Fiene's Key Indicator Statistical Methodology©

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This short paper provides the technical and statistical aspects of the Fiene key indicator methodology©. It will provide the roadmap in taking businesses through the necessary steps to generating the respective key indicators which will then predict overall successful outcomes for their respective businesses.

One of the first steps is to sort the data into high and low groups, generally the highest and lowest ratings can be used for this sorting. Frequency data will be obtained on those data elements in the top level (usually top 20-25%) and the bottom level (usually the bottom 20-25%). The middle levels are not used for the purposes of these analyses. These two groups (top level & the bottom level) are then compared to how each data element (see Figure 1). An example would be the following: let's say a business has varying levels of success in selling a specific product. Sort all the salespersons by the number in the highest group and the lowest group by successful sales. Then determine how the groups scored on specific data elements, such as number of phone calls back to each client. Sort the number of phone calls into the top 25% number of calls and the bottom 25% of calls. Fill in the cells within Figure 1 accordingly (see Figure 2).

Figure 1	***Data Element in the Top 25%***	***Data Element in the Bottom 25%***	***Row Total***
Highest level (top 20-25%)	***A***	***B***	***Y***
Lowest level (bottom 20-25%)	**C**	**D**	***Z***
Column Total	***W***	***X***	***Grand Total***

Figure 2 depicts that all programs that were in the top 25% (5+ calls) were also in the highest rating while the bottom 25% (3 or fewer calls) were also in the lowest rating.

Figure 2	***5+ Calls***	***3 or Fewer Calls***	***Row Total***
Highest Level	***117***	***0***	***117***
Lowest Level	**0**	**35**	***35***
Column Total	***117***	***35***	**152**

Once the data are sorted in the above matrix, the following formula (Figure 3) is used to determine if Item 16 is a key indicator or not by calculating its respective Fiene coefficient. Please refer back to Figure 1 for the actual placement within the cells and Figure 2 for the data within the cells. The legend (Figure 4) below the formula shows how the cells are defined.

Figure 3 – Formula for Fiene Coefficient

$$\phi = (A)(D) - (B)(C) \div \sqrt{(W)(X)(Y)(Z)}$$

Figure 4 – Legend for the Cells within the Fiene Coefficient

A = High Group + Data Element in High Group.
B = High Group + Data Element in Low Group.
C = Low Group + Data Element in High Group.
D = Low Group + Data Element in Low Group.

W = Total Number of Times Data Element in High Group.
X = Total Number of Times Data Element in Low Group.
Y = Total Number of Times in High Group.
Z = Total Number of Times in Low Group.

Once the data are run through the formula in Figure 3, the following chart (Figure 5) can be used to make the final determination of including or not including the item as a key indicator. Based upon the chart in Figure 5, it is best to have a Fiene Coefficient approaching +1.00 if we are dealing with normally distributed data[1]. This requirement is relaxed with skewed data (+.26 and higher).

Continuing with the chart in Figure 5, if the Fiene Coefficient is between +.25 and -.25, this indicates that the indicator is unpredictable in being able to predict overall compliance with the quality rating assessment tool. Either a false positive in which the indicator appears too often in the low group as being in compliance, or a false negative in which the indicator appears too often in the high group as being out of compliance[2].

The last possible outcome with the Fiene Coefficient is if it is between -.26 and -1.00, this indicates that the indicator is a terrible predictor because it is doing just the opposite of the decision we want to make. The indicator would predominantly be in compliance with the low group rather than the high group so it would be statistically predicting overall non-compliance. This is obviously something we do not want to occur.

Figure 5 – Thresholds for the Fiene Coefficient

Fiene Coefficient Range	Characteristic of Indicator	Decision
(+1.00) – (+.26)	Good Predictor	Include
(+.25) – (-.25)	Unpredictable	Do not Include
(-.26) – (-1.00)	Terrible Predictor	Do not Include

Notes:

1. The reason for pointing out the need to have a higher Phi Coefficient than what has been reported previously is the fact that the dichotomization of data should only be used with skewed data and not normally distributed data because it will accentuate differences. However, since the purpose of the dichotomization of data is only for sorting into a high and low group, it would appear to be acceptable for this purpose (MacCallun, etal, 2002. On the practice of dichotomization of quantitative variables, *Psychological Methods, 7, 1,* 19-40.).

2. These results would show an increase in cells B and C in Figure 1 which is undesirable; it should always be the case where A + D > B + C for key indicators to maintain their predictive validity.

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