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# Subscription business in retail segment

## Background

The world of internet is progressing towards making individuals’ life easier to live. It does it by means of various appliances, gadgets and online services by which an individual can either take his products to the world or get benefitted by the ones provided online by others. In the retail world too, the benefits are realized by society, where not only customers are happy buying their needs online at competitive prices but merchants also are able to reach to very large volume of customers and hence able to register large profits through big volume turnover.

Retail Shopping portals provide customers an ability to choose their products from among 100s of options available and buy them online with hassle free home deliveries as well as ability to return some goods if not found suitable to one’s choice. Retail giants are offering great discounts and cash back options in order to be ahead of their competitors. Merchants can do that because they have reached to the remotest customer in the region who carries a smartphone, which makes them deal with huge volume of goods. So gaining even a smallest profit per unit of sale enables them to earn huge profit figures due to huge volume of turnover. Giving away major portion of their gains to customers is also increasing the customer base as well as customer affinity further and this cycle continues.

All the transactions are paid through some e-payment (credit card, e-wallet, net banking etc.) which is much cleaner option than conventional “by cash” approach as customers can track their expenses through single statement. Retailer too can easily track their transactions associated with each purchase made thereby managing their booking keeping simpler and easier to maintain.

Along with these “e” initiatives there are parallel initiatives such as “curbside” are also picking up well mainly in case of periodic buying of items such as grocery, medicine and household items. A person can place an order to the third party agency through their mobile app/website, mentioning the name of the retail outlet/mall(s) of choice and, can receive his/her package on the way home by roadside mobile outlet. He saves significant time in finding closer parking for his car, spending few hours together in the mall as well as in the billing line every day/week/month and still have control on what is he buying and from where he wishes to buy.

The most important benefit of both these initiatives is “lot of valuable time” that a person can save which he can spend on “better things”.

Growth of such initiatives clearly indicates that customer’s convenience is playing major role in growth of e initiative as well as hybrid initiative. The notion of “Time is money” for a customer is really playing very well for the merchants. Any innovations which will add value to the customer convenience are going to be the key to the profound success in retail business.

So far industry has given internet based shopping options, mobile based shopping options, curbside like hybrid options and all of them are super hit as of now. But they have given rise to a very big competition. New players are coming into this market almost every day and trying to follow the strategy which has already been laid out by their competitors. They are surely providing more and more options for the customer. But are they really adding any value in the way retail business is done? IS that all that business can do for customers? Is this dead end to the customer convenience story?

In order to find answers to these questions one need to dig further into

* customer expectations & challenges/limitations in front of them
* merchant’s expectations & challenges/limitations in front of them
* Uncovered factors to retain business with a merchant

Let’s see these questions from the perspectives of stakeholders associated with business.

## Buyer

Buyer is an obvious epicentre of “e” nnovation in online retail segment, as the whole concept has been centred around increasing the shopping experience and convenience of a buyer thereby increasing overall customer base and sustain the business in the hard hitting competition.

Despite of these options available, the shopping trends tell different story. Though considerable segment of the customer base has started benefitting from the online shopping mainly in electronics, fashion apparels/clothing, still majority of it is still relying of shopping malls for routine items such as grocery.

## Convenience

For periodic routine products, hybrid initiatives such as “CURBSIDE” are also picking up well along with pure online options. Again here the purchase mainly happens from the malls but the order is placed through net/mobile and purchase is actually done by the third party agency and the package is handed over to customers through curbside counters on their way home. The reason for success of these initiatives is because

* For pre-planned items with adequate lead time customers may opt online buying options. But where they do not plan their daily needs well in advance or if the need is urgent they go for curbside kind of options;
* Some of their needs are perishable items (milk, fruits, and vegetables) which are needed fresh and they cannot rely on online shopping/delayed delivery for them.
* All payment options or loyalty cards are acceptable at curbside and loyalty points can be redeemed in terms of payments. So they are at par with malls as far as shopping options are concerned but at much added convenience.
* All the latest discounts being offered by the local shopping malls are also applicable if the shopping is made from these malls through curbside agencies.
* Merchants offer regional/territorial pricings for some products. Customers may also get benefitted by them.

Though curbside presently does not provide any value additions apart from increased convenience, still they are becoming popular. Those who wish to gain more price discounts may go for online option or shopping by self on less rush hours (midnight)/days(working days) where they may rip more discounts/benefits.

If convenience is playing such a major role in case of periodic needs, it will be an icing on a cake if it is made available at much lesser cost to customer.

## Price benefits?

Are customers really get greatly benefitted on price front? Typically when a customer buys products, he gets good discounts on some of the items, but buys others at MRP. Shopping mall typically arranges revolving discounts on their product range in such a way that few unrelated(those which are not substitutes of each other’s) are offered price discount for specific time period and then different set of products are offered discounts and so on. The strategy takes into consideration bundling of products (by customers) at different time intervals and determines the “low demand” items in every specific time period using statistics and data analytics. Then they project these items with discounted prices in that time period. Example: Milk products may be offered discounts in the afternoon, clothes may be offered discounts in the midnight shopping etc.

As customers view MRP of a product as the reference product price for every product they buy, they are happy even if they get few percent discounts on only few of the items from their grocery basket. Due to above mentioned rotating discounts policy, there is a very less likelihood that a single customer will get benefits on most of the items that he/she is purchasing at a time. So they pay less for few items and compensate these discounts on other items where they pay at MRP. To summarize we can say that customers get benefitted but their benefits are not maximum.

## Value added benefits?

When a customer buys a goods ‘package’ worth ‘X’ rupees and other customer buys worth 2X rupees as he has bought more, the later should be appraised(by cash back, package level discounts, redemption points etc.) by passing on some value added benefits for buying much more goods than the threshold. This is because he is contributing more to merchant’s overall revenue and profit margins as compared to average customers. We can call them as package or basket level benefits. But in most cases such a provision does not exist. Benefits are only computed at product level and there is no added incentive for buying more goods and increasing the basket worth.

Some segment of customer base perceives different products at lesser prices than their offered (discounted) prices. Such price sensitive customers may compare offered prices of different branded products at different shopping malls/portals and selectively buy their needs from different shopping malls/portals so as to maximize their overall benefit. Also their choice of merchants keep on changing based on who is providing maximum benefits for their needed product at every time. They do this because they see no value of buying all their needs from the same merchant, as he is neither providing all their needed items at their perceived prices or closer to them nor he is providing any package level benefits. But such comparison of product prices, their ordering from different places and tracking the order is very inconvenient, though it may save some money.

Basket level benefits/discounts can be a very effective way of enabling a customer to buy more and more form the same merchant, as the more he buys the more will be his basket level benefits.

## Rewards for loyalty?

Unlike fashion apparels or electronics items which are not so periodically purchased, many retail/grocery items are periodically and very frequently needed by every household. Also the brand preferences for each product for every customer are also more or less constant. Then why does a customer need to order them again and again(every week/month), or get into the hassles of going to a shopping mall, standing in the billing lines for hours again and again?

Also if a customer is periodically buying his needs from the same merchant( physical or online),does his merchant remembers him? Moreover is he being rewarded for his long term association with a merchant?

Some portals (I know of only amazon US) have provided ability to “subscribe” for the items which are periodically needed, thus eliminating the efforts of periodically ordering same set of items every month.

Looking little deeper in this kind of relationship, a customer is getting into long term agreement with the merchant where he promises to buy certain (perhaps same) set of products periodically for the agreement duration. He may be paying fully in advance, partial advance payment or cash on delivery to merchant so as to affirm the agreement and should be assured of timely delivery on a specified date for every period.

Merchant is automatically wining a long term relationship with a customer and in turn can predict assured business forecast for the given period and can accordingly plan his resources much more precisely as compared to the instantaneous business. But what the customer should expect in turn? Should he not be respected/ benefitted for his loyalties?

Customer relationship management fundamentals suggests that business should keep customer preferences and wishes in mind and strive to improve customer satisfaction in order to win more and more business. So appreciating customer’s loyalty with a merchant or with a brand should enable him win more benefits on top of product level and volume based benefits. It will ensure longer term agreements between merchant and number of customer and increases merchant’s predictability to forecast business as well as ability to negotiate better with suppliers based on this assured future business.

There should be strategies in place which will compute the loyalty units for every customer based on duration of their agreement as well as number of renewals of agreements. They should then be converted in the form of benefits such as redemption points, added discounts, gifts etc.

## Retailer

## Forecasting and resource management

The first and foremost challenge in front of any merchant is to increase the bottom line and make all efforts, first to retain current customer base and then to grow it so that business can be more predictable. A merchant is considered to be doing bad if a customer who has purchased some products from him in past does not turn up again to the same merchant. So even if merchant’s business is growing due to engagement with new customers, its stability will always be a question mark if retention of existing customers is not ensured.

Merely making efforts to gain new customers does not enable merchant build precise business forecasts, because probable new customers are in thin air and it is impossible to predict how many more can be won. There may be even tougher challenges associated with demand due to varying customer density as well as varying needs from new coming customers for each product across geographies, periods and demography.

For example customer base in cities prefer different product brands than those in small towns. Moreover due to difference in usage patterns the consumption is different.

Unpredictable demands adversely impact procurement of goods, inventory management, operating expenses and may lead to either customer dissatisfaction due to “out of stock” kind of situations or lot of wastage due to expiries of batches. Ultimately they result into vast underperforming of business on revenue and profit fronts.

Different online retailers try different options to circumvent around this problem of variable/unpredictable demand. Some may prefer to manage their own stock of inventory at different warehouse locations using some probability based as well as historical data based statistics and fulfil the orders through them using some shortest path routing strategies( so as to optimize on operating expenses). Some try out “Just In Time” strategy where they collaborate with regional/local retailers and fulfil local orders through them. In turn the local retailers pay them commission for awarding business.

In first approach per item net profit is inefficient due to inability to control wastages, operating expenses and product pricing.

In second approach merchants rely on the inventories being managed by local retailers as well as services provided by them. They in turn gain much less gain as compared to first approach because they themselves are not dealing with suppliers in wholesale but rather selling items which are purchased by their regional counterparts in much higher purchase prices. Benefit of this approach is saving of inventory cost as well as transportation as well as zero accountability of wastages.

These challenges are much bigger in case of online retailers due to their wider reach. They use sophisticated analytics tools to predict the consumption based on historical trends. But predications are predictions.

The ideal business which will succeed as well as grow exponentially when

* 1. Merchants almost precisely know their annual customer base as well as sale distribution throughout year.
  2. Merchants have stable and retained customer base where somehow customer is engaged for longer duration for his periodic purchases needs.
  3. Due to above two, merchants can be effective in dealing with their suppliers and possibly make annual deals with them by giving them precise demand and its periodic distribution for every products. It will give them edge in dictating the purchase price of every item. Suppliers can happily offer them competitive prices as they are getting assured high volume business for the full year.
  4. Merchants directly or indirectly manage their own inventory so that they can afford bulk purchases for which they are expected to get incentivised from suppliers. It may increase their operating cost marginally but should get compensated with improved customer satisfaction due to avoidance of “excess stock” or “out of stock” situations.

## Price determination

Other challenge is on the pricing of products. Online retail concept is primarily centred around turnover of huge volume of goods. So even if a single penny is earned on a unit as profit, it yields millions at the end of a day. The same is inversely true if single penny per unit is lost.

Merchants typically compete with each other by offering lucrative discounts on product prices. But how much to offer on a product/brand is determined by demand vs supply ratio for that product. The “Hot Favourite” brands usually offer fewer margins to the seller and hence may yield negligible discounts for the customer, whereas new arrivals offer heavy discounts and offers due the element of unpredictability in them being successful in the market.

If the market is very volatile, and merchants are unable to predict demand, they face real challenges in determining prices. The price per unit that they have offered(with some discounts) , anticipating certain sales growth in coming months may turn loss making as the predicated growth did not happen but the operating expenses remained constant resulting into distribution of higher operating expenses across sold (limited) volume.

Retailers try to rotate offers on different products so that discounts on few products may get compensated by yields on other products and ultimately earn desired profits. So on any day, at any moment if you buy few items from a mall/online store you get discounts/offers on few of them whereas pay MRP for the remaining ones. Buyer is viewing MRP as a reference price for every product. Even getting discount on few items may also make him happy.

The only way to minimize this uncertainty is to gain capability of ensuring stable (and growing) demands for every product being sold. Such capability can be achieved by engaging customers for longer associations while making efforts to gain more customers.

## Ensure sustainable growth

Sustainable customer base is the only key to success of sustainable business. In instantaneous sale, where customer approaches, buys his needs and leaves, it is difficult to ensure if the same customer will come back to same merchant/portal for his future needs. Since customer has so many options to buy his needs from, if he does not have any specific incentive to buy from the same merchant he may not turn up again, and demand calculations at merchants may end up being some probability function hoping for same/new customers to turn up.

A systematic engagement with every customer for a long duration where customer not only benefits of buying one time buts get more benefitted for by again and again and more and more ensures sustainable customer base. This in turn achieves all the above mentioned benefits for the merchant.

## Notion of Subscription

Concept of subscription is not new. It has been popular in publications business since long time. In IT world it has been practiced for SAAS (Software as a Service) business too. There are good evaluation metrics developed for SAAS to measure the effectiveness of the SAAS model.

In simple understanding a ‘subscriber’ subscribes(registers for periodic receipts) for some goods(articles and/or magazines in case of publications) or services (software licenses in case of SAAS) by getting into long term agreement with supplier and keep on receiving these products/services periodically at a predefined interval. It yields periodic delivery to the subscribers, saving his efforts of procuring them newly, every time. It brings sustainable business for the providers they can count on.

In publications as well as SAAS business models the market and cost vulnerabilities are limited and predictable as compared to retail business, mainly the one which is related to everyone’s daily needs.

Subscription to products in retail business is not so popular/ practiced in current retail market. It may be because in volatile market situations and unstable product prices there is no business model available which can ensure sustainable business along with assured(and growing) profits.

Since this concept elaborates application of subscription model to retail business it is inevitable to compare the conventional ‘instantaneous’ business model with subscription model. Understanding of the potential similarities as well as differences between normal retail business and subscription business provides us the way to dig out challenges associated and approaches to mitigate them. Also outcome of such comparison is going to contribute to the overall success or failure of subscription thinking.

## Long term association

The basis and intent of subscription concept is to establish a long term association of customer with a merchant, where he/she agrees to receive a fixed set of selected products repeatedly at desired intervals. In default case an intangible advantage of ‘subscribing’ is ‘saving of lot of time and energy on buying his periodic repeatable needs’ becomes his primary source of motivation for subscribing. An order needs to be placed just once, mentioning the periodicity of every item being subscribed to and appropriate packages are delivered to his doorsteps on completion of every period. No periodic visits to malls, no standing in long billing queues, not even periodic ordering online; Order once and you are done for subscription period.

Merchant in turn is hugely benefitted by such long term associations. As described earlier he is more equipped to make precise predictions. It because 60-70% of his predictions (forecast) will be actual subscriptions (ensured for number of months or for full year), as the customers subscribed once are going to stay with him for months together.

He is more empowered to manage his resources well. As he almost exactly knows how many customers to serve, he can precisely decide how much good sot be procured for current/future period, how much will be transportation/delivery cost, how many personnel to be employed, how much cost of infrastructure etc. etc.

Moreover he may as well gain good control on cost of goods. He can negotiate better with suppliers (may be getting into long term supply agreement with them), reduce wastage cost to minimum. In turn he can launch his products at competitive prices which will be difficult for his competitors to beat.

But is it enough motivation for customers to get into long term agreement with any merchant? What about price competitiveness? What about their loyalties with single merchant for longer duration? Will they pay him off?

## Layered Benefits Model

When a ‘subscriber’ subscribes for few items, though it is primarily based on his/her periodic needs but the choices (and quantity) are also influenced by the ‘added’ tangible/intangible benefits being offered by merchants. The duration and quantity of subscription gets positively impacted by these added offerings.

First and foremost intangible benefit after the ‘convenience’ factor described above can be commitment of price or discounts on every product. If a subscriber is subscribing with a merchant for number of products because he has seen that competitive prices are being offered by that merchant, he would not like to see these prices changing at every delivery during subscription period. It may create a feeling in him of being fooled by the merchant where initially competitive prices are displayed but after few deliveries they are increased. Instead if he is ‘committed’ a price on subscribed products for his total subscription period, he is assured of not only reliable deal but also assured of ‘inflation proof’ prices for a longer duration regardless of ups and down in the actual market prices of these items. Isn’t it a great advantage for him to consider subscription business model for procuring his needs? In countries having high inflation rates where prices of daily needs are expected to frequently grow up, price commitment can be a sure measure of ensuring sustainable customer growth.

But is it really possible to commit price of each product at subscription time? Some products are more ‘price elastic’ (we will understand this notion is next sessions) than others. The daily needs such as food items/grains/edible oil/milk etc. are most vulnerable to inflation and shortage due to natural calamities and it may not be practical to commit prices for each (throughout subscription period) to subscribers. In such instead of ‘price commitment’ can ‘discount commitment’ be offered on latest prices (throughout subscription period) for some them? Merchants, based on their experience as well as historical data of prices of different products/brands can think of offering ‘percentage discount commitment’ on latest prices. There are some products for which either of these options may not be feasible. In such case merchants may not want to get into any commitment but can strive to offer best prices to subscribers.

Next ‘topping’ can be to offer products at ‘discounted’ prices to subscribers so that they can get to buy things at lesser prices than MRP. The fundamental of online subscription based retail business is to sell things to large volume of people. Even a very small profit for merchant for each unit being sold can bring huge profits to him. In retail domain typical profit margins for large volume of sale is from 30-50% to a retailer. If merchant is flexible enough to share his net gains with his subscribers than he can win more subscribers which in turn increase his bottom line, thereby increasing his net gain.

How will merchant arrive at appropriate prices by which his cost of goods sold will get covered as well as minimum profit margin is ensured? It will be the responsibility of sophisticated subscription platform based on predefined market parameters/metrics. We will learn about this model in next sections.

Next ‘added’ topping that will further motivate subscriber to get into long term agreement with merchant, can be in the form of added discounts/ reward points for buying more goods per period (big baskets).The more goods he will buy per subscription period ,more will be his ’Basket Level Discount’. Similarly ability to added discounts/loyalty points for his long term association with merchant. The longer association/renewals of association with merchant more will be the loyalty benefits.

If merchant manages to provide committed benefits as well as offer benefits at product level, basket level, loyalty based then winning more customers, offering them competitive prices, retaining them for longer period should be the obvious outcome.

But how does a merchant manages to provide all these benefits and still manage to retain some gain for him?

## Success Factors for retail subscription model

The success will depend on following factors

1. How precisely the overall business budget & forecast is defined/tracked and corrected based on actual trend.
2. How well are the metrics defined to precisely measure the performance of the business/investments made on sales and marketing/customer retention index/per customer revenue growth etc.
3. How well overall gains are distributed into
   1. Merchant profit,
   2. Provision for price discount,
   3. Provision for basket level discounts/benefits,
   4. Provision for loyalty discounts/benefits,
   5. Provision for other on the fly benefits (seasonal, brand loyalty, promotional etc.)
   6. Provision for recovering loss making products
   7. Provision for possible market price changes for some products
   8. Provision for future losses in business
   9. Provision of more/future business growth
4. How well each provision is automatically adjusted depending on volume of overall gain.
5. How early predications can be made about products that are not doing so well and adding to overheads?
6. Can well performing product help moderate/low performing products to recover?
7. Can the business learn and recover from its earlier mistakes?

## Product Categories

A product does not operate independently in the market. It has various forms of correlations with other products and these correlations help it share the total market demand. These relationship also aid in determining the price of a product.

Some products are more essential than other. Clever marketing can make a less essential product more essential by making people habituated to it. Some product are required more frequently than others.

Following categories describe all such distinctions.

## Essential Vs Optional products

As per the lifestyle of a territory where merchant is intending to do business products can be categorized as essential (mandatorily needed) products versus optional (occasionally/optionally needed) products. This categorization cannot be universal and needs to be fine-tuned as per geographic needs.

Example: In India Tea can be considered as an essential product, as drinking tea is an inevitable part of Indian culture in most areas. But the same is not true in case of European countries. Here Corn Flakes may fall into essential category.

## High/Low demand products:

Among the range of products being sold under retail, some of them are well established brands, whereas others are relatively less popular and trying to establish themselves.

The high demand products ensure a sustainable sale as well as steady state growth. Their sale volume is also relatively higher than their low demand counterparts.

The popular brands usually offer lesser profit margins for the merchants (due to their monopoly) as compared to their less popular competitors.

So a merchant needs to balance the sales targets as well as sale prices for both types of brands, so as to ensure repeatable and consistent profit margins on the reliable brands whereas putting extra efforts on enhancing the sale of less popular brands, thereby making more money on them. For enhancing the sale of medium/low demand brands typical ways to maximize sale is by offering them at discounted prices or provide some schemes (one free on the other etc.), providing some offers/schemes on them etc.

Example: Colgate is a more popular brand than Pepsodent, Nescafe is a higher demand product brand than its competitor Bru, Dove is getting more popular than Rexona etc.

## High/Low velocity /frequency products:

Some products are needed in daily life and hence their consumption is faster. It results into more frequent demands for them.

Example: Toothpaste, washing powder, deodorants and corn flakes are more needed than cosmetics, specific brand of biscuits, tooth brushes.

So the high frequency products are those which are ordered at low periodicity (2 per month or 4 per quarter) than the low frequency products (tooth brushes (once per half year per person), lipstick (one per quarter) etc.

Thus even if the high frequency items are getting consumed from low demand brands they may yield higher consumption due to higher frequency nature.

## Generation influencing products

Some product brands influence specific generations. Example: Pampers and Huggies are inevitable brands for children in the range of 0 – 24 months, Axe/Old Spice/Fogg deodorants attract young generation, whereas kiwi shoe polish is more used among middle aged members.

Companies promote their brands through various innovative ways of sales promotion due to which even if a product is not an essential commodity item, but still attracts handsome demand among people under specific age class.

## Seasonal products

Some products do business in specific seasons.

Example: Fruit squashes and Sharabats are sold mainly during summer season. Demand for Food mixes (Git sweet mixes), chocolates increases mainly in festive seasons (Diwali, Christmas).

In some cases some brands are capable of recovering their dues in merely few months, which is their peak season. Setting targets for them is not as uniform per month as the other categories, but higher targets are set for their peak seasons and marginal targets are set for other months.

## Substitutes and Complements

Some products invite sale of their peers, and this behaviour can be understood by analysing historical data.

Example: Does a customer ordering schezwan sauce always order noodles? Does a customer ordering condensed milk mostly orders dry fruits? Does a customer always order sugar when he/she orders coffee?

Based on the territory the sale is intended, historical data analysis can reveal such facts. In which the product which creates need for a peer product can be considered as a sale promoter for the peer product and should deserve a due credit while setting the price for it. These are the Complements.

On the contrary think of apple juice and orange juice. If a customer has ordered apple juice there is a less likelihood that he will order orange juice. These are called substitutes.

## Regional products

Some products are sold more in some region than the others. Example: Sambar Masala may be less popular/regular in southern states(because people prefer to use home made masala) but will sale more in metro cities as well as in northern regions, Condensed milk is more sought in Northern states due to more frequent sweets making.

For an online portal it is very challenging to offer regional prices at an item level but this categorization may help us in determining basket level offers based on number of regional products contained in it.

## Determinants of Demand

There are five determinants of demand for a good.

qD = *f* (price, income, prices of related goods, tastes, expectations)

1. **Price of goods**- The [law of demand](http://useconomy.about.com/od/demand/a/Law-Of-Demand.htm) states that when prices rise, the quantity demanded falls. This also means that, when prices drop, demand will rise. People base their purchasing decisions on price, if all other things are equal. The exact quantity bought for each price level is described in the [Demand Schedule](http://useconomy.about.com/od/demand/fl/Demand-Schedule.htm). It's then plotted graphically to show the [Demand Curve](http://useconomy.about.com/od/demand/a/Demand-Curve.htm).

If the quantity demanded responds a lot to price, then it's known as [elastic demand](http://useconomy.about.com/od/glossary/g/Elastic-Demand.htm). If the quantity doesn't change much, regardless of price, that's [inelastic demand](http://useconomy.about.com/od/glossary/g/inelastic_demand.htm).

1. **Income** - When income rises, so will the quantity demanded. When income falls, so will demand. However, even if your income doubles, you won't necessarily buy twice as much of a particular good or service. Since this is not which the platform can influence this attribute is considered to be **out of scope**.
2. **Prices of related goods or services** - The price of complementary goods or services raises the overall cost of using the good you demand, so you'll want less.

The opposite reaction occurs when the price of a substitute rises. When that happens, people will want less of the good or service.

1. **Tastes** - This is the desire, emotion, or preference for a good or service. When tastes rise, so does the quantity demanded. Likewise, when tastes fall, it will depress the quantity demanded. This is what brand advertising is all about. Again this is not something which the platform can influence, though it can show the trend if the taste is getting shifted from product A to product B.
2. **Expectations** - When people expect that the value of something will rise, then they demand more of it. Even from merchant’s point of view this attribute may hold considerable value.
3. **Number of buyers in the market** - The number of buyers affects overall, or aggregate, demand. As more buyers enter the market rises, so does the quantity demanded -- even if prices don't change.

## Subscription Business Model

Conventional retail business metrics are single dimensional in nature. It considers customer as the epic around which to measure revenue growth, profit making, losses, operating cost etc. This is because nature of business is instantaneous where association of a customer with merchant and with a purchased product (and its price) is true for an instance and finishes when the product is purchased by that customer. Next time even if the same customer is buying (probably the same) product again from same merchant it will be a fresh association and it does not carry any memories of earlier association. So new price is offered to his and he makes a fresh purchase and so on.

If subscription business needs to fulfil multiple expectations of customers for long term (as described in section 7) its business model should be multidimensional.

## First dimension: Subscriber

As in conventional (instantaneous) retail business where customer is the centre of all forecasting and budgeting the same dimension is applicable to subscription business where it measures business in terms of incoming (new) customers, churned customers, their purchase volumes (basket sizes) and thereby overall revenue, gross and net profit.

Since average customer in subscription business typically subscribes for more than one product as well as for more than one time, it is appropriate to forecast and measure the business in terms of subscriptions instead of customers. This is because

* Subscription repeatedly adds to revenue for the given subscription period (customer remains the same).
* Customer may remain associated with merchant but can change his total subscription one or more times during subscription period resulting into different revenue for his subscription.

But merely accounting business does not provide precise dynamics. Also it does not provide information about where things are going better or worse, and what needs to be tuned in order to recover or grow the business as the overall tracking is happening at subscription level (which encompasses multiple products).

The main dynamic element required for precisely predicting as well as controlling the business is the product being added to every subscription. Every product carries its own dynamic in terms of profits or losses as well as ups and downs in its prices due to varying demands. So subscriber’s longer association with products having varying demands/profits/losses/prices gives the real picture of contributors of growth or decays and what needs to be done in order to correct or improve the situation.

## Second dimension: Association with products

When a subscriber subscribes for set of products for some subscription period, he is establishing long term association with each of these products, expecting their steady in-flow at a constant price. But the products themselves have number of attributes such as their purchase price, MRP, offered price, which may vary multiple times during subscription period.

* If a product is doing well, its demand will increase. Hence its offered price may need to be increased in order to rip more profits from it. If it does not do well, its offered price may have to be lowered down so as to promote its sale. Thus during the subscription period (of a product with a customer) actual cost on that product cannot be assured.
* Alternatively, its purchase price (thereby MRP) may get changed due to exponential increase in market demand or stock shortage. Hence, its offered price should be recalculated with reference to new purchase price and offered to new subscribers.

In case of price committed products, in either of the above scenarios the product still needs to be served with earlier committed prices to existing (old) subscribers (registered before offered price change).Hence every product may carry multiple active offered prices ( I would call them price buckets) at any given instance and number of subscribers get associated with each price bucket depending on when they have joined the subscription journey. How to track such price dynamics happening differently at each product level at different times?

Due to the price dynamics when a different price is offered for a product almost every day,than its earlier offered price, it will apply to new subscribers joining since new price is offered. But existing subscribers are still being served with earlier offered price(s). In case increased price is offered for a product than its earlier offered prices, all existing subscribers lower profits or even incur losses, as they are being served with lesser prices. In case new price is lower than earlier prices then new joining subscribers start lowering profits or even losses, as they will be served with lower prices than earlier ones. Such change may happen even daily depending upon volatility in its demand. The same rule applies to all products regardless of if they are price committed, percentage discount committed to none committed.

Similarly dynamics occur on offered price changes due to change in purchase price. Due to inflation usually purchase price increases. In such case, for price committed products, as the prices committed to earlier subscribers cannot be changed, the revenue incurred on all such past subscribers start registering lower profits/losses.

The profit and loss dynamics resulting from the price dynamics can be limited by

* Anticipating for future price changes in every price being offered and compensating for forecasted losses in current offered price in a piecemeal way AND/OR
* Limiting the total subscription period max limit (to say one year), so as to limit the losses. At renewal of subscription period subscriber will be offered freshly calculated price.

Who should be responsible for bearing forecasts of such dynamics, track actual demand changes and thereby vary offered prices without defeating either of subscriber’s or merchant’s interest?

Obviously the product itself can track its progress in terms of demand and can according track price, revenue and profit dynamics.

It should also track the added expenses incurred at product level as some of them are strongly related to its demand and its delivery frequency. For example: Sales and marketing expenses may be more for some products as they are relatively new as against those which are well established brands. Also in periodic subscriptions, some items are needed more frequently/in more quantity than other products (example: toothpaste is needed every month but toothbrush may be need only once in 4-6 months.).

So the subscription model proposes the product to be the self-managed entity in subscription business where it should

* Forecast for dynamics in its demand, price, revenue and profit.
* Track/measure the actual progress against the forecast
* Propose price changes depending upon increase or decrease it demand
* Track subscribers being registered with each offered price
* Track actuals now with revised offered price
* Create foundation of future forecast based on current actuals.

In order to take care of this aspect of an intelligent product, each product will be associated with a ‘Product Account’. Product will have following attributes which will describe a product in from of its metadata.

1. Unique product identifier and name
2. Category/sub category of product describing the product belonging to which family and if there is any sub category where they are further classified into.
3. Weight of the product which will help in precisely identifying a specific product among all variants of the same product/brand as well as it will be used to calculate the delivery charges required to deliver product.
4. Current available quantity in stock and its unit ( ml, gram, kg etc.)
5. List of its substitutes and complements; as price changes in them are impacting pricing of the product
6. Demand density of the product. It defines the percentage share of a product in its category against all its substitutes/competition. Here assumption is made that total demand in market for given type of product is 100.If product A is sold 20 out of 100 then its demand density is 20(%).Demand density helps in setting up the initial offered price of a product when historical data is not available as it represents the demand against others. The same is also used for price determination when purchase price changes and earlier historical price data (which was based on earlier purchase price) becomes meaningless to drive current price.
7. Average demand per year per subscriber. It indicates that on an average how many units of a product are ordered per year per subscriber. This is used to offer basket level discount per product (added to basket). If a subscriber orders above the average demand then he should be entitles for more basket level discount per product and inverse if orders lesser than the average.
8. Product account. It maintains forecasts for the product which it is associated with as well as track the actual transactions happening with product including its price change. We will see it in detail in next section.

If it is so, then can it be empowered to help its colleague products if they are in crises? Let’s figure that out.

## Products Collaboration Model

The total business is a consolidated contribution of businesses for each product available for subscription. In this some products are more popular than others, some of them are monopolistic, some are having stable(though not growing) demand, some are new and trying to establish in the market and finally some of them are not doing well and need assistance to boost business for them.

Every product is expected to earn specific revenue and margin and accordingly forecasted .The forecast is mainly based on historical experience about that project which may be extrapolated to arrive at forecast for current year.

Out of the products which are expected to do good business, few products over shine and register more revenue/margin than forecasted whereas some may underperform even after setting pessimistic forecast.

Product collaboration model suggests that revenue attributed due to over performance of some products should be provisioned for making recovering underperforming products. When any product is underperforming typically following provisions are tried to boost its performance.

1. Offer additional discounts/benefits on them so that price sensitive customer segment can be attracted.
2. Increase advertisement expenses to promote that product and broadcast added benefits being offered on it.
3. Initiate clearance sale for some underperforming products at throw away prices so as to minimize losses due to wastage of inventory due to expiry of such products.

So collaboration model suggests that over performing products should contribute to support the underperforming ones by offering the excess gains(on top of targeted figures) at a central account(lets name it as nodal account) and earn credit points for each 100/ 1000/ 10000 Rs contributed (configurable). These credit points will serve three purposes.

1. It will ensure that the gains earned by a product should be attributed to itself even if it has contributed to nodal account and total gains visible in its own account are less(due to the donation described above)
2. It will enable them to request for similar help from nodal account when similar situation may arise to them OR clearance sale need to be initiated for them OR Seasons sale need to be initiated for them OR additional discounts need to be provisioned for them for various reasons.
3. It will indicate their demand score in the form of credit points earned by them in business monitoring/reports which will help analysts take appropriate decisions while setting sales targets for them.

## Objectives of subscription business

In order to establish a business model fulfilling all the necessities of subscription business as described in earlier sections it is essential to set up objectives of the model. It will be help maintaining the scope of the model as well as lay out ground rules which will serve as guidelines for detailed requirements.

## Categorization

1. Subscription model assumes three types of products which will be offered to subscribers based how they react to the changing business demands.
   1. Price committed products: many branded product such as tooth pastes or shampoos do not fluctuate greatly on price fronts. Their price gradually increases as response to inflation or increasing demands but the overall rise in a year is within acceptable limits. They are termed as “Price Inelastic” products. So it is safer to commit prices of such products to a subscriber for his/her entire subscription period.
   2. Percentage discount committed products: Some products may fluctuate more frequently and considerably but they provide relatively constant margin. These are “Price Elastic” products. Committing absolute price for entire subscription period may be risky but instead it is relatively safer to commit percentage discount on their latest price.
   3. No commitment products: Many primary needed products such as food grains, vary so unpredictably on price front that it is impossible to either commit price or percentage discount for the entire subscription period. They are highly “Price Elastic” and gains on them are also not ensured.
2. In case of price committed products, price of a product committed to a subscriber should remain same until end of his current subscription period (contract period with merchant). This should hold true even if the product/merchant has started incurring losses on that product (after committing price) OR cost of that product gets changed one/many times during subscription period (after committing one price).
3. In case of percentage discount committed product the subscriber should get a constant committed percentage discount on the latest price at the time of every delivery. In this case the actual price to be paid by subscriber will vary as the percentage discount is calculated on latest price at the time of every delivery.
4. In case of no commitment products the subscriber has to pay latest offered price on the product at every delivery. Some time it can be much lesser than the one shown at the time of subscription and sometimes it may be considerably more.

## Pricing

1. The model should offer item level discounts (reduction of fixed amount from MRP in case of price committed products, reduction of percentage of MRP in case of percentage discount committed products) as a default mechanism where every product being bought will carry some discount against its current MRP. Though it is default discounting mechanism it is not mandatory. In case the demand is too high than supply the few subscribers may have to subscribe for a product with its MRP.
2. Item level discount should not depend on the subscription duration of an individual or volume of its items being purchased by a specific subscriber but should mainly depend on current demand and overheads (operating expenses/marketing expenses). Mostly everyone who has subscribed to the same product on a same day will see the same (per unit) price/percentage discount for that item, regardless of subscription duration of each subscriber/volume subscribed by each.
3. Although same price/percentage discount is applicable to subscribers subscribing on the same day, it may very every day depending upon variations in their demand (and overheads) so that subscribers subscribing for same products next day may see different offered price/percentage discount.

## Benefits

1. Platform should provide an interface using which rules for configuring any additional benefits such as basket level benefits, loyalty benefits, brand loyalty benefits, seasonal benefits etc. can be defined in a consistent fashion. Each benefits should adhere to following rules.
   1. Benefits are applicable to one of the **domain entities**. For example: In case of Basket level benefit, the benefit is applicable on basket (and thereby products added to it). In case of loyalty benefits it is applicable to subscriber.
   2. Benefits are dependent on some **independent attributes** of the domain entity to which they are applicable. For example: As Basket level benefits are applicable to Basket, they are dependent on total basket amount for entire subscription duration, demand density of products added into it. Loyalty benefits depend on number of subscription renewals, duration of each subscription and total subscription amount for ach subscription.
   3. Dependency of Benefits on **independent attributes** of applicable entity is linear or non-linear, proportional or inversely proportional. For example basket level benefit is non-linear and proportional to total basket amount AND linearly proportional to average demand density of products contained in it.
   4. Benefits are offered in various **instruments** such as discount, redemption vouchers, cashbacks etc.
2. Basket level benefits should also be offered as an optional configuration. Subscription business is not sustainable if subscriptions for single/few products are encouraged. In order to handle the equilibrium between profit and loss among products, in order to minimize operating expenses and in order to maximize benefits on sales and marketing expenses it is essential to encourage a subscriber to add more and more items in his basket as well as remain subscribed for as longer duration as possible.
3. Basket level benefits depend on
   1. Demand of the items added to the basket(thereby profit margins available on these products)
   2. basket worth
   3. Subscription duration.
   4. Static basket definition vs changing basket definition

Consider following scenarios as below

* 1. In case two subscribers who has subscribed for the exact same set of items on a same day will be given different basket level benefits if their subscription duration is different.
  2. In case two subscribers who have subscribed on the same day with same duration will be offered different basket level discounts if their basket worth are different. Basket worth is a function of basket amount as well as demand level of basket ingredients.
  3. In case two subscribers who have subscribed on same day with same total basket amount, may get different basket level discounts as demand levels of the products added to respective baskets are different. The subscriber who has added more high demand products will get lesser basket level discount than the one who has added more low demand products.
  4. If two subscribers who have subscribed for same set of products and for the same duration are offered same basket level discount until their basket definition remains unchanged. Now if one of the subscribers has made changes to his basket content, his basket level benefits will get recalculated and he will be offered lesser basket level benefit.

1. The basket price with benefits (with item level as well as basket level benefits) will remain same only until the content in the basket remains unchanged. In case a subscriber modifies the content in the basket (replace few items with few other etc.), the basket level benefits will be recalculated. In this case item level discounts for the items subscribed in the past should remain unchanged.
2. For the same reasons platform should make provisions for offering benefits for the customers loyal to the merchant, brand etc.. The more association a subscriber has with a merchant the more benefits he/she can be awarded. This benefit will be in addition to item level and basket level discount and is optional.

## Constraints

1. There should be rules around how many maximum units of a same product can be subscribed by a subscriber. Also the rule regarding what should be the maximum allowed subscription period for any subscriber. The first rule is to eliminate the possibility of some retailers pretending themselves as subscribers and subscribe for large volumes of products (thereby getting heavily discounted) and selling those to their actual customers. The second rule is to limit the price commitment period in the truly volatile and uncertain market situations.

## Collaboration

1. Products should collaborate among each other indirectly through an intermediator (nodal account) so as to share their profits and losses as well as for building corpus for basket and loyalty level benefits. The reason they do not directly collaborate is to avoid any bias in sharing benefits among competitors.
2. On every day when a profit is registered for a unit of product, this profit amount should be distributed to various portfolios and in the given sequence/priorities
   1. Operating expenses share( even if loss occurs still this share needs to be given mandatorily)
   2. Nodal account share( money will go here only if profit is registered else no money is deposited)
   3. Product account share (If profit is registered the product will hold its own share of profit equal to the targeted/forecasted profit or less, in case of loss nothing goes here)
   4. Merchant account share: the remaining (in case of profit) after distributing the above components will get added to this account. No money is deposited if there are losses.

## Provisioning needs

When a merchant is about to set retail subscription business for subscribers, he is expected to have some estimation/forecast regarding

1. Probable number of subscribers he may win over a period(monthly, quarterly, yearly) as well as probable turnaround of subscribers(subscribers leaving their subscription OR they are not renewing their expired subscriptions due to competition or other reasons)
2. Average subscription amount per subscriber per period(say Rs. 2000 per subscriber per month)
3. Probable average distribution of subscription basket (how many product categories an average basket will constitute. Example: grain, bathing soap, washing powder, sugar, house cleaning items, spices, sauces/jams, ready to eat food items etc.)
4. Periodic operating expenses(total monthly/yearly as well as per subscriber monthly/yearly )
5. Sales and marketing expenses to acquire every new subscriber.
6. Probable changes in the prices of items due to inflation, short of stock or other reasons.
7. Other losses due to situations like payment defaulters, rejection/returning of goods by subscribers, wastages and handling damages, interest on delayed payments etc.

Based on this estimation merchant is expected to allocate some annual budget for the subscription business. It is the provision of amount he has made to run the subscription business, as well as to recover from any possible losses. Typical provisions include

1. **Cost of goods/purchase price** for different products as per the estimation about their demand and usage volume. Since the subscription platform does not take care of the actual purchase process and relies on the main shopping application to take care of it, this is simply a purchase price of an item when someone subscribes for it. The job of procurement of goods is out of scope for the subscription business and main shopping application is expected to take care of it. Subscription platform will periodically provide the demand of each product so the main application in order for the merchant to negotiate better with suppliers/manufacturers. This price becomes the investment reference against which the margins are estimated, sale prices are decided for each product as well as actual margins are realized. Ideally there should not be any separate provision required at item level discounts as the products provisioned for purchase are expected to make it through their sale.
2. **Provision for additional benefits**. Basket represents set of products (each with certain quantity) which a customer has subscribed to for periodic buying. Subscription business suggests more benefits at basket level than at individual product level, so as to attract subscribers to add more to basket thereby increasing overall revenue.

Similarly in order to retain a customer for long term different loyalty benefits (subscriber loyalty, brand loyalty etc.) should also be provisioned by a merchant. Seasonal discounts on seasonal as well as clearance products needs provisioning as well.

This provision is expected to be required only for initial set up of subscription business because after it is stabilised every profit making product is expected to contribute into it.

1. **Provision for recovering loss making products/establishing new products by promoting overall sale**. This amount is typically expected to be used for offering additional /time bound/surprise benefits in addition to the normal discount/benefit calculations already made for every product as well as at basket level. In case of crisis situation for some products which are incurring losses, this can be used as a rescue mechanism in order to boost the sale for these products. Similarly n order to launch a new product in market for which the demand is not known, such kind of promotions will be useful. This provision is optional. Whether to make this provision is on merchant’s discretion.
2. **Provision for Operating expenses**. It includes the expenses incurred on managing the inventory of subscribed products, cost one periodic deliveries to subscribers; cost of managing the software systems for subscription business, cost on personnel required to run the business etc.

Again actual dispatch to customers or managing any systems for that is not in scope of the affiance platform. But it is important to account for these expenses (proportional to subscription business out of total operating expense incurred by the shopping enterprise) in identifying the breakeven quantity/price below which sale of any product is not recommended. Also the gross and net profit calculations are heavily based on this.

1. **Sales and marketing expenses** so as to acquire more subscribers as well as an attempt to retain them. Again the actual efforts on sales and marketing is not in scope for subscription business but will be carried out by the parent organization along with normal/instantaneous business. But the investment being made on subscription specific sales/marketing should be known to compute the impact of it on acquisition and retention of customers for subscription business. Its computation provides some metrics (Lifetime subscriber value(LSV), Lifetime subscriber period, Cost of acquiring a subscriber(CAS), LSV/CAS ratio etc. which indicate health of subscription business.
2. **Provisioning for losses** due to reasons mentioned above.

## Business Forecasting

Every product being sold under the subscription portfolio is expected to contribute some percentage to the total revenue and profit depending upon the demand associated with it in current market as well as the margin it offers the merchant. The same two factors are also used determine its pricing and benefits.

Target setting is the process by which merchant need to carefully evaluate and set probable demand for a product for the probable price, possible changes in its price(due to supply shortage or inflation) and thereby calculating the overall revenue generation by that product as well as net profit earned by it.

Progress of a product is not only a function of its own credibility but also depends on how its competitors are doing at the same time. So every product should be aware of its “substitutes”.

Thus demand of that product will be a relative function of total demand of all products in a given category and how much contribution a specific product has in it. (product A’s demand(quantity per unit period) in category X/total demand(quantity per unit period) in category X).let’s name it as “demand density”.

## Inputs Forecast parameters

Following parameters need to be entered by the merchant at start of the year **for every product** during the initial setup of platform.

1. Its purchase price from the manufacturer/supplier(Cost of goods sold-COGS)

* If this price changes in a month due to inflation/excess demand and low supply then the changed price should be marked from that month onwards

1. Its MRP( manufacturer suggested sale price)

* If this price changes due to change in purchase price (due to any reasons mentioned above), then the changed price should be marked from that month onwards.

1. Demand Density of the product
2. Expected number of new subscriptions each month.
   * New subscriptions always get affiliated to the latest offered price of the product
3. Expected number of churned subscriptions each month: When churning of subscriptions happen, these subscriptions may have been offered different prices at time of subscription, as they may have been subscribed at different times in an year.
   * Churned subscriptions affiliated to price at start of the years
   * Churned subscriptions affiliated to the changed sale price1
   * Churned subscriptions affiliated to the changed price2 and so on.

In forecasting it is not possible to predict how much and how many time an offered price undergoes changes. So forecast will assume single average offered price per month. In this case there are twelve (12) offered prices per year(one average offered price per month) to which subscriptions are affiliated. So All churning with respect to all 12 prices should be forecasted.

1. Merchant’s expectation of profit for self(%)
2. From date of the forecast
3. To date of the forecast.

Example input parameters table will look like this

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Month1** | **Month2** | **Month3** | **Month4** | **Month5** | **Month6** | **Month7** | **Month8** | **Month9** | **Month10** | **Month11** | **Month12** |
| Purchase Price | 45 | 45 | 45 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | 48 |
| MRP | 75 | 75 | 75 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| Demand Density | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% |
| Average Offered price1 | 65 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 |
| Average Offered Price2 | 0 | 0 | 0 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 |
| Average Offered Price 3 | 0 | 0 | 0 | 0 | 74 | 74 | 74 | 74 | 74 | 74 | 74 | 74 |
| ….12 | 0 | 0 | 0 | 0 | 0 | 0 | 75 | 75 | 75 | 75 | 75 | 75 |
| New subscriptions | 3000 | 2300 | 2400 | 2540 | 2600 | 3200 | 2800 | 3500 | 3200 | 3300 | 3100 | 2800 |
| Churned susbcriptions1 | 300 | 200 | 120 | 160 | 150 | 210 | 160 | 140 | 120 | 100 | 130 | 170 |
| Churned subscriptions2 | 140 | 120 | 100 | 130 | 170 | 200 | 120 | 160 | 150 | 210 | 160 | 210 |
| Churned subscriptions3 | 130 | 170 | 200 | 120 | 160 | 150 | 300 | 200 | 120 | 160 | 150 | 210 |
| ….12 | 140 | 120 | 100 | 130 | 170 | 200 | 120 | 160 | 150 | 210 | 160 | 210 |
| Merchant’s expected profit(%) | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 14 | 14 | 15 | 15 | 15 |

## Calculated Forecast Parameters

Based on these parameters following parameter values are calculated and stored against the product

1. Monthly operational expenses to be borne per product. This should be calculated based on per product operating expenses contribution calculated as given in next section.
2. Monthly sales and marketing expenses calculated per product based on monthly sales and marketing expenses forecasted by merchant (total expenses to be distributed across all the products..)
3. Breakeven price: The amount of money for which a product or service must be sold to cover the costs of manufacturing or providing it.  
   Breakeven price= Fixed cost for a product per unit + variable cost for a product per unit.

**Breakeven price = product’s purchase price + operating expenses per unit + sales expenses per unit**.

1. Offered price per unit: It is per unit offered price including unit level discount if any but without any additional benefits. Refer to pricing section for the same.
2. Net new subscriptions and Total subscriptions per month(to indicate demand)
3. Total churned subscriptions and % subscriptions churn per month(- #number of churned customers current month/total # customers at last month)
4. Monthly recurring revenue due to new subscriptions in a month( MRR New)
5. Monthly Churned MRR among subscriptions affiliated to price1, price2 etc. and total churned MRR( approximate indication of impact of changed price on subscriptions churn),percentage net MRR churn( churned MRR/starting MRR)
6. Ratio of Its expected quantity demanded per month against total quantity demanded of all products in the same category( product and all its substitutes)
7. Monthly Average revenue per new subscriptions (ARPS (New) = New MRR/# New Customers \*1000) and Average revenue per total subscriptions (ARPS= Ending MRR/# total subscriptions\*1000).
8. Total monthly revenue
9. Total Cost of goods sold (COGS= Total subscriptions\* latest purchase price): Though subscriptions are committed the instantaneous sale price at the time of registration, they are periodically dispatched these products which are purchased at the latest purchase price (at the dispatch time). This is an important indicator of impact of change in product price on the revenue and margin.
10. Operating profit/loss(gross margin – operational expenses) and Operating profit/loss percentage( operating profit or Loss/COGS)
11. Subscription Lifetime Value(SLV): ARPS(New)\*Gross margin%/%MRR churn
12. Subscription lifetime period = 1/%customer churn
13. Cost of Acquiring a subscriptions (CAC=(sales& marketing expense/# new subscription) \*1000) : Isn’t giving discount per item included in cost of acquiring a customer?
14. SLV to CAC ratio: SLV/CAC. This indicates how much a subscription will yield by investing specific cost of acquiring a customer as a subscription. For a healthy product this ratio should be more than 4.It means if a merchant invests x rupees in acquiring a subscription, the subscription should at-least yield 4x rupees of business with the merchant.
15. Months to recover CAC= CAC/(ARPS(New)\*Gross Margin%) . This indicates how many months (minimum) an average subscription should be retained in order to at least recover cost of acquiring it.

## Correction of Forecasts

When subscription business is initially set up using the subscription model described in this document, one does not have much historical data to validate and correct the forecasts made on certain business parameters (as described above). So initial forecast made by a merchant is merely a reflection of his experience, perceptions about various products and expectations from each of them (as well as from overall business).

In reality when the actual subscriptions start getting registered and sale is starting to happen, the actual attributes and performance may be way different than the forecast. Some merchant’s may have provided very ambitious forecasts where they have expected large boosts in revenue and net gain. On the other side few might have made cautious forecasts where they have kept their expectations to bare minimum in terms of profit and revenue growth.

Also some parameters are almost impossible to forecast. Offered price of a product may vary almost daily based in price elasticity of that product. So averaging it out for the whole month would not provide very precise forecast about it. Similarly probable changes in purchase price in a year are almost impossible to predict as they may not follow any pattern.

But it does not allow us to let the forecast be merely based on merchant’s expectations and experience. When adequate historical data on actual transactions is accumulated in initial months it can be used to correct the forecasts for the future period.

Following process is recommended in order to keep the forecasts in alignment with actual business trend.

1. There should be a configuration to decide how much historical data should be accumulated in order to trigger the correction of forecast. Also another configuration on forecast for how much duration should be corrected using the historical data.

Example: Merchant may want to trigger the forecast correction after accumulation of every **three** months of business data. Also he would want the correction of next **six** months of forecast.

1. Extrapolation technique should be used to derive future projection based on historical data. We will see in next subsection about extrapolation technique and which methodology to be used for the same.
2. Following among the input parameters should be considered for forecasting using extrapolation technique.
   1. Purchase price
   2. MRP
   3. Average Offered price per month
   4. New subscriptions per month
   5. Churned subscriptions per month affiliated to each offered price

Example outputs will be seen like the following (by plotted on graph)

## Extrapolation

Extrapolation is a mathematical concept which is used for estimating values beyond the original observation range. The forecasted values of a variable are predicated based on values in original observation and their relationship among another values.

There are number of extrapolation methods used based on the context where it is to be applied and business need, such as Linear Extrapolation, Polynomial Extrapolation, Conic Extrapolation, French Curve extrapolation etc.

We are using time series analysis method to extrapolate values based on actual time based values.

A time series is a sequence of data points typically consisting of successive measurements made over a time interval. Time series forecasting is a method to use the time series analysis model to predict future values based on previously observed values.

Moving average or smoothing: Collection of data spread over time, which has been picked up for analysis is some form of random variations . Number of methods exists for reducing or cancelling the effect of random variations. This process is called “smoothing”. Two types of smoothing methods exist.

* + 1. Averaging methods
    2. Exponential smoothing methods

A manager of a warehouse wants to know how much a typical supplier delivers in 1000 dollar units. He/she takes a sample of 12 suppliers, at random, obtaining the following results:

Supplier Amount Supplier Amount

1 9 7 11

2 8 8 7

3 9 9 13

4 12 10 9

5 9 11 11

6 12 12 10

The computed mean or average of the data = 10. The manager decides to use this as the estimate for expenditure of a typical supplier. Is this a good or bad estimate?

Mean squared error is a way to judge how good a model is. We shall compute the "mean squared error":

The "error" = true amount spent - the estimated amount.

The "error squared" is the error above, squared.

The "SSE" is the sum of the squared errors.

The "MSE" is the mean of the squared errors.

The results are: Error and Squared Errors

The estimate = 10

Supplier $ Error Error Squared

1 9 -1 1

2 8 -2 4

3 9 -1 1

4 12 2 4

5 9 -1 1

6 12 2 4

7 11 1 1

8 7 -3 9

9 13 3 9

10 9 -1 1

11 11 1 1

12 10 0 0

The SSE = 36 and the MSE = 36/12 = 3.

So how good was the estimator for the amount spent for each supplier? Let us compare the estimate (10) with the following estimates: 7, 9, and 12. That is, we estimate that each supplier will spend $7, or $9 or $12.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Estimator | 7 | 9 | 10 | 12 |
| SSE | 144 | 48 | 36 | 84 |
| MSE | 12 | 4 | 3 | 7 |

The estimator with the smallest MSE is the best. It can be shown mathematically that the estimator that minimizes the MSE for a set of random data is the mean.

What is exponential smoothing?

This is one of the popular technique to produce a smoothed time series. Exponential smoothing assigns exponentially decreasing weights as the observations( being used to derive time series) get older. In other words recent observations are given relatively more weight in forecasting than the older observations. The Exponentially Weighted Moving Average (EWMA) is a statistic for monitoring the process that averages the data in a way that gives less and less weight to data as they are further removed in time.

Single exponential smoothing:

For any time period t, the smoothed value St is

St=αyt−1+(1−α)St−1 0 < α ≤ 1 t ≥ 3.

This is the basic equation of exponential smoothing and the constant or parameter α is called the smoothing constant.

Why is it called "Exponential"?

Let us expand the basic equation by first substituting for St−1 in the basic equation to obtain

St = αyt−1+ (1−α) [αyt−2+ (1−α)St−2 ]

St = αyt−1 + α (1−α) yt−2 +(1−α) 2 St−2.

By substituting for St−2, then for St−3, and so forth, until we reach S2 (which is just y1), it can be shown that the expanding equation can be written as:

t-2

St=α ∑ (1−α)i−1yt−i+ (1−α)t−2S2, t ≥ 2.

i=1

For example, the expanded equation for the smoothed value S5 is:

S5=α[(1−α)0y5−1+(1−α)1y5−2+(1−α)2y5−3]+(1−α)3S2.

In the current context we are using triple exponential time series method of extrapolation to forecast future values based on set of actual current values.

Trend

Seasonality

INCOMPLETE

## How target setting is used?

The main purpose of forecasting is set reference point against which actual business performance can be compared. The detailed description of how the targets are used to determine price and benefits will be elaborated in respective sessions but this section lists the basic approach for using targets to let the platform know the comparison between forecast and actual performance and make a decision on how to alter price and/or benefits.

1. Forecast for each product is initially set manual using merchant’s expertise/expertise and expectations. Assume that they may be far from reality on the higher or lower side.
2. Since targets are set at monthly interval they are transformed into daily targets by appropriate interpolation algorithm so that daily actual performance of a product can be compared with daily targets.
3. Rules are set by merchant regarding at what difference between forecasted revenue and actual revenue the price should be recalculated.
4. Appropriate pricing formulation/algorithm is used to recalculate the price when the set threshold is crossed, in such a way that offered price will be increased when actual value(revenue) is more than forecast value for a day by threshold percent(say 10%),else offered price will be lowered.
5. Similarly forecast can also be used to predict if (actual) customer base (in form of number of subscriptions) is increasing or decreasing so as to pump in more money on sales/marketing efforts. Or if churning is happening more indicating customer’s reluctance to adopt subscription model due to possible flaws in it.
6. Lastly the forecast is used to correct itself. When forecast is found vastly different than the actual business trend the historical data of actual business is extrapolated and becomes the new forecast of coming months. Thus it helps in minimizing human errors in forecasting.

## Calculating Operating expenses

Subscription business may run as a dedicated business or it may run along with regular (instantaneous) retail business as a business sub model. In case it is run as a sole dedicated business, all the infrastructural and operational expenses borne by the business will be attributed to subscription business. But in case it is run as a segment of overall retail business then theses expenses should be shared in the proportion of their revenue. For example: Amazon is already into regular retail business. If they provide an option for subscription business(presently they do but it is a simpler model) and follow the subscription business model, they will share the same inventory, payment channels, and delivery channels for delivering goods to customer doorsteps, same staff, and same infrastructure.

In such cases subscription business will share common operating expenses out of total expenses borne by the total business based on its revenue contribution to the total revenue.

Example: If total monthly revenue of a retail business is 200,00,000 Rs. and subscription business contributes 40,00,000 Rs. of it then subscription business share in revenue is 20%. Hence the 20% of the common operating expenses should get attributed to subscription business. In case total operational and infrastructural expenses are 5,00,000 Rs. then 20% of it, 1,00,000 Rs. will be attributed to subscription business.

In case of shared business model usually fixed cost is not attributed to subscription business, if subscription model has been launched by already running and established retail business. Only recurring costs are to be shared between regular and subscription business.

In case one needs to categorize different expense headers under which the operational expenses are made, some of these expenses do no depend upon actual products, their demand, frequency of usage etc. attributes and hence can be shared uniformly across all the unit subscribed so far. These are called as common expenses. Rental expenses, inventory management expenses, staffing cost, electricity and communication charges are some such examples of common expenses.

But some expense headers are highly dependent on products, their demand or their usage frequency. They are termed as subscription specific expenses.

## Common expenses

All expenses attributed under “common expenses” are summed up and evenly distributed across all subscribed items (not subscribed products but total number of items subscribed from different products). This is because they are neither depending on demand of the products nor delivery frequency (we can also call it as need frequency as delivery frequency is determined based on need frequency).

Following are few expense headers can be considered as common expenses

* + - Software maintenance and enhancement cost(includes procuring/revising third party software licenses, hosting charges, Expenses on integration with third party paid services (payment gateway, goods tracking system etc.),hardware/data backup) - Annual
    - Expenses on communication charges(phone, internet usage) - Monthly
    - Electricity charges – Monthly
    - Rental expenses - Monthly
    - Personnel related expenses(salaries, bonuses, HR) – Monthly/Annual
    - Taxes/Service charges to run business – each header under it as monthly or annual
    - Housekeeping expenses( maintaining office, storage spaces, disposing/returning expired goods, personnel transportation, furniture/interior, repairs) – Monthly
    - Cost of recurring travel( personnel traveling across locations for any official purposes)
    - Printing/stationary- Monthly
    - Renewals of licenses/permits/certifications – Annual

## Subscription specific expenses

Subscription being a recurring business model there are certain recurring expenses which should be specifically attributed to subscription business

## Goods Delivery expenses:

These are recurring expenses for every product and customer and hence require special calculation.

Different companies follow different delivery models in case of grocery business.

Some companies maintain their own network of distributed warehouses where they maintain inventory of products and they supply them from their to all nearby subscribers.

Few companies do not maintain inventory of their own but have a tie up with local grocery merchants in every town and they pass on the delivery requests to these merchants. The merchants then are responsible for delivering baskets locally to all nearby subscribers. In tur they pay commission to the company owning subscription business.

So in first case one need to identify the delivery cost in terms of transportation and local dispatch (personnel, fuel etc.) OR in terms of courier charges (in case shopping company is using third party courier agency for the same). In both the cases it can be represented by the basket delivery cost per kg. Let’s call it as “Distribution Based Delivery Costing Strategy”.

## Distribution Based Delivery Costing Strategy

Following factors determine the share of operating expenses to be borne by different entities.

Number of products being subscribed has different demands. Some products are sold more than others. So they should share more of the delivery expenses

Different customers opt for varying frequency of basket deliveries such as weekly, monthly, and quarterly. More is the basket frequency more will be the operating expenses. So the baskets being delivered more frequently than others should share more of the delivery expenses than those which are delivered less frequently.

Delivery expenses are determined by the weight of the basket. So the baskets having more weights should share more contribution to operating expenses than those which carry less weight.

So we can use the following sequence to determine per unit delivery cost for every product.

1. Get the list of all delivery rates for every weight range (20 Rs. up to 1s kg, 25 Rs for goods from 1 to 2 kg etc.).
2. Get monthly baskets fitting into each weight range. In case of weekly baskets multiply each by two. In case of quarterly basket divide total baskets by 3 to arrive at total monthly baskets).
3. Apply appropriate delivery rate for baskets in each weigh range and find out total delivery cost to be paid for delivering basket in each weight range per month.
4. Now get each subscriptionable product associated with number of baskets falling under each weight range. Same product may be contained in baskets falling under different weight ranges. Since each product has its weight registered with it, multiply unit product weight with number of products(contained in baskets with specific weight range) so as to calculate total weight getting delivered under each weight range. Multiple per kg delivery cost to this total weight (in kgs) to calculate how much delivery cost a product is bearing under each weight range. For the same product calculate it for all weight ranges.
5. Calculate the total delivery (per month) is to be borne by a product, by summing up the costs calculated for each weight range in step 4.
6. Repeat this for all products contained in baskets falling under different weight ranges.
7. Total sum of monthly delivery cost for each product should match the cost found at basket level in step 3.

Thus total delivery cost will get distributed across products as per their volume per month (which is translated from their frequency of delivery) as well as per unit weight.

Example:

|  |  |  |
| --- | --- | --- |
| Price category | Rule | Amount |
| Distribution price1 | below/up to 1 kg | 20 |
| Distribution price2 | 1 .01 kg to 2kg | 25 |
| Distribution price3 | 2.01 kg to 3kg | 28 |
| Distribution price4 | 3.1 kg to 5kg | 34 |

|  |  |  |  |
| --- | --- | --- | --- |
| Basket category | Baskets per month | weight(more than) | Total deivery cost per month |
|  |  |  |  |
| cat1 | 6507 | 3 | 182196 |
| cat2 | 6557 | 2 | 163925 |
| cat3 | 4272 | 1 | 85440 |
| Total | 17336 |  | 431561 |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| product ID | weight | product count in cat1 | total weight A in cat1 | cost of delivery- A in cat1 | product count in cat2 | total weight of A in cat2 | cost of delivery- A in cat2 | product count in cat3 | total weight of A in cat3 | cost of delivery- A in cat3 | total cost per unit |
|  |  |  |  |  |  |  |  |  |  |  |  |
| A | 0.2 | 6507 | 1301.4 | 12146.4 | 6557 | 1311.4 | 16392.5 | 4272 | 854.4 | 17088 | 2.6319162 |
| B | 0.3 | 6507 | 1952.1 | 18219.6 | 6557 | 1967.1 | 24588.75 | 4272 | 1281.6 | 25632 | 3.9478744 |
| C | 0.25 | 6507 | 1626.75 | 15183 | 6557 | 1639.25 | 20490.63 | 4272 | 1068 | 21360 | 3.2898953 |
| D | 0.5 | 6507 | 3253.5 | 30366 | 6557 | 3278.5 | 40981.25 | 0 | 0 | 0 | 5.4613633 |
| E | 0.3 | 6507 | 1952.1 | 18219.6 | 6557 | 1967.1 | 24588.75 | 4272 | 1281.6 | 25632 | 3.9478744 |
| F | 0.2 | 6507 | 1301.4 | 12146.4 | 6557 | 1311.4 | 16392.5 | 0 | 0 | 0 | 2.1845453 |
| G | 0.25 | 6507 | 1626.75 | 15183 | 6557 | 1639.25 | 20490.63 | 0 | 0 | 0 | 2.7306816 |
| H | 0.3 | 6507 | 1952.1 | 18219.6 | 0 |  | 0 |  |  | 0 | 2.8 |
| I | 0.3 | 6507 | 1952.1 | 18219.6 | 0 |  | 0 |  |  | 0 | 2.8 |
| J | 0.3 | 6507 | 1952.1 | 18219.6 | 0 |  | 0 |  |  | 0 | 2.8 |
| Total |  |  |  | 176122.8 |  |  | 163925 |  |  | 89712 |  |

## Calculating offered price

This is the most complex phase of overall lifecycle. Price of a product is a function of various parameters such as

1. Its purchase price
2. Its MRP
3. Available margin
4. Demand of the product
5. Demand of the substitutes
6. Demand of complementary products
7. Operating expenses to be borne by product(common + subscription dependent)
8. Sales and marketing expenses to be contributed by the product (optional).

When the platform is initially set up determination of price is merely based on the general idea of market in which the product is being sold and costs associated with product. Section 8.1 addresses the initial price set up for each product when not historical data is available.

There are two variants of offered price set

1. Offered Price when basket level discount is not applicable: If a subscriber adds few items of a product in basket but due to basket rules he/she is not eligible for basket level discount, then this is the price offered to him/her.
2. Offered price when basket level discount is applicable: If a subscriber who has added few items of a product in the basket becomes eligible for the basket level discount then this is the price to be offered to him. Actually he will be shown the price when basket level discount not applicable but the added discount is shown at basket level.

## Calculate price based on expected margin

Initially we do not have any historical data and setting the forecast for the first time. So we will start with the basic pricing calculation based on expected margin.

Margin = gross profit/selling price

## Adjust price based on demand curve

## Adjust price based on extrapolation of profit/revenue

## Adjust price of associated products(substitutes and complementary)

## Budget Distribution and lifecycle management

Based on the above provision needs, platform defines different accounts which are responsible for managing transactions in respective areas as well as flow of money from one account other in case of specified events. These accounts help in

1. Tracking the impact of different events/activities on the overall money being invested.
2. Making provisions for contingencies
3. Getting ready information on how different products are doing, and how overall business is doing

## Subscriber account

Subscriber account keeps track for all transactions such as payments made, provision for different expenses, payment due, loyalty points, prices committed for every product he has added to basket, basket level benefits committed, last subscription history ( should it be in Subscriber instead?).

## Item prices – Price Committed products

When a subscriber confirms subscription to few items for a specific period, the item level prices are committed to him in case of price committed products. For every item he has subscribed to, the identifier of the **price bucket** (described in Product Account) has been linked against that item for the periodic quantity he has asked for.

In case subscriber increases the quantity of some product later (than subscription date) the new quantity gets associated with latest price bucket, so that his total quantity of a product may get distributed into one or more price buckets. When a subscriber decreases the quantity of some product then the total quantity remains associated with original price bucket of that product. Also basket level discount will be recalculated

In case subscriber removes some product from his list completely, no price will be charged to him on that product then onwards but basket level discount will be recalculated.

## Item Prices – Percentage discount committed products

Similar to price committed products, when a subscriber confirms subscription to few items for a specific period, he is linked to latest price bucket of every product active on that day. For every item he has subscribed to, the identifier of the **price bucket** (described in Product Account) has been linked against that item for the periodic quantity he has asked for. But here he is not associated with the latest offered price but the latest MRP (as the committed percentage discount is always calculated on latest MRP). In fact in this category, there is no need to calculate latest offered price.

When offered price changes (in product account) for a product that he has subscribed to, then he gets associated to the new price bucket. This is how all subscribers are always associated with latest price bucket for a product that they have subscribed to.

## Item Prices- No commitment products

The behaviour is exactly same as that in percentage discount committed products. All subscribers subscribed to a product are always associated with its latest price bucket.

## Basket level Benefit

This will have the discounted on total basket price per period (per month/week). When subscriber confirms subscription the basket level benefits (per period) should be calculated and kept here. It should also keep the mode of redemption. The mode of redemption can be either of

1. Redemption points of the discounted price per period, every end of a period they will get added here. Different rules should be configured on how the redemption can be done.
2. Direct discount form the total basket amount every period. In this case while subscriber is paying for the subscription duration he/she will pay the total basket amount minus discount per period.
3. Cashback option where the subscriber will pay for the total basket amount and discount money will be refunded him/her after certain duration( based on set rules)

How to calculate Basket level benefit: Basket level benefit should depend on following factors and in the given sequence

1. Demand of the products being added to basket. More demanded products will yield lesser benefits. Demand can be realized by credit points earned by each product. Each product added to a basket should contribute to basket level benefit and the same can be calculated by using the credit points earned by that product.
2. Total amount of basket. Obviously higher the amount of basket, more will be the benefits.
3. Duration of the subscription. More the subscription duration more will be benefit.
4. Payment mode. Full advanced payment for the whole subscription duration will attract more benefits
5. Stability of basket content. If no content is changed in the basket after subscription then it will attract full benefits. But if the content is modified /reduced the benefits should be reduced.

## Payments

When a subscriber confirms subscription for some items for a specific period,

1. When subscriber confirms his subscription for a desired period the total subscription amount is registered in the “Payments to be made by Subscriber” attribute of this account. The total amount in this attribute indicates the total subscription value for a subscriber, which he will be expected to pay (as per the agreed payment modes) during course of subscription.
2. If subscriber has made partial payment or full payment of the total subscription value, then amount paid will be set as credit amount (positive) in “payments made by subscriber” attribute.
3. Every time when a basket is delivered successfully to a subscriber, the basket amount (offered) is debited (negative) in the “payments or equivalent made to subscriber” attribute.
4. If subscriber changes content of the basket due to which total basket value changes for the remaining period, then the difference amount ( positive or negative) will have to be added in “Payments to be made by Subscriber” attribute depending upon whether new basket price is more or less than original basket price. In case new basket amount is more than original basket amount then the difference is positive. If it is less, then the difference is negative.
5. After the change of basket content system should ensure that revised basket amount should get debited in the “payments or equivalent made to subscriber” attribute, when next time the basket with revised content is delivered to him.
6. If subscriber cancels subscription in between the subscription period, then the total basket amount paid by him for the remaining subscription period is calculated by total payments made by him minus “payments or equivalent made to subscriber”. This amount should be debited (negative) in the “payments or equivalent made to subscriber” attribute, so that payments made by subscriber should get nullified by payments or equivalent made to subscriber.
7. Even if subscriber does not cancel subscription, the difference between payments made by him and payments/deliveries made to him should be periodically calculated so that when they nullify each other but registered subscription period is not yet over, then a notification event should be sent to subscriber telling him the payment of the remaining subscription period is due, which he should pay in order to ensure next delivery.

## Product Account

The product account represents snapshot of product targets/forecasts as well as actuals for the given period (month/week).

When platform administrator registers a product for subscription its product account should get created.

## Forecast

When platform administrator creates forecast for every subscriptionable product, it goes in this section. Else at the end of the year The EOY batch should replicate actuals of current year as a forecast for next year, as default configuration. Administrator can modify its values wherever he wishes to.

1. Its purchase price from the manufacturer/wholesaler(Cost of goods sold-COGS)

* If this price changes in a month due to inflation/excess demand and low supply then the changed price should be marked from that month onwards

1. Its MRP( manufacturer suggested sale price)

* If this price changes due to change in purchase price (due to any reasons mentioned above), then the changed price should be marked from that month onwards.

1. Its weight, which may be impacting its operational cost.
2. List of all substitutes in the same category and weight scale
3. Ratio of Its expected quantity demanded per month against total quantity demanded of all products in the same category( product and all its substitutes)
4. Its categorization as high frequency/regional/perishable/semi-perishable etc.
5. Expected number of new subscribers/item registrations(?) each month
6. Expected number of churned subscribers/item registrations(?) each month

When churning of subscribers happen, one need to also register

* + Churned subscribers/items affiliated to price at start of the years
  + Churned subscribers/items affiliated to the changed sale price1
  + Churned subscribers/items affiliated to the changed price2 and so on.

1. From date of the forecast
2. To date of the forecast.

Based on these forecasts following values are calculated.

1. Monthly operational expenses to be borne per product.
2. Monthly sales and marketing expenses calculated per product.
3. Breakeven price.
4. Percentage of break-even price to obtain unit level price without any other benefits.
5. Percentage of break-even price to obtain basket contribution (addition for obtaining unit level price with basket contribution).
6. Net new customers and Total customers per month(to indicate demand)
7. Total churned customers and % customer churn per month(- #number of churned customers current month/total # customers at last month)
8. Monthly recurring revenue due to new customers in a month( MRR New)
9. Monthly Churned MRR among customers affiliated to every price bucket and total churned MRR( approximate indication of impact of changed price on customer churn),percentage net MRR churn( churned MRR/starting MRR)
10. Monthly Average revenue per new subscribers.
11. Total monthly revenue
12. Cost of goods sold.
13. Selling price derived from margin percentage.
14. Operating profit/loss and Operating profit/loss percentage.
15. Subscriber Lifetime Value(SLV
16. Subscriber lifetime period.
17. Cost of Acquiring a customer (CAC).
18. SLV to CAC ratio.
19. Months to recover CAC.

## Actuals

Actuals should have similar attributes which forecast section has. Every day a multiple data procuring jobs run which keep on updating different attributes. Every day a job should run and compute different metrics (listed in forecast) and store in data repository in order to compare them with interpolated forecast values.

Some of the attributes behave differently depending upon the category lf the product among price committed products, percentage discount committed products and no commitment products

## Price Committed products

Each product account has **price buckets** in order to keep track of the offered prices to different set of subscribers for that product as well as count of registered subscribers for each offered price. When the product is launched on a day a price bucket is created for it, having the current purchase price (and date),MRP and offered sale price of that product. When a subscriber subscribes to that product on the same day his/her id is registered with this price bucket.

Whenever the offered (sale) price of the product changes(every day platform should receive latest price quotes from main application) due to profit margin and discounting calculations a new price bucket will get created where the subscribers subscribing on the price change day are registered with this latest bucket.

Whenever purchase price of a product changes due to inflation or shortage, all the price buckets will get impacted. In this case a new version of purchase price will be added in each price bucket indicating the day on which purchase price has changed and the changed purchase price.

Example: consider that subscriber has subscribed to two units of toothpaste per month on 1st January 2016. On this day purchase price is 45 rs. And current offered sale price is 72 rs, then system will create a price bucket in which it will having first version of purchase price dated 1 Jan 2016 and amount as 45 rs, offered sale price as 72 Rs and the subscriber’s Id registered to this bucket. So all the subscribers, who have subscribed to this toothpaste on the same day, will get registered with the same price bucket.

After few days when few new subscribers are subscribing to the same toothpaste, if the offered price has been changed from 72 Rs to 69 Rs a new price bucket has been created mentioning the same purchase price but a different offered price and these subscribers will get registered to this new bucket.

So assume that there are these two price buckets only as of date 23rd Feb 2016. Now if the purchase price of the toothpaste has changed from 45 Rs to 48 Rs., both these price buckets will be updated where a new version of purchase price will get added to both with current date. So both buckets will have to versions of purchase price ; 1st with 45 Rs. dated 1st Jan 2016 and other with 48 Rs. dated 23rd Feb 2016.

Though purchase price of the product has changed, offered price for the subscribers who have subscribed to the earlier price cannot be changed. But the same will get changed for any new subscribers subscribing to the toothpaste newly on 23rd Feb 2016 or later by creating a new price bucket.

## Percentage discount committed products

In case of percentage discount committed products too, price buckets get created the same as described in above category. But all the existing subscribers are always associated to latest price bucket. They are in fact associated with latest MRP and not with latest offered price.

Actuals are collected and updated daily but many of the below metrics are calculated monthly as it does not make much sense to calculate them on a daily basis.

1. Actual operational expenses spent per product.
2. Monthly sales and marketing expenses.
3. Net new customers and Total customers per month.
4. Total churned customers and % customer churn per month.
5. Monthly recurring revenue due to new customers in a month( MRR New)
6. Monthly Churned MRR among customers affiliated to each price bucket, and total churned MRR, percentage net MRR churn.
7. Monthly Average revenue per new subscribers (ARPS (New)).
8. Total monthly revenue
9. Cost of goods sold (COGS).
10. Selling price derived from margin percentage.
11. Operating profit/loss and Operating profit/loss percentage.
12. Subscriber Lifetime Value(SLV).
13. Subscriber lifetime period.
14. Cost of Acquiring a customer (CAC).
15. SLV to CAC ratio: SLV/CAC.
16. Months to recover CAC.

## Credit Points

A batch job is targeted to calculate the performance of every product at the end of configurable period (typically every month). When it runs for a product it calculates the forecasted operating profit and actual operating profit.

If actual operating profit is a positive amount and is more than the forecasted profit then the surplus amount should be credited to nodal account.

If actual profit is a positive amount but less than forecasted figure then nothing gets transferred to nodal account. SHOULD IT GET TRANSFERRED TO SOME INTERNAL ACCOUNT??

If actual profit is a negative amount (it is loss) then the money equal to the break-even situation (no profit no loss) is borrowed from nodal account and it is used to reduce the price of that loss making product.

For every deposit that a product account will make to the nodal account it will get 1 credit point for every 1000 Rs (configurable), which is stored in this attribute. Similarly when a product wishes to borrow any money from the nodal account it will lose 1 credit point per 1000 Rs.(configurable) borrowed.

Credit points will be an easiest mechanism to track the credit history of any product and weigh it against its competitors. Also credit points are the investments a product is making so that it can first use it for itself (offering instantaneous, basket, loyalty level benefits) as make a social contribution towards upliftment of loss making products.

## Total Debit

This field is computed on a daily basis by some job. The product account also has total debit where sum of products of every purchase price and the items subscribed at that purchase price ( (purchase price1\* subscriptions at price1) + (purchase price2\* subscriptions at price2) +….) is calculated.

## Total Credit

This field is computed on a daily basis by some job. Then it will have total credit where sum of products of every sale price and number of items registered at that sale price has been calculated.

( (sell price1\* subscriptions at price1) + (sell price2\* subscriptions at price2) +….)

## Contingencies:

Finally it should have provision for contingencies. In case the product needs money in addition to the money that it is earning, then it will refer to this contingency before borrowing it form the nodal account. Thus in case of loss making products, if product wish to offer more discount in an attempt to recover from losses it will make use of this provision. In case available provision is not enough then it will try to borrow money from nodal account. It should be typically an annual deposit which few percent of the total spend (purchase) on the product.

Most importantly this account should be self-sustainable. In case it is unable to sustain itself it should raise a notification to the merchant so that the merchant will do manual intervention either by pouring additional contingency amount or by deciding to take the product out of subscription business.

One Rule to be followed is that when a product is making profits beyond the set targets, then this account will hold only amount equivalent of targeted profit in addition to the spend. The incremental/additional profit will be deposited to NODAL account for it to be used for provisioning across products and customers.

Example: Consider at start of the year merchant has targeted 3000 per month sale of a product, whose purchase price is 30 Rs and sale price is 50 Rs. So this is how the flow will happen.

A forecast is created by merchant for each month, where he will set the forecasted sale volume, forecasted purchase price and sale price and finally from and to dates for each forecast. These figures are completely based on his past experience. So volume forecast is 3000,forecasted purchase cost will be 3000\*30=90,000 Rs and forecasted sale amount with proposed offered price of 50 Rs will be 3000\*50= 150,000 Rs.( so expected profit of 60,000 Rs.), from date of forecast 1 Jan 2016 ,to date as 31 Jan 2016.

A contingency amount of 9000 Rs. (10% of purchase cost) has been added in the contingency provision.

A price bracket will get created with purchase price 30 Rs dated say 1st Jan 2016 and offered price 50 Rs, MRP as 56 Rs.

Say 300 subscribers register for this price bracket. So they get registered with the first price bucket. Total debit will be 300 \* 30 = 9000 rs and total credit is 300 \* 50 = 15000 Rs.

At the end of Jan 2016 if there is a volume of 3400 subscriptions for that product. The profit incurred out of the forecasted sale volume(3000) is the earning of this product( 3000\*(50-30)=60,000 Rs).

Since this is more than the forecasted volume of sale of 3000 the profit earned from additional sale of 400 items (400 \* (50-30)= 8000 Rs) is a bonus which should be transferred to the nodal account.

So in above cases the product has earned 8 credit points.

## Operating expenses Account.

This account keeps track of forecasted vs actual operating expenses and notifies the merchant if the provisioning (based on forecasting) is not enough to meet the actual expenses. We can broadly classify operating expenses into “common expense” and “subscription dependent expenses”. Common expenses are fixed expenses are not handled by the platform (as the platform is not an independent shopping application but acts as a subscription agent of some shopping application). But their share to be borne by subscription platform should be received from main application as they will get distributed among all the subscribed products volumes equally.

Subscription dependent expenses are used to handle the lifecycle of subscription business and hence should ideally be managed by products themselves.

Again here the same philosophy is recommended where since every product item being sold is consuming its portion of operating expenses, hence it is responsible to contribute to it in such a way that overall expenses should get nullified by the overall contribution by the subscribed items.

Initially merchant has to make forecast about the probable operating expenses he may incur throughout the year. Actual expenses are reported back by the main application when items are actually shipped to subscribers. Against these expenses all subscribed items will contribute so as to nullify the effect of expenses.

## Forecast

Merchant need to forecast the periodic (monthly) recurring operating expenses. He can choose some of the following headers for entering forecasted expenses per month under each, for the whole year.

## Common Expenses

* + - Creating and maintaining the web application(obtaining domain on cloud, procure number of servers, hosting site)
    - Expenses on integration with third party paid services (payment gateway, goods tracking system etc.).
    - Expenses on communication charges(phone, internet usage)
    - Data Backup and software maintenance/enhancements cost
    - Office and Inventory storage space expenses( rent)
    - Personnel related expenses( salaries, bonuses, HR)
    - Taxes to run business
    - Resources expenses
    - Housekeeping expenses( maintaining office, storage spaces, disposing/returning expired goods, electricity bills, personnel transportation)
    - Cost of recurring travel( personnel traveling across locations for any official purposes)
    - Renewals of licenses/permits/certifications

## Subscription dependent expenses

* + - Goods Delivery expenses: A merchant need to specify average delivery expenses per basket for every KG. When a subscriber confirms registration of basket items, the same event should calculate the total weight of that basket and registers total delivery expenses per delivery.

Forecasting should be typically based on historical data and platform should provide some mechanism to prefill the forecast based on the actual data that is getting received in the past.

## Actuals

* + - Credit:

Thus every product is sparing some amount from the profit that it has earned (as customer has paid for it, it has earned some profit) for the operating expenses incurred by the system to manage it’s own subscription lifecycle.

The interesting part is how to calculate each item’s contribution to the operating expenses.

Simpler approach is to divide total monthly operating expenses by total number of items subscribed (in different baskets) so as to arrive at the “per item” expense. Here all the items are considered equal in terms of weight, frequency of delivery etc.

A tedious but precise approach is to

1. Divide the recurring expenses into subscription independent expenses and subscription dependent expenses. So among the type of recurring expenses listed above ,the categorization will be
   1. Subscription independent :
      1. Creating and maintaining the web application(obtaining domain on cloud, procure number of servers, hosting site)
      2. Expenses on communication charges(phone, internet usage)
      3. Data Backup and software maintenance/enhancements cost
      4. Office space expenses(rent)
      5. Resources expenses
      6. Personnel related expenses( salaries, bonuses, HR) -
      7. Housekeeping expenses( maintaining office, storage spaces, disposing/returning expired goods, electricity bills, personnel transportation)
      8. Cost of recurring travel( personnel traveling across locations for any official purposes)
      9. Renewals of licenses/permits/certifications
   2. Subscription dependent
      1. Expenses on integration with third party paid services (payment gateway, goods tracking system etc.). – frequency dependent
      2. Inventory storage space expenses( rent) – weight dependent and frequency dependent
      3. Goods delivery expenses – weight dependent and frequency dependent
2. Categorize the subscription dependent expenses into weight and/or frequency dependent.
3. Distribute the subscription independent expenses equally among all items subscribed.
4. Distribute the subscription dependent expenses across items depending upon their weight and frequency of delivery.
5. Summarize c and d so as to arrive at total credit to be made to this account.
   * + Debit: The main shopping application is expected to provide actual operating expenses made on subscription business by provide this feed to the platform on a monthly basis. The feed should contain different ingredients of operating expenses (as listed in headers above). When such as feed is received it should be used for realizing the actual expenses and hence an amount equal to every product’s contribution towards operating expenses should get debited from this account. Again the same calculations should be made (as in credit procedure) to derive operating expenses per item delivered in that month.

Example: If total monthly operating expenses are forecasted as Rs. 200,000 and if there are total 100,000 items subscribed so far for monthly subscription then per item operating charges= 200,000/100,000 = Rs.2 per item. Every item so far added in every basket will credit Rs 2 upon subscriber payment per month. If a subscriber has added total 15 items in his basket and made a full yearly advanced payment then total credit by that subscriber = 15(items pm) \*2(Rs. per item pm ) \* 12(months subscription)=360 Rs.

In this case every month a basket is delivered successfully 15\*2 = 30 Rs get debited from this account.

If another subscriber has subscribed for same number of items but made an advanced payment of only 3 months then his contribution towards operating expenses as a credit = 15(items pm) \* 2(Rs. per item pm) \* 3(months subscription)= 90 Rs.

In this case too, every month a basket is delivered successfully 15\*2 = 30 Rs. get debited from this account.

In ideal situations the debit and credit entries should nullify each other. But there a few cases where this may not be true.

1. When a basket delivered to a customer has returned back and it needs to be resent(resulting into double dispatch charges)
2. When the planned/forecasted operating expenses are no longer valid due to environmental factors but products have already provisioned for them as per the forecasts.

These cases should be handled by platform carefully and should make provision to add more money to this account externally if required.

## Account for sales and marketing expenses (should we have this under scope??).

This amount is spent for acquiring more subscribers and retaining existing subscribers. These expenses should be correlated to the number of new subscribers joining each period to check the effectiveness of the effort. In case it is not enough then a separate additional provision should be made for it.

## Nodal Account

For motivating customers for buy more as well as to remain associated longer. This provision is used for basket level discounts for the eligible subscribers. There should be rules on how much basket level discount should be provided and to whom. Initially some provision will be made by the merchant but later all products should contribute to this account, as basket is an aggregation of these items for a customer. So if a product is making excess profit than its forecast, then it should contribute this excess profit amount to this account.

## Merchant’s account.

A Merchant will anticipate some periodic profit for himself on each product that he is selling under subscription. So every product should deposit that expected percentage of profit out of total profit into this account. The products who are making lesser profits than merchant’s expectations for himself or those which are making losses will not contribute to this account. Merchant can decide to spare the money from this account for any purpose that he wishes to and it will be a manual process.

## Calculating the price of a Product

This is the most crucial step of the overall process. We will define steps for determining price of a product for all three types of products (price committed, discount percentage committed, no commitment)

### Interpolation for transforming monthly target parameter values into daily values

1. Targets are set at monthly level as it is not practically possible to set target for every day, for the whole year. But they need to be available at daily level so that they can be compared with daily actuals. Comparing them at month interval may be too late as non-performing product may cause significant damage to the overall scene. So in order to compare the targets with actuals on daily basis the target parameters for the set discounted price(say 5%) are getting interpolated using cubic spline interpolation method. A Java code for cubic spline interpolation (SplineInterpolator) has been provided by apache.commons.math3 library and can be readily used here.

### Extrapolation of actuals for the current day for comparison

1. With the start discounting price product is getting sold every day in some volume. The sale volume on a day may be more than the set target or it may be lesser.
2. Values of parameters for a current day (where sale is not yet happened) and until the end of current month are obtained through extrapolation of actual parameter values until yesterday (which one??)
3. These extrapolated figures are compared with target figures for that day (obtained at day level through interpolation). If the actuals are higher than targets it indicates that the product is doing better than expected and hence no more discounts pouring is required at this time.
4. If the actuals are lesser than targets then it indicates that the demand trend may be on negative side than expected but cannot be confirmed with a single day
5. Demand Curve???
6. Elasticity : strength of the relationship between price levels and consumer demand. A product is highly elastic if consumer demand varies considerably with price.
7. Non-Price shifts: Sometimes, non-price factors such as consumer taste, income or expectations affect a change in the relationship between price and demand. In these cases, businesses responding to non-price factors stimulate sales of a product by lowering prices to increase demand. In this way, a non-price shift in demand will result in a change in price, even if price did not originally cause the shift.
8. For every product the intended profit target is considered to have been reached if the target volume (for the specified period) of units is sold at the carefully calculated target retail price, all other parameters (purchase price) being constant.
9. Usually the target exceeds for some products whereas for some it falls short of its targets. If the volume of sale exceeds beyond target, the additional profit (in addition to targeted profit) should be considered as the “**bonus**” for that item.
10. There is more likelihood of guaranteed profits (though limited per unit volume) on established brands. So these products should be considered as vehicles for sustainable business with gradual growth. In order to get considerable bonus from them the volume of sale (sale target per unit period) should be substantially high as these items usually yield lower profit margins per unit for the retailers. So the unique sales proposition for selling established brands is to earn a very high volume of business for them. Let’s call them “Volume Driven” products.
11. There are brands which are so popular that despite of considerably higher retail price than all their competitors they undoubtedly rule the market. But again, more the monopoly lesser is the margin for the retailer.
12. On the contrary less popular/secondary demand products do everything to conquer considerable portion of market and hence yield much higher profit margins for the retailers even for a moderate volume of sale. Their consumption turnover may not be guaranteed and can change across geographies. A clever retailer needs strategies to promote sale of few carefully chosen such products (without compromising his reputation) in order to rip more profits and eventually start gaining bonuses from them. The investment for promotional measures for these products can be provisioned form the bonus gained from high demand/monopolistic items.
13. But all low demand items do not necessarily yield greater profits, as few of them cannot pick up well in the market, despite of adequate promotional measures. Also as the “bonus” available out of sale from high demand items is limited and hence retailers need carefully crafted strategies to determine how to effectively promote these items and which products are the best candidates for promotional investments.
14. How to choose right products which are eligible for increased promotion? And how to decide on how much promotional investment to be made on every item (obviously it will be different for every product based on its proven historical merits)?
15. First let’s see what can be the strategies to earn more and more bonus. First let’s make an assumption that few products exceeded their target sale at target retail price and hence won some “bonus”.
16. This strategy considers use of the accumulated “bonus” from various items to aid in determining
17. The revised price of the same item for new subscriptions, so as to lift more “bonus” on them.
18. For determining and sustaining the price of low demand items, who are unable to make their targets.
19. For maintaining the corpus to yield additional benefits to subscribers such as offers, loyalty points, basket level discounts, brand loyalty discounts etc.

## Benefits

Apart from product level discount if subscriber is to be offered any additional benefits they all fall under this category and a separate domain is required for managing them. Some common benefits that merchant may want to offer them are as follows.

There are some ground rules for the benefits which should be commonly applied for benefits.

1. Benefits are applicable to one of the **domain entities**. For example : In case of Basket level benefit, the benefit is applicable on basket(and thereby products added to it)
2. Benefits are dependent on some **independent attributes** of the entity to which they are applicable. For example: As Basket level benefits are applicable to Basket, they are dependent on total basket amount for entire subscription duration, demand density of products added into it.
3. Dependency of Benefits on **independent attributes** of applicable entity is linear or non-linear, proportional or inversely proportional. For example basket level benefit is non-linear and proportional to total basket amount AND linearly proportional to average demand density of products contained in it.
4. Benefits are offered in various **instruments** such as discount, redemption vouchers, cashbacks etc.

## Basket level benefits

A clever merchant would always try to attract subscribers to load as much good in their baskets as possible. He can achieve this by offering basket level benefits in addition to product level discounts which are calculated and maintained by pricing engine.

When a subscriber sees his/her gains getting increased by subscriber for more and more they will be tempted to add more and more items to baskets. It will be a win-win condition for both as subscriber is getting dual benefitted (item level discounts as well as basket level benefits), where merchant is achieving substantial increase in revenue thereby profits.

Basket level benefits are determined in the following way.

1. Entire basket amount is calculated by multiplying periodic basket amount with total period. Example: For monthly basket of Rs.1800 subscribed for the duration of one year the entire basket amount will be 1800 \* 12 = 21600

This way basket’s dependency on basket amount and duration both will be taken care.

1. Total breakeven cost of basket is determined by adding breakeven costs of items added in it. This is the minimum price at which basket can be sold without making any profit.

## Out Of Scope

The domains which are not managed by affiance are inventory management, actual payments, portal (UI) for subscription business and actual deliveries. The context assumes that the subscription platform is to be integrated with a full-fledged shopping portal which is already taking care of inventory management and supply of goods, deliveries to customer, payments through payment gateways etc. Also the user interface requirements (and channels) are very brand specific for every Shopping provider site.