



E-Commerce Website Recommendation Engine

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Our Team

Data



Eason Peng

Sr. Data Scientist



Evelyn Wu

Sr. Data Visualization Specialist

Marketing



Kelsey Liu

VP Marketing



Lulu Wang

Marketing Analytics Manager

Finance & Customer Service



Alex Mo

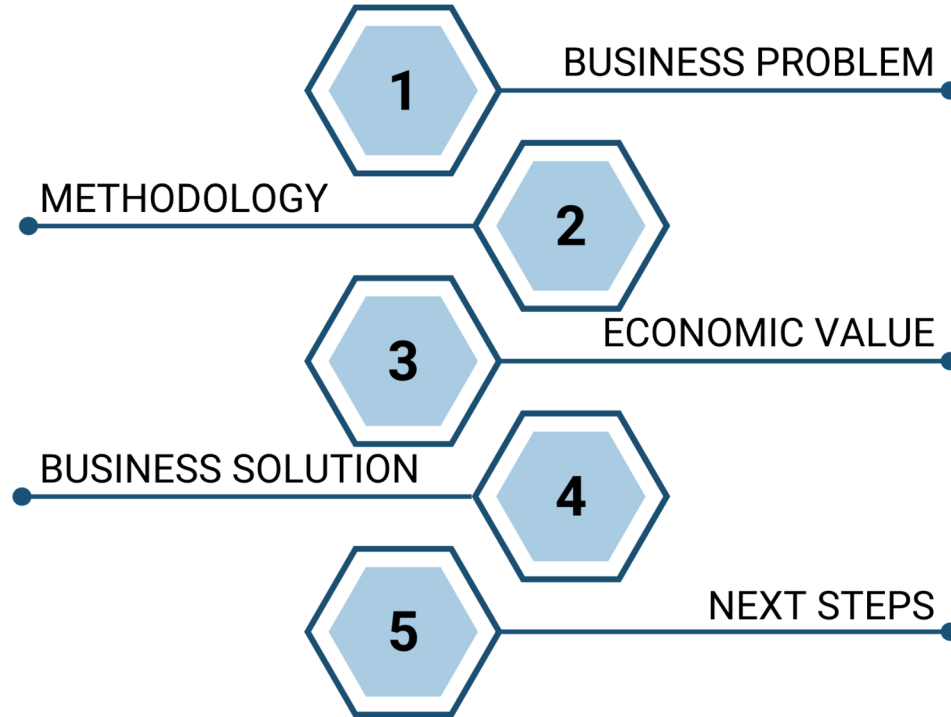
VP Finance



Shirley Liu

Customer Satisfaction Manager

Agenda



Business Problem



Business Problem



Segment Customers

Encourage more customers
to be in the top 15%



Maintain Relationships

Maintain solid long-term
relationships



Increase Revenue

Increase by **17%**
Resulting in **700K**

Methodology



RFM Quartile

REGENCY

FREQUENCY

MONETARY

2+ Years

1 Order

\$38

1 Year

3 Orders

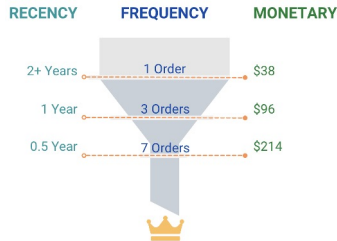
\$96

0.5 Year

7 Orders

\$214





RFM Segmentation

Champion

Bought recently, order frequently and spend a lot



Loyalist

Bought recently, order often but with less amount



Promising

Bought recently, order occasionally but spend a lot



One-Time Purchaser

Customer who only purchased once



At Risk

Last purchase was over a year ago, but within 2 years



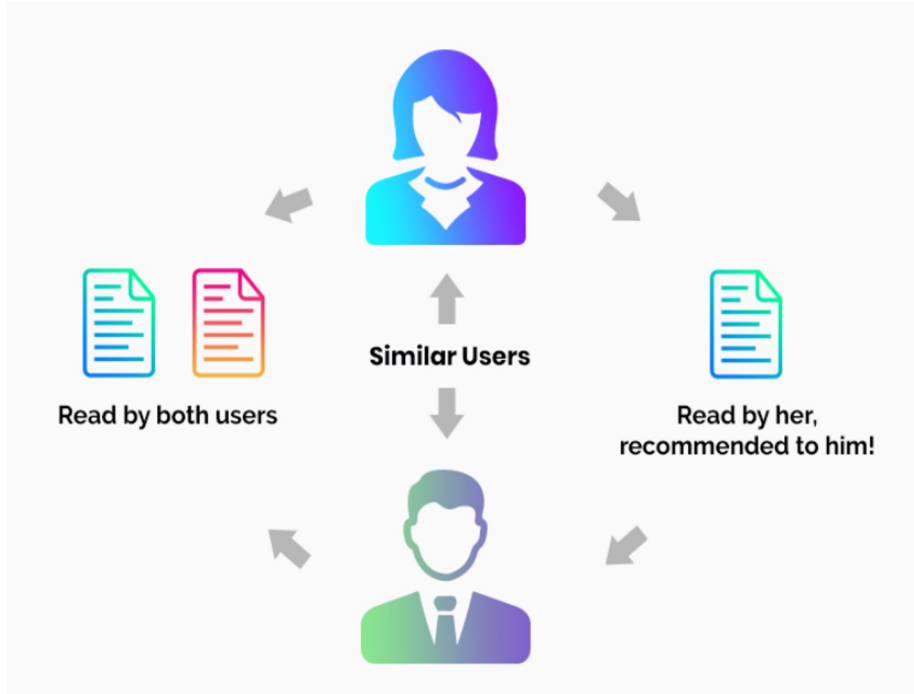
Others

All other customers



Recommendation Engine Method & Result

Collaborative Filtering



Content-Based Filtering

- History books contributes most sale

```
s = df_category.sum()  
s.sort_values(ascending=False).head(1)
```

Mhistory19 865466.138466

History Books - Cosine Similarity

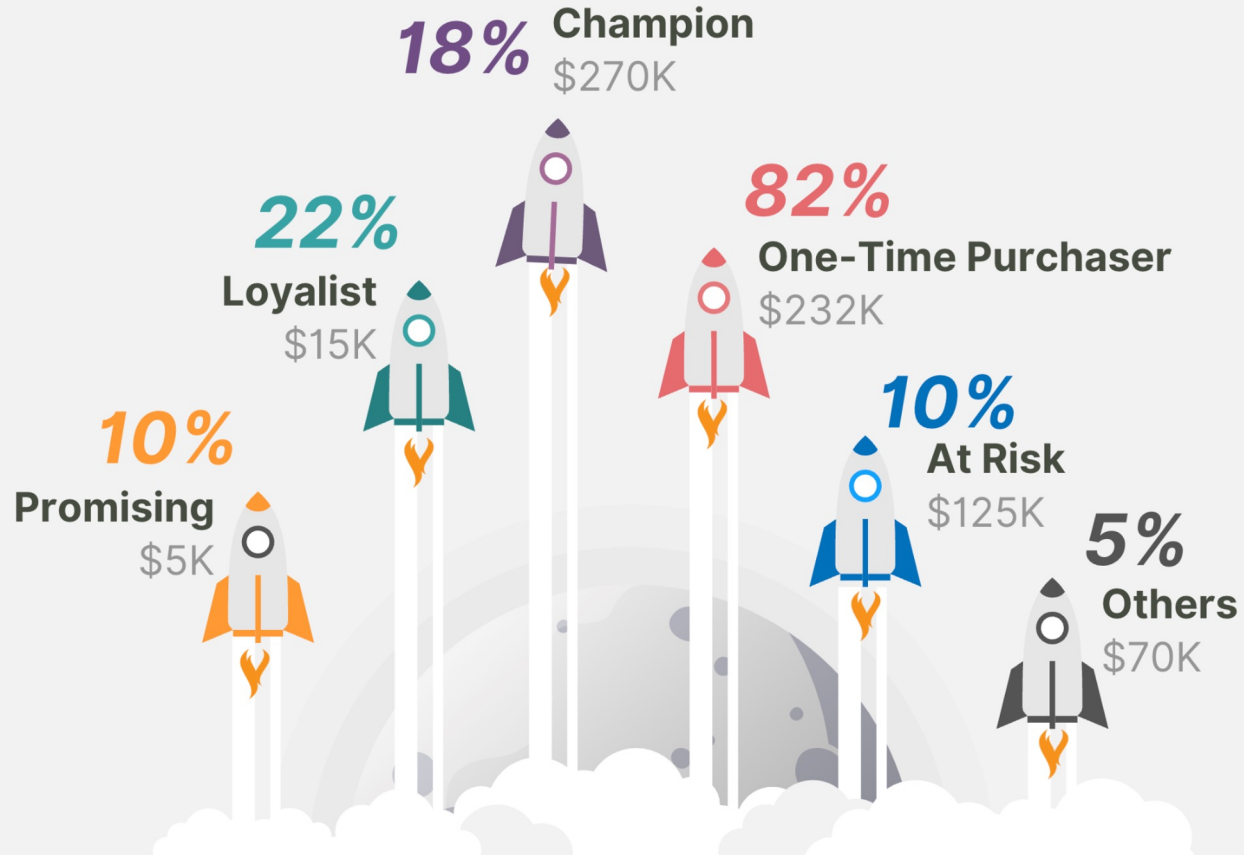
Conthist Book	0.4063
Art Book	0.3586
Travel Guide	0.3450

- Based on cosine similarity, customers buying history books tend to buy conthist books as well

Economic Value



Economic Value Table





17%

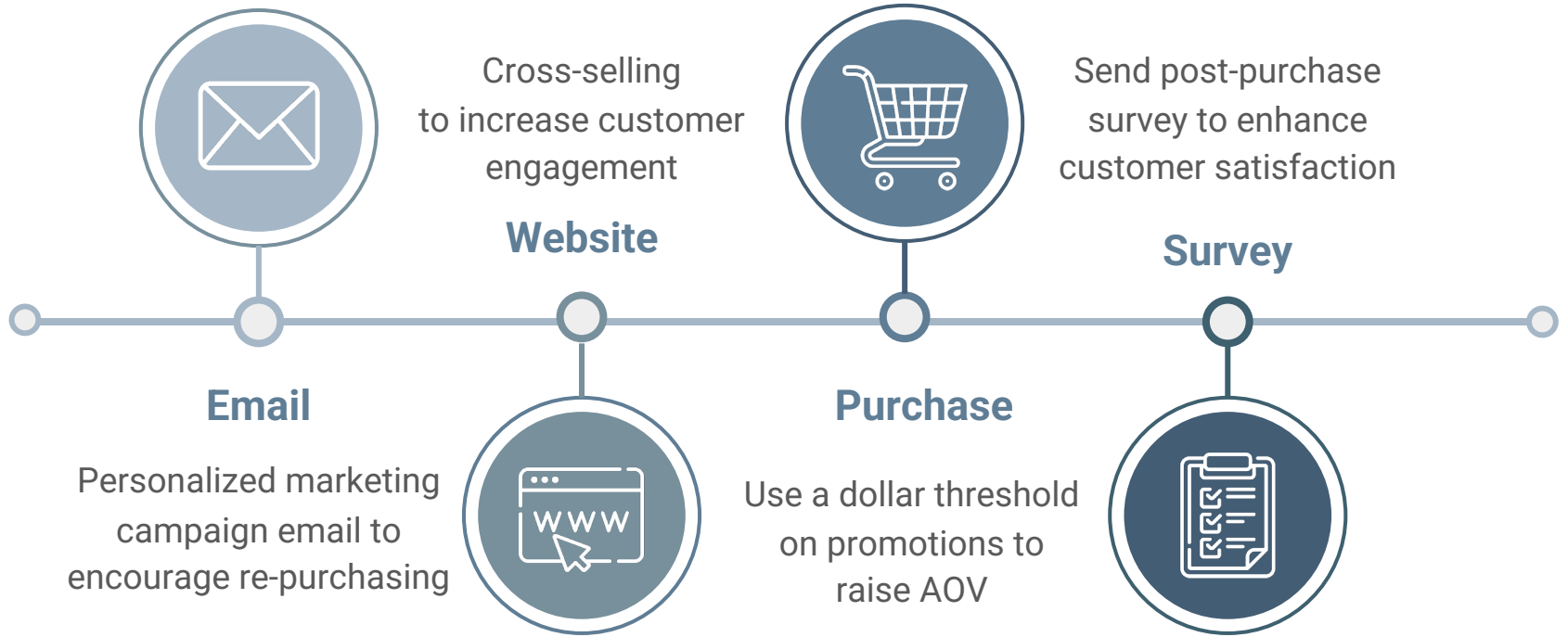


\$700K



Business Solution





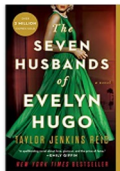


Champion

High F High M

Dear Eason,

Your Last Purchase...



The Seven Husbands of Evelyn Hugo: A Novel

Books › Literature & Fiction

We Found More Things You'll Love



Fiction



Fiction



Cartoon

You Like?

VISIT THE STORE NOW!



Loyalist

High F Low M

Dear Shirley,



VISIT THE STORE NOW!



Promising

Low F High M

Dear Kelsey,

Earn a \$20 reward

**Make 4 qualifying purchases of \$35
or more to earn a \$20 reward!**

1

2

3

4

Expires Dec 23, 2022

VISIT THE STORE NOW!



One-time Purchaser

Dear Lulu,

Feedback from verified purchasers like yourself
improves online shopping for everyone.

**In your honest opinion, was shopping
with us a good experience?**

Review us 😊

**And get a \$10 voucher after
completing the survey!**

VISIT THE STORE NOW!



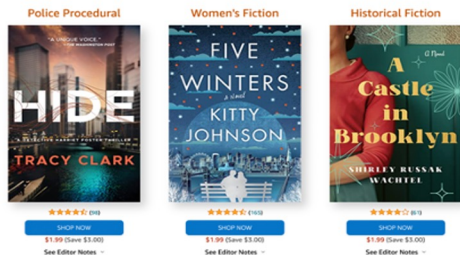
At Risk

Low Recency

Dear Alex,

WE REALLY MISS YOU...

Check out our new releases



Last chance to claim your order!

Enter this code at checkout to redeem your discount.

CODE: 3ZTV5W7

VISIT THE STORE NOW!



Other Customers

Dear Evelyn,

You didn't miss it yet: 30% off!

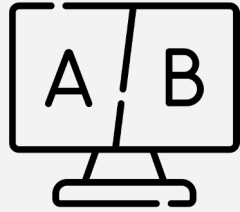


VISIT THE STORE NOW!

Next Step



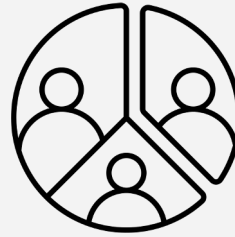
Next Step



A/B Testing



**Customer
Profile Data**



**Customer
Segmentation**



Shopper Panel

Q & A

Thank you and happy holidays!



Appendix



Appendix - Economic Value

	RFM	Shopping cart value before	Shopping cart value after	Current revenue	New revenue	\$ Increase	% Increase
Champion High F High M	R_Q=1,2 F_Q=1 M_Q=1	424	500	1.5M	1.77M	270k	18%
Loyalist High F Low M	R_Q=1,2 F_Q=1,2 M_Q=3	74	92.5	69K	84K	15k	22%
Promising Low F High M	R_Q=1,2 F_Q=3 M_Q=1	305	335	53K	58K	5k	10%
One time purchaser	F=1	34	84	281K	513K	232k	82%
At Risk Low recency	R_Q=3	148	153	1190K	1315K	125K	10%
Other customers		127	133	1160K	1230K	70k	5%

Detailed Calculation for Economic Value

- Current Revenue = average shopping cart value * # of users
- New Revenue = average shopping cart value * # of users * (1+ increase in %)

Ex. Champion Current Revenue = $424 * 3538 = 1500K$

Champion New Revenue = $424 * 3538 * (1+18\%) = 1770K$

- One-time purchaser: increase shopping cart value from 34 to 84
 - Average shopping cart value before: \$34 (Avg. M of One-Time Purchaser (F=1))
 - Average shopping cart value after \$84 (Avg. M of F_Q = 3)
 - Current Revenue = Average shopping cart value before * # of One-time purchaser = $34 * 8215 = 281k$
 - New Revenue = 74% (% of Repeat Customer) * 8,215 (# of One-Time Purchaser) * \$84 = 513K