**DISCOVER ASSOCIATIONS BETWEEN PRODUCTS**

**Executive Summary**

The CTO, Danielle has asked for a market basket analysis report to help Blackwell’s board of directors understand the nature of Electronidex’s clients so as to ascertain if acquisition of Electronidex would be a favorable acquisition.

A dataset of 9835 transactions was provided. These transactions are a month’s worth of Electronidex’ online transactions.

The task to is to discover relationships or associations between these customers’ transactions and the items they have purchased so as to use these discoveries to drive sales-oriented initiatives.

**Deductions from the Analysis**

It should be noted that the data obtained was only for one month, thus the results may be biased. Therefore, the conclusions reached in this report should only serve as a reference to decision making. demonstrated in this report should serve just as a reference.

Analyzing the sales pattern, it is obvious that Electronidex´s clients are both final customers and companies. These groups have completely different shopping behaviors and therefore follow different association patterns.

Blackwell will benefit a lot from selling Electronidex’s items because of the following reasons:

* ***Customer & Products Base & Expansion*** : Electronidex has some different product categories which Blackwell does not have. Acquiring Electronidex will help Blackwell in adding to its existing catalog of customers and products which will help boost Blackwell’s revenue.
* ***New Marketing/Sales Strategies:*** Blackwell can leverage on knowledge gained from this market basket analysis to adopt new marketing or cross-selling strategies. Lowly purchased items can be merged with the highly demanded products so as to encourage sales for the less desired products. We can also use the associations discovered to provide recommendations to our online customers thus boosting revenue.

In common product types between Blackwell and Electronidex are: Laptops, Printers, PC, Monitors, Tablets and Accessories.

**Data Processing**

A summary of the data shows that:

* total of 985 transactions in the period with 125 different items purchased.
* iMac is the most purchased product being purchased 2519 times.
* number of items purchased per transactions varies from 1 to 30.
* median is 3 and mean is 4.38.

The graph below shows the top 10 products according to frequency of the sales made. The top 5 products are ***iMac, HP Laptop, CyberPower Gamer Desktop, Apple EarPods and Apple MacBook***. We can deduce from here that Electronidex customers are rich and they prefer Apple products.

![A close up of a logo

Description automatically generated]()

To aid Blackwell in efficient decision making, We decided to categorize Electronidex products into “product types”. This is because the “Profit Predictability Report” was based on Blackwell’s Product Types.

A summary of the stratified data shows that:

* total of 9835 transactions in the period with 17 product types.
* Desktop is the most purchased product type being purchased 5704 times.
* number of product types purchased per transactions varies from 1 to 14.
* median is 3 and mean is 3.38

The graph below shows the top ten products according to frequency of the sales made. The top five product types are ***Desktop, Laptops, Monitors, Computer Mice and Keyboard.***

![A close up of a logo

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**Market Basket Analysis**

The market basket analysis ran on R returned 413 rules, scatter plot shown below

![A screenshot of a cell phone

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Below are the top ten rules derived.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **lhs** | **rhs** | **support** | **confidence** | **lift** | **count** |
| 1 | {Computer Mice, Desktop, Mouse and Keyboard Combo, Printers} | {Monitors} | 0.01047280 | 0.8240000 | 2.096234 | 103 |
| 2 | {Computer Tablets, Desktop, Laptops, Printers} | {Monitors} | 0.01138790 | 0.8235294 | 2.095037 | 112 |
| 3 | {Accessories, Desktop, Keyboard, Speakers} | {Monitors} | 0.01016777 | 0.8196721 | 2.085224 | 100 |
| 4 | {Active Headphones Desktop, Keyboard, Printers} | {Monitors} | 0.01067616 | 0.8139535 | 2.070676 | 105 |
| 5 | {Active Headphones, Desktop, Keyboard, Speakers} | {Monitors} | 0.01108287 | 0.8134328 | 2.069351 | 109 |
| 6 | {Computer Headphones, Desktop, Laptops Printers | {Monitors} | 0.01118454 | 0.8088235 | 2.057625 | 110 |
| 7 | {Active Headphones, Keyboard, Laptops Speakers} | {Monitors} | 0.01057448 | 0.8062016 | 2.050955 | 104 |
| 8 | {Computer Cords, Desktop, Laptops Mouse and Keyboard Combo} | {Monitors} | 0.01382816 | 0.8047337 | 2.047221 | 136 |
| 9 | {Computer Tablets, Laptops, Printers} | {Monitors} | 0.01250635 | 0.8039216 | 2.045155 | 123 |
| 10 | {Computer Cords, Desktop, Laptops, Printers} | {Monitors} | 0.01037112 | 0.8031496 | 2.043191 | 102 |

Most popular transaction is that of Mouse and Keyboard Combo, Monitors, Desktop and Computer Cords. This is followed by Computer Tablets, Laptops, Monitors and Printers.