E-COMMERCE PROJECT

	InvoiceNo	StockCode	Description	Quantity	InvoiceDate	UnitPrice	CustomerID	Country
0	536627	22783	SET 3 WICKER OVAL BASKETS W LIDS	1	12/2/2010 10:53	19.95	15658.0	United Kingdom
1	536627	22941	CHRISTMAS LIGHTS 10 REINDEER	2	12/2/2010 10:53	8.50	15658.0	United Kingdom
2	536627	21756	BATH BUILDING BLOCK WORD	3	12/2/2010 10:53	5.95	15658.0	United Kingdom
3	536627	22961	JAM MAKING SET PRINTED	12	12/2/2010 10:53	1.45	15658.0	United Kingdom
4	536627	22423	REGENCY CAKESTAND 3 TIER	4	12/2/2010 10:53	12.75	15658.0	United Kingdom
5	536627	22697	GREEN REGENCY TEACUP AND SAUCER	12	12/2/2010 10:53	2.95	15658.0	United Kingdom
6	536627	22699	ROSES REGENCY TEACUP AND SAUCER	12	12/2/2010 10:53	2.95	15658.0	United Kingdom
7	536627	21755	LOVE BUILDING BLOCK WORD	4	12/2/2010 10:53	5.95	15658.0	United Kingdom
8	536628	85123A	WHITE HANGING HEART T-LIGHT HOLDER	6	12/2/2010 10:54	2.55	17850.0	United Kingdom
9	536628	71053	WHITE METAL LANTERN	6	12/2/2010 10:54	3.39	17850.0	United Kingdom

Marketing Action Optimization

Marketing Action Optimization is a methodology of identifying and running the most effective marketing action for each customer.

The goal of Marketing Action Optimization is to convert more customers, increase the spend of existing customers and reduce customer churn (abandonment). Optimizing every marketing action is especially important for consumer-facing online companies, such as Internet gaming, e-commerce and online services, Shopping Malls.

The Context of Marketing Action Optimization

Most companies with a large number of customers frequently run marketing actions (also known as campaigns, offers, incentives, upgrades, treatments and the like) to increase the revenues generated by their customers. For example, a company may send their customers an email announcing limited-time free shipping on their next purchase to encourage the customer to make a purchase in the next few days. Another example is sending customers who have not made a purchase for some length of time an email containing a discount coupon to entice the customer to return and make a purchase.

This type of marketing is in the lifeblood of consumer-facing online companies, such as Internet gaming, e-commerce , Shopping Malls and online services (such as financial services, telephony, SaaS applications, etc.). For these companies, there is no face-to-face marketing contact with their customers and their only opportunities to try increase income from their existing customers are via email, SMS, telephone , sending invitation . The Goal is to bring them on our MALL, websites etc.

A Unique Marketing Action Optimization Approach

This method revolves around the performing dynamic micro-segmentation of customers based on Purchase behavior (and other) characteristics and being able to predict the future purchase behavior of customers in response to different marketing actions. (In other words, the next best marketing action for a particular customer is the one that most increases long-term revenue from the customer and not only a short-term spending uplift.)

Predictive Behavior Modeling

Predictive behavior modeling helps predict the future Purchase behavior of customers allowing customer marketers to maximize the effectiveness of their efforts.

What is Predictive Behavior Modeling

Predictive behavior modeling is the science of applying mathematical and statistical techniques to historical and transactional data in order to predict the future behavior of customers.

Main Goal

Clustering/Segmentation of the customer group as per their Purchase Pattern

E-COMMERCE PROJECT

Necessary information: -

The data for doing this, readily available in the company's CRM or transactional databases, can be compiled in an Excel spreadsheet or database:

What we look in the Data set:-

 (*)Financial year/Time period transaction detail of company .

There may be Lakhs of entry.

Which include, Invoice no. Date, different item id ,Unit price, Total Price, discount on item , item return, order cancelled etc......

To understand customer purchase behavior the Business /sales Management concept we can apply :-

RFM Segmentation

RFM stands for Recency, Frequency and Monetary –

- RFM segmentation is a method to identify groups of customers as per their purchase history.

About customer database:-

recency, frequency and monetary

The customer data center typically have extensive data on their existing customers – such as purchase history,

--browsing history,

--prior campaign response patterns

---and demographics –

We need to calculate :-

Recency:

How much time has elapsed since a customer's last activity or transaction has been made by a particular customer or with a particular brand?

Serious Recency Activity is usually a purchase, Not just the casual visit to mall or a website browsing .

but still the Simple Browsing and Normal visit with minimum amount purchase is also under little consideration to keep a record of such customer for future business prospects.

In most cases, the more recent visited customer are more likely a potential customer. who will be responsive to a new business opportunity, new product launch, new discount offer etc.

Frequency:-

How often has a customer interacted with the brand during a particular period of time?

Clearly, customers with high frequency are probably more loyal and has better future business prospect , than customers who rarely visit.

Again here more no. of visit is not only high consideration but along with Purchase volume is also important .

Monetary: "monetary value," how much a customer has spent with the brand during a particular period of time.

Big spenders should usually be treated differently than customers who spend little.

Monetary divided by frequency indicates the average purchase amount.

Why RFM needed?

- Pinpointing the potential buyer.

- Avoiding cold calling, better to call the targeted potential buyer.

- Dedicated Marketing Message as per customer class.

- Sales and business with increase.

Performing RFM Segmentation and RFM Analysis:-

Step 1

Calculate the value of Recency , Frequency and Monetary to each customer as per their invoice no. , Invoice Date. , customer id.

Recency is simply the duration of time since the customer's most recent transaction/visit .

(mostly it is considered in days)

Frequency is the total number of transactions made by the customer (during a defined period).

Monetary is the total amount that the customer has spent across all transactions during a defined period.

We will calculate these three parameters.

STEP-2

The second step is to Give the valuation of Recency , Frequency and Monetary .

Grading or importance to the value assigned.

Example. high value total purchase , prime customer.

Single invoice high value also a prime customer.

OR

We can be the bench mark on the basis of Quantile percentile 25%, 50%,75% etc. The Valuation of Recency,Frequency and Monetary.

To make the evaluation .

For example:- Evaluation can be done 4 or more no. of labels/ Category.

STEP -3 Aggregate (summation) all three evaluation Recency, Frequency, Monetary and Give the overall marks/value considering R-F-M altogether.

We can segregate type of customer according to their total marks.

Or

Another way of segmentation / segregation is to provide a identification as per customer type.

Coding no. identification Basis also .

Step 4

RFM segments.

A shortened notation for this segment is 1-1-1; we'll use this notation going forward.

We are keeping high marking for favorable action and low marking for unfavorable action ..

for exp high spend(Monetary) –4.

------ moderate purchase-3

Average Purchase-2

Least purchase-1 and so on..

Most Recent visit -4,

………..

High no. of Frequency-4.

……….

	Recency	Frequency	Monetary
VIP Customer:-	4.	1-4.	4
	3	1- 3	4
VIP customer (need special attention)	1-2	1-2	4
Platinum customer	4	4	3
	-	-	3
Platinum customer (need special attention)	1/2	-	3
Gold customer	4	4	2
	-	-	2
Gold customer (need special attention)	1-2	-	2
Silver Customer	3-4	3-4	1

E-COMMERCE PROJECT…

UnicodeDecodeError: 'utf-8' codec can't decode byte 0xa3 in position 107419: invalid start byte

```
with open('filanem.csv', 'rb') as f:

enc = chardet.detect(f.read())

df=pd.read_csv("filename.csv",encoding = enc['encoding'])
```

E-Commerce File:-

Columns:-

- **Invoice No**
- **Stock Code**
- **Description**
- **Quantity**
- **Invoice Date**
- **Unit Price**
- **Customer ID**
- **Country**

- **What are the independent and dependent variables?**

UNSUPERVISED MACHINE LEARNING SEGMENTATION/CLUSTERING/GROUPING

- **supervised learning uses labeled input and output data/dependent variable.**

- **while an unsupervised learning algorithm has no output date no dependent variable.**

- **unsupervised learning can be more unpredictable .**

Clustering

sample   Cluster/group

She knows and identifies her dog.

Few weeks later a family friend brings along an new dog and baby tries to play with the new dog.

Baby has not seen that dog earlier. But she recognizes many features (2 ears, eyes, walking on 4 legs) are like her pet dog. She identifies the new animal as a dog.

This is unsupervised learning, where you are not taught but you learn from the data our ourself (in this case data about a dog.)

Unsupervised ML widely used—Biology, Computer Vision, Deep Learning , neural Network, Geological exploration, Information retrieval, Clustering .

Clustering Types of Unsupervised Learning Algorithms.