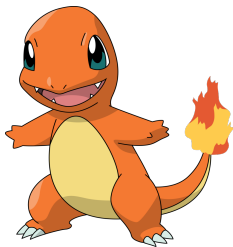


# Online Book Ecommerce Website

## Unsupervised Recommendation Engine

Zan Li



# Agenda

- Business Problem
- Methodology
- Customer Segmentation
- Marketing Strategies
- Economic Value
- Conclusion

# Business Problem

The consulting team's approach addressing *Book Ecommerce's low realization in book recommendation* is to design and improve their *book recommendation strategy* that will result in:

*A comprehensive marketing strategy based on customer RFM segmentation algorithm, in order to deliver **personalized, individual-customer tailored strategy that encourage customer purchase,***

so that *The client could improve their overall profitability with reasonable investment to individual customer group.*

# Data

**Source:** Book Ecommerce internal data with about 33K customers records

- **CustomerID**
- **R:** Recency
- **F:** Total Number of Books in Each Category
- **M:** Monetary Value
- **ToF:** Time on file in days
- Additional Data on RMF by Book Category

# Data Preparation

- **Data Cleaning:**
  - Drop outliers:
    - Only  $M = 0$
    - Abnormal Ratio between F & M
- **RFM Score Calculation:**
  - $fm\_score = 20\% * f\_score + 80\% * m\_score$
  - Standardize RFM values
  - Divide RFM values into score bins 1/2/3/4 by quartile

# RFM Segmentation

	id	r_score	fm_score	type
0	914	3.0	4.0	Best_Customers
1	957	4.0	4.0	Best_Customers
2	1406	1.0	4.0	Churning_Valued_Customers
3	1414	3.0	2.0	New_Customers
4	1546	3.0	4.0	Best_Customers
5	1651	1.0	2.0	Lost_Customers
6	2046	2.0	2.0	Lost_Customers
7	2534	4.0	3.0	Potential_Customers
8	2801	4.0	3.0	Potential_Customers
9	3689	2.0	3.0	Churning_Valued_Customers

# Customer Segmentation

		R Score	
		3 - 4	1 - 2
F&M Score	4	Best Customers (5,336)	Churning Valued Customers (7,012)
	3	Potential Valued Customers (4,061)	
	2	New Customers (7,043)	Lost Customers (9,366)
	1		

# Maketing Strategy

	Strategy	Income	Investment	Return
Best Customers (5,336)	New Recommendation System VIP Customer Services	\$688,325	\$160,000	\$528,325
Potential Valued Customers (4,061)	Old Recommendation Engine Referral + Trial	\$34,050	\$12,183	\$21,867
New Customers (7,043)	Old Recommendation Engine New Customer Activities	\$16,703	\$1,670	\$15,033
Churning Valued Customers (7,012)	Old Recommendation Engine Call Back Advertisement	\$90,042	\$13,506	\$76,536
Lost Customers (9,366)	Old Recommendation Engine	\$14,062	-	\$14,062
			<b>TOTAL</b>	<b>\$655,823</b>



# General Strategy

## **Book Club Membership (\$10 per month)**

- Free shipping & Free return

## **Annual Sale:**

- Early Entry for Best Customers

## **Free Shipping Standard for Public:**

- Purchase over \$100

# Strategy – Best Customer

## New Recommendation System (2 algorithms)

1. Based on the customer's most **recent** purchase
  - a. recommends Frequently Bought Together Products
2. Based on the customer's **historical** purchases,
  - a. recommends recent Best Selling books within his/her favourite categories

## VIP Customer Services:

- Private Sale early entry
- First-hand new book information
- Unlimited free return

## Economic value

- Gain Profit up to **\$528,325**

# Strategy – Best Customer – Example (id: 914)

1st recommendation: When id914 purchased a **'music'** book most recently



Recommends Frequently Bought Together Products: other **'music'** books

2nd recommendation: Also, since id914 bought **'conthist'** the most in the past



Recommends trending **'conthist'** books

	f_count
Fconthist20	17
Fmusic14	7
Ftravelguides31	2

# Strategy – Rest of Customers

	Strategy	Return	Timebound
Potential Valued Customers (4,061)	referral & first-hand advertising email one-month book club membership trial	\$21,867	-
New Customers (7,043)	10%-off first order purchase 10%-off purchase on top 3 popular categories	\$15,033	3 months
Churning Valued Customers (7,012)	regular advertising email & new books introduction welcome back discount 15%-off	\$76,536	3 months
Lost Customers (9,366)	weekly regular advertising email & sales email	\$14,062	-

# Conclusion

1. Overall \$655K increase in total revenues for all segments
2. More personalized recommendation system applied for the top 15% customers
3. Promote customers experiences and satisfaction