1. Executive Summary

Motivation(Business Insight): Quality Alloys is a relatively small US based distributor of a variety of alloys used in industrial manufacturing. In mid 2008, QA decided not only to extend their marketing reach by establishing a web presence, but also designed a brochure as a promotional campaign. In our data analysis which is conducted in "Excel Sheet-Quality Alloy", we will examine our data to find out answers for questions such as;

Method: The data was collected in 2008, starting from the first full week the website was available to visitors which is over the period May 25 2008-August 2009. Web metrics were tracked using Google Analytics and the sponsored links to the QA's website that were promoted by Google Adwords program. The entire time-frame given in the dataset was divided into four sections; "initial", "pre-promotion", "promotion" and "post-promotion" periods.

Mechanics:
The analysis is conducted as a 3 step process during the Quality Alloy Case Study;

The first part of our analysis was mainly focused on understanding the effectiveness of promotion specifically whether it generated visitors to the QA's new website and how that reflects to the company sales.

- The four different charts were created and examined for the following variables; **unique visits over time, revenue over time, profit over time, pounds sold over time.** See "Appendix" Figure-1:4
- Summary statistic values (See "Appendix: Table1:4"), visual charts representing the mean changes across different promotional periods (See "Appendix: Figure 5") and table See "Appendix: Table 5"representing those were created for the following variables; **visits, unique visits, revenue, profit and pounds sold** for the four different time-periods to examine the impacts of promotions.

Findings: When we look at the data and the charts conducted in this first section, we can point to an apparent increase for unique visits starting from the end of January and the level off starts around the May which aligns with the promotion period given in our case. (See "Appendix: Figure1") On the other hand, when we look at the revenue, profit and lbs sold charts, there is a slight decline for the same time frame(Jan-May)(See "Appendix: Figure2:4")

MEANS					
	VISITS	UNIQUE VISITS	REVENUE	PROFIT	LBS SOLD
INITIAL PERIOD	1,055	976	608,250	200,233	18,737
PRE-PROMOTION	563	517	534,314	159,932	18,441
PROMOTION	1,814	1,739	456,399	131,930	17,113
POST PROMOTIO	857	801	371,728	111,046	14,578

Looking at the data and the analysis & charts especially analyzing mean values, there's an obvious positive effect **on visits and unique visits** coming from promotion. However, looking at the **average revenues in the promotion period**, there is no increment seen. Moreover there is a moderate decline. The decline might not be associated with the promotion, we need more analysis to understand. The rate of visits ended up with purchases is not high so even if we see the dramatic increase in the mean visits, we cannot see the same with revenue and profit. So from a brand marketing standpoint, we could say **promotion is successful because it generated a high rate of increment in the visits and unique visits** to the page. However, from the business development-financial standpoint it's hard to say that promotion was successful before doing further analysis.

In the second step of our analysis, we moved from analyzing each variable separately to see the relationships between pairs of variables to understand the driven factor generating revenue for the company.

- Two scatterplots were created to see the correlation between revenue vs visits and revenue vs lbs sold. (See "Appendix: Figure 6-7") From a marketing standpoint, we intuitively expected a positive relationship between the quantity sold vs revenue.

Findings: Our hypothesis is validated by **0.86 correlation coefficient** (See "Appendix:Table-5") which indicates a strong positive linear relationship between pounds sold and revenue. The revenue for the company goes up with the increase in quantity sold.
But when we move to identify the relationship between revenue vs visits, considering the previous work discussed in "Question 1-2-3-4", no positive correlation is expected between revenue vs visits. Thus the **correlation coefficient is found -0.059** (See "Appendix: Table 6")which aligns with our expectations. The visits generated to QA's websites couldn't yield actual sales. We will realize that there were no options for add to cart/purchase. Even though our promotion has a positive effect on visits to the website, these visits couldn't yield to the actual sales, therefore it couldn't create revenue.

For the last part in our analysis,

- First, we calculated the summary values (See Appendix: "Table-7") and examined the frequency distribution (below) for lbs sold starting from the week of Jan 3, 2005 through week of July 19, 2010.

Even though the above chart shows a right skewness and slight kurtosis, it is not wrong to assume that this histogram is a bell-shaped histogram which shows a normal distribution.

- Second we created visual representations to the demographics for Quality Alloys customers. By creating visual representations for following variables, we took a closer look to the demographic data coming from visits based on the variables; **all traffic sources to the website, top ten referring sites visits, top ten search engine sources of visits, top ten**

geographic sources by continent region visits, top ten browsers used for visits, top ten operating systems used visits. (See “Appendix

Findings,

- Out of all traffic sources listed in the dataset, referring sites seems to be the far most important source for generating traffic to the QA's website. (See “Appendix:Figure-9”) However, from a marketing standpoint we need more data to investigate if the promotion had a significant effect for referring sites.
- When "Referring Sites" in the first data set is elaborated in the second part, "googleads.g.doubleclick.net" and "pagead2.googlesyndication.com " can be seen as the main referral sources for generating visits to the QA's website. We can say that the promotion in Google Adwords worked well.
- As "Google Search" is the main search engine source which drove very significant amount of visits to the website.
- The geographical areas which generated the most visits to the QA's website is South America (%34 of the whole traffic) and North America (%27)
- Internet explorer and Firefox are the two most used browsers by the visitor's of QA's website which shows that the customer profile for Quality Alloy is more than tech savys.
- Windows is the top operating system used by the visitor's for QA's website.

Message (Recommendations):

- ❖ Focused on the findings especially coming from demographics data, a recommendation to the management of Quality Allot would be restructuring their marketing campaign in a more targeted expedient. Example: more targeted referral links to generate more visitors especially focused on the South and North America market.
- ❖ Quality Alloy’s visitor’s demographics data shows that the majority of the customers are more traditional type of people rather than tech savvy people. Another recommendation for Quality Alloy would be considering organizing promotions & events for traditional non-tech people.
- ❖ Another recommendation to the management of Quality would be considering adding the “Purchase/Add to cart” option to the QA’s website if they would like to track the relationship between promotions vs revenue.

Appendix:

FIGURE 1: Q1-VISITS TO THE QA WEBSITE PER WEEK

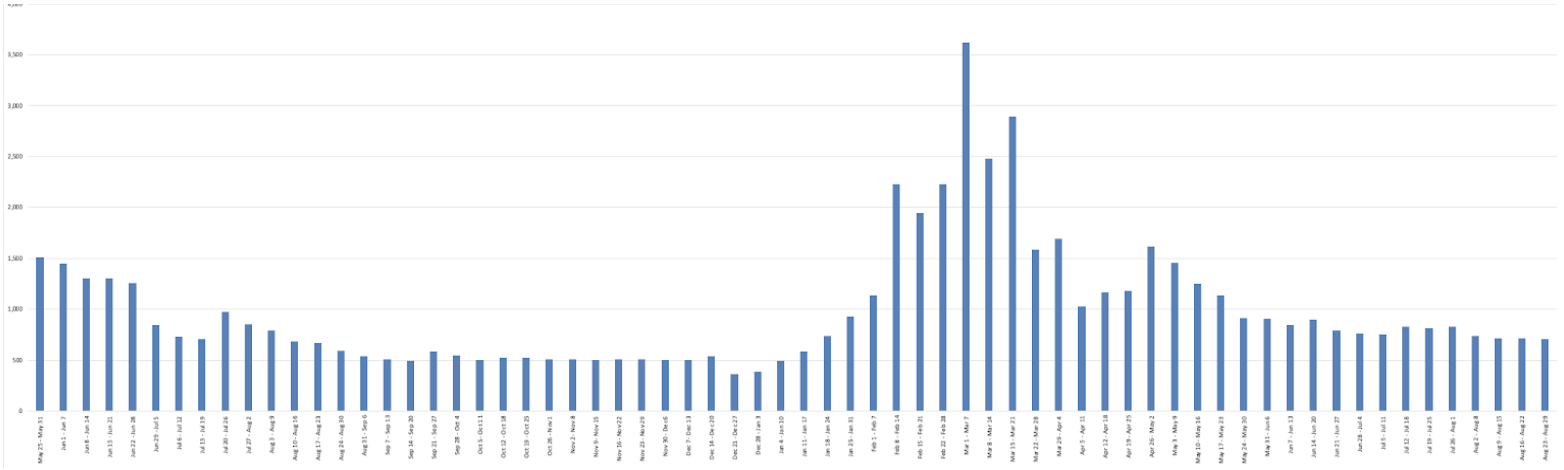


FIGURE 2: Q1-REVENUE FOR QA PER WEEK

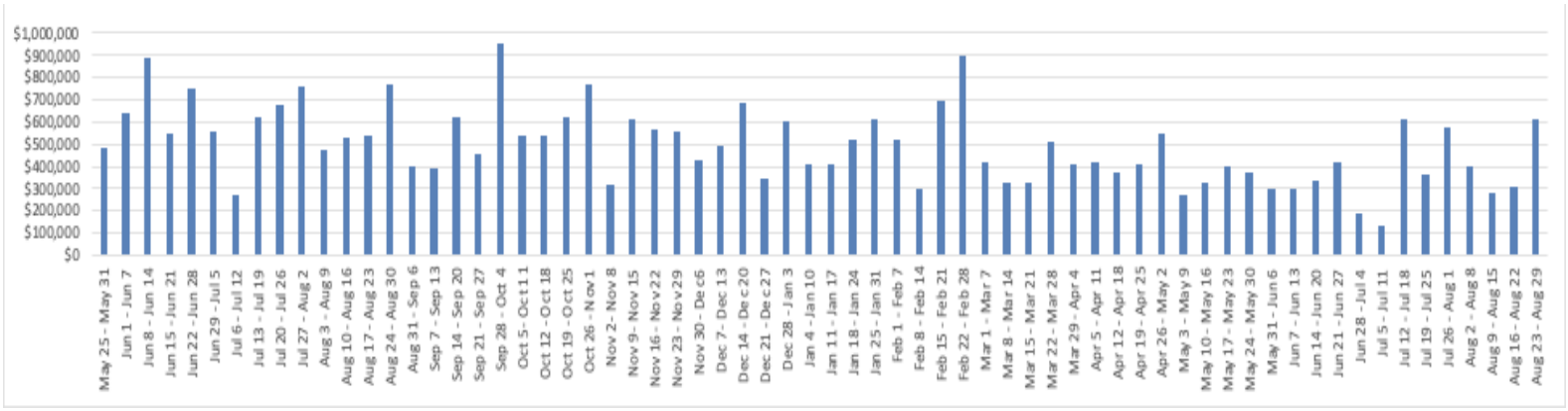


FIGURE 3: Q1-PROFIT FOR QA PER WEEK

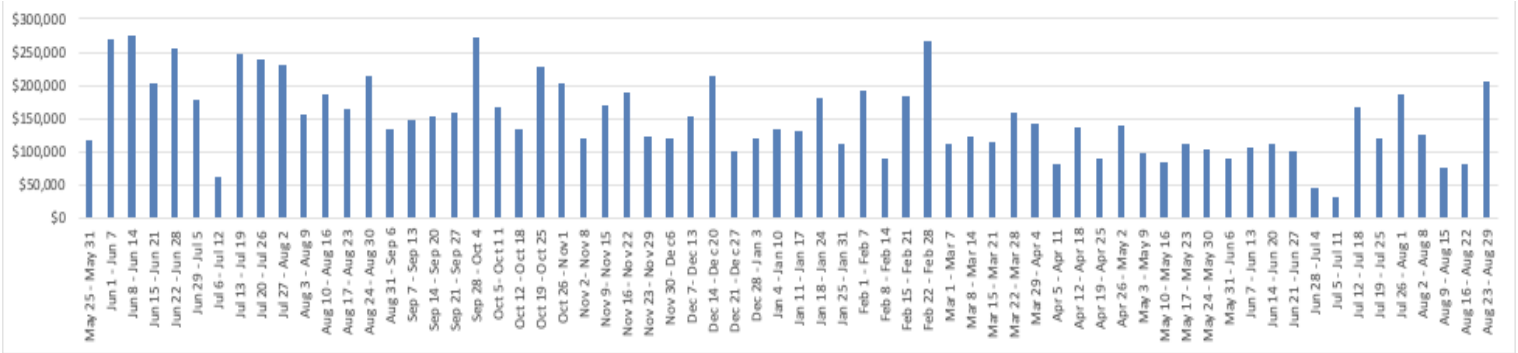


FIGURE 4: Q1-LBS. SOLD FOR QA PER WEEK

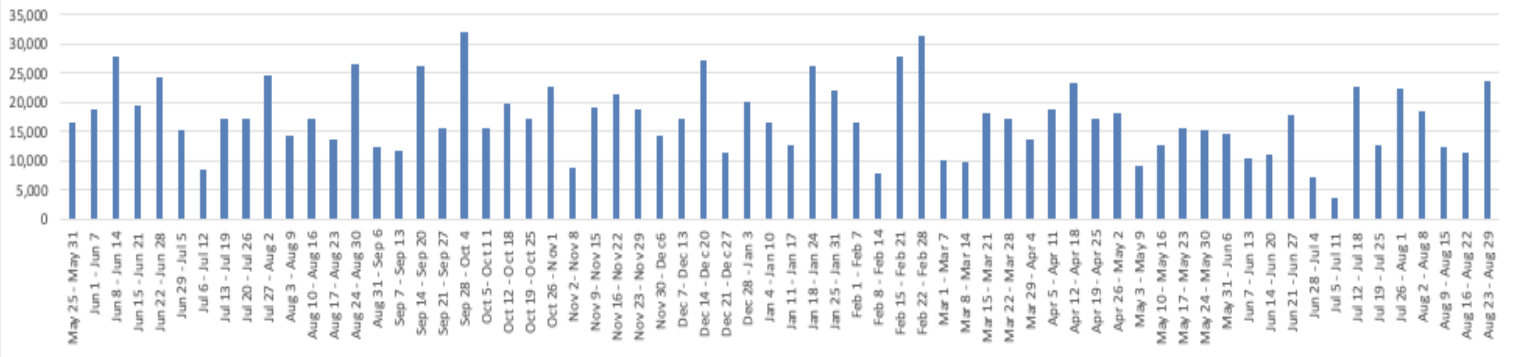


TABLE 1- Q2-VISIT AND FINANCIAL SUMMARY MEASURES-INITIAL PERIOD

VISIT AND FINANCIAL SUMMARY MEASURES-INITIAL PERIOD					
	VISITS	UNIQUE VISITS	REVENUE	PROFIT	LBS SOLD
MEAN	1,055	976	608,250	200,233	18,737
MEDIAN	899	846	586,170	208,913	17,270
STD DEV	342.1186466	307.9715813	150,258	58,484	5,230
MIN	626	594	274,568	62,580	8,633
MAX	1,632	1,509	890,077	275,218	28,053

TABLE 2- Q2-VISIT AND FINANCIAL SUMMARY MEASURES-PRE-PROMOTION PERIOD

VISIT AND FINANCIAL SUMMARY MEASURES-PRE-PROMOTION PERIOD					
	VISITS	UNIQUE VISITS	REVENUE	PROFIT	LBS SOLD
MEAN	563	517	534,314	159,932	18,441
MEDIAN	558	510	534,542	152,476	17,215
STD DEV	78.92218964	69.22951411	146,876	41,654	5,822
MIN	383	366	315,647	100,388	8,992
MAX	795	734	951,216	273,175	31,969

TABLE 3- Q2-VISIT AND FINANCIAL SUMMARY MEASURES-PROMOTION PERIOD

VISIT AND FINANCIAL SUMMARY MEASURES-PROMOTION PERIOD					
	VISITS	UNIQUE VISITS	REVENUE	PROFIT	LBS SOLD
MEAN	1,814	1,739	456,399	131,930	17,113
MEDIAN	1,663	1,585	413,937	114,328	17,299
STD DEV	735.4666339	720.8404601	156,912	46,350	6,324
MIN	1,000	930	268,160	81,841	7,814
MAX	3,726	3,617	897,164	266,477	31,496

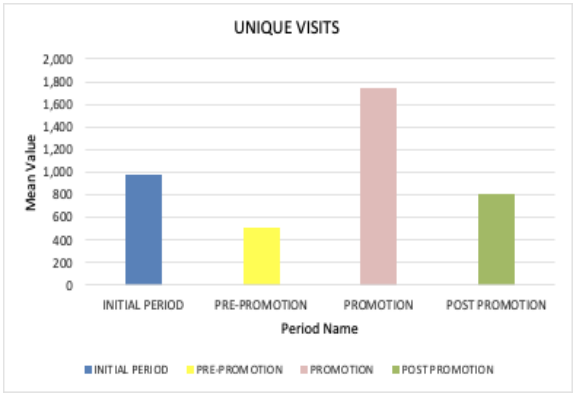
TABLE 4- Q2-VISIT AND FINANCIAL SUMMARY MEASURES-POST-PROMOTION PERIOD

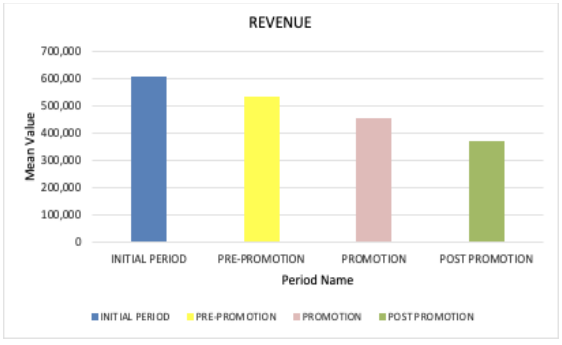
VISIT AND FINANCIAL SUMMARY MEASURES-POST-PROMOTION PERIOD					
	VISITS	UNIQUE VISITS	REVENUE	PROFIT	LBS SOLD
MEAN	857	801	371,728	111,046	14,578
MEDIAN	848	800	348,397	104,530	13,647
STD DEV	68.30991801	69.7241284	140,427	47,280	5,725
MIN	772	709	133,967	32,825	3,826
MAX	963	912	615,950	206,441	23,762

TABLE 5- Q3-VISIT AND FINANCIAL SUMMARY MEASURES-POST-PROMOTION PERIOD

MEANS					
	VISITS	UNIQUE VISITS	REVENUE	PROFIT	LBS SOLD
INITIAL PERIOD	1,055	976	608,250	200,233	18,737
PRE-PROMOTION	563	517	534,314	159,932	18,441
PROMOTION	1,814	1,739	456,399	131,930	17,113
POST PROMOTIO	857	801	371,728	111,046	14,578

FIGURE 5: Q3- MEAN VALUES PER PERIOD





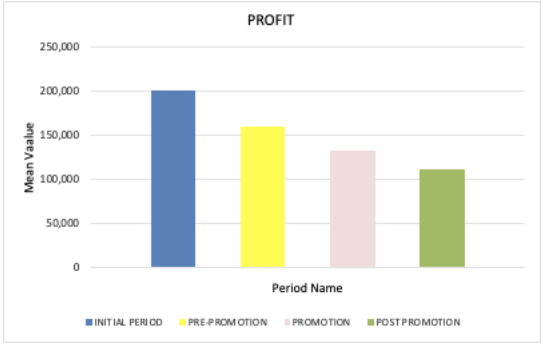


FIGURE 6: Q5- SCATTERPLOT FOR REVENUE VS LBS SOLD

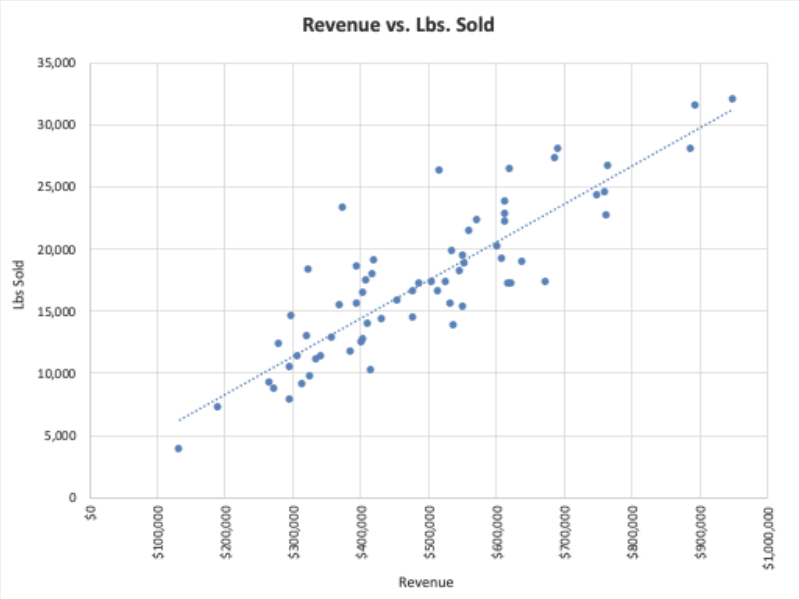


TABLE 5- Q5-CORRELATION COEFFICIENT REVENUE VS LBS SOLD

	Revenue	*Lbs. Sold*
Revenue	1	
Lbs. Sold	0.8689297	1

FIGURE 7: Q6- SCATTERPLOT FOR REVENUE VS VISITS

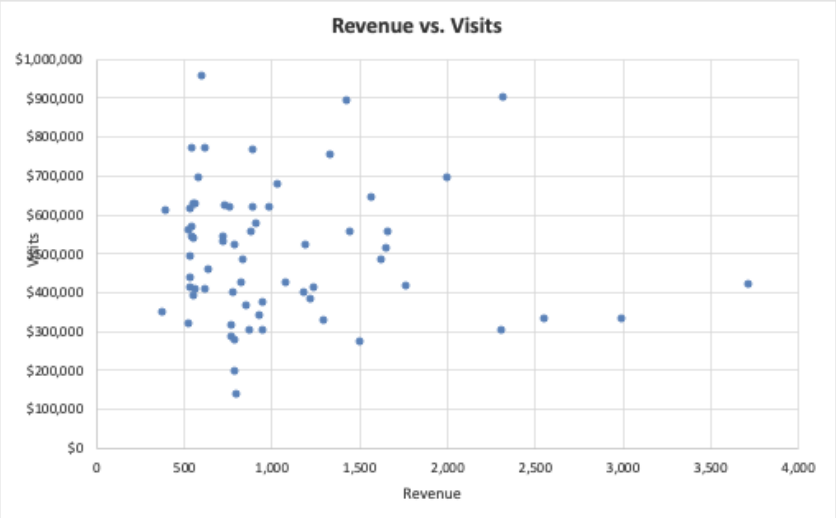


TABLE 6- Q6-CORRELATION COEFFICIENT FOR REVENUE VS VISITS

	Visits	*Revenue*
Visits	1	
Revenue	-0.0593918	1

TABLE 7- Q8a-SUMMARY VALUES FOR LBS SOLD

Lbs. Sold	
Mean	18681.55517
Standard Error	401.6884574
Median	17673
Mode	28865
Standard Deviation	6840.50794
Sample Variance	46792548.87
Kurtosis	0.563661442
Skewness	0.632307485
Range	40914
Minimum	3826
Maximum	44740
Sum	5417651
Count	290
Largest(1)	44740
Smallest(1)	3826
Confidence Level(95.0%)	790.6058069

FIGURE 8: Q8b- FREQUENCY DISTRIBUTION LBS SOLD

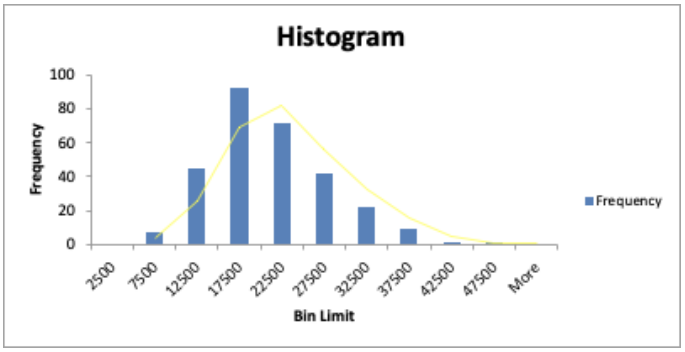


FIGURE 9: Q10- ALL TRAFFIC SOURCES TO THE QA WEBSITE

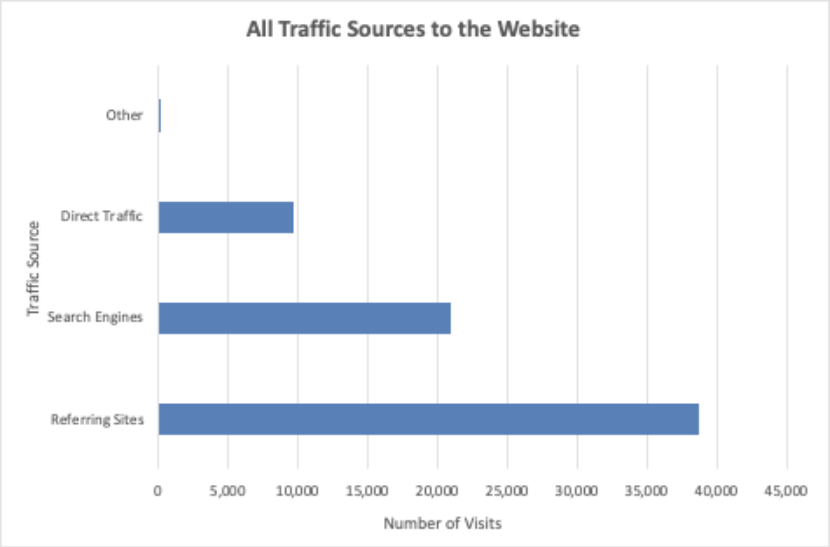


FIGURE 10: Q10- FREQUENCY DISTRIBUTION LBS SOLD

FIGURE 11: Q10- TOP TEN SEARCH ENGINE SOURCES OF VISITS

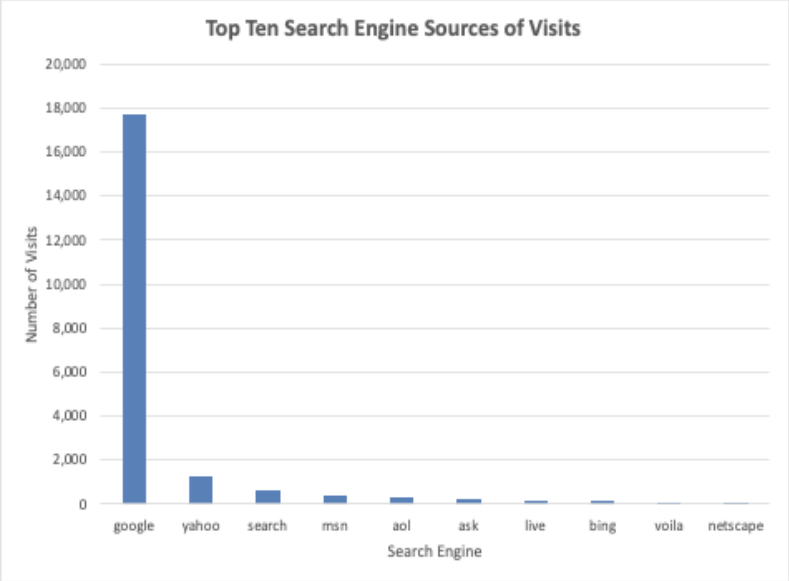


FIGURE 12: Q10- TOP TEN GEOGRAPHIC SOURCES BY SUB CONTINENT REGION VISITS

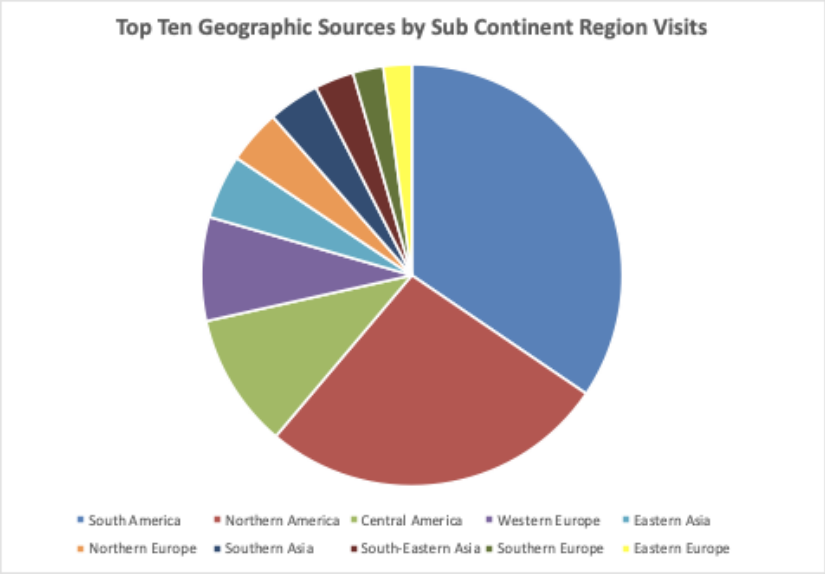


FIGURE 13: Q10- TOP TEN BROWSERS USED FOR VISITS

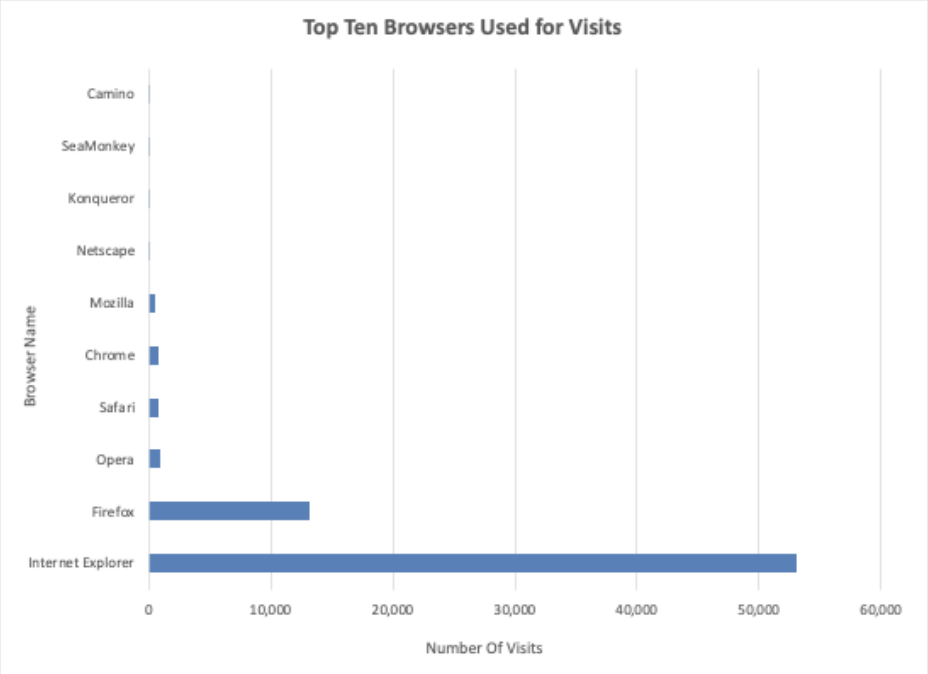


FIGURE 14: Q10- TOP TEN OPERATING SYSTEMS USED FOR VISITS