Do averages cause us to see mirages?

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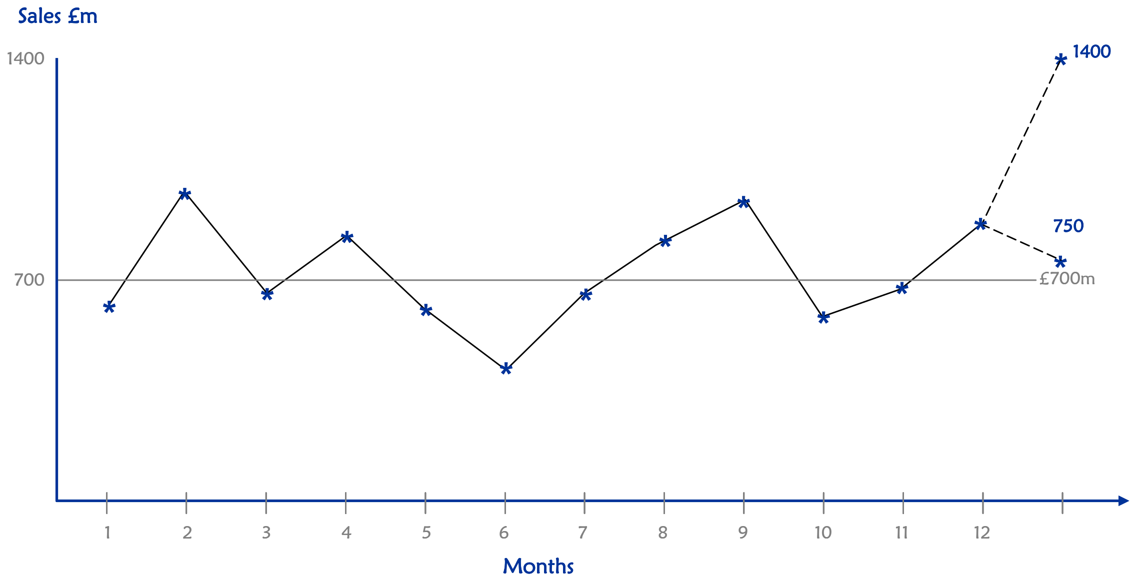
Have you ever thought about the number of decisions that we make in business based on averages. It probably runs into millions per day across the UK. We drive our businesses on these *'facts'* but are we missing something; are we seeing mirages in averages?

An example to illustrate this point.



A fictitious supermarket monitors sales of clothing over the last 12 months and works out that its average sales is £700m per month. The chain decides to embark on a major promotional activity (radio, television, billboards etc.) in an attempt to increase sales and market share. It is noted that in the month following the beginning of the promotional activity the clothing sales increase to £750m.

Do we rejoice, spend even more on promotional activity or not?

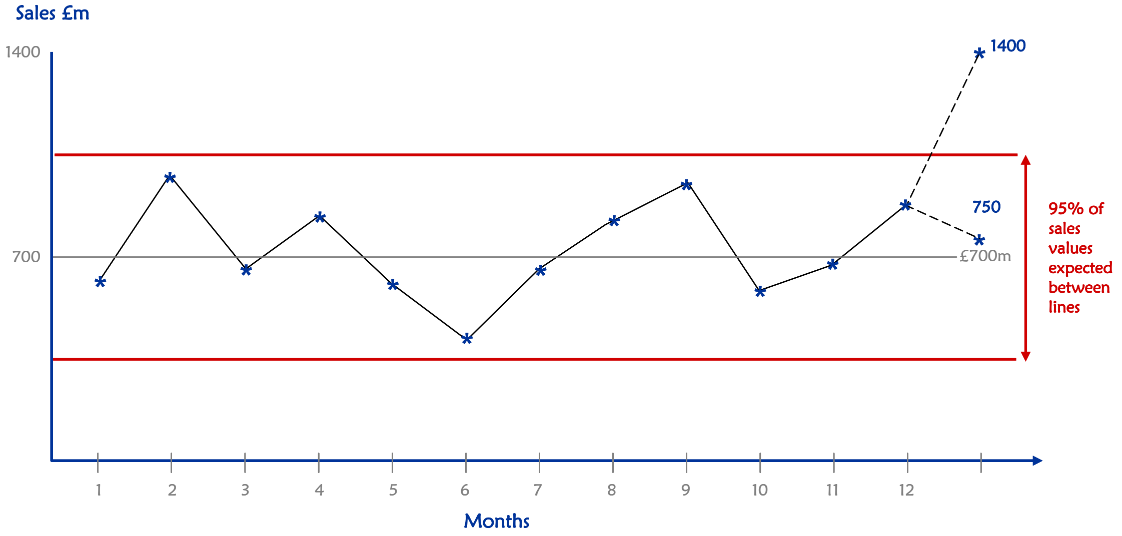
Do we expect the sales value to be the same every month i.e. £700m?

The answer is no. We expect the sales value to vary depending on people's buying habits, the weather, the season etc.

So has the promotional activity been successful?

To answer the question we need to consider how far the value of £750m is away from the value we expected, which was £700m.

If the value following the promotion was £1400m, we would be pretty sure that it was being successful, but the value of £750m is not as clear cut.



We need to consider how much the monthly values usually differ from the expected historical average. If there have been no *'special'* events to which we could definitely attribute a change in sales, we can do this by looking at the monthly sales values over the last 12 months and drawing two lines between which we would expect the majority (say 95%) of monthly sales values to lie. If there have been special events, then this data can be discarded from the calculations of the positions of the lines. The distance between these two lines gives us an idea of how much *'natural'* spread there is in the monthly sales values.

Any values that are outside the two lines are likely to be caused by some action (such as the promotional activity).

Working with averages without considering the spread in the monthly sales figures may cause us to *'chase mirages'*. If we work with both expected and unexpected levels of variation as well, we have a more complete picture of whether the difference in Sales is real or just a mirage.