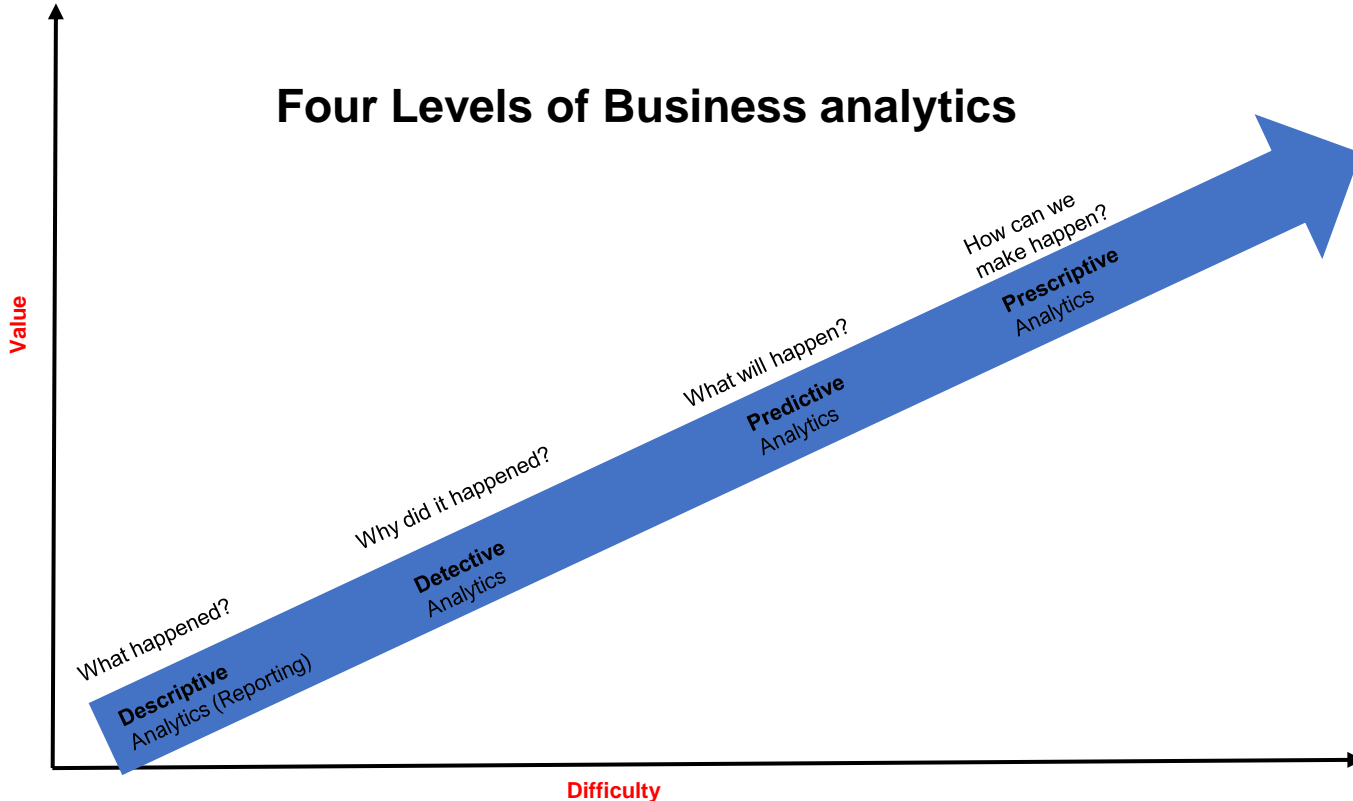


# My story - Something about myself

- Bachelor of Engineering
- Merchandising planner at Tesco
- Rotman MBA at UofT, and graduated in 2015
- No previous data science work experience
- Data scientist at Capital One Canada, a bank specializing in credit cards  
and known for its data-driven approach
- Credit risk management & machine learning modelling at RBC

# BA – Business Analytics Definition

**Business analytics** is the process of collating, sorting, processing, and studying business data, and using statistical models and iterative methodologies to **transform data into business insights**



# BA – Business Analytics Definition

The goal of business analytics is to determine which datasets are useful and how they can be leveraged to solve problems and **increase efficiency, productivity, and revenue**

Customer  
analytics

Marketing  
analytics

Operation  
analytics

People  
analytics

Sales  
analytics

Financial  
analytics

## Data Scientist, People Analytics Restaurant Brands International

- Assess employee engagement across all brands, perform analytics on drivers of engagement, and present findings to senior leadership to roll out engagement initiatives to improve overall employee engagement
- Research, design, and implement predictive analytics algorithms that will be utilized during hiring and succession planning processes

## Predictive Maintenance: Shell

- Royal Dutch Shell PLC recently implemented a predictive maintenance system driven by artificial intelligence to reduce time lost to machine breakdowns
- The systems can anticipate when and where a failure will occur, inform about the location of parts and the location of facilities, and plan when to make purchases of machine parts.

## M&A Analytics, Deloitte

- Leverage analytics to generate deeper data-driven insights and optimize decisions across the deal cycle
- Analytics for operational efficiency, to drive productivity and cost control
- Advanced analytics to identify opportunities for profitable revenue growth.

# What is Marketing Analytics

**Marketing analytics** is the practice of collecting, managing and analyzing marketing data to measure marketing programs' effectiveness and optimize return on investment (ROI)

With marketing analytics, you can answer questions like these:

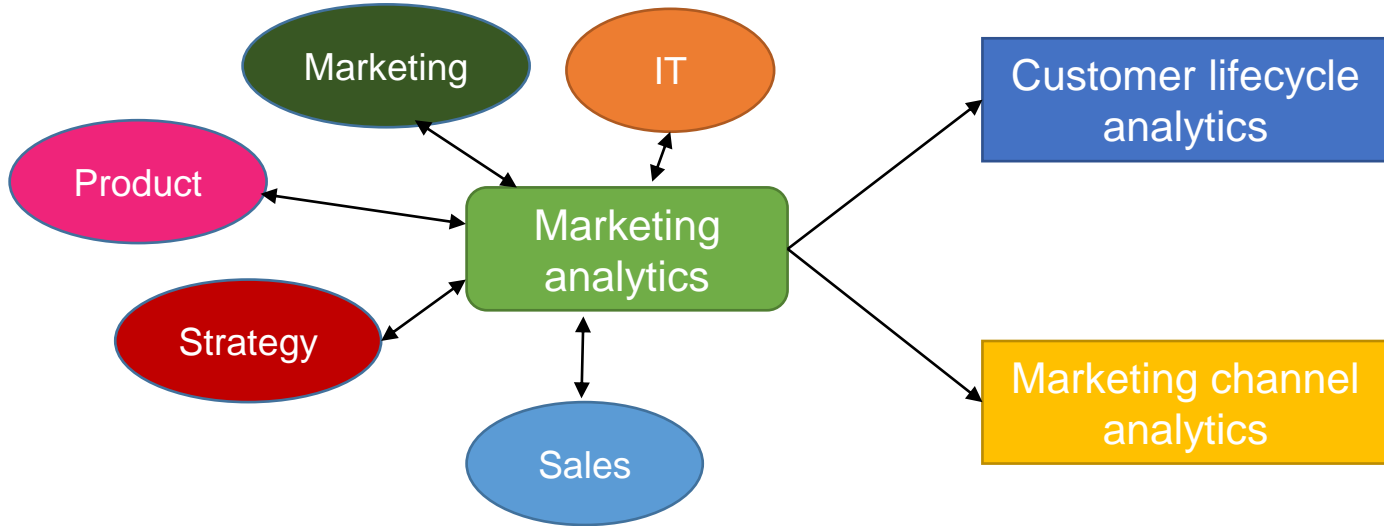
- *How are our marketing campaigns performing today? How about in the long run?*
- *What can we do to improve them?*
- *What should we do next? Are our marketing resources properly allocated?*
- *Are we devoting time and money to the right channels?*
- *How should we prioritize our investments for next year?*

Two important components of Marketing analytics:

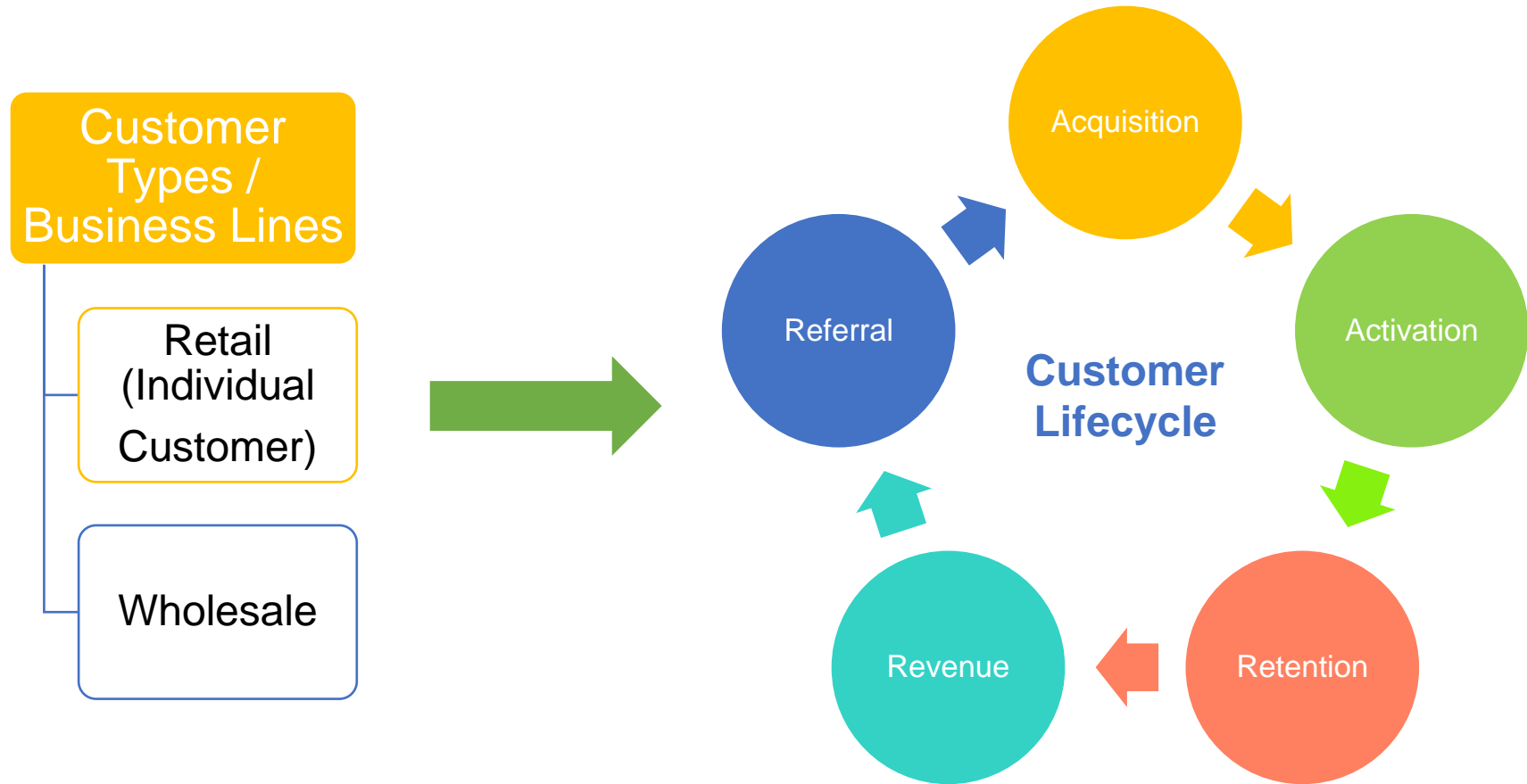
1. **Data analytics skills**
2. **Business metric**

# What is Marketing Analytics

**Marketing analytics** can be broken down into 2 areas and requires lots of cross-functional work



# CRM – Customer Relationship Management



# CRM – Customer Relationship Management



## Key Function:

The process of bringing new customers or clients to the business

## Relevant metrics:

- Traffic
- Mentions
- Cost per click
- Search results
- **COA – cost of acquisition**
- Open rate

# CRM – Customer Relationship Management



## Key Function:

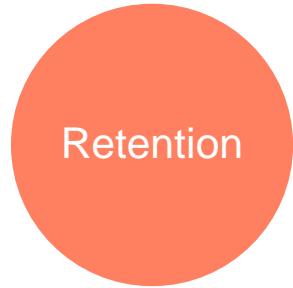
Turn the resulting drive-by visitors into users who are somehow enrolled

## Relevant metrics:

- Enrollment rate
- Signups
- Subscriptions
- Used services at least once



# CRM – Customer Relationship Management



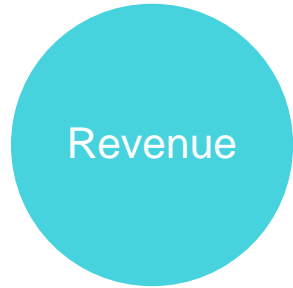
## Key Function:

Convince users to come back repeatedly, exhibiting sticky behavior

## Relevant metrics:

- Engagement,
- Time since last visit
- Daily and monthly active use
- Churn rate

# CRM – Customer Relationship Management



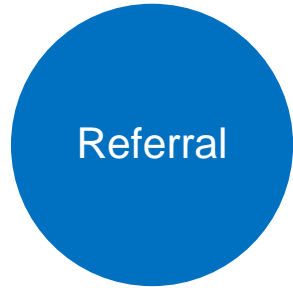
## Key Function:

Focus on evaluating business outcomes by building revenue models, such as purchases, subscriptions, etc.

## Relevant metrics:

- Customer lifetime value (CLV)
- Conversion rate
- Shopping cart size

# CRM – Customer Relationship Management



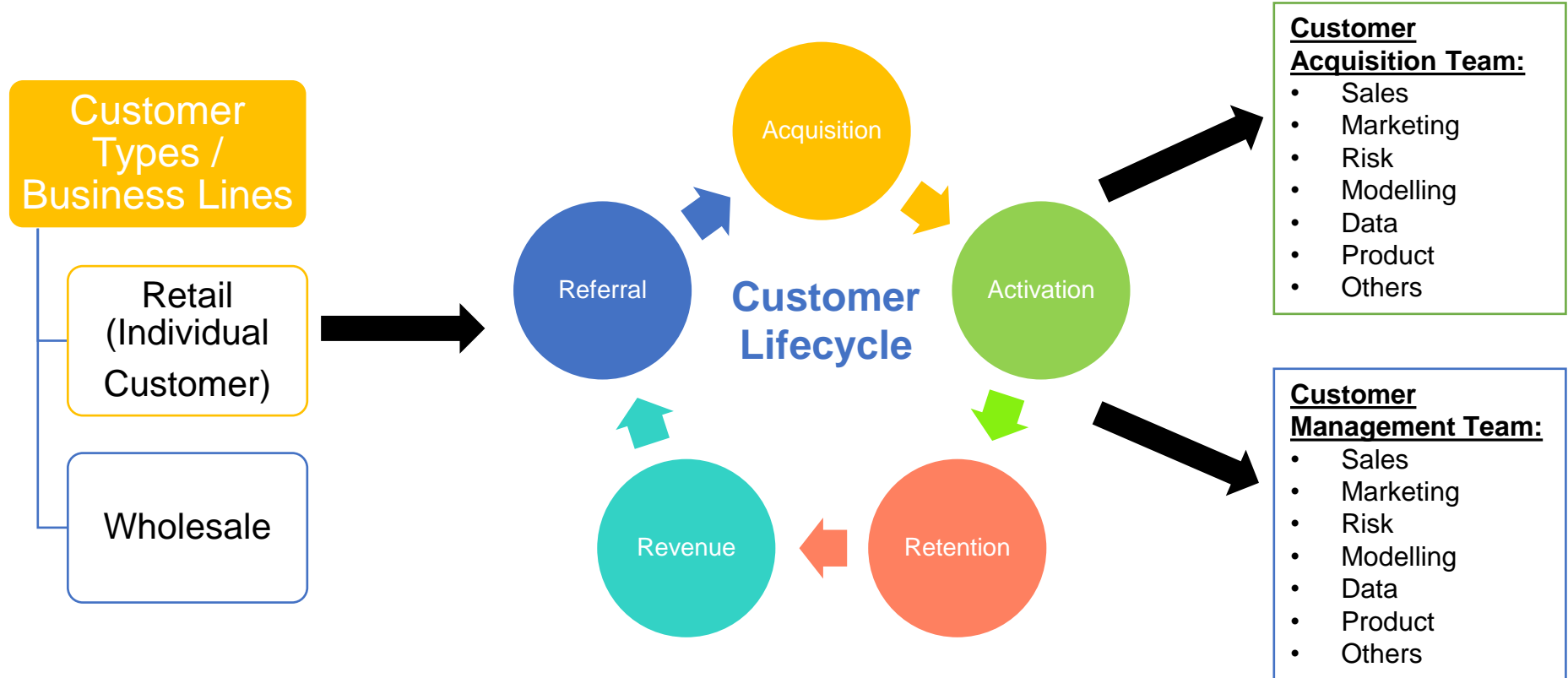
Key Function:

Create viral and word-of-mouth invitations to other potential users

Relevant metrics:

- Invites sent
- Viral coefficient
- Viral cycle time

# CRM – Customer Relationship Management

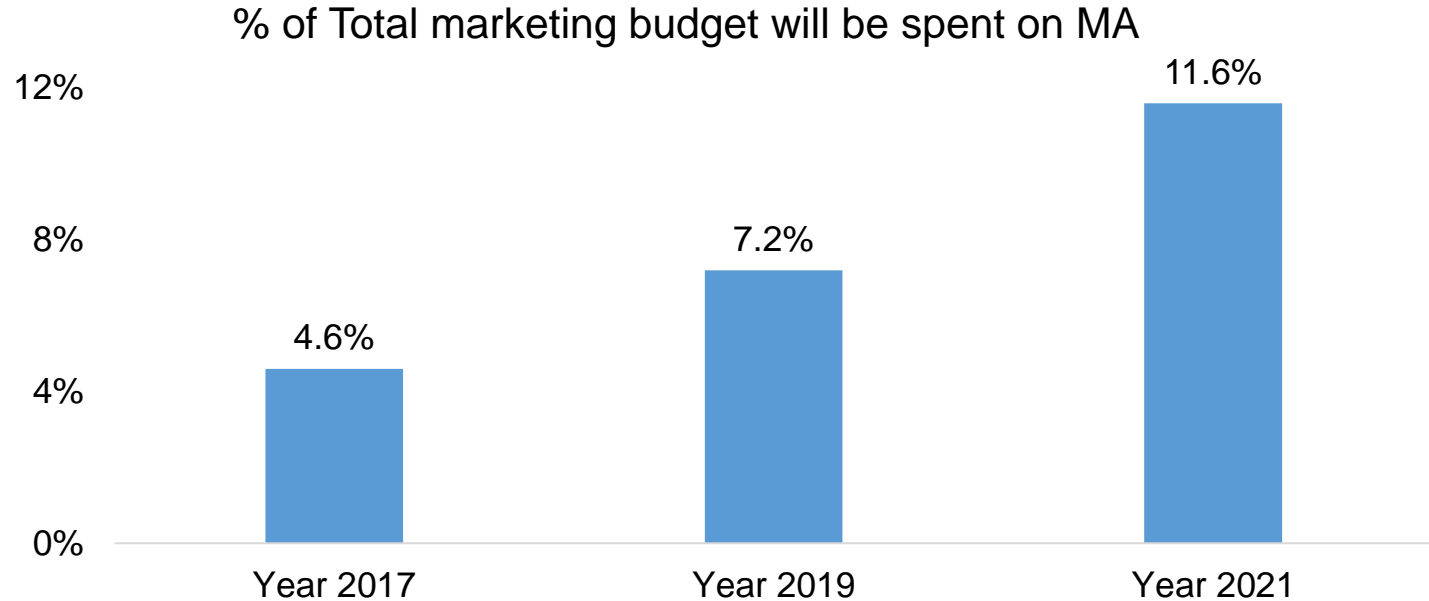


# Marketing Channel Analytics

Marketing channel  
analytics

- Campaign performance tracking
- Measurement of performance
- Channel optimization
- Test and experiment (A/B) testing
- Digital Marketing

# Why Marketing analytics



Marketing leaders also report a 27% increase in the use of **artificial intelligence and machine learning** in their toolkits over 2018 levels and expect this level to increase another 60% within three years

# Why Marketing analytics

More analytics job openings from Marketing analytics across different industries

## Recent Searches

Edit

data analytics - Toronto, ON

2,561 new >

marketing analytics - Toronto, ON

1,458 new >

data scientist - Toronto, ON

274 new >

### Analytics Manager

1,111 salaries reported  
Analytics Manager Jobs

\$115,326 per year



### Marketing Analyst

487 salaries reported  
Marketing Analyst Jobs

\$63,414 per year



### Marketing Manager

4,825 salaries reported  
Marketing Manager Jobs

\$67,029 per year



### Data Analyst

4,581 salaries reported  
Data Analyst Jobs

\$70,825 per year



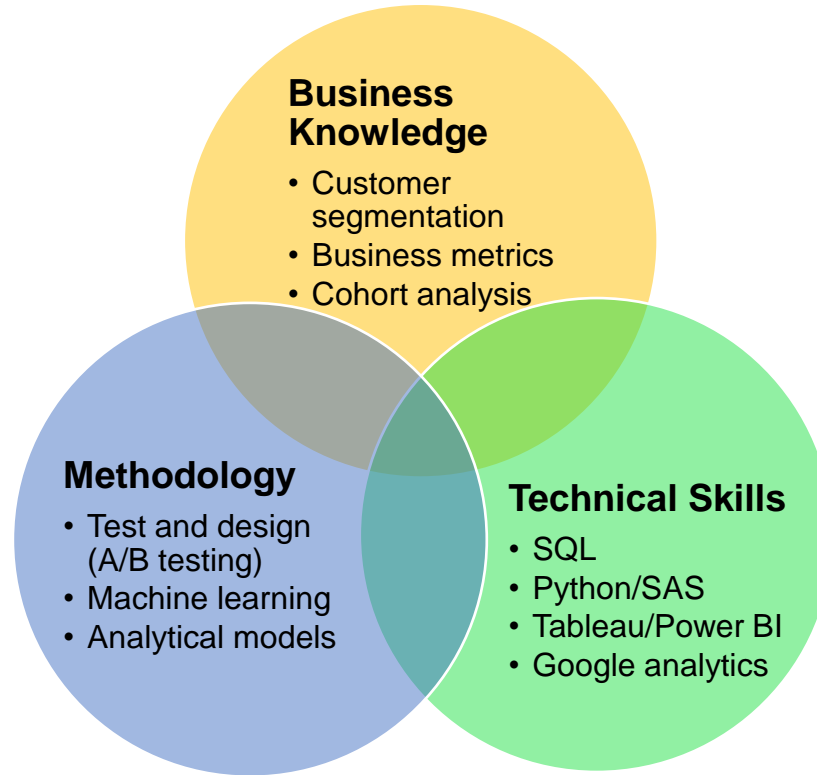
### Marketing Specialist

2,386 salaries reported  
Marketing Specialist Jobs

\$50,252 per year

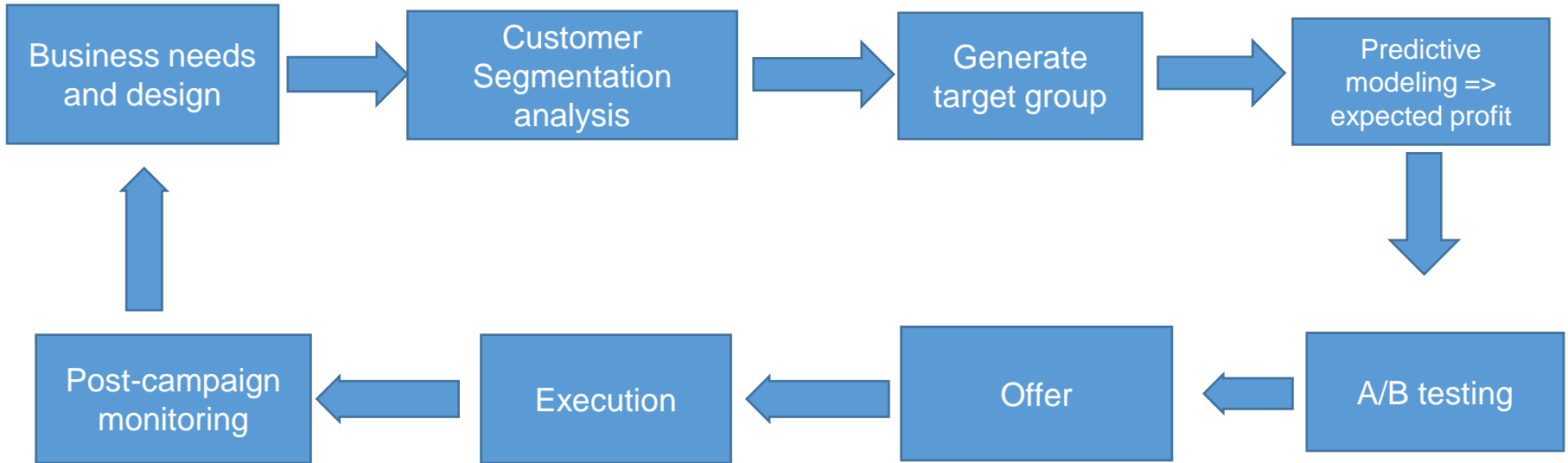


# Skills you need for Marketing analytics





# An end-to-end marketing campaign process



# Product Recommendation System

A **product recommendation** system is a system with the goal of predicting and compiling a list of items that a customer is likely to purchase

Various business use cases:

- music streaming service
- e-commerce company, Amazon, utilizes recommendation systems to predict and show a list of products that a customer is likely to purchase
- media service provider, Netflix, uses recommender systems to recommend movies or TV shows for individual users that they are likely to watch


The usage of a recommender system does not stop here. It can also be used to recommend related articles, news, or books to users

# Product Recommendation System


These recommendations are based on [items you own](#) and more.

view: **All** | [New Releases](#) | [Coming Soon](#) [More results](#)

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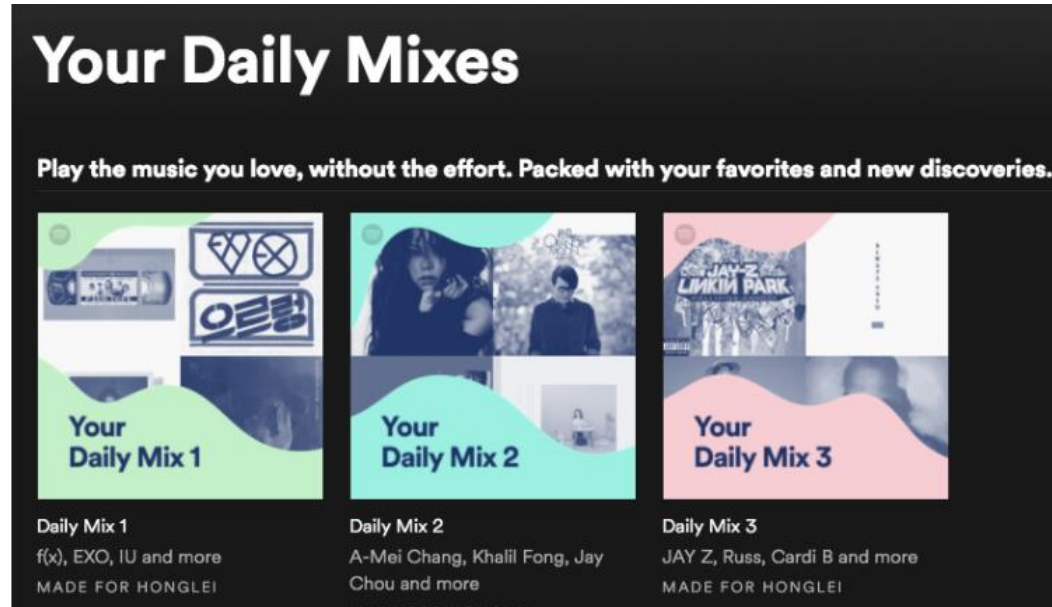
1.  **Bean Head #1 Canadian Organic Coffee**  
by BEAN HEAD  
Average Customer Review: ★★★★★ (202)  
In Stock  
**List Price:** ~~CDN\$ 13.49~~  
**Price:** **CDN\$ 11.43** [Add to cart](#) [Add to Wish List](#)  
☐ I own it ☐ Not Interested ☒ ★★★★★ Rate this item  
Recommended because you purchased **Hamilton-Beach 49989C Single Serve Grind and Brew** ( [Fix this](#) )

---

2.  **Kicking Horse Coffee, Three Sisters, Medium Roast, Whole Bean, 1 lb**  
by Kicking Horse Coffee  
Average Customer Review: ★★★★★ (512)  
In Stock  
**Price:** **CDN\$ 16.27**  
[2 new](#) from CDN\$ 16.27 [Add to cart](#) [Add to Wish List](#)  
☐ I own it ☐ Not Interested ☒ ★★★★★ Rate this item

According to McKinsey & Company, 35% of Amazon's revenue is generated by its recommendation engine

# Product Recommendation System



The new recommendation system has helped Spotify increase its number of monthly users from 75 million to 100 million at a time, in spite of competition from rival streaming service Apple Music.

# Product Recommendation System

There are typically two ways to produce a list of recommendations:

- **Collaborative filtering:** The basic **assumption** behind the collaborative filtering method is that those who have viewed or purchased similar contents or products in the past are likely to view or purchase similar kinds of contents or products in the future
- **Content-based filtering:** The basic **assumption** behind the content-based filtering method is that the users are likely to view or purchase items that are similar to those items that they have bought or viewed in the past.

# What is Churn Rate

**Churn Rate is the percentage of people who abandon your service over time**

	Jan	Feb	Mar	Apr	May
<b>Users</b>					
Starting with	50,000	53,000	56,300	59,930	63,920
Newly acquired	3,000	3,600	4,300	5,280	6,299
Total	53,000	56,600	60,620	65,110	70,141
Monthly growth rate of new users%		20%	19%	23%	19%
<b>Active users</b>					
Starting with	14,151	14,900	15,690	16,642	17,816
Newly active	849	900	1,079	1,297	1,556
Total	15,000	15,800	16,769	17,939	19,372
Monthly conversion rate		2.4%	2.6%	3.0%	3.3%
<b>Paying users</b>					
Starting with	1,000	1,035	1,084	1,142	1,219
Newly acquired	60	72	86	104	124
Lost	25	23	28	27	32
Total	1,035	1,084	1,142	1,219	1,311
Monthly Churn rate		2.2%	2.6%	2.4%	2.6%

Churn Rate = (Number of churns during period) / (Number of customers at beginning of period)

*Question: what does 1/(churn rate) mean?*

# What is Customer Lifetime Value (CLV)

The **lifetime value of** a customer, or customer lifetime value (CLV), represents the total amount of money a customer is expected to spend in your business, or on your products, during their lifetime

- *CLV gives you crucial insight into how much money you should be spending on acquiring your customers by telling you how much value they'll bring to your business in the long run*
- *With CLV you'll be able to understand which customers you should be focusing on and, more importantly, why you should be focusing on them?*

*Therefore, CLV is a clear look at the **benefit of acquiring and keeping any given customer***

# How to calculate CLV

## **Step One – Segment customers with RFM model:**

- **Recency** - the last time that a customer made a purchase.

*A customer who has made a purchase recently is more likely to make a repeat purchase than a customer who hasn't made a purchase in a long time*

- **Frequency** - how many times a customer has made a purchase within a given time frame.

*A customer who makes purchases often is more likely to continue to come back than a customer who rarely makes purchases*

- **Monetary Value** - the amount of money a customer has spent within that same time frame.

*A customer who makes larger purchases is more likely to return than a customer who spends less.*

*Therefore, by segmenting your customers with RFM, you'll be able to **analyze each group individually and determine which set of customers has the highest CLV***



# How to calculate CLV

## ***Step Two – Give a score for each variable (RFM variables) and create segment based on RFM:***

- *Assign customer's recency, frequency, and monetary value each a value on score of 1 to 3*
- *Think of these three values as categories: 1 being the least valuable, 2 being somewhat valuable, and 3 being the most valuable*
- *When sorting data,  $\frac{1}{3}$  of customers will get assigned a score of 1, the  $\frac{1}{3}$  above that will get a 2, and so on*

	A	B	C	D	E
1		Recency	Frequency	Monetary Value	
2	Customer A	1	2	1	
3	Customer B	3	1	1	
4	Customer C	2	3	2	
5	Customer D	1	2	1	
6	Customer E	2	1	3	
7	Customer F	2	1	3	
8	Customer G	1	1	2	
9	Customer H	1	1	3	
10	Customer I	2	3	1	
11	Customer J	3	2	1	
12	Customer K	3	4	2	
13	Customer L	3	3	1	
14	Customer M	3	2	1	
15	Customer N	3	1	1	
16	Customer O	2	2	1	
17	Customer P	1	2	1	
18					
19					

# How to calculate CLV

## ***Step Two – Give a score for each variable (RFM variables) and create segment based on RFM:***

- *Add up the score for each customer and list a total under RFM Score*
- *Sort data by RFM Score and divide results by highest (shown here in red), middle (orange), and lowest score (yellow)*
- ***The highest scoring results will be your most valuable customer segment***

	A	B	C	D	E	
1		Recency	Frequency	Monetary Value	RFM Score	
2	Customer K	3	3	2	8	
3	Customer C	2	3	2	7	
4	Customer L	3	3	1	7	
5	Customer E	2	1	3	6	
6	Customer F	2	1	3	6	
7	Customer I	2	3	1	6	
8	Customer J	3	2	1	6	
9	Customer M	3	2	1	6	
10	Customer B	3	1	1	5	
11	Customer N	3	1	1	5	
12	Customer O	2	2	1	5	
13	Customer A	1	2	1	4	
14	Customer D	1	2	1	4	
15	Customer G	1	1	2	4	
16	Customer H	1	1	3	4	
17	Customer P	1	2	1	3	
18						
19						

# How to calculate CLV

## ***Step Three – Calculate the Customer Lifetime Value for each customer segment***

- *Average Order Value per customer :*  
$$\text{Average Order Value} = \text{Total Sales} / \text{Order Count}$$
- *Purchase frequency per customer :*  
$$\text{Purchase Frequency} = \text{Total Orders} / \text{Total Customers}$$
- *Customer Value per customer:*  
$$\text{Customer Value} = \text{Average Order Value} \times \text{Purchase Frequency}$$
- *CLV per customer :*  
$$\text{CLV} = \text{Customer Value} \times \text{Average Customer Lifespan}$$

$$\text{Average Customer Lifespan} = 1/(\text{churn rate})$$