ACQUISITION OF ELECTROINDEX
MARKET BASKET ANALYSIS

OBJECTIVE
Blackewell is considering of an acquisition of Electroindex. In order to decide, Data Science team support with an analysis to help the management decision making.

ELECTROINDEX
The new e-commerce company has a similar portfolio as ours which could indicate us to buy their customers:

1. PCs and Laptops are the most popular products. Its sells are outnumbering our volume of PCs and Laptops.
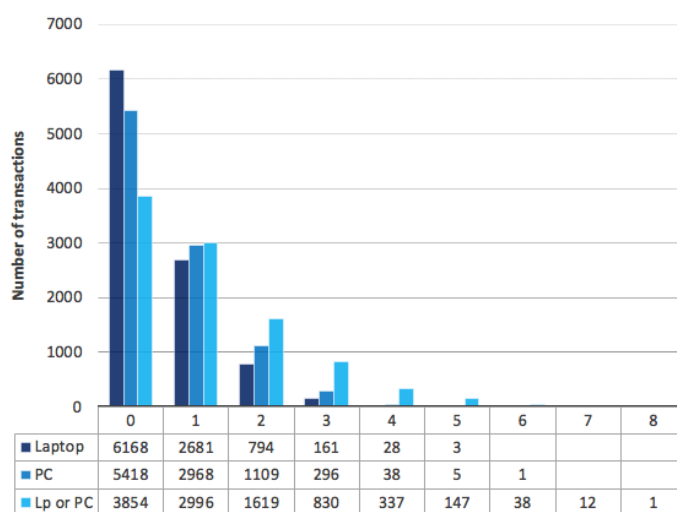
	Existing product - Avarage No. Item	Predicted product - Avarage No. Item	Avarage No. Item	New Company - Avarage No. Item	
PC	29	934	481	736	↗
Laptop	172	442	307	733	↗
Display	485	139	312	552	↗
Accessories	982	0	982	526	↙

2. Sold Displays have also better figures.

3. Number of purchased Accessories are falling behind comparing to us but still can be a potential market.

4. As PCs, Laptops and Displays usually have higher prices our profit could be higher. Accessories have lower margin and profit hence potentially it will not be a significant loss.

DEEPER INSIGHT OF THE PRODUCTS' RELATION

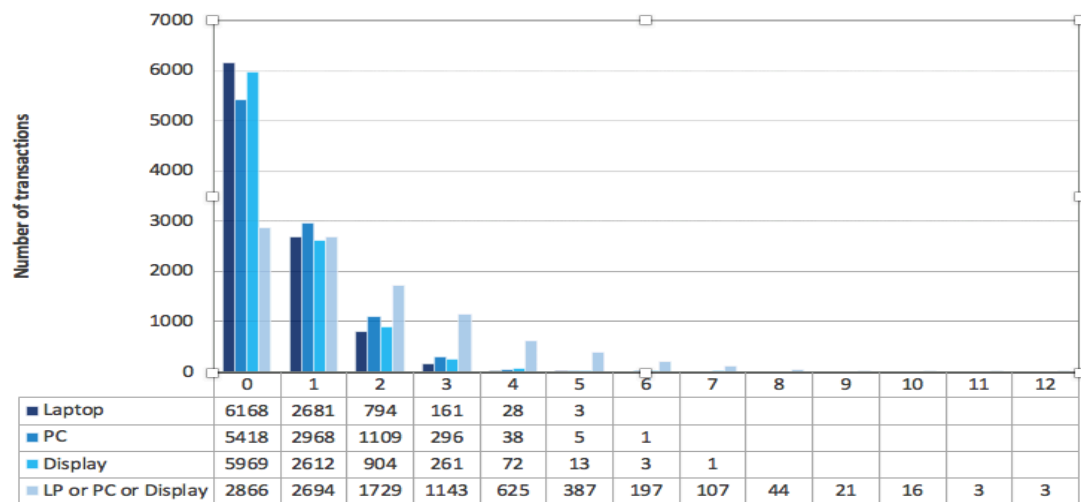|	0	1	2	3	4	5	6	7	8
Laptop	6168	2681	794	161	28	3			
PC	5418	2968	1109	296	38	5	1		
Lp or PC	3854	2996	1619	830	337	147	38	12	1

X label shows us how many PCs or Laptops were in one transaction.

Even the number of 1 PC/Laptop in a basket is extremely high, meaning with an acquisition we could buy a big market.

Note: transactions are not equal to customers. It can be one costumer who purchased 1 and 6 PCs and/or Laptops but in. different time.

But that we can still say purchasing power for those items are high.

	0	1	2	3	4	5	6	7	8	9	10	11	12
■ Laptop	6168	2681	794	161	28	3							
■ PC	5418	2968	1109	296	38	5	1						
■ Display	5969	2612	904	261	72	13	3	1					
■ LP or PC or Display	2866	2694	1729	1143	625	387	197	107	44	21	16	3	3

Add Displays to the formula, purchasing all three-product type are high.

Transactions where there are more than 3 items of PCs, Laptops or Display, we assume that behind there is a distributor or company behind. It means 2645 out of 10.000 transaction was made by those customers!

	0	1	2	3	4	5	6	7	8	9	10	11	12	14	14
■ Accesories	2470	3059	1843	1084	663	338	171	93	45	35	19	10	2	1	2
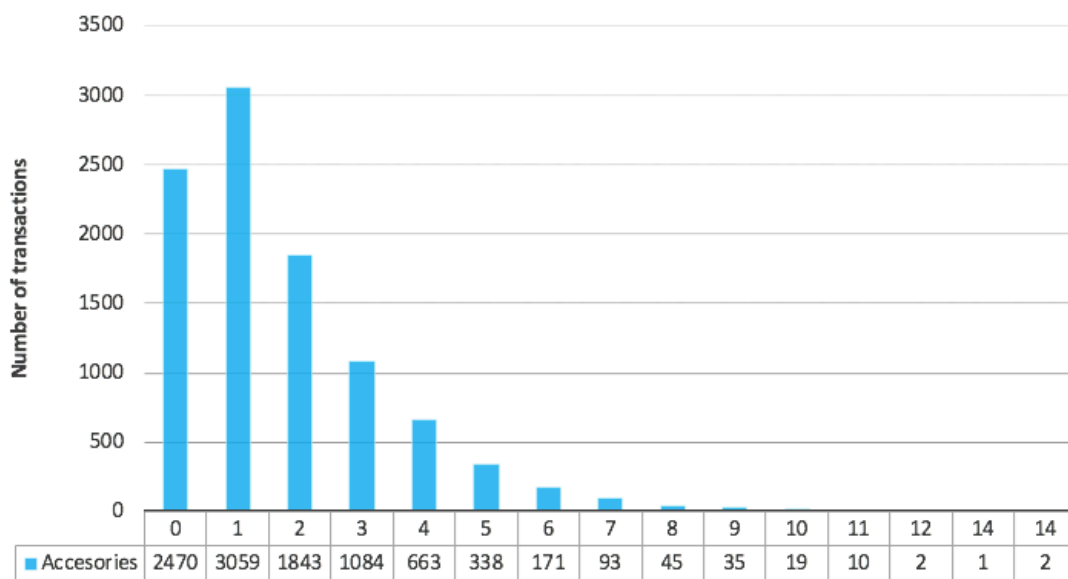
Elcetroindex has a very diverse product palette regarding to their Accessories. As our company do not have subset labels to this category, we merged all external devices such as headphones, disks, keyboards etc. to category Accessories.

Although Balckwell should consider specifying its categories more precisely for better recommendation systems in the future.

DEEPER INSIGHT OF THE PRODUCTS' RELATION

In order to investigate the relation between products we used Market Basket Analysis. We plotted more than 1300 rules to visualize those we are most likely interested in.

We break down the rules to have discovered into three categories:

1. **The Insightful Rules Category**
   Contains rules that are most useful.

2. **The Irrelevant Rules Category**
   The second category is for the rules that either aren't helpful or are obvious.

3. **The Unclear Rules Category**
   The third category is for rules that are indecipherable and, thus, from which we cannot draw insightful conclusions.

Scatter plot for 1378 rules
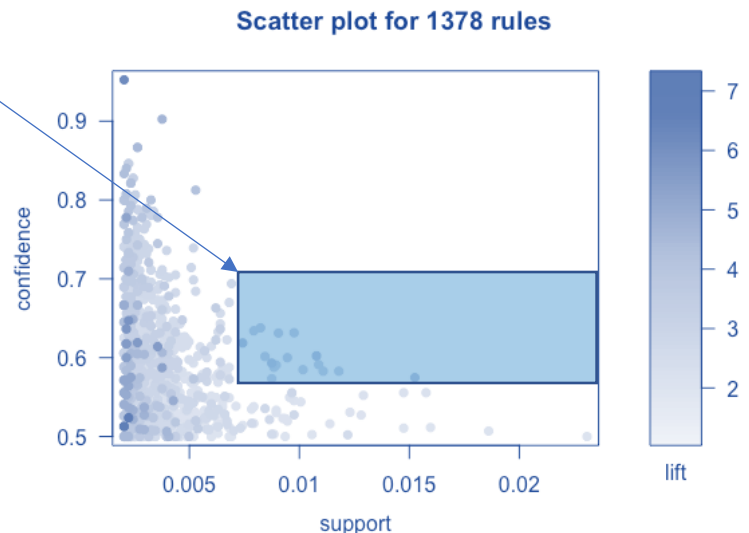
*Setting our support to 0.0055 and confidence to 0.55. Resulting a lift between 2 and 3.

No.	Left Hand Side of the Basket	Right Hand Side	Support	Confidence	Lift	Count
[13]	{Acer Aspire,ViewSonic Monitor}	{HP Laptop}	0.011	0.602	3.103	106.000
[10]	{ASUS Monitor,Lenovo Desktop Computer}	{iMac}	0.010	0.632	2.466	96.000
[11]	{Dell Desktop,Microsoft Office Home and Student 2016}	{iMac}	0.009	0.600	2.343	93.000
[4]	{ASUS 2 Monitor,Dell Desktop}	{iMac}	0.009	0.631	2.464	89.000
[20]	{HP Laptop,Lenovo Desktop Computer,ViewSonic Monitor}	{iMac}	0.008	0.601	2.348	83.000
[8]	{ASUS Monitor,ViewSonic Monitor}	{iMac}	0.008	0.638	2.490	81.000
[9]	{ASUS Monitor,Dell Desktop}	{iMac}	0.008	0.634	2.476	78.000
[1]	{Computer Game,ViewSonic Monitor}	{HP Laptop}	0.007	0.619	3.187	73.000
[19]	{Dell Desktop,Lenovo Desktop Computer,ViewSonic Monitor}	{iMac}	0.007	0.694	2.709	68.000
[6]	{Apple Magic Keyboard,ASUS Monitor}	{iMac}	0.007	0.670	2.616	67.000
[12]	{Acer Desktop,Apple Magic Keyboard}	{iMac}	0.007	0.623	2.431	66.000
[3]	{Acer Desktop,ASUS 2 Monitor}	{iMac}	0.006	0.643	2.510	63.000
[15]	{Acer Desktop,HP Laptop,ViewSonic Monitor}	{iMac}	0.006	0.656	2.562	63.000
[16]	{Acer Desktop,iMac,ViewSonic Monitor}	{HP Laptop}	0.006	0.636	3.278	63.000
[17]	{Acer Desktop,HP Laptop,Lenovo Desktop Computer}	{iMac}	0.006	0.633	2.470	62.000
[14]	{Acer Aspire,iMac,ViewSonic Monitor}	{HP Laptop}	0.006	0.663	3.416	61.000
[18]	{Dell Desktop,Lenovo Desktop Computer,ViewSonic Monitor}	{HP Laptop}	0.006	0.622	3.207	61.000
[5]	{ASUS Monitor,Microsoft Office Home and Student 2016}	{iMac}	0.006	0.615	2.400	59.000
[7]	{Acer Desktop,ASUS Monitor}	{iMac}	0.006	0.600	2.343	57.000
[2]	{Computer Game,Dell Desktop}	{HP Laptop}	0.006	0.609	3.136	56.000

The most popular products are HP Laptop and iMac Desktop, also the rules are confirming that there is connection between other products to those items. Support means of the

Our rules show for instance if customer buys Aces Aspire and ViewSonic Monitor there is 60 % of likelihood that customer would buy an HP laptop too. For future marketing campaign those products together can boost the sales numbers.
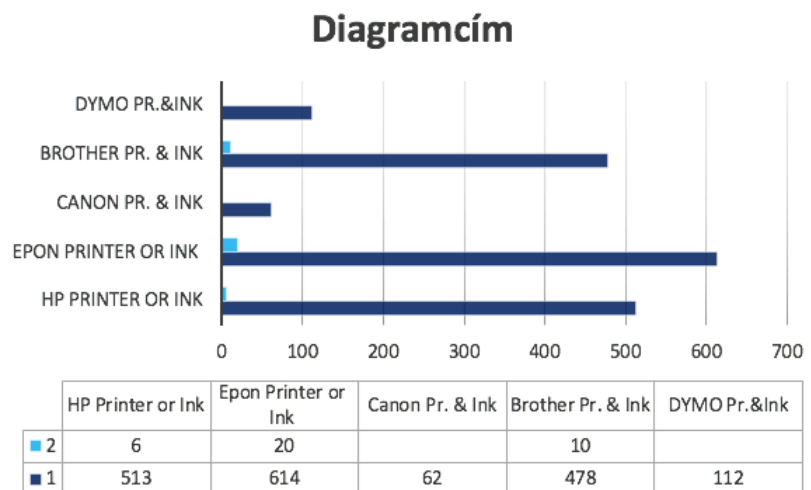
How iMac or HP Laptop explain other products?

There is also a connection between HP Laptop and iMac, if customer buy an HP laptop it is 38 % of likelihood that buy an iMac too. Opposite way iMac only explain 29%.

The rest of the rules are relatively low on Confidence to be useful.

No.	Left Hand Side of the basket	Righ Hand Side of the basket	Support	Confidence	Lift	Count
[1]	iMac	HP Laptop	0,07554652	0,2949583	1,519599	743
[2]	iMac	Lenovo Destkop Computer	0,0587697	0,2294561	1,549932	578
[3]	iMac	CYBERPOWER Gamer Destkop	0,05673615	0,2215165	1,20432	558
[4]	iMac	Dell Destkop	0,05460092	0,2131798	1,590762	537
[1]	HP Laptop	iMac	0.07554652	0.389209	1.519599	743

So, if a customer buys a printer how much percentage is that they buy the associated ink: Seems to be an obvious statement but is it?

Customer are not buying printers and inks together – should be investigate what is behind the phenomenon.

Diagramcím

	HP Printer or Ink	Epon Printer or Ink	Canon Pr. & Ink	Brother Pr. & Ink	DYMO Pr.&Ink
2	6	20		10	
1	513	614	62	478	112

CONCLUSION

Based on the volume of high price products, major company's customers might be high spender as distributors or companies. Which can be good asset for Blackwell strategy where we already prognosed the popularity of PCs, Laptops.

The new company product portfolio is diverse and well-labeled which can be also a contribution.

Further investigation such as profit margin and profitability, and obviously other aspect shall be considered during the acquisition.