

# ASKINOSIE CHOCOLATE RECOMMENDER SYSTEM

Scott Askinosie

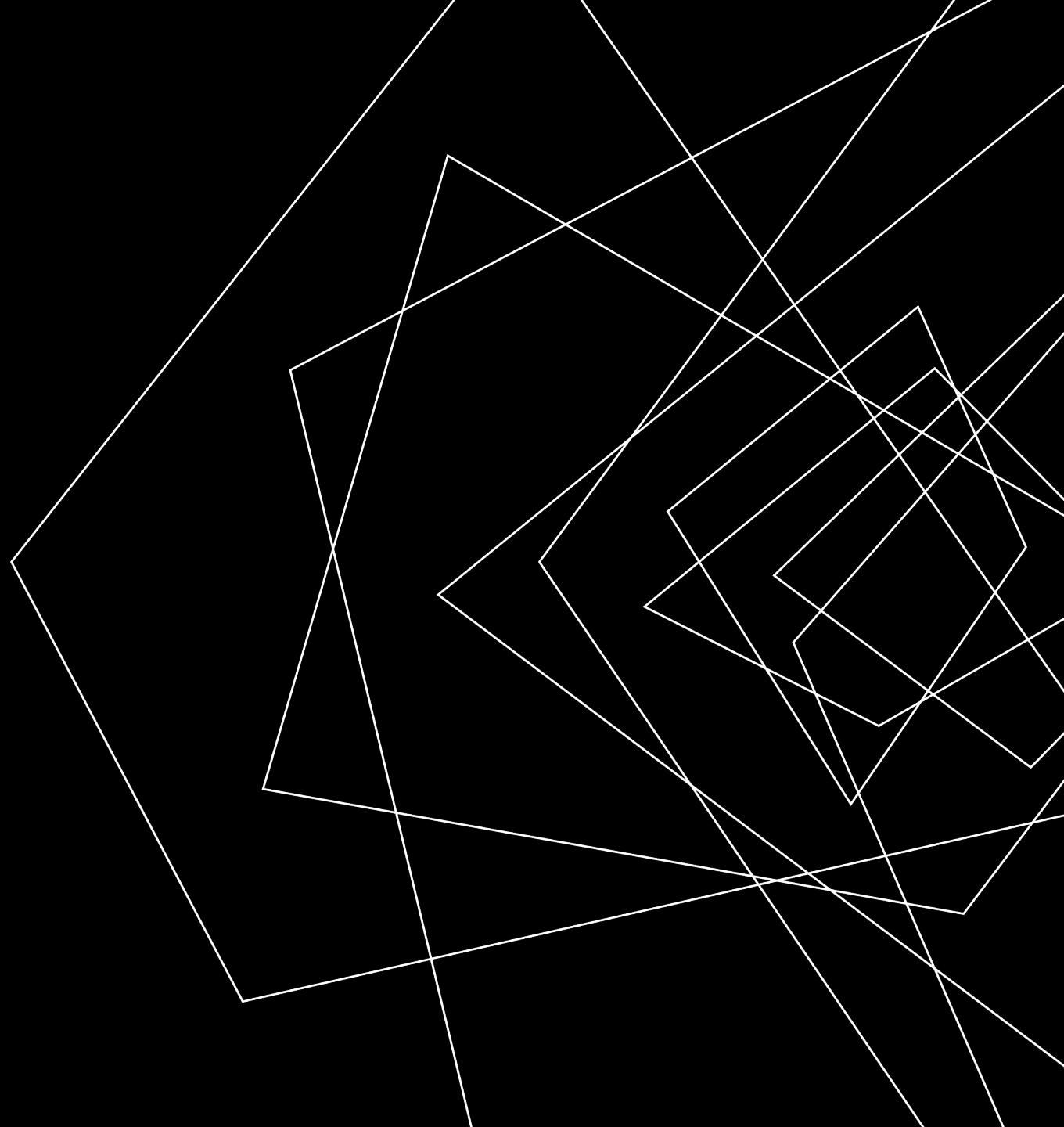
# PROBLEM STATEMENT

Askinosie Chocolate is a small batch chocolate factory with an online shopping cart that serves both wholesale and retail customers

It has been featured in well known periodical such as Food Magazine, Embibe and even Oprah Magazine

However, it lacks some basic features that can increase average transactional value (ATV)

a recent study by barilliance suggests that product recommendations were responsible for up to 31 percent of ecommerce revenues



# INTRODUCTION



- Founded in 2006 by criminal defense attorney gone rogue
- Pioneers in small batch/bean to bar chocolate making
- First to press cocoa butter in 150 years
- Holds a unique business philosophy called "A Stake in the Outcome"
- involved in community building programs both domestically and abroad



# DATA CLEANING!

3 Shopping carts spanning 16 years

Magento export documentation

base\_store\_ratio - base store ratio

Product\_options -  
{"info\_buyRequest":{"uenc":"aHR0cHM6Ly9hc2tpb  
m..."}

Of approximately 400 columns...

I used 4

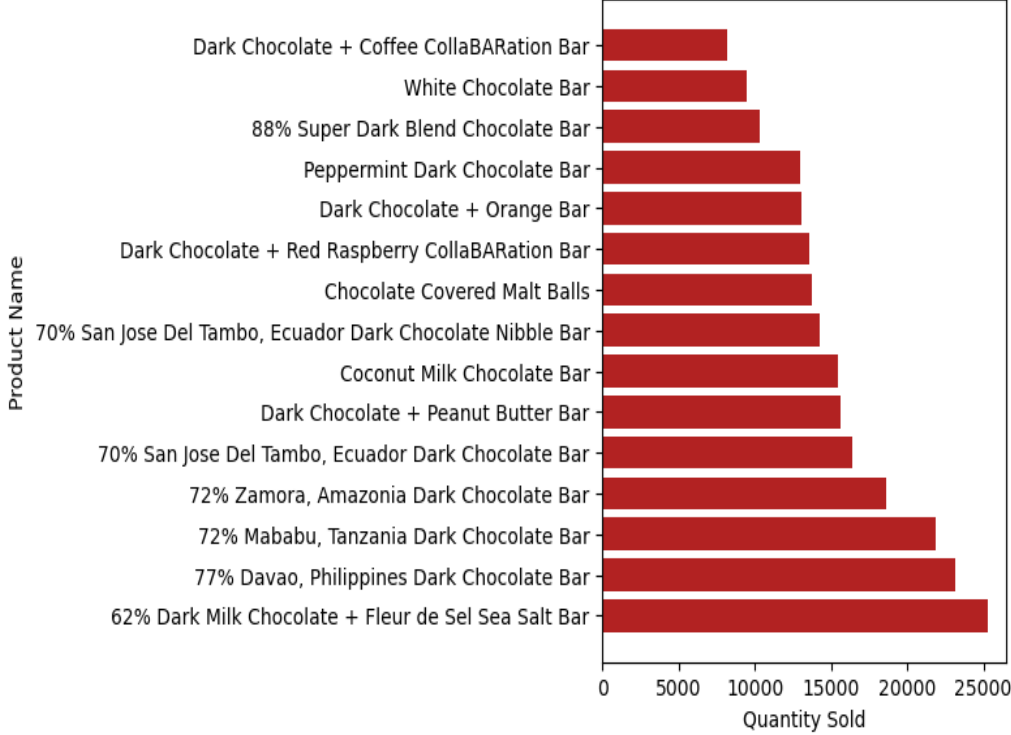
# BASE VS CUSTOM RECOMMENDER SYSTEM

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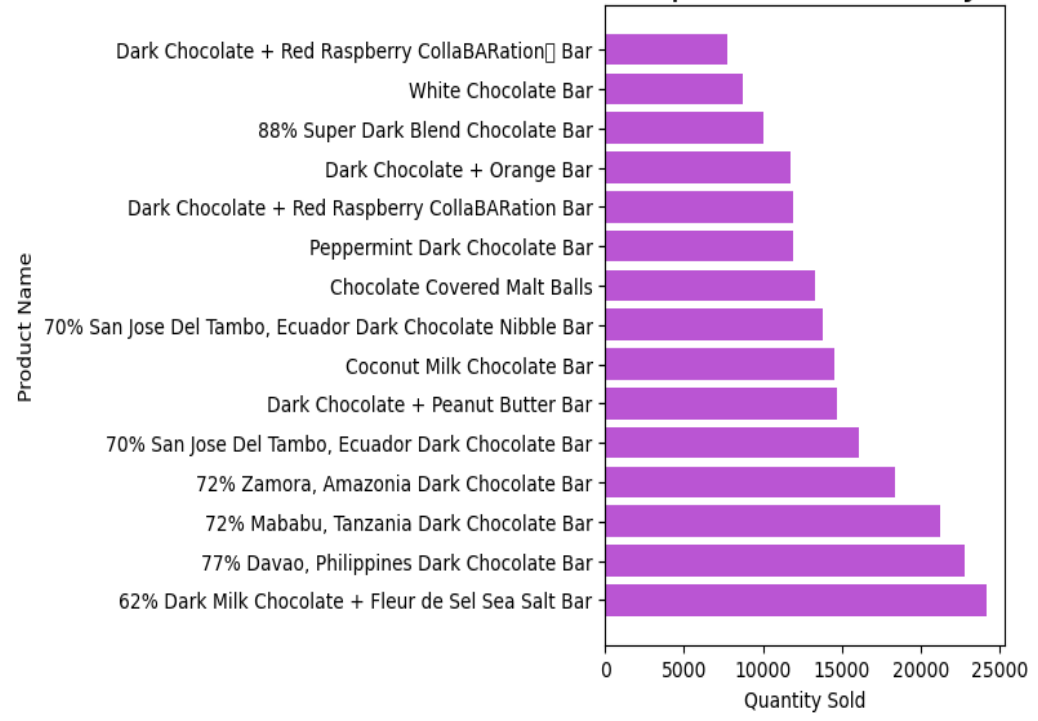
- Custom System- Sifted through 15 years of customer data from 2 (technically 5) shopping carts
  - Created multiple data frames preserving order\_id's, emails and quantities ordered and store\_id's
  - Manipulated aggregates based on quantity separately, concatenated, split again into wholesale Vs retail based on store ID, concatenated with email addresses and order ID's, aggregated and anonymized email addresses
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- Base System- Created pivot table of all orders since 2008 (when we had an online shopping cart) with individual order ID

# BASE VS CUSTOM RECOMMENDATION SYSTEM RETAIL

Base Retail Top 15 Products by Quantity Sold



Custom Retail Top 15 Products by Quantity Sold



The base recommender and custom recommender share 14 of the top 15 products in terms of quantity sold

# BASE VS CUSTOM RECOMMENDATION SYSTEM RETAIL

Recommendations based on your choice of 62% Dark Milk Chocolate + Fleur de Sel Sea Salt Bar

Base Recommendation System		Product Suggestion	correlation	Custom Recommendation System		Product Suggestion	correlation
0	Dark Chocolate + Coffee CollaBARation Bar		0.081692	White Chocolate Nibble Bar			0.082637
1	White Chocolate Nibble Bar		0.080833	Dark Chocolate + Coffee CollaBARation Bar			0.079591
2	Dark Chocolate + Coffee CollaBARation Bar		0.070498	Dark Chocolate + Coffee CollaBARation Bar			0.069547
3	70% San Jose Del Tambo, Ecuador Dark Chocolate Bar		0.060828	70% San Jose Del Tambo, Ecuador Dark Chocolate Bar			0.057055
4	Peppermint Dark Chocolate Bar		0.052322	Dark Chocolate + Orange Bar			0.050517

# BASE VS CUSTOM RECOMMENDATION SYSTEM RETAIL

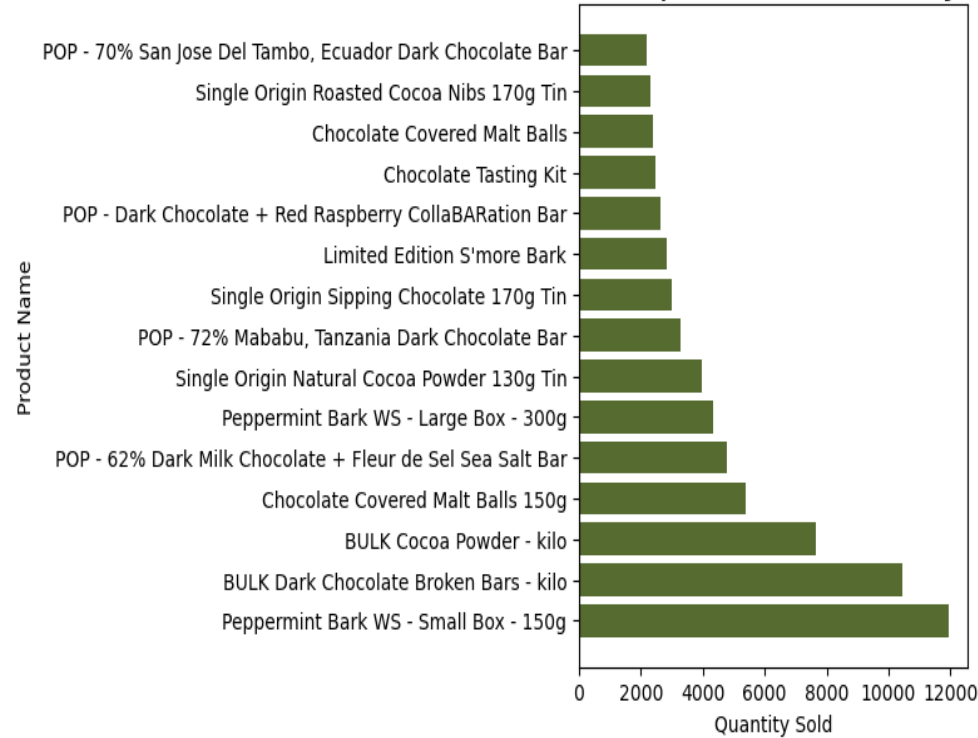
Recommendations based on your choice of Peppermint Dark Chocolate Bar

	Base Recommendation System Product Suggestion	correlation	Custom Recommendation System Product Suggestion	correlation
0	Dark Chocolate + Peanut Butter Bar	0.163636	Dark Chocolate + Peanut Butter Bar	0.164854
1	Dark Chocolate + Orange Bar	0.127284	Dark Chocolate + Orange Bar	0.125405
2	Coconut Milk Chocolate Bar	0.087299	Coconut Milk Chocolate Bar	0.086076
3	Dark Chocolate + Red Raspberry CollaBARation Bar	0.073616	White Chocolate Bar	0.073851
4	White Chocolate Bar	0.072838	Dark Chocolate + Red Raspberry CollaBARation Bar	0.071370

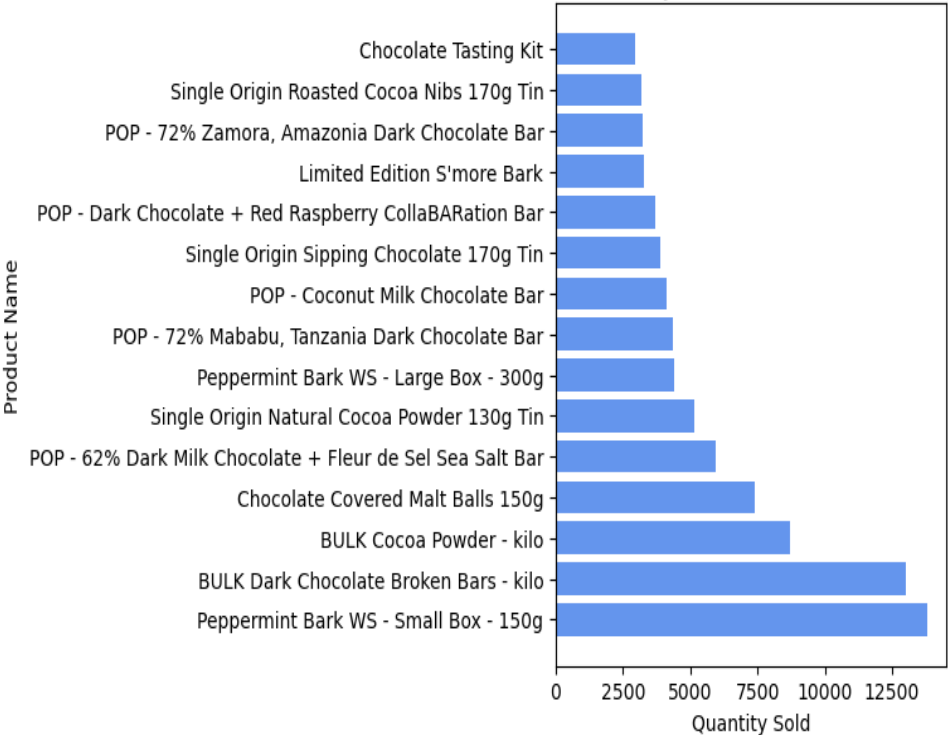


# BASE VS CUSTOM RECOMMENDATION SYSTEM WHOLESALE

Base Wholesale Top 15 Products by Quantity Sold



Custom Wholesale Top 15 Products by Quantity Sold



The base recommender and custom recommender share 13 of the top 15 products in terms of quantity sold

# BASE VS CUSTOM RECOMMENDATION SYSTEM WHOLESALE

Recommendations based on your choice of Peppermint Bark WS - Small Box - 150g

	Base Recommendation System Product Suggestion	correlation	Custom Recommendation System Product Suggestion	correlation
0	Peppermint Bark WS - Large Box - 300g	0.464721	Peppermint Bark WS - Large Box - 300g	0.593397
1	POP Gingerbread Dark Chocolate Bar	0.219071	POP Gingerbread Dark Chocolate Bar	0.274914
2	Chocolate Covered Malt Ball Tin	0.128743	Chocolate Covered Malt Ball Tin	0.195257
3	CASE Single Origin Natural Cocoa Powder	0.011548	Wholesale C-Ration    Month Supply of Chocolate	0.013781
4	Half Bar - Coconut Milk Chocolate	0.006133	Half Bar - Coconut Milk Chocolate	0.008865

# BASE VS CUSTOM RECOMMENDATION SYSTEM WHOLESAL

Recommendations based on your choice of Single Origin Sipping Chocolate 170g Tin

Base Recommendation System Product Suggestion		correlation	Custom Recommendation System Product Suggestion		correlation
0	Chocolate Covered Malt Balls 150g	0.327696		Chocolate Covered Malt Balls 150g	0.361084
1	Peppermint Bark WS - Large Box - 300g	0.098669		Peppermint Bark WS - Large Box - 300g	0.117077
2	POP Gingerbread Dark Chocolate Bar	0.090671		POP Gingerbread Dark Chocolate Bar	0.101738
3	POP - Dark Chocolate + Avocado & Rosemary CollaBARation Bar	0.080340		Single Origin Natural Cocoa Powder 130g Tin	0.085184
4	POP - Dark Chocolate + Coffee CollaBARation Bar	0.070567	POP - Dark Chocolate + Coconut Sugar & Toasted Coconut CollaBARation Bar		0.083891

# CONCLUSIONS AND RECOMMENDATIONS

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- For the retail customer data, the base system performed slightly better in terms of correlation.
- This could be described by the fact that customer purchases may be more based on purchasing items more randomly
- For the wholesale customer data the custom system performed better than the base system
- This is likely due to the fact that wholesale orders are more tailored to the purchasing stores needs or previous orders
- The custom system would be more impactful in not only cross-selling to wholesale customers but also solidifying retention as, theoretically, their sales numbers of Askinosie Chocolate products would improve as well.

# FUTURE WORK

- Streamlit App
- Optimize Custom RS
- Clustering
- All of the data is already where it needs to be



**BUSINESS OPPORTUNITIES ARE LIKE  
BUSES. THERE'S ALWAYS ANOTHER  
ONE COMING.**

Richard Branson