Appendix D

Data Types: Qualitative and Quantitative

Statistics is about organizing the data so that it can be explained in a meaningful and simple way from its raw or original structure. How to store the data and where it can be processed is essential. In order to do that it is vital to know what types of data to use and when to use it in probability and statistics.

There are two basic types of data variables used and they fit into two general categories. They are called qualitative and quantitative data types.

Both qualitative and quantitative data types are necessary and essential for effective business management. Understanding the difference between the two and why each is used is pertinent for making decisions. Before organizing your dataset, it is important to understand what type of data you are collecting, because different types of data are needed for different statistical tests. When conducting a full analysis of a given dataset, understanding the qualitative aspects of your subject will help you to better understand the quantitative results of the dataset. For example, you have sales data for inventory that is in units and dollars - quantitative data. But understanding the color palette, style and size ranges that are driving the bulk of units or dollar sales is utilizing qualitative real-world understanding to gain meaningful insights from the quantitative. Also meaningful is expanding qualitative analysis to include data such as consumer feedback e.g. “I bought this for a special occasion”, implied preferences via user behavior on a website or with a store display, or psychology leading to a particular color, size or style purchase.

Qualitative data can be organized into separate categories using limited sets of classes. There are two main types of qualitative data: nominal and ordinal. Nominal data does not follow a natural ordering. Each data does not follow a natural ordering. And, each data has its own distinct name. For instance, types of clothing which could be pants, shirts, and socks. The category could also just be a binary or two-level nominal variable like do you like cola yes and no. There is no natural order to these variables.

Ordinal variables, on the other hand, have a natural order to them. This could include the size of clothing of small, medium, and large. When using these qualitative variables in statistics the labels are converted to numerical numbers so that excel or another statistical program can process them to generate results.

Quantitative data types of data are numerical numbers that are either countable or infinite numbers in nature.

A discrete number is a numerical number that can be counted. For instance, when a coin is flipped it will either fall on a head or tail. Each flip is independent of the other flip. Therefore, if a coin is flipped 1,000 times the number of heads and the number of tails can be counted individually. This demonstrates that the number of flips is countable or discrete.

A continuous variable is a number on a number line that can go on infinitely. Typical examples of this type of data are height and weight.

In Chapter 9, for independent T-tests, a dichotomous nominal variable which is qualitative, is used with a continuous quantitative variable. For instance, you may want to see the difference in mean of the quantitative variable such as revenue for the model vs no model group. The model vs no model groups are the qualitative dichotomous nominal variables.

For the Pearson Correlation in Chapter 10, you may want to see the correlation between the continuous variable of items bought with the continuous predictive variable of revenue. Both are quantitative continuous measures.