To: Danielle Sherman

From: Michael Bauler

Date: December 19, 2020

Subject: Market Basket Analysis Report

**Introduction**

We have been given the task of performing a market basket analysis of data provided by the online retailer, Electronidex. Electronidex is potentially going to be acquired by Blackwell Electronics. Danielle has requested that we identify the purchasing patterns of Elctonidex’s clientele based on 30 days of transactions and discover the relationships between what customers order. Some important tasks to consider are the patterns between transactions, how Blackwell can benefit from acquiring Electonidex, and if they should acquire this company.

**Observations**

The Electronidex online transaction dataset contains 9835 total transactions with 125 total possible products to choose from within a 30-day time span. A summary of transactions was performed and revealed the following observations:

* Top 20 most frequently purchased items include: Apple iMac, HP Laptop, Cyberpower Gamer Desktop, Apple Earpods, Apple MacBook Air… (be see Figure 1).
* The Apple iMac was the most frequently purchased items at 2519 purchases
* 7672 transactions included more than 1 item, however, 2163 transactions only included 1 item, indicating potential for cross-selling opportunities
* The average # of items purchased per transaction is 4.4

**Figure 1. Top 20 most frequently purchased items from Electronidex**Chart, bar chart

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**Modeling and Rules**

The apriori model was used to create rules of association between the products in all the transactions. Apriori is an unsupervised learning model used for basket market analysis and finding the associations between all the items, creating rules to show how products relate when purchased together. In this case we used a support of .005, meaning that there needs to be at least 50 cases where the rule happens. With a confidence of at least 65% if item X is purchased, item Y will also be purchased.

**Terms**

* Rule notation that represents which item/s is frequently bought with what item/s. It has an *LHS* and an *RHS* part and can be represented as follows:

**itemset A => itemset B** This means, the item/s on the right were frequently purchased along with items on the left.

* LHS Left-Hand Side
* RHS Right-Hand Side

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**Would Blackwell benefit from selling any of Electronidex’s items?**

Blackwell and Electronidex both sell similar products (PCs, Laptops, Accessories, Software, and Printers), and as such, the clientele for both companies is alike. I believe Blackwell would benefit from selling Electronidex’s top 20 most frequently purchased items not already sold by Blackwell, as well as any item listed within the top product relationships (potential for sales boost).

**Conclusion and Recommendations**

I believe Blackwell should acquire Electronidex as long as projected growth in sales and profits surpass the expenditure of purchasing Electronidex. If Blackwell acquires Electronidex, I recommend that it focus on cross-selling products shown in this analysis to be correlated by initiating package deals that offer discounts if certain products are purchased together i.e. purchasing a Viewsonic Monitor with the purchase of a Dell Desktop. This will help maximize sales revenue.