitability is quite often a function of scale but that is when the profitability figure is an aggregate figure, in case of individual product profitability scale is rationalized [ as we term it in mathematics]. An OLAP tool fares better than any data analytics in cases of multi-basis study. However, even in this account, the fast changing of the bases pose a challenge in the fast rendition of meaning.









# idealanalytics

Analytics On-Demand

[www.ideal-analytics.com](http://www.ideal-analytics.com)

Self-service, real-time, on-demand ad-hoc analysis and high performance exploration functionality with plug-ability, scalability & security, available in both SaaS and on-premise model



[contact@ideal-analytics.com](mailto:contact@ideal-analytics.com)

## >> Contact Us

### Office in India

202 SDF Building  
Sector V, Salt Lake City  
Kolkata - 700091  
Tel: **+91 33 2357 6415**

### Office in France

14 Street Seguier  
75006 Paris - France  
Tel: **+33 01 53 05 93 75**  
Fax: **+33 (0)1 42 66 34 24**