

Market Basket Analysis for Electrodinex

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Introduction

The objective of this report is to find reasons among relations between order transactions to justify the decision on purchasing Electronidex company. The transactional data belongs to 1 month period of Electronidex's sells.

Summary

After doing the analysis we advice that it would be interesting to purchase the company in order to add products like Desktops and Laptops to the portfolio.

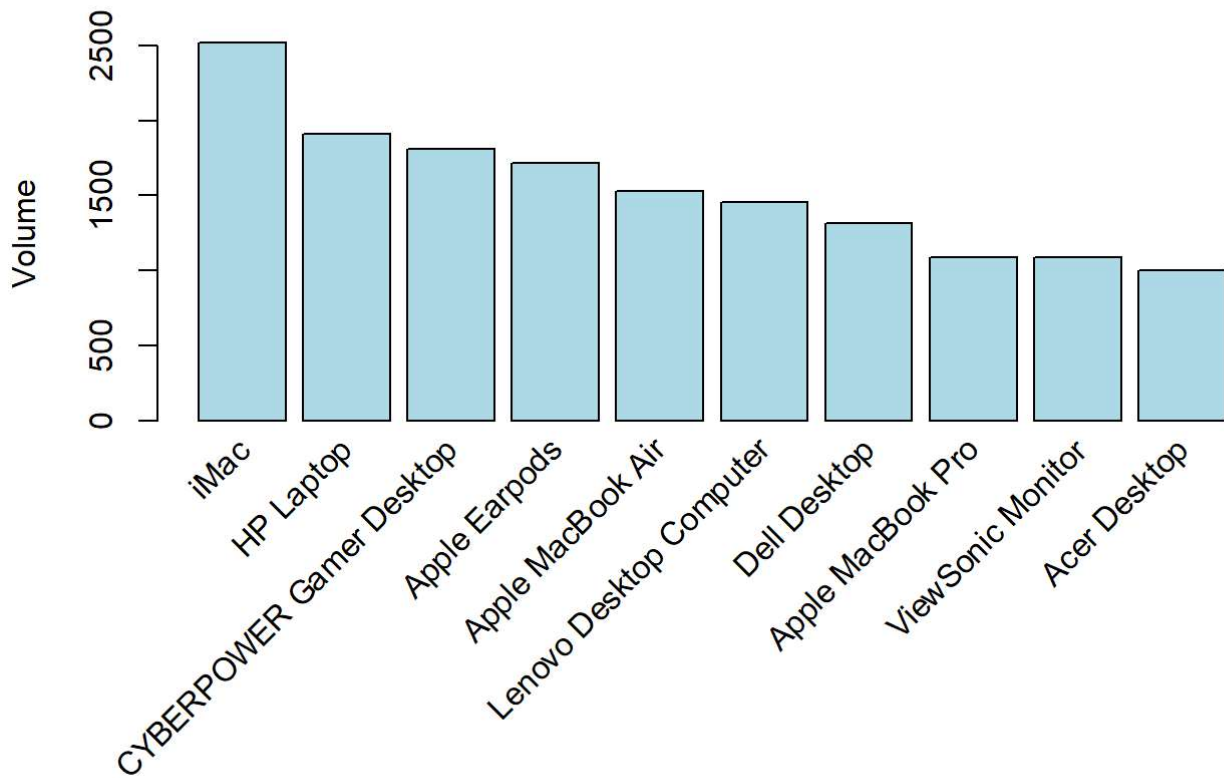
We could expect to gain new customers from the Electronidex aquired products aswell.

Even so, it would be important to keep in mind that the time period of sales of Electronidex's transactions covers only one month, which means that it could be different from another one. This is because it would not be the same selling products on June than on December. It would be interesting then to have the sales data for the same period of time for both companies, as well as the transactional data of Blackwell.

Conclusions by product

Let's look at some histograms that show the frequency of purchases for each category for both, Electrodinex and Blackwell.

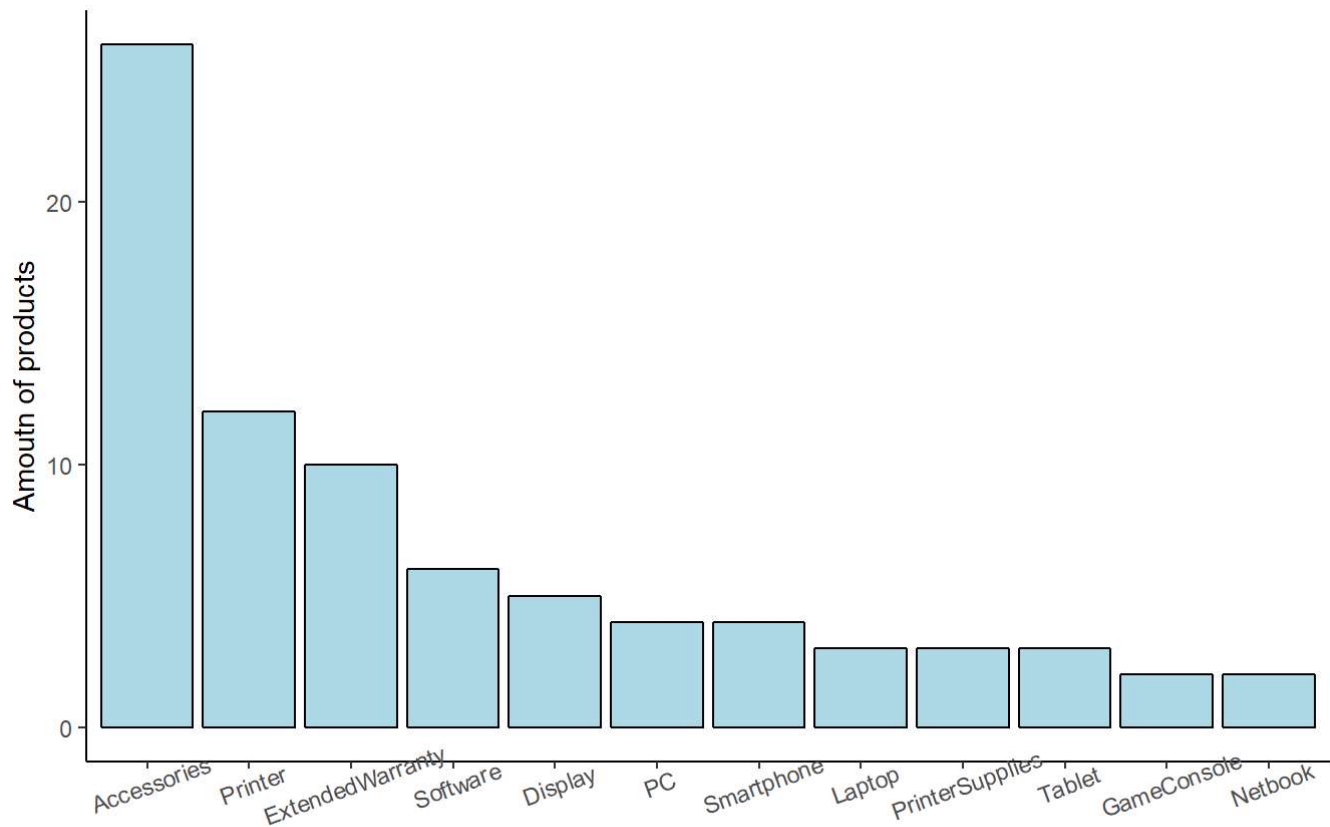
Top 10 Products Electronidex



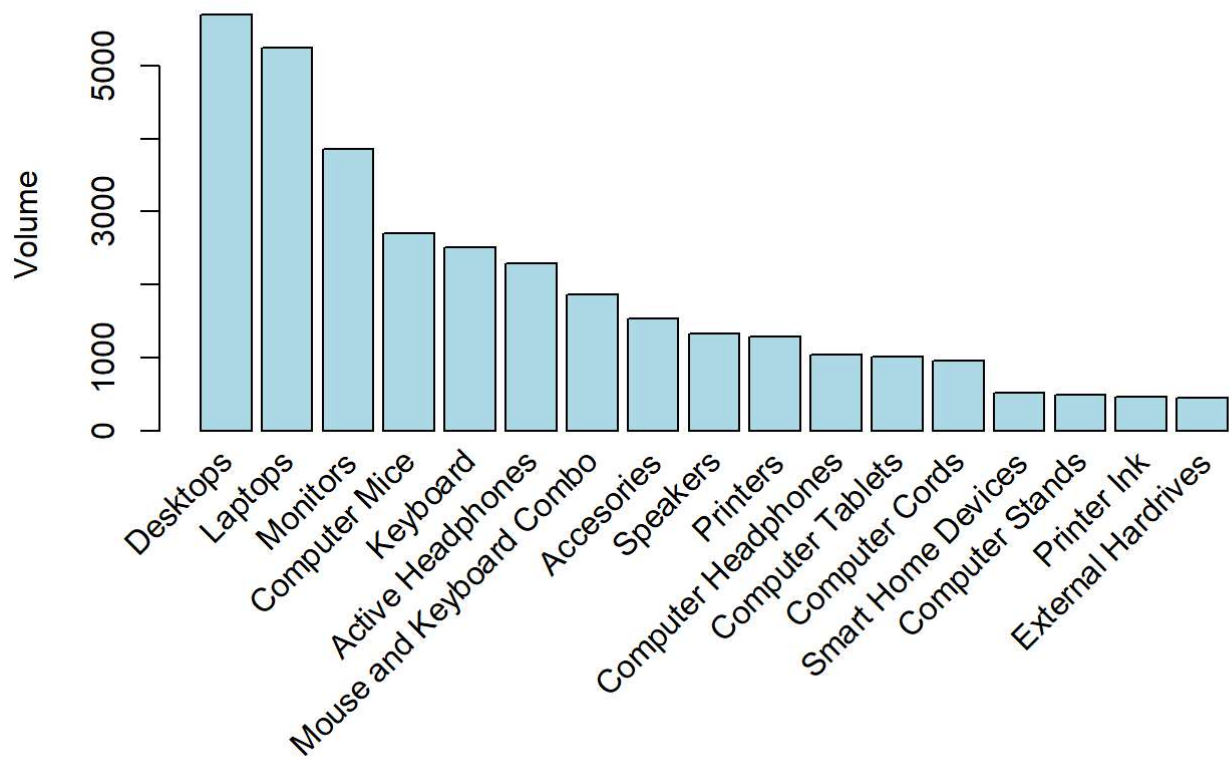
As we can see, Electronidex sells many different products. Products belong to brands like Apple or HP and to categories like Desktops or Monitors. Studying the products using those conditions could bring more insights aswell.

In the following histograms, we can observe the different categories of products for each company.

Blackwell products by category



Electronidex products by category



If we had the transactional data of both companies, we could confirm, as we observe in the histograms, that we should acquire Desktops and Laptops to increase the Blackwell catalog. This way, it would increase the volume of clients and company profit, since we know that Desktops and Laptops are the ones that have the greatest profitability at Blackwell.

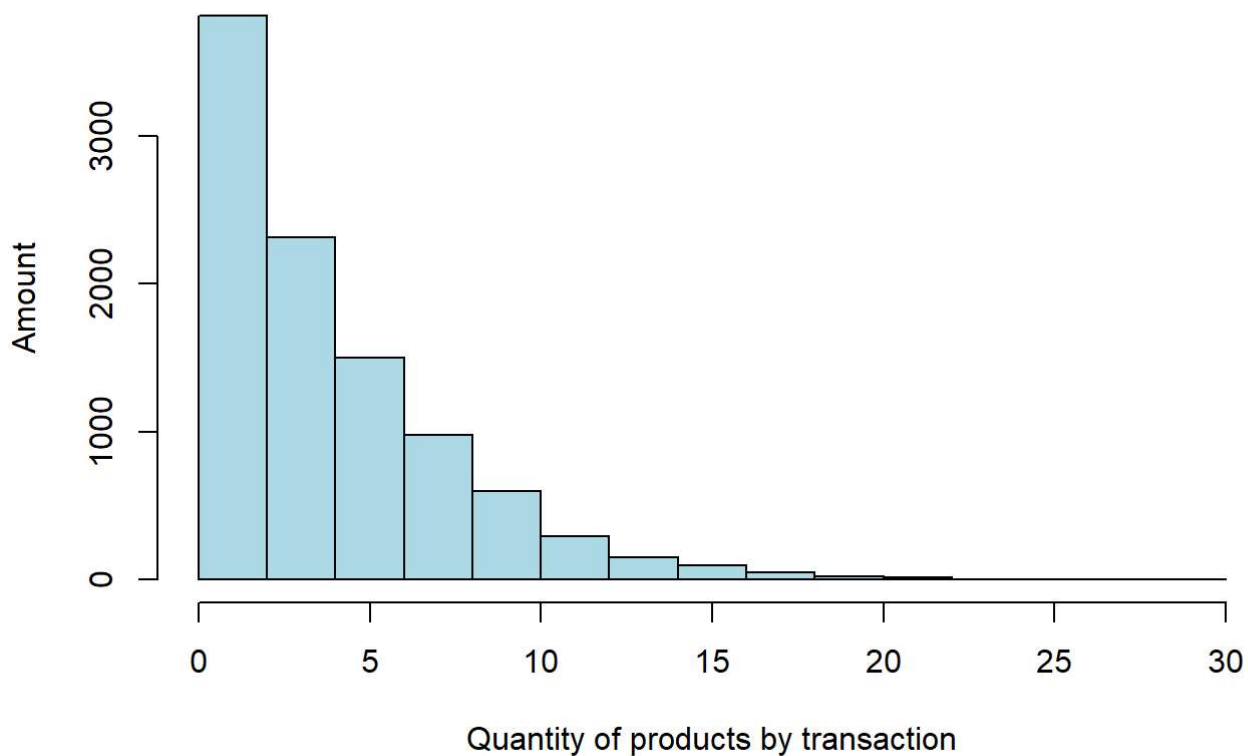
Analysing relations among products

```
##      lhs                                rhs      support
## [1] {Acer Aspire,ViewSonic Monitor}    => {HP Laptop} 0.01077783
## [2] {ASUS 2 Monitor,Lenovo Desktop Computer} => {iMac}    0.01087951
## [3] {Apple Magic Keyboard,Dell Desktop}  => {iMac}    0.01016777
## [4] {ASUS Monitor,HP Laptop}            => {iMac}    0.01179461
## [5] {ASUS 2 Monitor,HP Laptop}          => {iMac}    0.01108287
## [6] {Dell Desktop,ViewSonic Monitor}    => {HP Laptop} 0.01525165
##      confidence lift      count
## [1] 0.6022727  3.102856 106
## [2] 0.5911602  2.308083 107
## [3] 0.5847953  2.283232 100
## [4] 0.5829146  2.275889 116
## [5] 0.5828877  2.275784 109
## [6] 0.5747126  2.960869 150
```

The relationships among products is very low when the entire portfolio is analyzed globally. Apparently, this indicates that the products are not related to each other. In addition, the fact that in the same transaction there are products of the same category, for example Desktop, could indicate that the type of customer is Whole Sale apart from Retail.

In the following histogram we could guess that there are the two types of clients mentioned above. We reached that conclusion because the number of products per transaction varies between 1 and 30, so that transactions with a smaller number of products could be from the retail sector.

Frequency of transactions



As we have seen, that iMac and HP Laptop are the best selling products, we will study the direct relationships with the other products.

```
##      lhs      rhs      support  confidence
## [1] {HP Laptop,iMac} => {ViewSonic Monitor} 0.02369090 0.3135935
## [2] {HP Laptop,iMac} => {Lenovo Desktop Computer} 0.02308083 0.3055182
## [3] {HP Laptop,iMac} => {Dell Desktop} 0.02226741 0.2947510
## [4] {HP Laptop}      => {ViewSonic Monitor} 0.04799187 0.2472499
## [5] {HP Laptop,iMac} => {CYBERPOWER Gamer Desktop} 0.01799695 0.2382234
##      lift      count
## [1] 2.842574 233
## [2] 2.063716 227
## [3] 2.199451 219
## [4] 2.241200 472
## [5] 1.295151 177
```

We can conclude that the products with more sales, “iMac” and “HP Laptop”, are not related to the rest of products due to the low values on support and confidence.

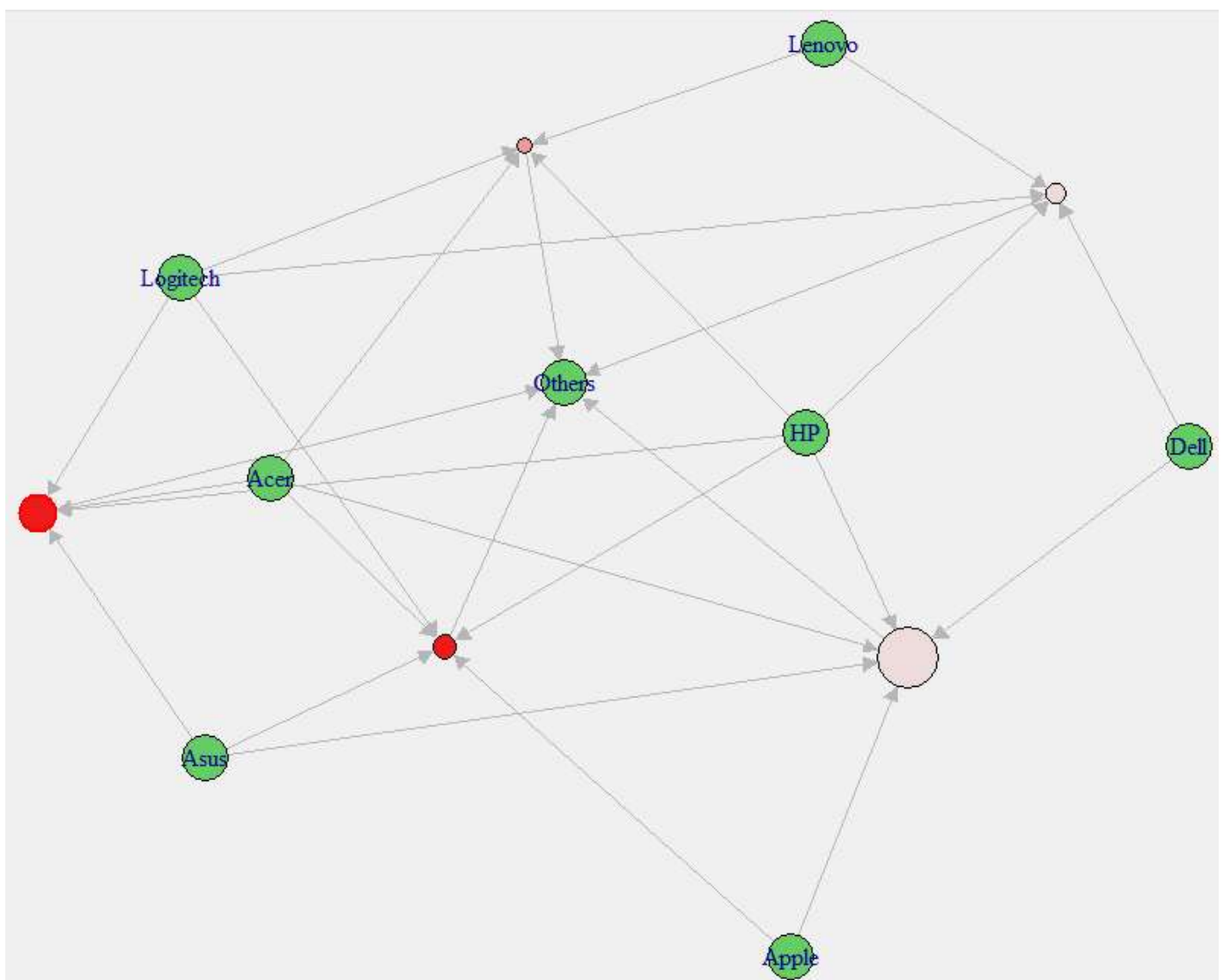
Conclusions by brand

We have identified the brands with more products and the rest has been grouped with the name “Others”.

##	lhs	rhs	support	confidence
## [1]	{Acer,Asus,HP,Logitech}	=> {Others}	0.01281139	1.0000000
## [2]	{Acer,Apple,Asus,HP,Logitech}	=> {Others}	0.01128622	1.0000000
## [3]	{Acer,HP,Lenovo,Logitech}	=> {Others}	0.01016777	0.9900990
## [4]	{Dell,HP,Lenovo,Logitech}	=> {Others}	0.01067616	0.9813084
## [5]	{Acer,Apple,Asus,Dell,HP}	=> {Others}	0.01586172	0.9811321
## [6]	{Acer,Asus,Dell,HP}	=> {Others}	0.01789527	0.9777778

##	lift	count
## [1]	1.584501	126
## [2]	1.584501	111
## [3]	1.568813	100
## [4]	1.554885	105
## [5]	1.554605	156
## [6]	1.549290	176

As we can see, the strongest rule among categories is directly related with the category “Others”, composed mainly by accessories.



Also we can see that Apple has no many relations with brand “Others” even if it is the most sold category of products.

Insights about Apple

```
##      lhs      rhs      support  confidence lift      count
## [1] {Apple} => {Others} 0.4061007 0.6373065 1.009813 3994
## [2] {Apple} => {HP}    0.2201322 0.3454603 1.067757 2165
```

We can confirm that Apple does not have many relations with any other brands. It only has relation with the category “Others”.

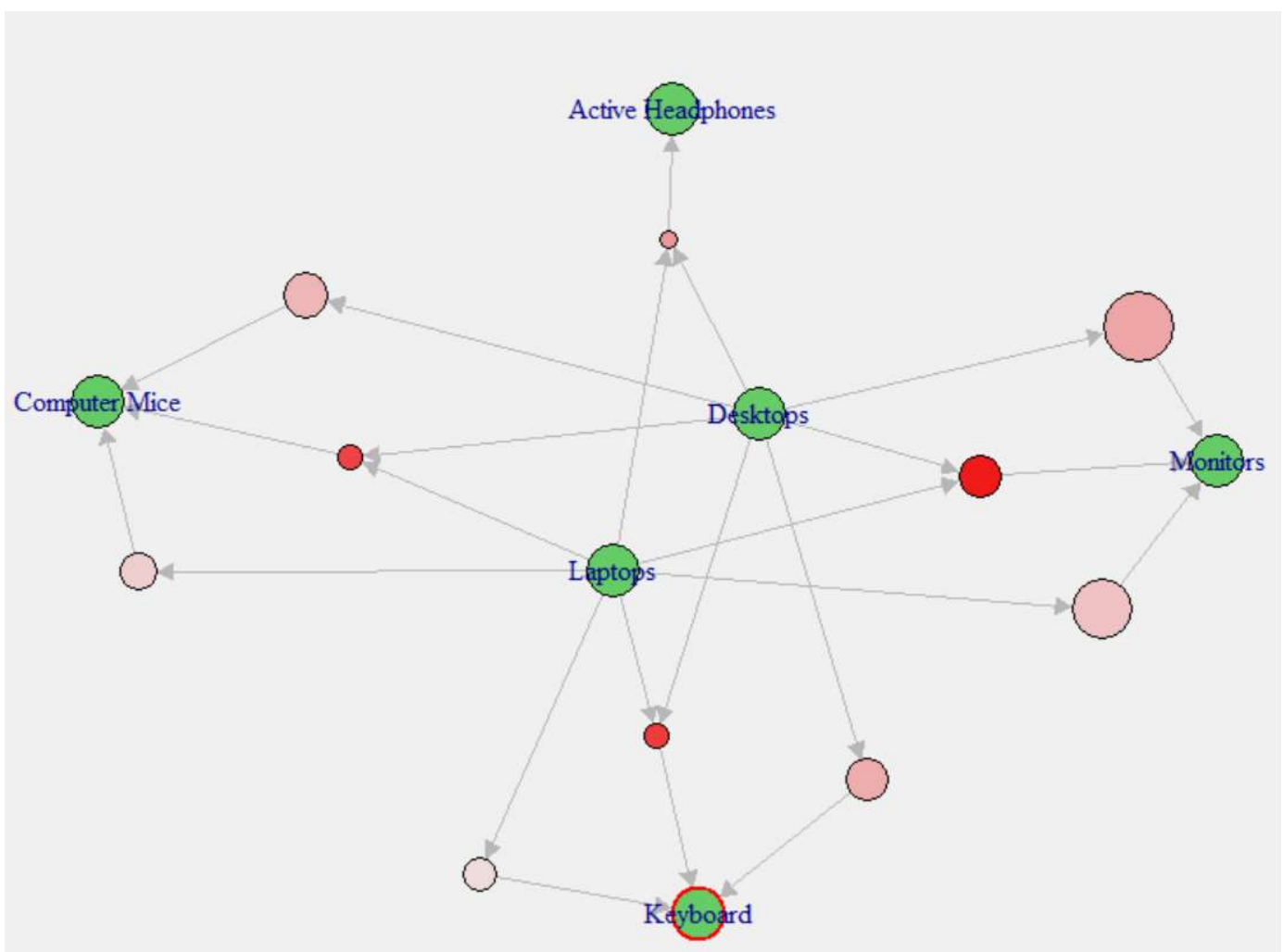
Conclusions by category

```
##      lhs                                     rhs      support confidence      lift count
## [1] {Computer Mice,
##      Desktops,
##      Monitors,
##      Mouse and Keyboard Combo,
##      Printers}      => {Laptops} 0.01077783 0.9298246 1.739883 106
## [2] {Active Headphones,
##      Computer Mice,
##      Computer Tablets,
##      Monitors}      => {Desktops} 0.01016777 0.9259259 1.596508 100
## [3] {Computer Mice,
##      Laptops,
##      Monitors,
##      Mouse and Keyboard Combo,
##      Printers}      => {Desktops} 0.01077783 0.9217391 1.589289 106
## [4] {Computer Mice,
##      Computer Tablets,
##      Keyboard,
##      Monitors}      => {Desktops} 0.01159126 0.9193548 1.585178 114
## [5] {Accesories,
##      Computer Headphones,
##      Laptops,
##      Monitors}      => {Desktops} 0.01250635 0.9179104 1.582687 123
## [6] {External Hardrives,
##      Laptops,
##      Monitors}      => {Desktops} 0.01199797 0.9147287 1.577201 118
```

As we can see, the strongest rules are related with Desktop and Laptops products.

Relations with the strongest product categories

```
##      lhs                rhs          support  confidence lift
## [1] {Desktops,Laptops} => {Monitors}    0.1825114 0.5689382 1.447363
## [2] {Desktops}         => {Monitors}    0.2785968 0.4803647 1.222035
## [3] {Laptops}          => {Monitors}    0.2404677 0.4499619 1.144691
## [4] {Desktops,Laptops} => {Computer Mice} 0.1224199 0.3816165 1.390588
## [5] {Desktops,Laptops} => {Keyboard}     0.1146924 0.3575277 1.399238
## [6] {Desktops}         => {Computer Mice} 0.1879004 0.3239832 1.180576
##      count
## [1] 1795
## [2] 2740
## [3] 2365
## [4] 1204
## [5] 1128
## [6] 1848
```



We can see that Electronidex sells many accessories when it sells different Desktops or Laptops, which led us to think that this is very interesting for Blackwell in case of buying Electronidex. It can increase the sales of its own accessories as well as attract the customers of the new acquired products.

Suggestions

- Detailed analysis with transactional data from both companies for the same period of time. We should have more historical data, not only monthly since the sales may change depending on the month they were registered.
- Break down the “Accessory” category from Blackwell data in order to cross it with future transactional data and confirm the hypothesis that when buying Desktops or Laptops, Accessories are bought aswell.

- Go deeper into the analysis of Electronidex's data by splitting it into subgroups of clients (eg. Whole Sale and Retail).
- Analyze the data by removing Apple brand products since the greatest relationship they have is with themselves.