Using Paper Reports and Charts
Even Though Computers Are Available

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I belong to several groups on the Linked In web site. I find some of the discussions both fascinating and informative. Not long ago, on one of the group sites a member named Karn Bulsuk posted the following topic for discussion: "Why Toyota still uses paper reports." He wrote:

"If you've ever had the fortune to visit a Toyota factory you'll notice that they still use a significant amount of paper in their operations. Their famous A3 reports for example, continue to remain rooted in the paper past.

"It's not that Toyota refuses to adapt new technology. Although they are a conservative company, they have the ability to the latest and greatest when its required - for example, the development of the know-how to create the hybrid car. However, Toyota doesn't believe in using technology for the sake of being new and shiny. The solution needs to be justified and demonstrate that it adds value to the operation, without depreciating the benefits of past solutions..."[1]

His excellent points motivated me to respond to his post, as follows:

Years ago, on a tour of a Toyota facility, we noticed a good number of keyboards and large screens with clear metrics on units produced, machine downtime, etc. The operators, however, were still maintaining control charts by hand. We asked our tour guide why the operators were still keeping their charts by hand when they had so much electronic data entry and display capabilities. The guide replied, "Because it helps them."

Another value of keeping control charts by hand was noted by Dr. Charles Holland. He told me that the most important information to be found on a control chart is the "operator's blood, sweat, tears and written comments." Sometimes they'll even add a sketch to show where on the part or the machine the malfunction occurred. Control charts on MiniTab in the QA engineer's office will never provide such important information!

In response to my comments, another group member named Tililola Awagboro noted how the manual handling of data is important to the persons self-development. She added, "That is why I never try to teach any tool during trainings, I never found them useful, because they could not give me the ability to build, develop, learn, innovate! We referred to it as learning by first principles - what you truly understand from first principle you can never forget."

I liked the reference to "learning by first principles" and added the following post to the discussion:

Titilola, I like the point you raised about "learning by first principles." This is why I do not use MiniTab, Statistica, SPSS or any other software when I teach Statisical Process Control (SPC) and Design of Experiments (DOE). I want my students to learn theory, concepts (first principles)

and the techniques. Then, they can go home and use the statistical software as the tool it's supposed to be -- but they will NOT be dependent on software!

Conclusion

As noted in one of my case studies posted on this web site, technology is no substitute for knowledge.[2] If learning by first principles and maintaining charts and records by hand yields more knowledge than using the computer, I vote for keeping the records by hand!

Dr. W. Edwards Deming once wrote, "Interpretation of data from a test or experiment is prediction – what will happen on application of the conclusions or recommendations that were drawn from a test or experiment? This prediction will depend on knowledge of the subject matter. It is only in the state of statistical control that statistical theory provides, with a high degree of belief, prediction of performance in the immediate future."[3] We can add to this observation Ms. Awagboro's point about learning by first principles and the whole concept of "ownership." Production operators will have a sense of ownership and control of a chart they must maintain (by hand) on an hourly or batch-by-batch basis. Paper records will always provide that sense of ownership, whereas I cannot own something buried deep in the bowels of statistical software or a CPU.

Notes

[1] Why Toyota still uses paper reports - Karn G. Bulsuk: Full Speed Ahead http://www.bulsuk.com/2013/05/why-toyota-still-uses-paper-reports.html#ixzz2UtH11tYb. Copyright © Karn G. Bulsuk.

[2] J.F. Leonard, "Beware Statistical Software!", http://www.jimleonardpi.com (2012).

[3] W.E. Deming, "A System of Profound Knowledge," from J.F. Leonard, *The New Philosophy for K-12 Education: A Deming Framework for Transforming America's Schools,* ASQ Quality Press, Milwaukee, WI (1996), p. 316.