*11/11/2020*

*Subha Varadarajan*

# Executive:

This report was commissioned to examine the Global Superstore Dataset, why few markets/regions experienced losses. The visual analysis draws attention to the fact that high promotions/discount rate is one of the major factors which plays an important role in reducing the profitability. Therefore, the first step would be to minimize the discount rate in order to get better profit or reduce the loss. Further investigations reveal the fact that region like (South Eastern Asia) heavy loss is incurred due to the increased discount rate. By performing all the above steps effectively and efficiently the decision makers can achieve their goal easily and quickly.

# Background:

Global Superstore is a global retailer company selling 3788 different products under 17 sub-categories and 3 categories including furniture, office supplier and technology across 165 countries, 23 regions in 5 major markets. From 2012 to 2015, the company has brought in $12.64M in total sales and $1.47M in profit. The overall profit margin is 11.61%.

While each region has a regional marketing manager who develops and implements strategic regional marketing plans, an international marketing manager is responsible for developing and executing business strategies organization and global wise.

As the initiator, the international marketing manager would like to know the overall sales performance and profitability across regions. Understanding which product category and segment has the highest profit vs lowest profit was also her area of interest. More importantly, she is eager to know what factor(s) of profit gain or loss could be. So that she and her team could make better decisions on marketing strategy, promotion strategy, pricing policy, operational process improvement, and/or sales channel recommendation in order to improve profitability organization wise.

In a nutshell, the initiator not only would like to have the high-level understanding of the sales performance, but also to put emphasis on the most problematic area and help to solve the issue.

# Purposes and Questions:

## Purpose:

The sole purpose of this study is to improve the profit. Our intent is to explore the losses occurred across various markets and regions. Initially, we found the root cause for the losses which was followed by a recommendation to fix the loss occurred. Hence, the analysis will be focused primarily on the factors affecting the loss.

## Questions that we brought up during analysis:

\* What is the profitability by market, region and country?

\* What is the profitability by product category, sub-category and segment?

\* How does the sales and profit change overtime?

\* What is the profit margin by market, region and country?

\* Which products are the most profitable vs least profitable?

\* Which products are most sold?

\* Will promotion/discount affect the total profit margin?

\* Will the shipping cost affect profitability?

\* Why customer return their order?

\* Is there common feature among returned order?

\* Will shipping method affect return?

# Methods and Data Source:

## Methods:

We used the following methods for our investigation:

* Drill Down method was used to study the profit change among categories, sub-categories, marketwise, region-wise and country-wise.
* Profit change over time was visualized in order to know about any event happened in that year/time which contributed to the loss on that year.
* Different factors were considered in this investigation – Shipping Cost, Discount, Time, Returns also was considered as one of the factors. (Since, returns did not give us a meaningful insight we did not add it to our story point)

## Data Source:

There are 3 data sets including People, Returns and Orders. The Orders and Returns data are transactional data which was recorded when sales transaction and Return request were completed during 2012 to 2015. In the People table, it records the regional marketing manager’s name for each region.

The original Orders table has 51,290 records and 24 columns; the original Returns table has 1,079 records and 3 columns; the original People table has 22 records and 2 columns. We also created more than 10 measures and new columns during our analysis.

We have joined the 3 tables for analysis, but the major part of our analysis is related to Orders. To be noticed, there is a one to many relationship between Returns table and Orders table as Returns uses Order ID as unique identifier which means for each return request, it returns all related products under the same order.

And also, there is a one to many relationship between People table and Orders table as each region only has one regional marketing manager. However, we found that in the People table, there are 2 regions for Canada named as Western Canada and Eastern Canada, while in Orders table, there is only one region named as Canada which can cause issues and may need to be solved as needed.

In addition, we have a few assumptions/clarifications listed as below:

* Profit = Sales – Cost – Shipping Cost; (we created a new column for Cost)
* Sales = Price \* (1- Discount) \* Quantity; (Price is not in the table)
* Profit Margin = Profit/Sales; (we created a new column for Profit Margin)

# Results and Recommendations:

Here goes the detailed description of the investigation done.

**Question1**: How does profit differ across product category and subcategory?

Timeline

Description automatically generated

**Observation**: It is clear that there is a profitability issue under the table subcategory.

**Next step:** We wonder if the issue is caused by time-related event? Namely, is there a specific time/year causing big profit loss?

**Question2**: Is there a specific time period related to the profit loss of tables? Namely, would the time be a factor for profit loss?

Chart, line chart

Description automatically generated

**Observation**: ﻿From the graph, it is unlikely that a specific time period caused the profit loss. There must be other reasons we should explore.

**Next step:** We wonder how table profit differ across market? Namely, we assume different market may have different customer needs and/or operational efficiency, etc., which could affect the profit of tables. Let's explore.

**Question3:** How does the profit of table differ across market?

Chart, bar chart

Description automatically generated

**Observation**: ﻿It is clear that large proportion of profit loss are from the four markets. There must be distinct factor(s) causing the difference of profit between Africa and the other four market.

**Next step:** We wonder if shipping cost could be a factor as we assume higher shipping cost could lead to lower profit. Let's first explore the relationship between the two variables. If the assumption holds true--higher shipping cost leads to lower profit, and Africa market has lower shipping cost than other market, then we can will get the answer.

**Question4**: Is shipping cost a factor for profit loss in tables?

Chart, scatter chart

Description automatically generated

**Observation**: The trend line shows that it is very likely the shipping cost has very small impact on the table's profit as the r-square is only 0.03, which means shipping cost can only explain 3% variance of profit, profit loss as well. Hence, instead further explore the difference of shipping cost among the market, we need to explore another factor.

**Next step:** How does the promotion (measured by discount) affect profit? As we assume if promotion can't lead to more sales, then the profit would go down. Let's explore.

**Question5:** Is discount a factor for profit loss in tables?

Chart, scatter chart

Description automatically generated

**Observation**: It is very likely that discount has a large negative impact on profit in tables, higher discount leads to lower profit. It also indicates the discount related promotion activities are not effective when it comes to tables. An explanation can be that customer won't buy more tables even if there is a good discount.

**Next step:** In order to know whether discount is the factor which cause Africa differing from other four markets in terms of table profit, we need to see how discount differs across markets.

**Question6**: Is discount the reason why Africa has the highest profit in table compared to other four markets?

Chart, box and whisker chart

Description automatically generated

**Observation**: Yes, the assumption that discount is the factor causing difference of profit among markets holds true.

**Next step:** Now we are confident to say "discount" is the factor causing profit loss. But which market we should focus on considering restricted resources and time?

**Question7:** Which market has the lowest profit margin vs highest profit loss?

Chart, bar chart

Description automatically generated

﻿**Observation**: As Asia Pacific has the lowest profit margin and the largest profit loss in tables, our first priority is to look into this market and figure out where and how to locate resources to improve profitability by looking at region, country, and product segment that was affected most.

**Next step:** Figure out which area is most problematic.

**Question8**: Which region and country have larger profit loss in which product segment?

Map

Description automatically generated

﻿**Observation:** Highest loss for tables was incurred in Southeastern Asia. In this region, Indonesia contributes to the majority loss. Meanwhile, the profit differs across product segments where consumer and corporate product have relatively higher profit loss than home office. As a result, the highest priority should be in this region and especially in Indonesia.

**Recommendation:**

The following are the recommendations in order to fetch profit where losses have occurred.

Firstly, high discount in table should be avoided or reduced.

Secondly, each regional marketing manager should evaluate the efficiency of their promotion activities in table, especially in Southeastern Asia region.

Thirdly, research on customer needs about tables from different segment is suggested to be performed.

**Limitations:**

* As a result of our investigation, discount is one of the factors influencing the loss. We are not sure whether there are any other factors which affect the profitability.
* Our study is restricted to only the Tables sub-category because it accounts to the major loss when compared to the other categories. Hence, the recommendation suggested in this study may not be applicable to other categories/ sub-categories.
* We are unsure whether the sales were recorded before or after the return. If the sales noted is after the return, then return should give us a clear insight.