Enhancing Ecommerce Recommendation

Utilizing RFM Analysis for Tailored Book Shopping Experience

Group 2
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ADSP 31016 IP04 – Leadership & Consulting for Data Science

Alpha
Analytics

Agenda

- Team Introduction
- Business Problem & Preliminary Solution
- Modeling Process
- Tailored Customer Incentives & Business Impact
- Implementation Process
- Change Management
- Conclusion

Our data science experts drive tailored solutions

Project Manager

Jason C.

- M.S. in Mathematics
- 5-year experience in Data Science
- Manager of data consulting projects for McDonald's and Verizon

Data Engineer

Khushi R.

- B.E. in Computer Science
- 2-year experience in Data Engineering
- Build and manage multiple data infrastructures

Machine Learning Engineer

Yixuan C.

- B.S. in Mathematics
- 3-year experience in Data Mining
- Former TikTok MLE, specialized in recommendation engines

Data Scientist

Andy L.

- B.S. in Statistics
- 2-year experience in Data Science
- Proficient in integrating cutting-edge AI techniques with customer experience

Data Analyst

Jiayi D.

- B.S. in Statistics
- 2-year experience in Data Analytics
- Skilled at big data analytics and real-time data processing

Objective: Enhance customer experience through personalized recommendations
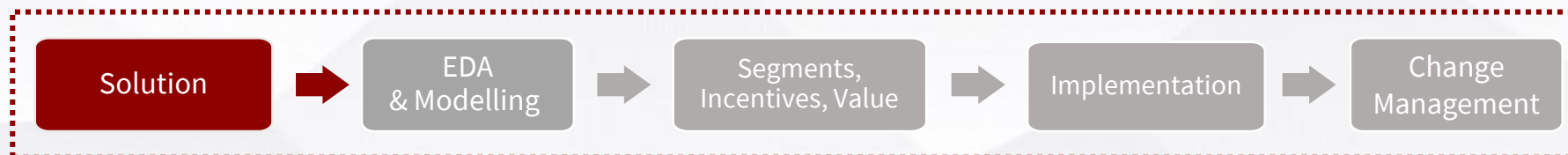
Business Problem:

The current ecommerce platform relies on a 'most popular' item recommendation strategy to boost cart additions and increase average purchase sizes. However, this approach falls short in addressing individual customer preferences.

Analysis Goal:

Our objective involves utilizing customer transaction data to generate personalized recommendations, with the aim of enhancing engagement and sales beyond the constraints of the current approach.

Leverage RFM analysis for strategic customer engagement

| Solution | → | EDA & Modelling | → | Segments, Incentives, Value | → | Implementation | → | Change Management |

Solution:

Determine Customer Engagement Levels:
- Implemented RFM analysis to discern the *Recency*, *Frequency*, and *Monetary Value* of customer interactions
- Constructed a comprehensive RFM scoring system

Segmentation for Strategic Focus:
- Classified customers into three pivotal segments – high-value, potential growth, retention & engagement
- Three segments were further divided into nine targeted groups

Customized Engagement Strategies:
- Created tailored incentives for each group, aiming to maximize customer engagment and fostor loyalty
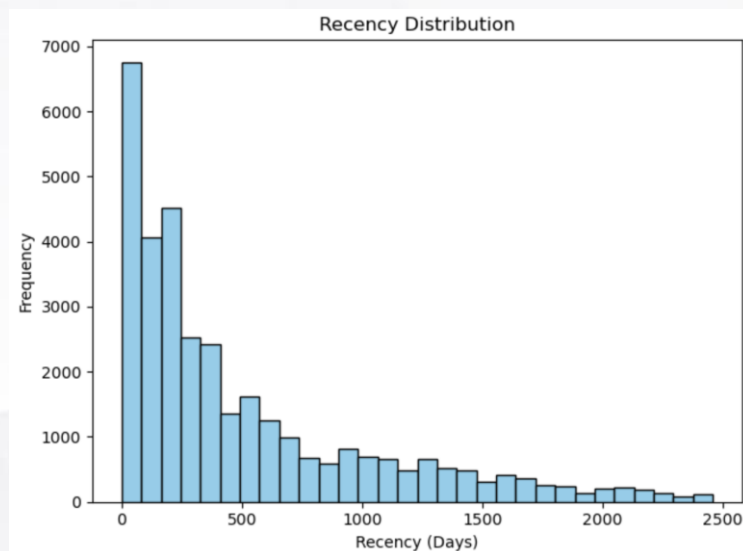
Benefit:
- Revenue growth of **$841k** via precision marketing to high-value segments
- Boosted customer retention & lifetime value through targeted incentives, and reduced churn of at-risk segments
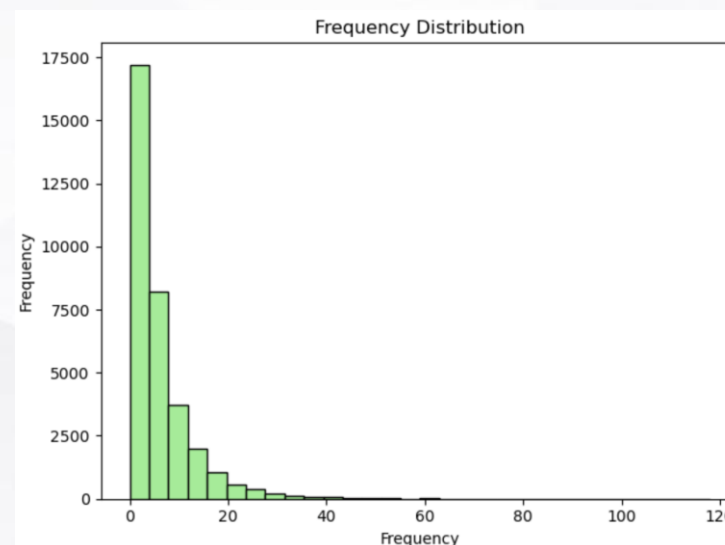
Most customers made recent but infrequent purchase and with low expenditure

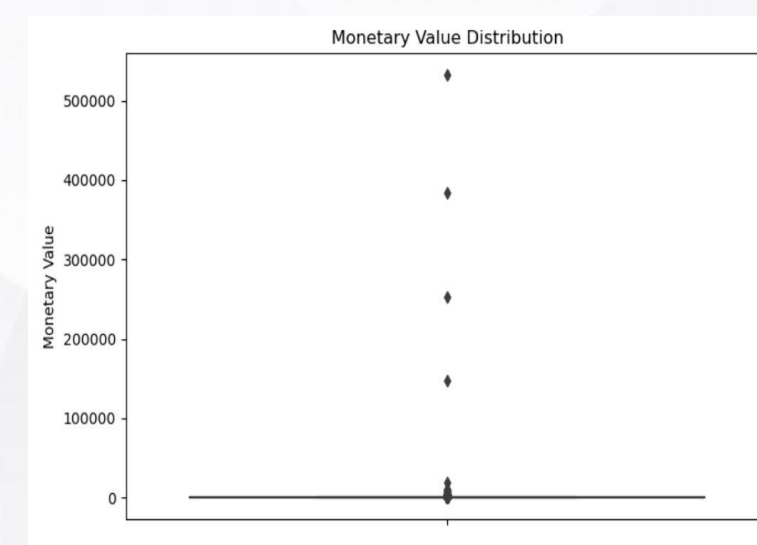| Solution | → | EDA & Modelling | → | Segments, Incentives, Value | → | Implementation | → | Change Management |

- 33,713 customers in total
- Some purchase data is missing, but this doesn't impact overall information
- Most customers make purchases recently but not frequently (graph 1, 2)
- Only a few customers spend large amount (graph 3)


Graph 1

Graph 2

Graph 3

Choose RFM analysis to better understand your customers

| Solution | → | EDA & Modelling | ⇒ | Segments, Incentives, Value | → | Implementation | → | Change Management |

1. **Clear standard for segmentation**: We set clear standards to understand different customer groups based on our business goals. RFM makes sure every customer is uniquely placed in the right group without any overlapping.

2. **Flexible**: RFM is effective regardless of whether we have a small or extensive customer base.

Perform RFM modeling to set customers into groups
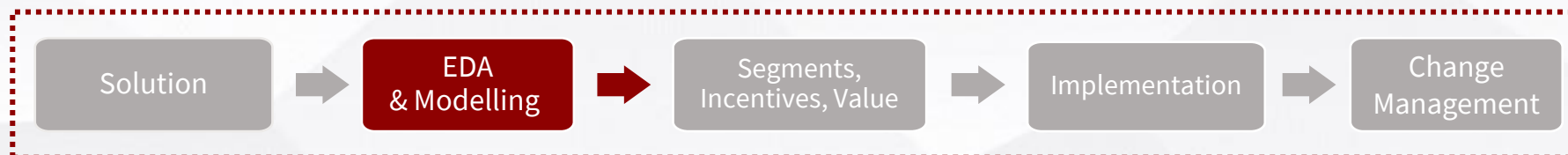
RFM Modeling Process:

o **Segmenting customers**: We place customers into groups based on their purchase behavior.

- *Recency*: How recently did they purchase
- *Frequency*: How often did they purchase
- *Monetary Value*: How much did they spend

▪ **Step1**: Define the cutoff points to categorize data into low, median, and high ranges for each variable above.

▪ **Step2**: Set a designated monetary threshold to categorize exceptionally high-value customers into a distinct group.

▪ **Step3:** Create RFM groups for each customer.

All combinations of RFM Scores are categorized into 9 customer groups without overlapping or omission

| Solution | → | EDA & Modelling | → | Segments, Incentives, Value | → | Implementation | → | Change Management |

① High-Value Groups

VIP Customers

M:5

Big Spenders

R:3, M:4 / R:4, F:4, M:4

Loyal Customers

R:2-4, F:4, M:2-3/ R:4, F:4, M:1

② Potential Growth Groups

Recent Incoming Customers

R:4, F:1-3

Promising

R:2-3, F:2-3, M:2-3 / R:2, M:4

At Risk

R:1, F:2-4, M:2-3/ R:1, M:4

③ Retention and Engagement Groups

Hibernating

R:2-3, F:1, M:1-3

Low-Value Customers

R:1-3, F:2-4, M:1

Almost Lost

R:1, F:1, M:1-3

Top 16% of customers contribute an incremental sales of $841,000

Solution → EDA & Modelling → **Segments, Incentives, Value** → Implementation → Change Management

Segment		Count	Percentage of Count	Incremental Sales
High-Value Groups	VIP Customers	4	0.01%	263.3k
	Big Spenders	3,950	11.7%	521.3k
	Loyal Customers	1,519	4.5%	56.5k
Potential Growth Groups	Recent Incoming	5,261	15.6%	22.0k
	Promising	8,027	23.4%	67.8k
	At Risk	5,428	16.1%	42.9k
Retention and Engagement Groups	Hibernating	4,873	14.5%	5.7k
	Low-Value	1,887	5.6%	1.8k
	Almost Lost	2,764	7.6%	4.0k
Total		33,713	100.0%	985.3k

~16.2%   +$841k

Tailored incentives for all customer groups

Solution → EDA & Modelling → **Segments, Incentives, Value** → Implementation → Change Management

High-Value Groups: Foster Strong Loyalty and Drive Incremental Revenue from Top Spenders

Sales Increase:

VIP Customers
offer an exclusive annual discount of 10% on all purchases

Big Spenders
Yearly $50 voucher for spending over $500 in a calendar year

Loyal Customers
Loyalty Points Program: Earn 1 point / $10 spent, redeemable at 100 points for a $10 voucher

+20%

Potential Growth Groups: Encourage Repeat Purchases and Prevent Churn

Recent Incoming Customers
Second Purchase Discount: With 15% off on second purchase

Promising
Second Purchase Discount: with 10% off on second purchase

At Risk
Re-engagement voucher worth $10, redeemable in 30 days

+4%

Retention and Engagement Groups: Revitalize Engagement and Enhance Lifetime Value of Customers

Hibernating
Rekindle their interest through -$5 coupon without limit

Low-Value Customers
Promotional campaign on $3 books -> promotion to *'promising customer'* segment
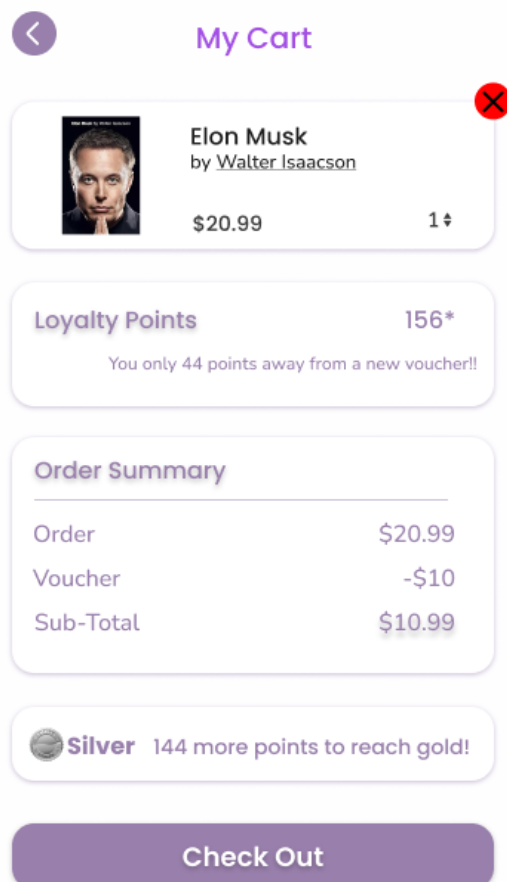
Almost Lost
Buy any book get a $5 off redeemable next year

+4%

Loyalty points UI/UX implementation with loyalty level system

Solution → EDA & Modelling → Segments, Incentives, Value → **Implementation** → Change Management
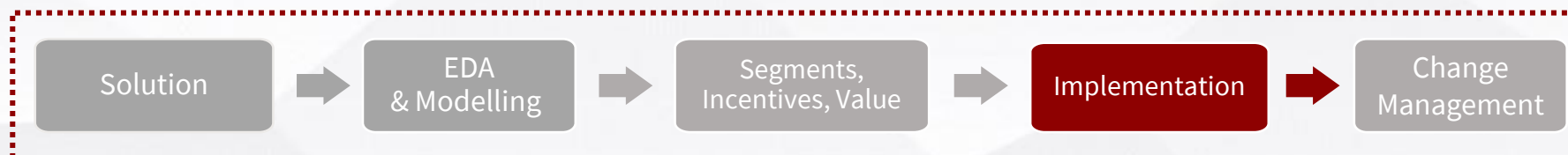
My Cart for Loyal Customer

My Cart

Elon Musk
by Walter Isaacson
$20.99   1 ⇕

Loyalty Points   156*
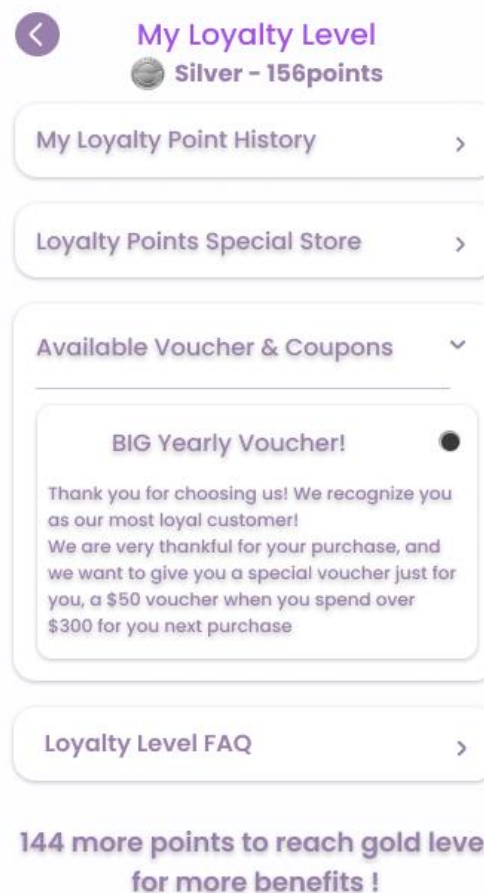You only 44 points away from a new voucher!!

Order Summary
Order $20.99
Voucher   -$10
Sub-Total $10.99

🥈 Silver   144 more points to reach gold!

Check Out

My Loyalty Level for Big Spender

My Loyalty Level
🥈 Silver – 156points

My Loyalty Point History   >

Loyalty Points Special Store   >

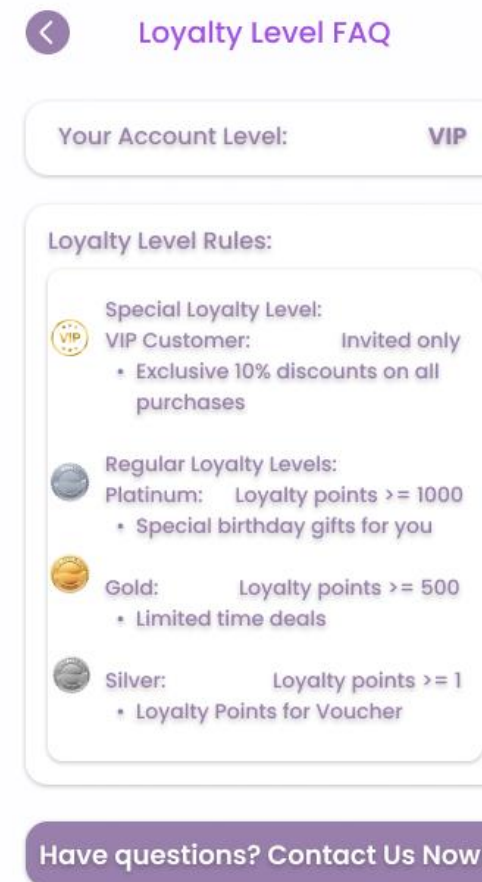Available Voucher & Coupons   ⌄

BIG Yearly Voucher!   ●
Thank you for choosing us! We recognize you
as our most loyal customer!
We are very thankful for your purchase, and
we want to give you a special voucher just for
you, a $50 voucher when you spend over
$300 for you next purchase

Loyalty Level FAQ   >

144 more points to reach gold level
for more benefits !

Loyalty Level FAQ for VIP

Loyalty Level FAQ

Your Account Level: VIP

Loyalty Level Rules:

🟡 Special Loyalty Level:
VIP Customer: Invited only
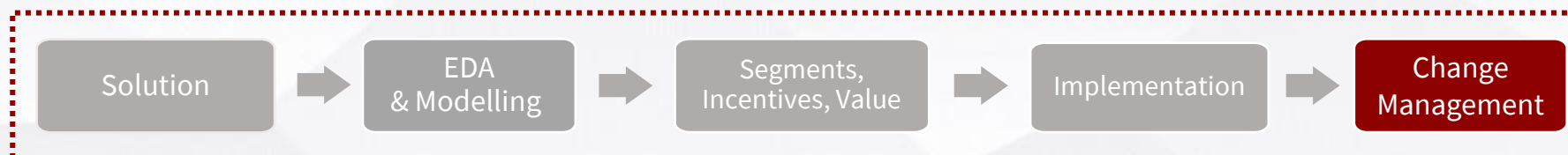• Exclusive 10% discounts on all
  purchases

🥈 Regular Loyalty Levels:
Platinum: Loyalty points >= 1000
• Special birthday gifts for you

🥇 Gold: Loyalty points >= 500
• Limited time deals

🥈 Silver: Loyalty points >= 1
• Loyalty Points for Voucher

Have questions? Contact Us Now!

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Project Milestones: Gantt chart overview of progress and timelines

Alpha Analytics

Solution → EDA & Modelling → Segments, Incentives, Value → Implementation → **Change Management**

TASK ID	TASK TITLE	START DATE	DUE DATE	PCT OF TASK COMPLETE
1	**Project Definition and Planning**			
1.1	Define project scope and objectives	11/27/23	12/01/23	**100%**
1.2	Initial stakeholder + segmentation analysis	11/27/23	12/15/23	**67%**
2	**Further Segmentation Strategy**			
2.2	Segment strategy development	12/18/23	01/05/24	**0%**
2.3	Communication and training plan	12/18/23	01/05/24	**0%**
3	**Solution Implementation**			
3.1	Communication campaigns and personalized offers	01/08/24	01/19/24	**0%**
3.2	Monitoring	01/08/24	01/26/24	**0%**
4	**Feedback Collection**			
4.1	Continuous feedback collection	11/27/23	02/09/24	**18%**
4.2	Quarterly performance reviews	Every Quarter		**0%**
4.3	Strategy Refinement	01/29/24	02/09/24	**0%**

Gantt chart timeline columns:
- **Project Definition and Planning**: Week 1, Week 2, Week 3
- **Further Segmentation Strategy**: Week 4, Week 5, Week 6
- **Solution Implementation**: Week 7, Week 8, Week 9
- **Feedback Collection**: Week 10, Week 11

^ Current Point

Maximizing RFM Success: Strategies for alignment, communication, training, and performance tracking

Solution → EDA & Modelling → Segments, Incentives, Value → Implementation → Change Management
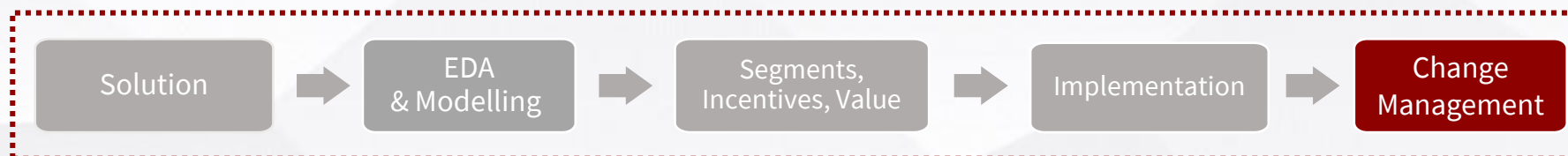
**6: Continuous Enhancement Loop for FRM Strategies**

Incorporating customer feedback into RFM-based strategies to refine and optimize recommendations continually

5: Performance Metrics Tracking for RFM Effectiveness

Monitoring KPIs influenced by RFM for performance evaluation and assessing the impact of tailored recommendations.

4: Tech Integration Strategy for RFM Implementation

Resolving technological issues to ensure smooth integration of RFM data into the e-commerce platform, enabling the extraction of actionable insights
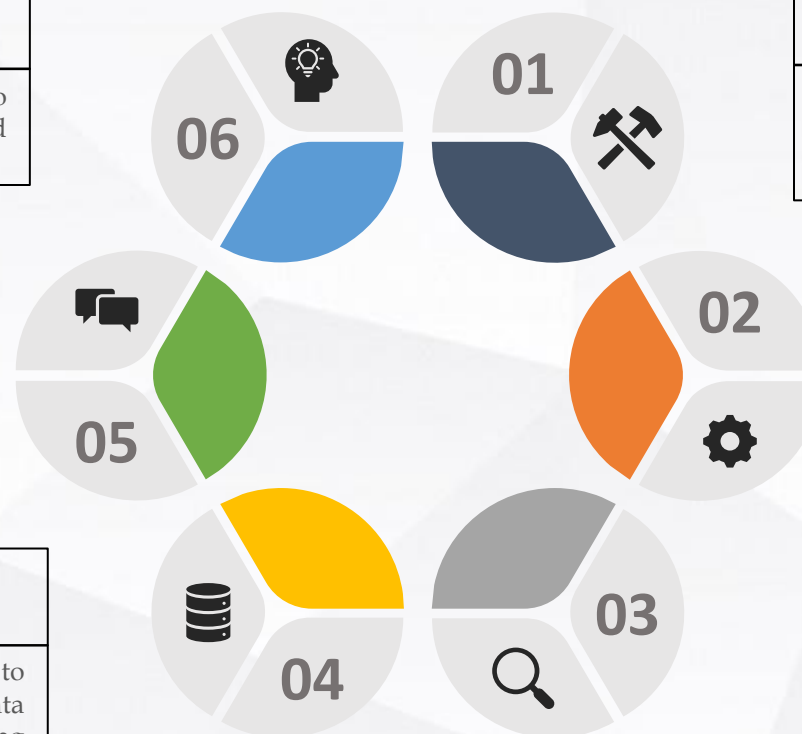
1: Stakeholder Alignment for RFM Adoption

Bringing together Marketing, Sales, and IT departments to grasp and reinforce the RFM-based recommendation strategy, enabling its effective execution on the e-commerce platform

2: Customized Communication Plan

Creating Customized Communication: Crafting personalized email campaigns utilizing RFM analysis to effectively engage customers by leveraging their purchasing behavior

3: RFM Training for Enhanced Insights Implementation

Educating teams in interpreting and using RFM data to customize product recommendations and improve customer insights proficiently
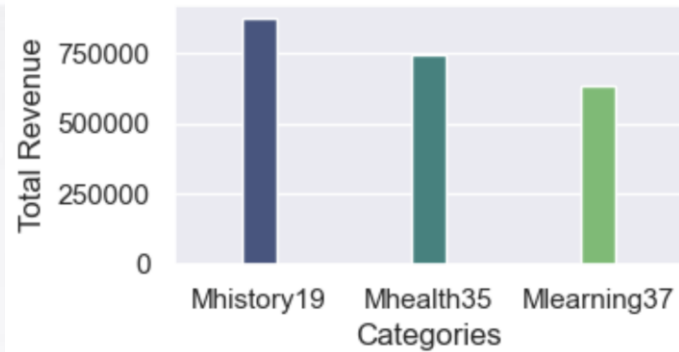
01 02 03 04 05 06

Conclusion

- Through RFM analysis, we've personalized recommendations, yielding a **substantial $841k revenue growth**. This targeted approach maximizes engagement beyond generic suggestions.

- Segmented customers into **nine groups**; through the identification of high-value segments and targeted engagement strategies, we've fostered loyalty and reduced churn.

- The **Gantt chart** outlines a structured implementation plan for integrating RFM-based recommendations into our ecommerce platform – shown in the **UI/UX** demonstration.

- With a robust **change management** strategy in place, we are ready to adapt, seamlessly integrate RFM-based recommendations, and drive sustained growth while prioritizing customer satisfaction.
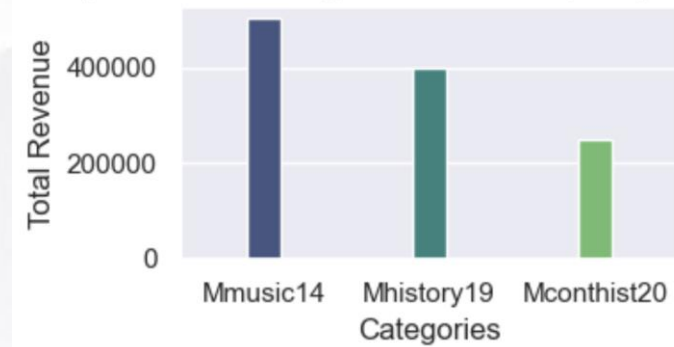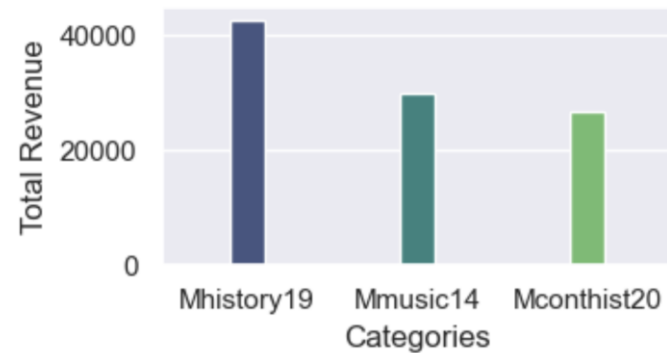
Appendix A – EDA of Book Categories
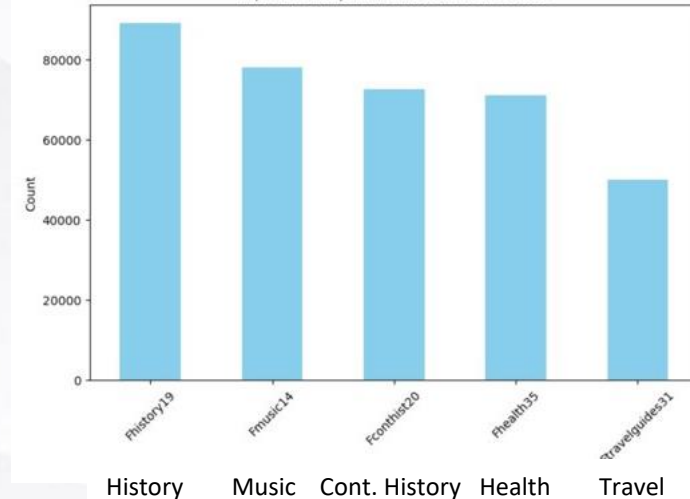
Appendix B – EDA Customer Spending Pattern

Customer Segmentation Based on Spending Behavior
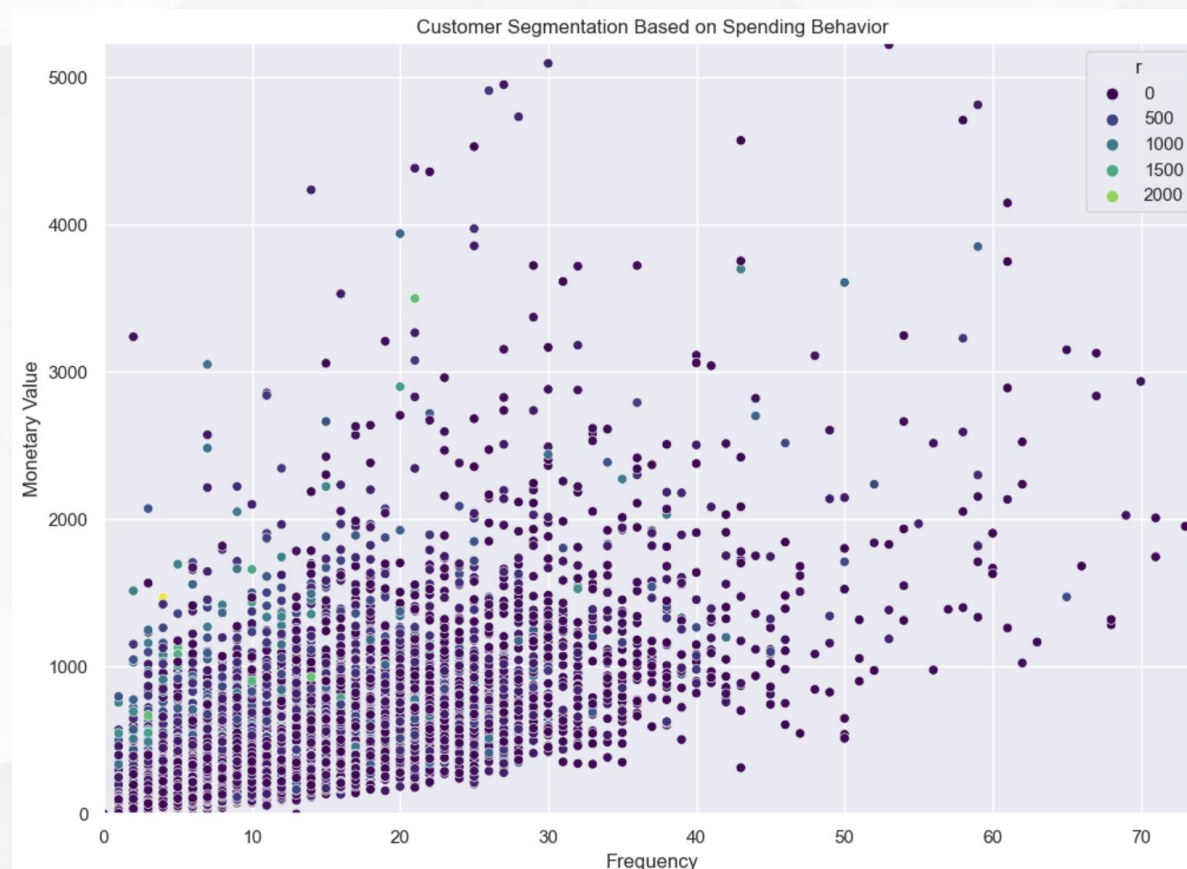
Appendix C – Sample RFM Score

id	r	f	m	R_Score	F_Score	M_Score	RFM_Score
914	194	7	318.89	3	3	4	334
957	3	14	368.05	4	4	4	444
1406	1489	15	423.30	1	4	4	144
1414	155	4	71.22	3	3	2	332
1546	194	6	422.64	3	3	4	334
1651	1797	2	47.93	1	2	2	122

Appendix D - Logic of Segmentation

Segment	RFM Score Like	Explanation(Talking Points)
VIP Customers	__5	Top-tier customers with the highest monetary contribution
Big spenders	3_4/444	Customers with recent large amounts of spending, though not necessarily spend as much as VIPs
Loyal Customers	[2,3,4]4[2,3]/441	Customers who shop frequently and have a strong relationship with the bookstore
Recent Incoming	4[1,2,3]_	They have started shopping with you recently
Promising Customers	[2,3][2,3][2,3]/2_4	Recent customers with average frequency, showing potential to become more valuable
At Risk	1[2,3,4][2,3]/1_4	These were once regular customers but haven't made purchases recently
Hibernating	[2,3]1[1,2,3]	Customers who do not purchase very frequently
Low-Value Customers	[1,2,3][2,4]1	Customers who spend small amounts across history
Almost Lost	11[1,2,3]	Customers who may have churned or chosen a competitor