

# SECORA

**Averages should be thrown out the window**



Is your company making important decisions based on averages? Should you change your supplier based on average quality scores? Is one sales person better than the other based on averages? Should capital investments be made based on averages?

Recently I was invited to review part of a large company's customer satisfaction performance. The client could not understand why despite good KPI's new customer acquisition numbers were dropping, and established customers were leaving. The company had many leading indicators to monitor customer satisfaction, one of the most important being the "on-time delivery rate". The operational definition of "on-time delivery" simply meant the customers' orders were delivered on the first specified and agreed upon dates and times, without any adjustments.

This company shipped about 60,000.00 orders a year, with an average on-time delivery rate of 85.6% (company's minimum target was set at 80%). (The question of whether or not 80% is a good standard was discussed at a later point).

Before reviewing the data, I asked the client basic questions such as:

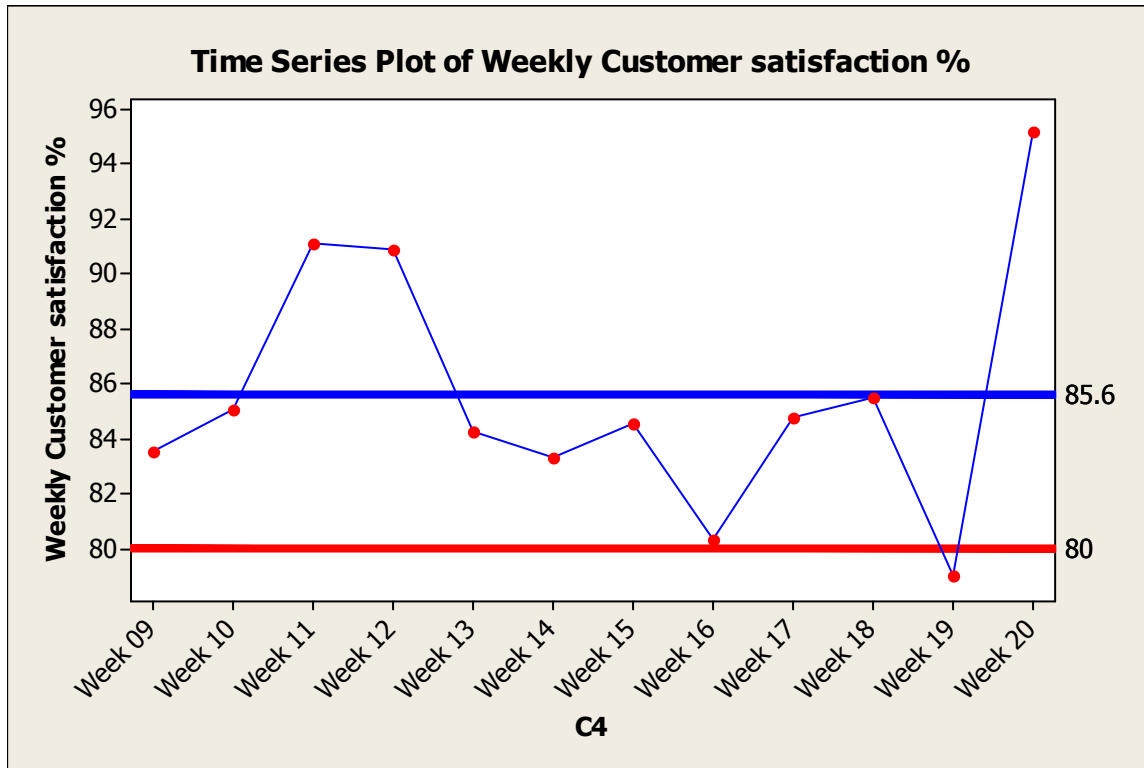
- Where did the data come from?
  - Sales department
- Who collected the data?
  - Members of the sales staff
- When is the data collected?
  - During the last 12 weeks
- How often is the data collected?
  - Each week the sales department collected, at random, 12-15 data points
  - He received a consolidated report from the V.P. of Sales once a week
- How is the data collected?
  - At random orders would be selected from SAP.
- Had a measurement system analysis been done?
  - No

I was then shown an excel spread sheet with the various data points.

Week	Week	Week	Week	Week	Week	Week	Week	Week	Week	Week
10	11	12	13	14	15	16	17	18	19	20
85.07	91.06	90.86	84.23	83.35	84.58	80.34	84.74	85.50	79.07	95.19
%	%	%	%	%	%	%	%	%	%	%

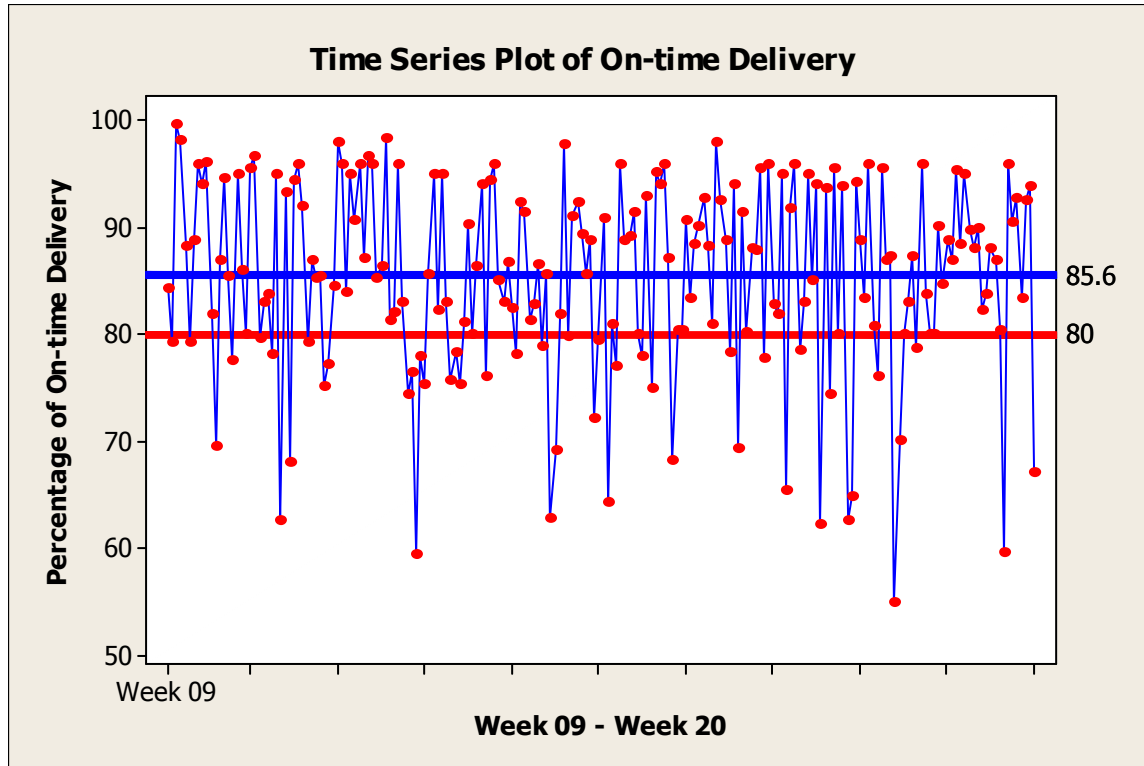
By just looking at the data points, we could see that all but 1 (week 19, 79.07%) were above the given target. The client speculated that maybe all they needed to do was to set the internal on-time delivery specification limit higher, to increase this customer satisfaction rate.

I asked them how they knew that the internal specification was incorrect, and although setting the *standard* higher is a typical reaction to poor outputs it does not in and of itself change the capability of the process. The process will still deliver what it has been delivering unless a successful process improvement action is implemented. Many times simply changing the internal standard without changing the process to enable a better output leads to changing the accuracy and reliability of the reports in an effort to satisfy the new standard. I encouraged them to look at the data in a graphical way before adjusting anything, rather than just in an excel spread sheet.



With a simple time series graph I was able to show them more than what the raw numbers in the excel spread sheet portrayed. Looking at the graph we could easily see that something was going on. I asked them why in week 19 they had a 79% on-time delivery rate, then in week 20 a jump to a 96% on-time delivery rate. To answer this question we called the V.P. of Sales and requested he bring all the data which made up the average weekly on-time delivery percentage. Over the last 12 weeks the sales department had collected 200 data points, with an average of 85.6%.

Again, we graphically displayed the data.



The picture was becoming a lot clearer. We could see from the individual data points that even though we did have an average on-time delivery rate of 85.6%, the range was somewhere between 99.6% and 55%. When asked why on some days we had 55% and others 99%, the V.P. of Sales could not answer this question, his performance was based on averages, not ranges.

The CEO and the V.P. of Sales both agreed that the on-time delivery target was reached 11 times out of 12. In other words, they had better than 90% success rate. Doing a Cpk analysis (using their weekly averages) showed that they had a potential of 83,000 late deliveries out of a million. Using all data points (a much truer picture) showed that they had a potential of 245,000 late deliveries out of a million.

The CEO had given the V.P. of Sales the target of 80%. It was not a matter of blaming the V.P. of Sales, he reported the weekly figures as directed, and on average he only missed the target once (week 19 at 79%). However, if looking at the variation, he had a failure rate of 24.5% (24.5% of the time he did not reach the minimum of 80%), but on average he was above the given target. This is a very good example of how bad decisions can be made based on averages. If you also take into consideration any measurement failure, the range could even be larger (here we assumed all data points were 100% correct).

Why do so many companies still use average?

Having interviewed numerous department heads, division leaders, Vice Presidents, COO's, CFO's, and CEO's:

- It seems to be a thing of tradition.
- Shareholders look at averages.
- An easy way to get your mind around performance.
- It is only one indicator to look at, rather than all data points that make up the average.

Reporting averages to shareholders, the public, or company publications is fine. No harm done. But business leaders should never make decisions solely based on averages. This is lazy, and will definitely lead to wrong and harmful decisions.

If you are bound on making decisions on averages, at least have a second indicator built into your report indicating the range.

Average quotes processed per week	Range of quotes processed per week
200	55 - 420

Even better would be a third indicator as to how many data points are used to calculate the average.

Average quotes processed per week	Range of quotes processed per week	Number of data points
200	55 - 420	67

Based on these three simple indicators you can now make much better decisions.

Does an average of 95% (of anything) really matter when one day it is 99.5% and on others 80%? Imagine yourself at the airport; you're at the end of an 80% day of either on-time flights or baggage handling? But at the end of the week both are at 95%. Does this mean we have good or stable business? How about if your doctor told you he had a 95% success rate for any particular surgery? Sound good? Well if the doctor performs 30 surgeries a month, this could mean a variation between 80% and 100%. (We are not talking about one surgery failing and all others at 100).

Managing your business with averages is futile and may be a precursor to serious problems in the future.

**About the Author:** *Sean C. Rast* is with Secora Consulting [www.secora.de](http://www.secora.de) which has offices in Frankfurt Germany, Tampa USA, and Sydney Australia. He has worked directly and indirectly with companies such as Textron, HP, Magna, VW, BMW, BHP Mining, Bao Steel China, Bosch, Fed-Ex, and the US Army. Mr. Rast is a certified process engineer with both process design and improvement expertise. Mr. Rast has extensive international experience and can communicate in English, German, Swiss-German and Swedish. He can be reached at [sean.rast@secora.com.au](mailto:sean.rast@secora.com.au).