

- Group 1
 - Class Project
- Marketing 3597**
- Chia-cheng Lin,
Yiting Wang,
Xianyuan Zhou,
Xin Zou

Segmentation

Durable goods

Service plan sales

Agenda



BACKGROUND



DATA



CLUSTERING



MARKET
PLAN

Background



Panel data from December 1998 to November 2004 at a major U.S. consumer electronics retailer

- Transaction types with customer information (eg. Income level, gender, etc)



Extended Service Plan (ESP) has become a major profit engine

- High margin
- Contribute up to 50% of profit



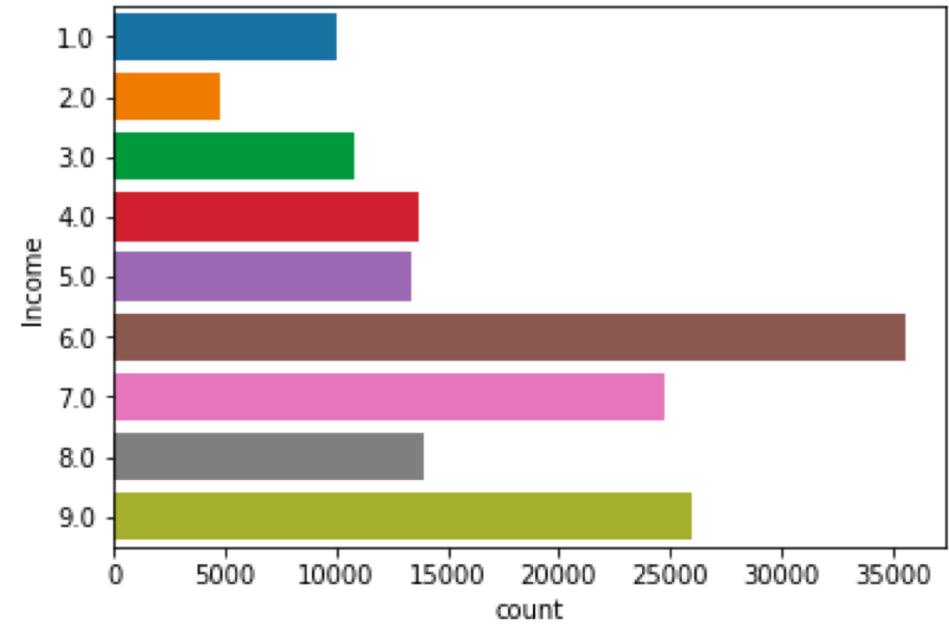
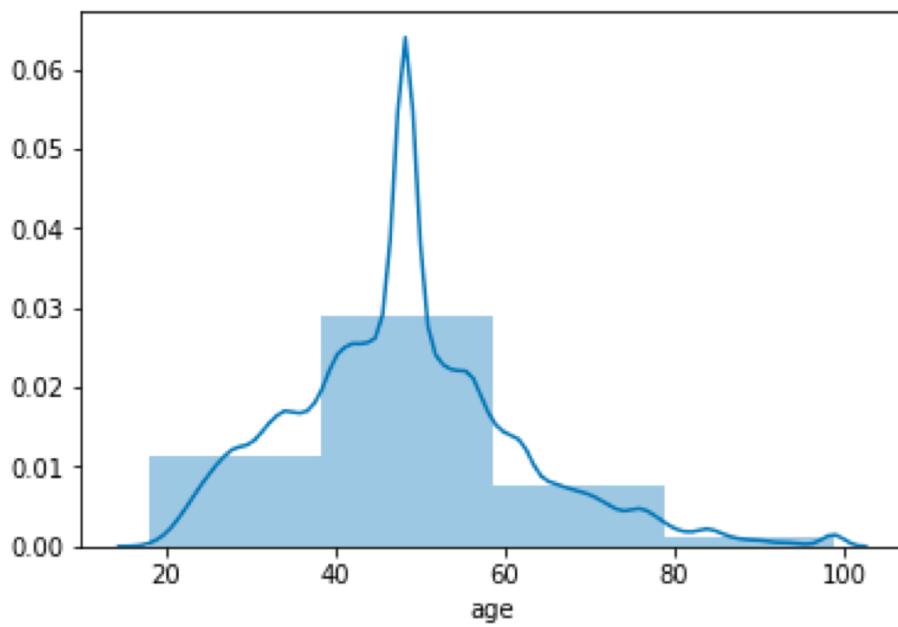
Improve marketing mix and drive ESP sales

Data

Descriptive Statistics-DurData

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
Household_ID	173,262	129,261,423.0	17,142,416.0	100,003,544	114,134,478	129,385,871	144,447,022	170,764,522
Transaction_NBR	173,262	12.7	17.8	1	3	7	15	255
Transaction_Total	173,262	24.3	28.3	1	8	15	30	255
Transaction_Location	173,262	2,544.5	1,353.1	2	860	3,202	3,611	4,510
Online_Transaction	173,262	0.01	0.1	0	0	0	0	1
ORIGINAL_TICKET_NBR	173,262	254,456,495,553.0	135,306,807,691.0	200,161,161	86,002,548,932	320,201,287,688.0	361,101,835,692	451,002,559,660
Transaction_type	173,262	1.3	0.8	1	1	1	1	6
PRODUCT_ID	132,099	717,114.1	123,859.6	532,656.0	581,097.0	740,313.0	810,272.0	1,068,840.0
Sub_Category_NBR	173,262	316.5	195.4	0	172	319	379	981
Quantity	173,262	0.8	1.4	-11	1	1	1	99
UNIT_PRICE	173,262	108.9	295.4	-6,900.0	10.0	40.0	130.0	7,000.0
EXTENDED_PRICE	173,262	109.2	295.5	-6,900.0	10.0	40.0	130.0	7,000.0
Return_Location_If.Any	173,262	2,519.4	1,351.6	2	859	3,196	3,607	4,510
Age_H_Head	152,291	48.3	14.3	18.0	38.0	48.0	56.0	99.0
Income	152,807	5.9	2.3	1.0	4.0	6.0	8.0	9.0
MALE_CHID AGE_0-2	173,262	0.01	0.1	0	0	0	0	1
MALE_CHID AGE_3-5	173,262	0.02	0.1	0	0	0	0	1
MALE_CHID AGE_6-10	173,262	0.04	0.2	0	0	0	0	1
MALE_CHID AGE_11-15	173,262	0.1	0.2	0	0	0	0	1
MALE_CHID AGE_16-17	173,262	0.1	0.2	0	0	0	0	1
FEMALE_CHID AGE_0-2	173,262	0.01	0.1	0	0	0	0	1
FEMALE_CHID AGE_3-5	173,262	0.02	0.1	0	0	0	0	1
FEMALE_CHID AGE_6-10	173,262	0.03	0.2	0	0	0	0	1
FEMALE_CHID AGE_11-15	173,262	0.1	0.2	0	0	0	0	1
FEMALE_CHID AGE_16-17	173,262	0.1	0.2	0	0	0	0	1
UNKNOWN_CHID AGE_0-2	173,262	0.03	0.2	0	0	0	0	1
UNKNOWN_CHID AGE_3-5	173,262	0.04	0.2	0	0	0	0	1
UNKNOWN_CHID AGE_6-10	173,262	0.04	0.2	0	0	0	0	1
UNKNOWN_CHID AGE_11-15	173,262	0.03	0.2	0	0	0	0	1
UNKNOWN_CHID AGE_16-17	173,262	0.01	0.1	0	0	0	0	1

Data



Important variables

HouseholdID	Transaction_Type	Online_Transaction	Sub_Category_Description	Extended_Price
Quantity	Age_H.Head	Gender	Income	Number of kids



Customer segmentation analysis on
customers who purchased
Extended Service Plan (ESP).

Data preparation

- **Data Cleaning**
- **Approach:**
 - Analyze transactions with service plan with the ones without
 - Identify categories/customer profile
 - Regression
 - Identify traits within customers who bought ESP
 - Normalize data
 - Cluster

Linear Regression

- OLS Model:
- Which customer segment are more likely to choose ESP? In which categories of goods?
- SERVICE ~ Online_Transaction + Age_H.Head + Income + Num_Kids + Gender + factor(Category_Description)

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	1.312e-01	4.125e-03	31.801	< 2e-16 ***
Online_Transaction	-5.231e-02	7.071e-03	-7.399	1.38e-13 ***
Age_H.Head	1.681e-04	5.784e-05	2.907	0.003651 **
Income	-4.257e-03	3.623e-04	-11.752	< 2e-16 ***
Num_Kids	-1.563e-03	9.122e-04	-1.713	0.086656 .
Gender	-5.799e-03	1.577e-03	-3.678	0.000235 ***
factor(Category_Description)DVS	4.384e-02	5.489e-03	7.988	1.38e-15 ***
factor(Category_Description)EXPRESS	-1.002e-01	2.971e-01	-0.337	0.735981
factor(Category_Description)HOME INS	-1.101e-01	1.598e-02	-6.890	5.59e-12 ***
factor(Category_Description)IMAGING	3.758e-03	3.495e-03	1.075	0.282303
factor(Category_Description)INTABGIBLE	-1.091e-01	1.178e-02	-9.258	< 2e-16 ***
factor(Category_Description)MAJORS	-3.313e-02	4.811e-03	-6.887	5.71e-12 ***
factor(Category_Description)MOBILE	1.107e-02	2.980e-03	3.713	0.000205 ***
factor(Category_Description)MUSIC	-8.424e-02	3.279e-03	-25.690	< 2e-16 ***
factor(Category_Description)OTHER	-1.015e-01	5.275e-03	-19.248	< 2e-16 ***
factor(Category_Description)P*S*T	-6.322e-02	2.848e-03	-22.197	< 2e-16 ***
factor(Category_Description)PC HDWR	6.836e-02	3.200e-03	21.359	< 2e-16 ***
factor(Category_Description)TELEVISION	3.634e-02	3.203e-03	11.347	< 2e-16 ***
factor(Category_Description)VIDEO HDWR	1.672e-02	3.516e-03	4.755	1.98e-06 ***
factor(Category_Description)WIRELESS	-1.137e-02	4.703e-03	-2.419	0.015581 *

Clustering

variable	1	2	3	4	5
DIGITAL AUDIO RECORDING_y_n	0.0165342	0.0006711	-0.0710479	0.0192053	-0.0710479
DIGITAL CAMERAS - SOHO_y_n	1.4221432	-0.2214369	0.0090288	-0.0302121	0.1115437
DIGITAL IMAGING PRINTERS_y_n	0.0803947	-0.011322	-0.011322	-0.011322	-0.011322
DIGITAL VIDEO_y_n	-0.0839804	0.0122109	-0.089058	-0.1008773	0.4632881
DIGITAL VIDEO RECORDERS_y_n	-0.0469916	-0.0469916	1.4804305	-0.0469916	-0.0469916
DIRECTV SYSTEMS_y_n	-0.1372403	-0.1522067	4.5326345	-0.0577783	0.0510744
DISHWASHERS_y_n	-0.0423986	-0.0423986	-0.0423986	1.1078864	0.1630369
DISNEY ELECTRONICS_y_n	0.0365308	-0.0035095	-0.0214857	-0.0214857	-0.0214857
DIVX -DVD_y_n	0.0454391	-0.0075666	-0.0375751	-0.0375751	0.1941428
DRYERS - ELECTRIC_y_n	-0.0118709	-0.0519508	-0.0519508	1.321349	-0.0519508
DRYERS - GAS_y_n	-0.0375751	-0.0375751	-0.0375751	1.0602643	-0.0375751
DVD SOFTWARE_y_n	-0.0156737	-0.0108565	-0.0052765	-0.0063279	0.7437696

variable	1	2	3	4	5
N_HHLD	963.0000000	6216.0000000	240.0000000	267.0000000	115.0000000
Age	47.6500519	48.3444337	49.8208333	52.0224719	44.5739130
Income	5.9688474	5.5899292	5.8291667	5.7453184	6.0434783
PctMen	0.5617861	0.5287967	0.6458333	0.4906367	0.5478261
N_child	0.5482866	0.3972008	0.3333333	0.5018727	0.3913043

01

Has the highest rate
for number of kids.

02

Has the highest
number of
households, lowest
income.

03

Is more likely to buy
TV, video recorders.

04

Is more likely to buy
refrigerator, air
conditioner, washer,
dryer, and
microwave.

05

Is more likely to buy
wireless, focus on
handset.

Clustering

Market Plan

- Cluster 1: Families - fathers
- Cluster 2: General Public - Tech savvy
- Cluster 3: “Couch Potatoes”
- Cluster 4: Housewives
- Cluster 5: “Golden Bachelors”

Since this is the sale of Extended Service Plan, incorporate Sales People Training towards different customer segments who made relative purchase. If they are making purchases online on the categories of products that we identified in cluster, we can push sales of ESP before checkout



QUESTION