Blackwell Electronics

Data Analysis &
Business Strategy

PROJECT MEMBERS
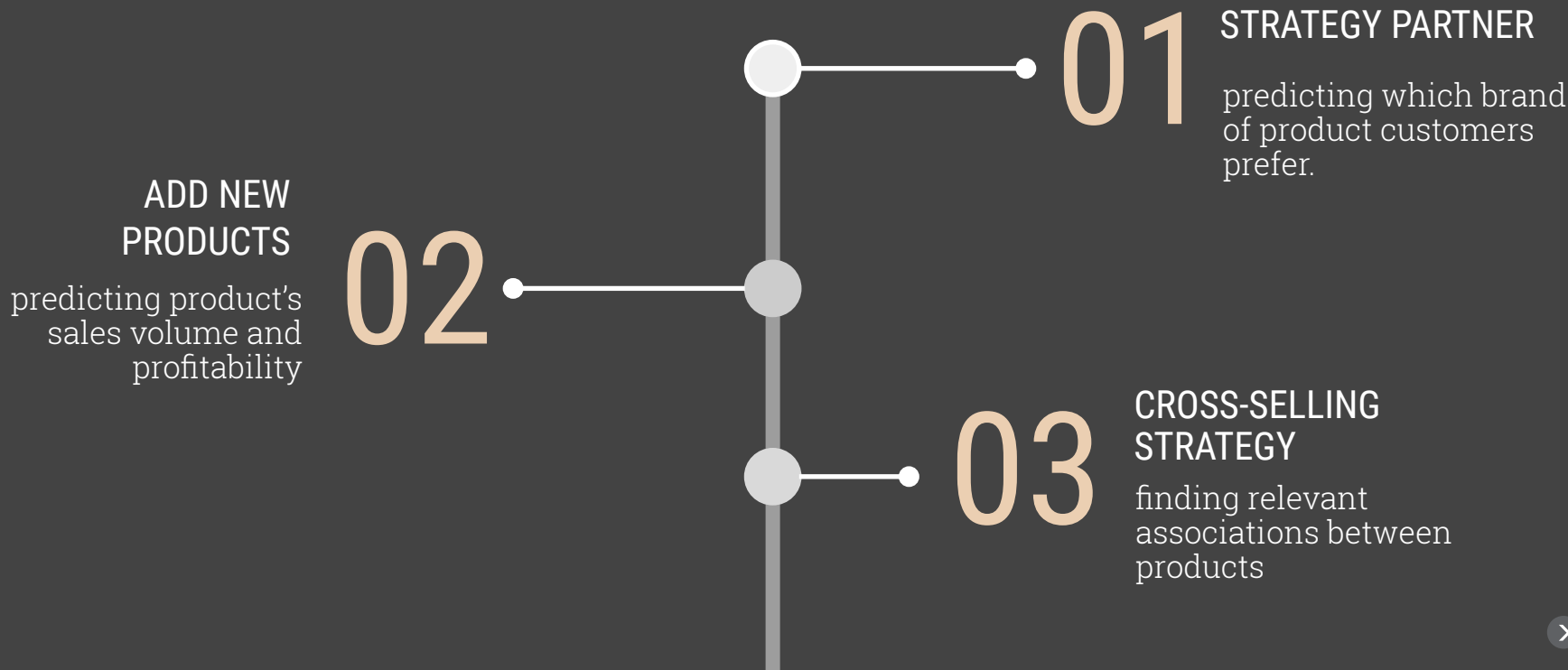

Ibai Barberena

Belén Agurto

HOW DOES DATA MINING HELP OUR COMPANY?

01 STRATEGY PARTNER

predicting which brand of product customers prefer.

02 ADD NEW PRODUCTS

predicting product's sales volume and profitability

03 CROSS-SELLING STRATEGY

finding relevant associations between products

01

STRATEGIC COMPUTER PARTNER

Acer vs. Sony

STRATEGIC COMPUTER PARTNER

Main goal: Recommend strategic computer partner: **Acer or Sony**

Resources: 14,898 survey responses (5,000 of them are incompleted).

**Methodology**: Classification training methods with caret package.

Other goals: - **Predict** the missing brand preference.
- Find out what **factors** impact on the brand preference.

STRATEGIC COMPUTER PARTNER

Findings:

- In total, 62% of survey respondents prefer Sony over Acer.

- **Age** and **salary** are the most relevant factors.

- **Sony** targets low- and high-income class clients.

- **Acer** targets middle-income class clients.
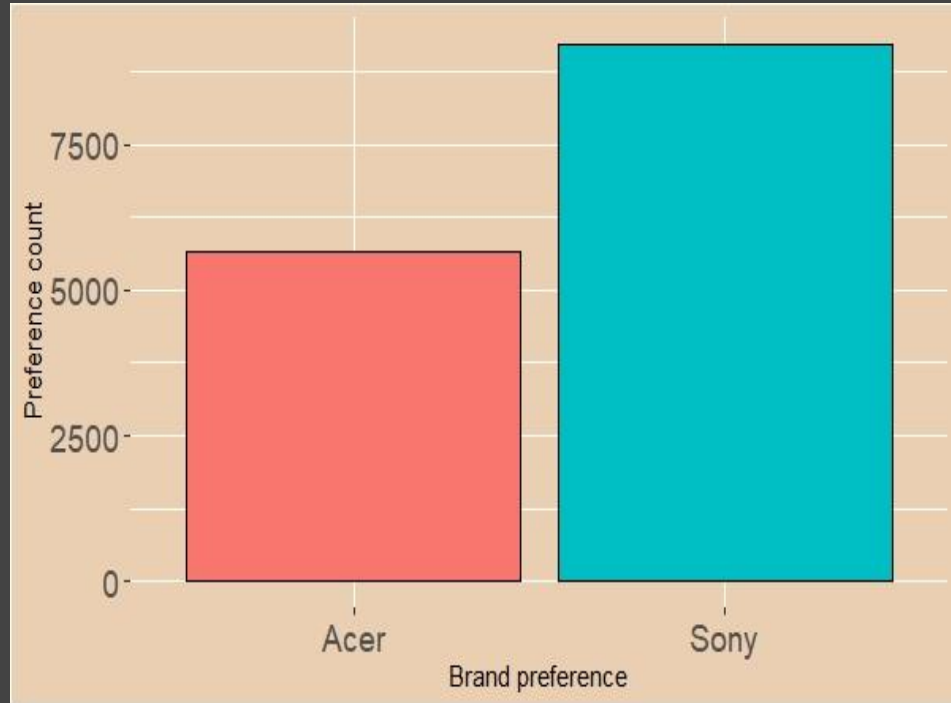
FINAL
RECOMMENDATION

Blackwell Electronics should strengthen relationship with both companies. Their client target is different from each other.

02

ADDING NEW PRODUCTS

predicting product's sales volume and profitability

ADDING NEW PRODUCTS

Main goal: Predicting profitability of four different product types

Resources: - List of 80 existing products with description
- List of 24 products to predict sales volume

Methodology: Random Forest Model

Other goals: Assessing the impact services reviews and customer reviews have on sales of different product types

ADD NEW PRODUCTS

Findings:

- PC category has the highest projected profits, followed by Netbook.
- In terms of volume, the smartphone has the highest predicted sales.
- Having 4 stars and positive service reviews increases the probability of selling more
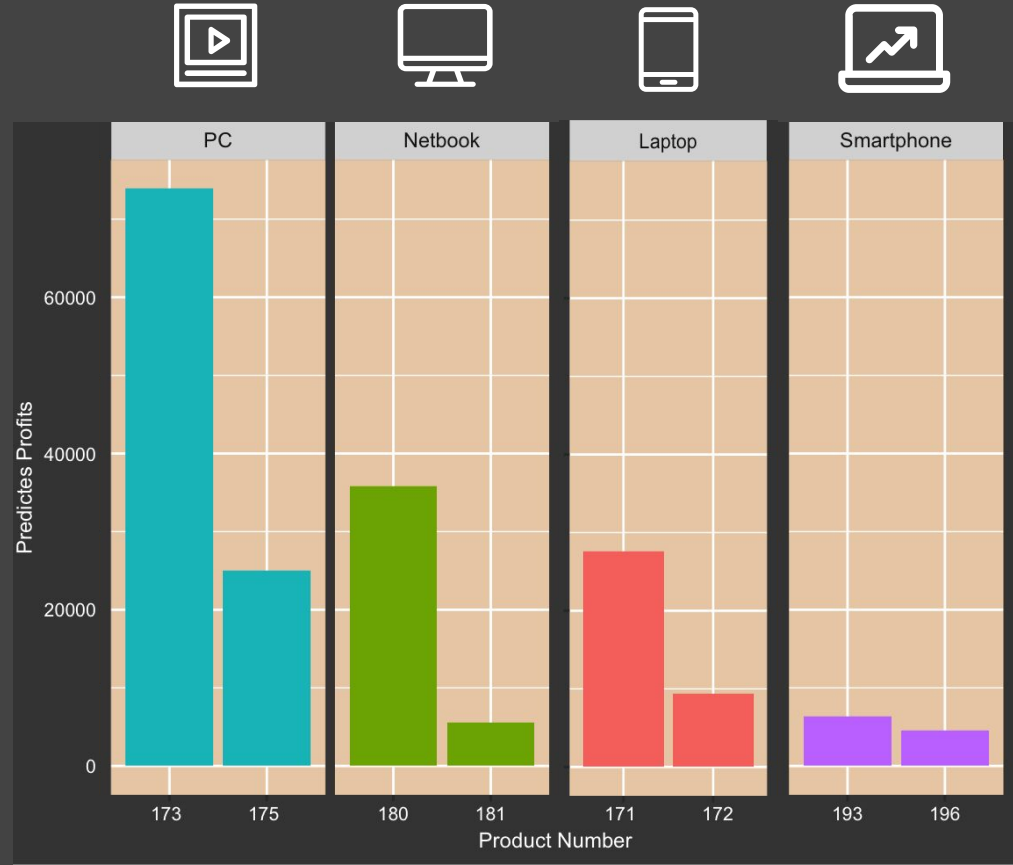
PROFITABILITY PREDICTIONS FOR NEW PRODUCTS

PC	LAPTOP	NETBOOK	SMARTPHONE
$ 99,712	$67,797	$48,697	$22,637

CROSS-SELLING STRATEGY

Goals: - **Identify** purchasing patterns in Electronidex transactions.
- Would Blackwell **benefit** from selling Electronidex's items?

Resources: - Electronidex transactions from 01-01-2017 to 14-03-2018.
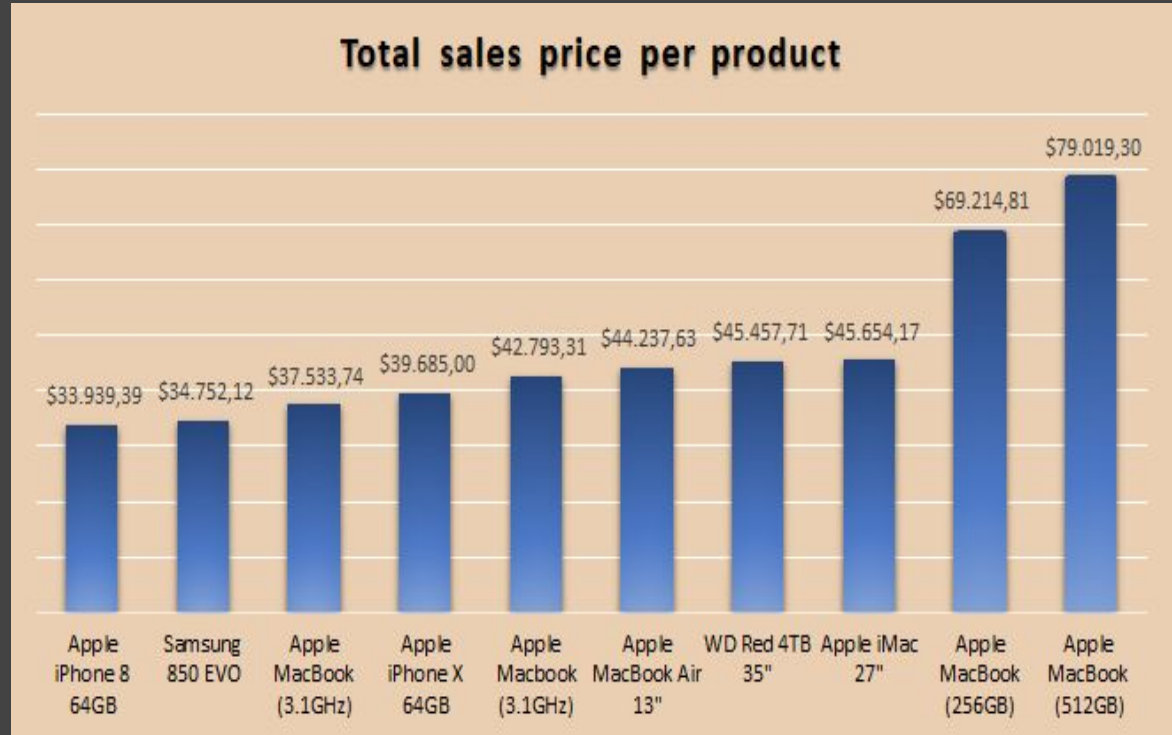- Electronidex products description.

Methodology: Apriori algorithm with arules package.

CROSS-SELLING STRATEGY

Findings:

- Among not famous brands, the item relationship is very high.

- **Apple** products have strong relationship with accessories from different brands (not only from Apple).

Total sales price per product

$33.939,39 — Apple iPhone 8 64GB
$34.752,12 — Samsung 850 EVO
$37.533,74 — Apple MacBook (3.1GHz)
$39.685,00 — Apple iPhone X 64GB
$42.793,31 — Apple Macbook (3.1GHz)
$44.237,63 — Apple MacBook Air 13"
$45.457,71 — WD Red 4TB 35"
$45.654,17 — Apple iMac 27"
$69.214,81 — Apple MacBook (256GB)
$79.019,30 — Apple MacBook (512GB)

FINAL
RECOMMENDATION

Blackwell Electronics should include popular Apple Smartphones, PCs, Laptops and Tablets to the product portfolio.
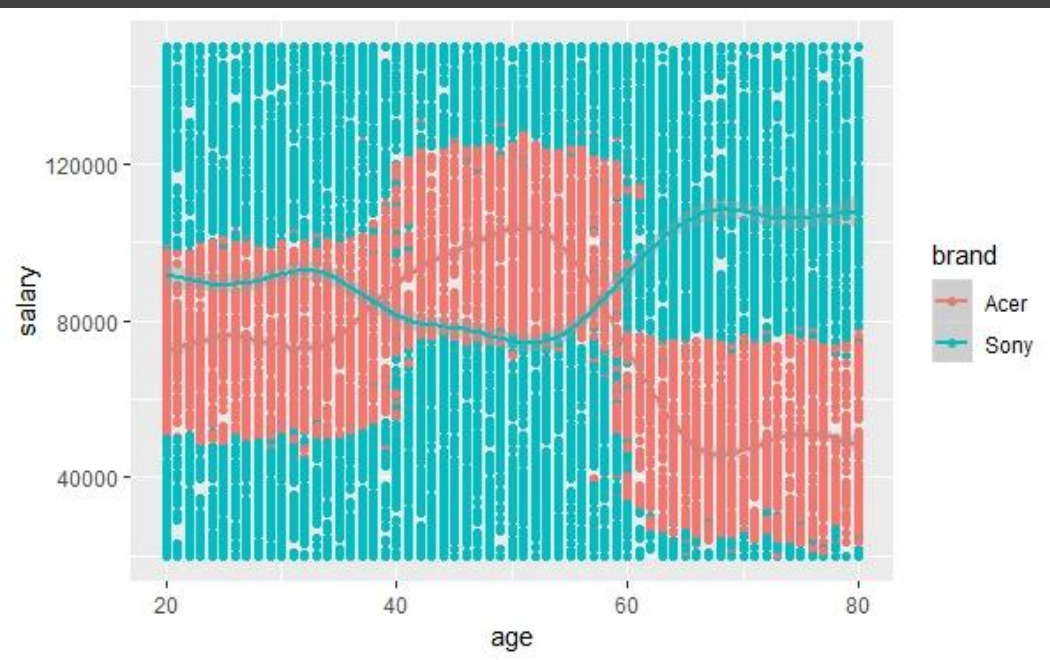
Does anyone have any question?

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THANK YOU!

TECHNICAL APPENDIX - STRATEGIC COMPUTER PARTNER

Importance of each factor in k-NN

Salary	0.6216
Age	0.5076

Performance metrics in testing

	k-NN	C5.0	RF
Accuracy	0.9256	0.9236	0.9179
Kappa	0.8424	0.8370	0.8260

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Confusion Matrix and Statistics

               Reference
Prediction Acer Sony
      Acer  853  101
      Sony   83 1437

              Accuracy : 0.9256
                95% CI : (0.9146, 0.9357)
    No Information Rate : 0.6217
    P-Value [Acc > NIR] : <2e-16

                 Kappa : 0.8425
```

TECHNICAL APPENDIX - ADD NEW PRODUCTS

Variables importance

Attribute	Importance
PositiveServiceReview	1.4544833
GoodReviews	1.3361507
x4StarReviews	1.2988155
BadReviews	1.0195509
x3StarReviews	0.7153787
x2StarReviews	0.4275328
ProductType	0
ProductNum	0
Price	0
x1StarReviews	0

Performance metrics in testing

	RF	KNN	SVM
RMSE	249.83	345.03	277.23
R Squared	0.249.83	0.697	0.946
MAE	122.3946	178.14	161.07

Correlation matrix
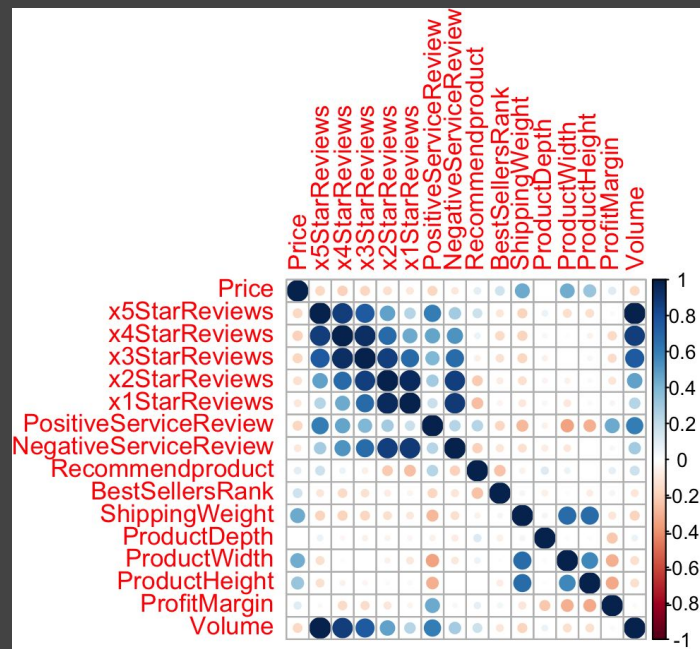
TECHNICAL APPENDIX - CROSS-SELLING STRATEGY
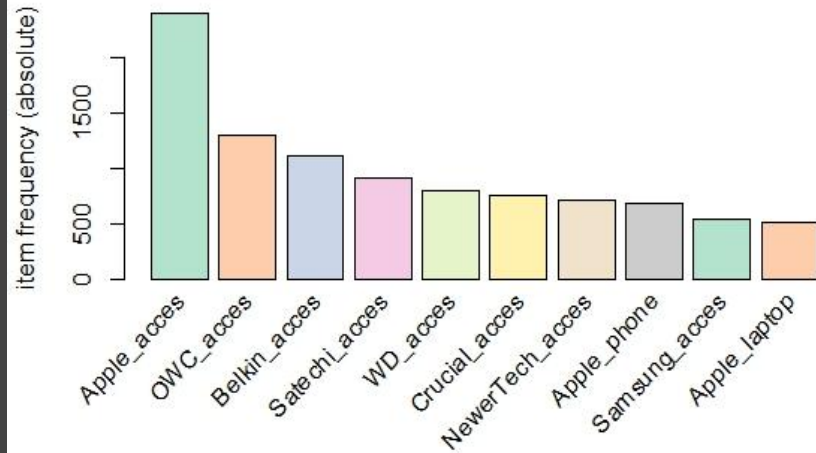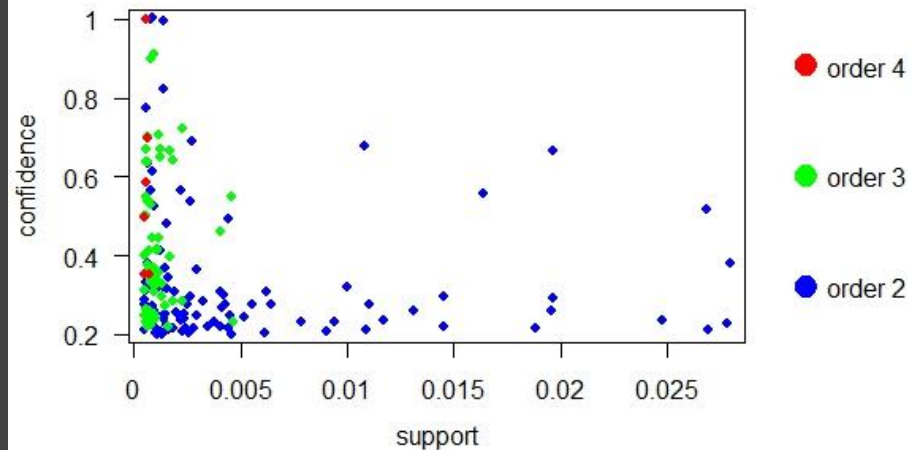
List of all the rules created: https://docs.google.com/spreadsheets/d/1MX_NF83i81jPENkPDgQMPCfyCExrOoOIHS61ddZDvN0/edit?usp=sharing

TECHNICAL APPENDIX - CROSS-SELLING STRATEGY

	Support	Confidence	Lift	Count
- Apple phone:				
{Apple_phone} => {Moxie_acces}	0.004017601	0.06043165	3.3250133	42
{Apple_phone} => {Otterbox_acces}	0.007843888	0.11798561	3.4744270	82
{Apple_phone} => {Griffin_acces}	0.006313373	0.09496403	2.3864278	66
- Apple laptop:	Support	Confidence	Lift	Count
{Apple_laptop} => {My MW_acces}	0.002582743	0.05162524	10.7938050	27
{Apple_laptop} => {Hyper_acces}	0.003156686	0.06309751	5.6377899	33
{Apple_laptop} => {Satechi_acces}	0.013105032	0.26195029	2.9830374	137
- Apple pc:	Support	Confidence	Lift	Count
{Apple_pc} => {LaCie_acces}	0.002391429	0.05966587	1.3861045	25
{Apple_pc} => {Apple_laptop}	0.002391429	0.05966587	1.1926329	25
{Apple_pc} => {Crucial_acces}	0.002391429	0.05966587	0.8250622	25
- Apple tablet:	Support	Confidence	Lift	Count
{Apple_tablet} => {Zagg_acces}	0.002295772	0.07868852	3.104188	24
{Apple_tablet} => {Apple_phone}	0.002104458	0.07213115	1.084977	22
{Apple_tablet} => {Apple_acces}	0.016261718	0.55737705	2.430880	170
- Apple Smartwatch	Support	Confidence	Lift	Count
{Apple_swatch} => {X-Doria_acces}	0.0011478860	0.07407407	5.415177	12
{Apple_swatch} => {Zagg_acces}	0.0022001148	0.14197531	5.600792	23
{Apple_swatch} => {Apple_phone}	0.0015305146	0.09876543	1.485603	16