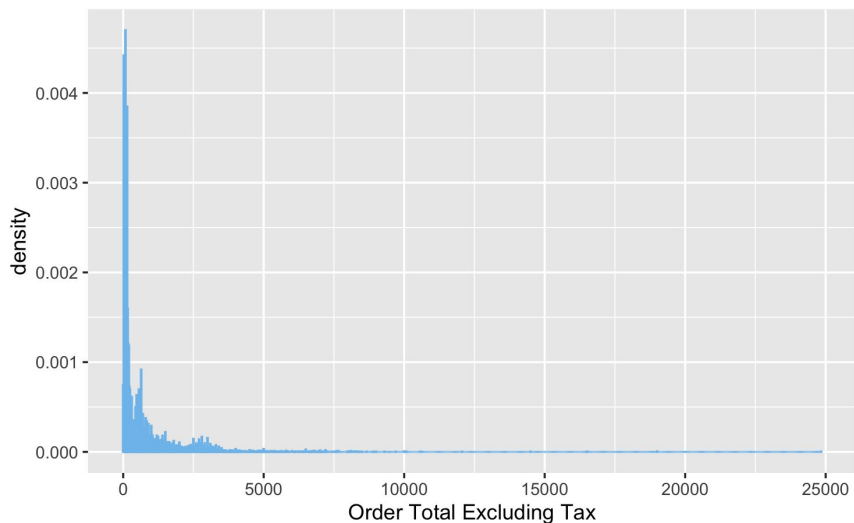

Democratization of Data

Team Hyjecs

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STATS 141SL Winter 2021

Intro

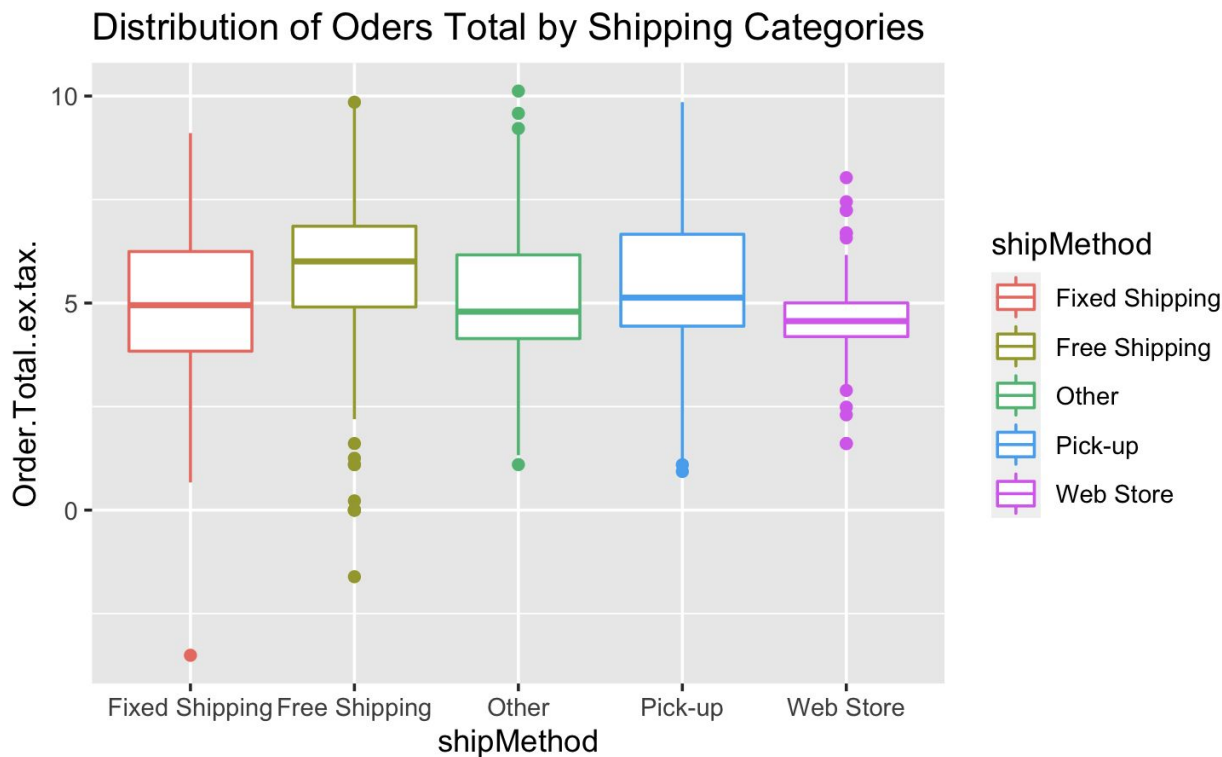
Orders Dataset



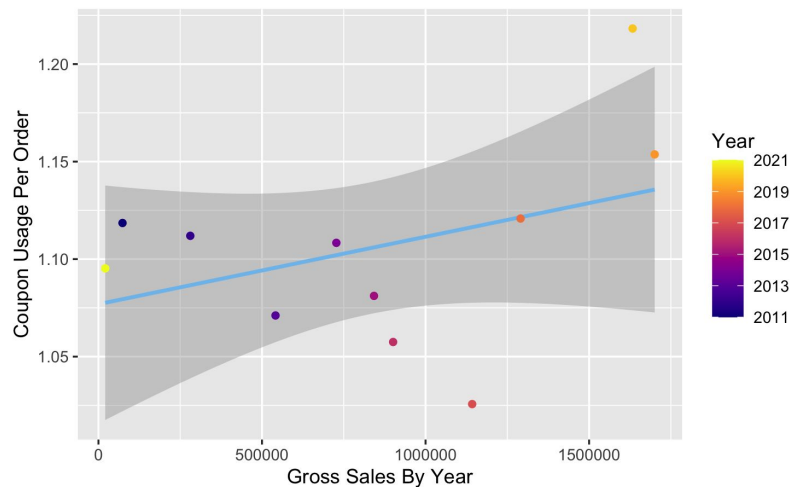
The Distribution of Orders Total

- We examined only completed/shipped orders and deleted orders with 0 in the transaction total.
- We removed payment methods as our predictors
- We extracted the total sold quantity of individual products for future analysis
- We generated a binary variable indicating the coupon usage

Distribution of Orders Total By Shipping Categories



Coupon Usage and Sales



Coupon Usage Per Order Grouped By Sales

- We could observe a positive relationship between coupon usage and gross sales.
- Interesting fact: year 2020 has the second highest sales and highest coupon usage...

Orders Model

One-way ANOVA F-test

Association of sales for each order (log transformed) with predictor variables: Order Date, Shipping Method, Coupon

	Df	Sum Sq	Mean Sq	F Value	Pr(>F)
Order.Date	11	58	5.25	2.565	0.00304
shipMethod	4	1184	295.90	144.504	<2e-16
Coupon.YN	1	34	34.07	16.637	4.57e-05

- p-values are significant for each variable
- reject the null hypothesis that the means of each category are the same

Post-hoc Tukey's HSD Test

	diff
02-01	0.261735159
07-01	0.180889101
11-01	-0.083088896

Table 5.1.2a: Order.Date: Tukey's HSD Test

	diff
Free Shipping-Fixed Shipping	0.88315427
Web Store-Fixed Shipping	-0.44449415

Table 5.1.2b: shipMethod: Tukey's HSD Test

	diff
1-0	-0.2064949

Table 5.1.2c: Coupon.YN: Tukey's HSD Test

Average Sales Per Order:

- **Order Date:** with January as the baseline, February highest and November lowest
- **Shipping Methods:** with Fixed Shipping as the baseline, Free Shipping highest and Web Store lowest
- **Coupon:** with using a coupon as the baseline, orders not using coupons had higher sales

Advice to Increase Order Sales

- bigger purchases when granted free shipping but coupons did **not** bring an increase in average sales
- ACB might have a more specific customer base compared with other retail businesses

A strategy for coupon usage:

Redesign coupons for free shipping: for example, use a **"first-time-customer"** coupon so new registered customers could have their **first order shipped free**

Advice to Increase Order Sales

- February and July welcomed the highest sales while November's sales were generally lowest

A strategy on seasonality:

Take advantage of high sales in February and July to send more email promotions

In the slower season of November, plan store maintenance or other activities accordingly

Products

Products

Further investigation on Brand, Viewed, Product.Visible

Response: log(Sold.Quantity)					
	Df	Sum Sq	Mean Sq	F Value	Pr(>F)
Brand	91	829.17	9.112	7.5293	2.2e-16
Calculated.Price	1	23.84	23.838	19.6976	1.063e-05
log(viewed)	1	131.41	131.411	108.5885	<2.2e-16
Product.Visible	1	77.24	77.238	63.8249	6.045e-15
Product. Inventoried	1	51.94	51.936	42.9161	1.148e-10

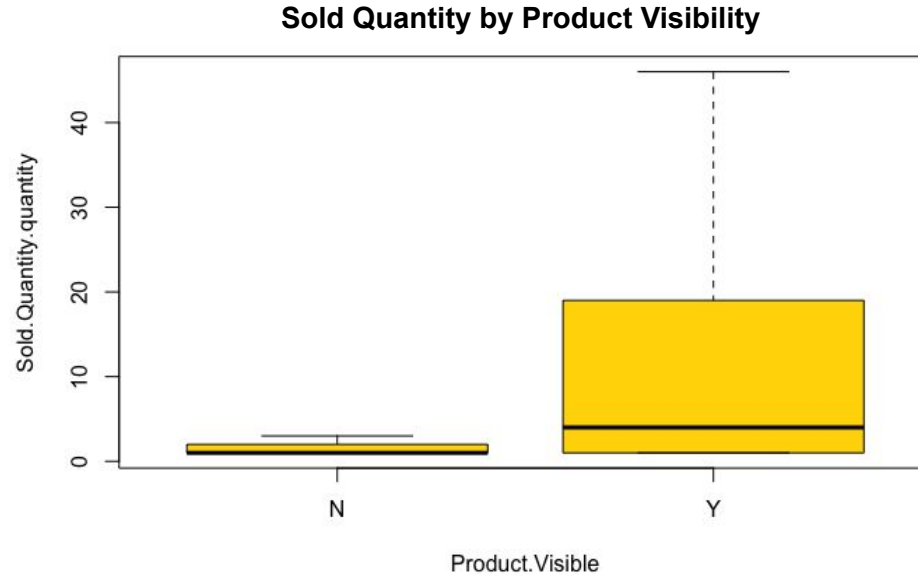
p-values are significant for all selected features

Products Brand Loyalty

Brand	Sold Quantity	Profit
Austin Custom Brass	8674	1177341.88
(other)	1084	44193.14
Hetman	815	1555.18
Adams	768	225330.03
Gard	723	55500.55
Ultra-Pure	559	1319.35
Warburton	396	8951.20
Schagerl	257	139765.86
Berp	254	1093.97
Leather Specialities	203	3496.97

- Brands with top sales might retain the customers and further bring more profit
- Some brands such as Hetman is popular but not profitable

Products Visibility



T-test p values: 0.00072

- Add at least one nice picture for each item online

Products

Most Popular Product Type



Most Viewed Items Online



Most Purchased Items in Orders

Insights:

- Customers have loyalty to brands and ideal products, but no loyalty to the website or store.
- Customers have clear ideas what they want.
- Customers search directly and make purchases.
- Customers want efficient purchases, and they are sensitive to prices.

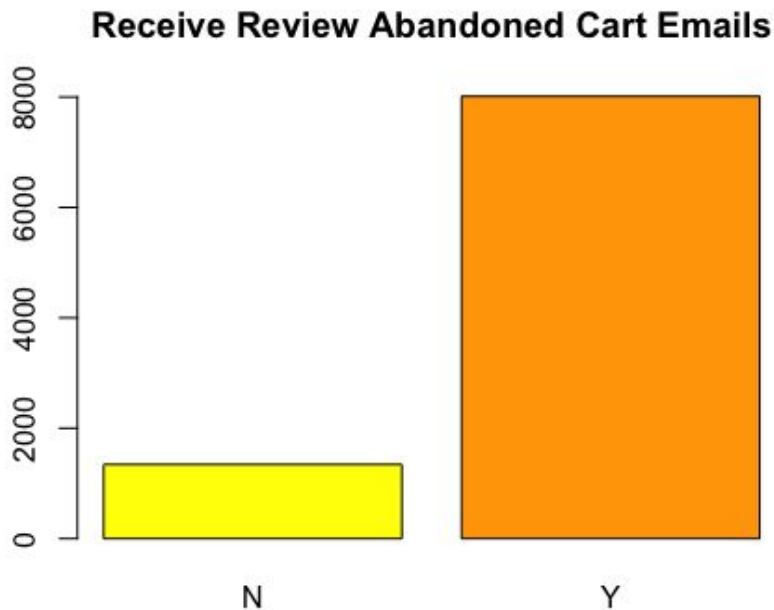
Advice:

- Recommend preferred brands for old customers
 - Recommend most popular brands for new customers
 - Popular Product Type: mouthpieces for trumpet
 - Reasonable Pricing
 - Website layouts: easy and fast to find products
-

Customers



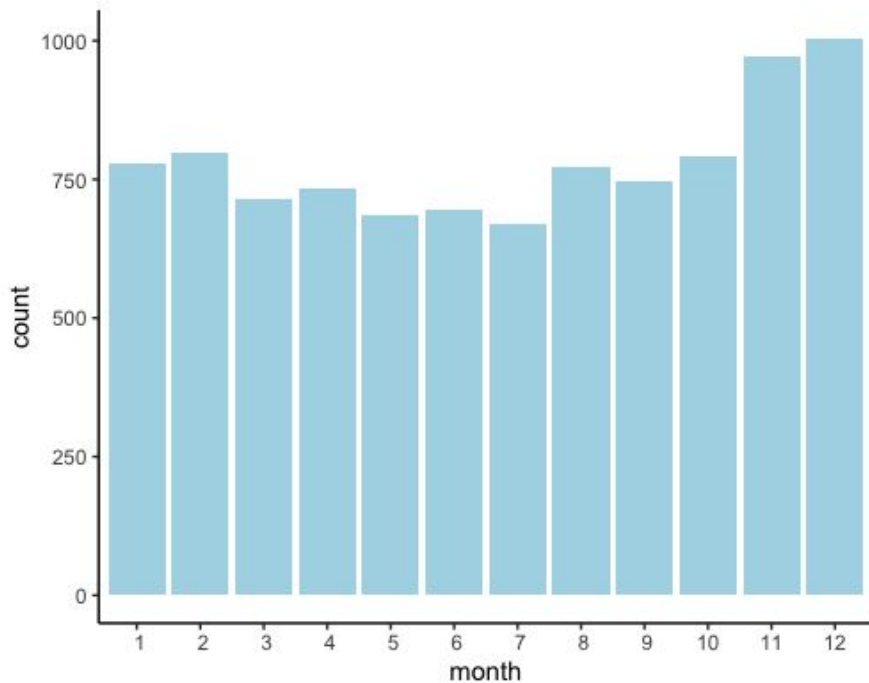
Reviewed / Abandon Cart Emails



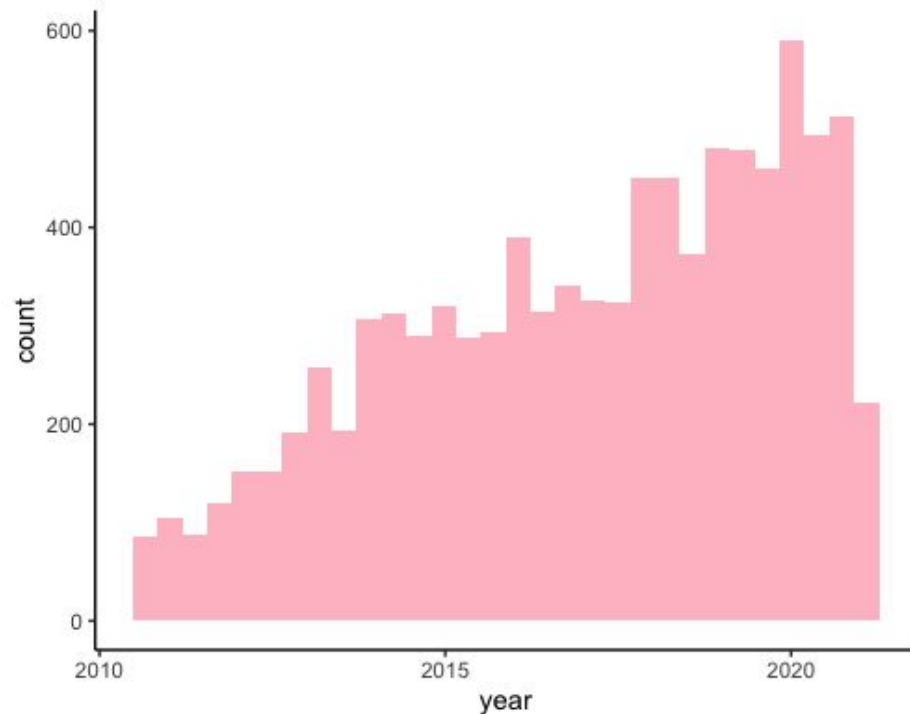
Using cart emails to advertise for the company's brand, new products, and promotions is a relatively efficient.

Customer Joined Date/Month

Customer Joined Month



Customer Joined Date



Insights:

- Cart emails are a relatively efficient way to advertise the company brand and the product.
- Bigger customer growth toward the end of the year with holiday seasons.

Advice:

- Continue advertising through email and target the end-of-the-year holiday seasons for more advertisements.
 - Amend information collect system to increase customer information accuracy
-

Thank you for listening!