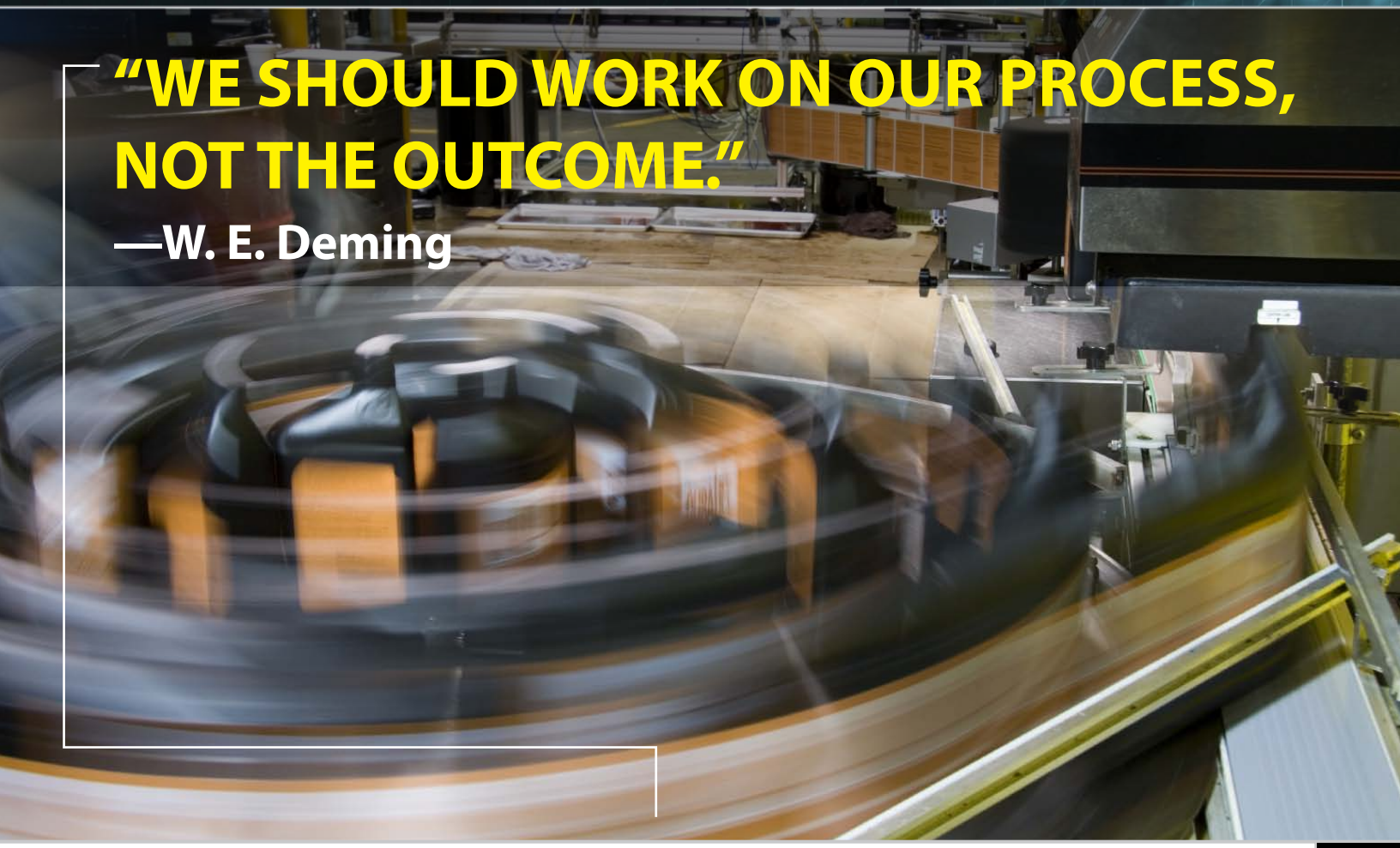
QiSOFT



"WE SHOULD WORK ON OUR PROCESS, NOT THE OUTCOME."

—W. E. Deming

It is unquestionable that the output and quality of our product is important to our customers and to the success of our business. Alas the emphasis is sometimes misplaced. Too often, effort is concentrated on results, diverting necessary attention away from the process that makes them happen, right or wrong. To get the right results we need to exert control at each and every stage of the manufacturing process. Get the process right and it will take care of the output and product quality.

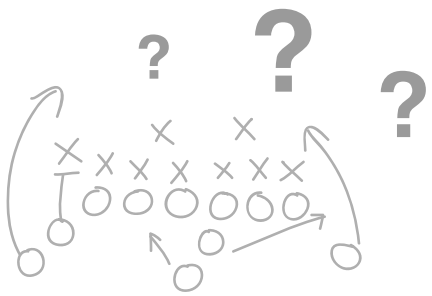
A simple process

Let us consider as an example, the well-known domestic process of cooking a chicken dinner. The cook is well aware of what has to be achieved. The output will be judged by the dinner in terms of appearance and aroma, taste and texture, fulfillment and safety. These in turn depend on what happens before the meal comes to the table. The controls of cooking temperature, time and conditions are critical. Earlier stages of the process include recipe determination, material selection and preparation. All these operations need to be conducted to plan, to schedule with correct and hygienic procedures. The quality effort of the cook is not spent on testing the resulting dinner but **invested in every stage of the process**, thereby making sure that the results will be correct. With the certainty that doing things right throughout the process, the capable cook does not even need to test the result but knows it will be right. Cooks have learned through centuries of acquired knowledge that getting the process right is the best way to control the product.

This domestic example contrasts with industrial practice. There, emphasis on product testing and inspection is still common, distracting from the critical control of the causes. Of course it is necessary to monitor the effectiveness of our process controls. We need to check and test from limited sampling of product to provide evidence for guidance, corrections and improvements of the control system. Product testing is the least effective way of assuring product quality. Ask the cook!

Predictability

For dependable output of the right quality, we need to operate a stable and consistent process. In his writing of quality, **Phil Crosby**, an eminent writer on quality matters, likens the usual manufacturing process to a ball-game. For this, the highly skilled people are coached by experts, trained and fired up to peak performance. **Despite this the pattern of play is quite unpredictable and the result uncertain.**



In manufacturing too, there seems to be satisfaction form the challenge of initiative taking in a state of uncertainty. Crosby contrasts this with another form of entertainment. In ballet, the actions of the participants on stage and off, are all predictable, the music, the arrangements, displays and lighting are all co-ordinated, to give the required setting for the artists, who perform exactly to plan. Though leaving room for interpretation differences, the process and its results are the same, performance after performance, over and over again.

Manufacturing, suggests Crosby, needs to be more like the controlled process of ballet and less like football.

Process Evidence

Process Control is very much a matter of doing the same things repeatedly but that is not easy. There are inevitable pressures to take risks. In the face of schedule demands, economic needs and imposed changes we have to respond, greatly increasing the vulnerability to errors. Process changes are too often made without due monitoring of the effects and with inadequate protection. We need to be armed with process knowledge to be able to pre-empt adverse results. Information Technology has given us the ability to take raw process data and translate into evidence for control action. Thus we detect unwanted changes to permit early adjustment. More importantly, control intelligence can help us to anticipate and prevent critical changes before the output and product quality is affected. Let us consider some areas of application:

Many commercial difficulties arise from commitment by producers to product characteristics that are in contact with actual competence and producability. The shrewd producer has continuing data analysis to quantify his process capabilities and knows what specifications he is able to achieve and commits himself to just what he is actually able to deliver.

To meet the changing needs of the market adaptability is critically important but it is not sufficient. The ability to adapt with confidence depends on knowledge. Today we have the benefit of systems to accumulate and distil the facts of material, process and product performance. With these, the informed manager can plan and control necessary changes with confidence and take up the challenge of adaptations that add to competitiveness.

The use of recycled materials can save on costs and is good for the environment. It can also breed problems in production and for product quality. Such changes of inputs should be introduced to plan and used under strict control. With careful surveillance of effects on process and product, the risks can be minimized and material economies achieved.

Of course we should always value and encourage the application of the initiative and skills of those who drive the process. We should not rely on intuitive control.

Being responsive is good but unguided action puts us at risk from under correction and over correction. Both destabilize the process and add to the vulnerability of product quality. The process operator who is armed with process evidence on where he has been, where he is now and where he is going has a great advantage. The process control charts and display available in modern information systems do not replace his expertise; they are there to help him use his skills to the full.

The whole process

Achieving efficient manufacture, the intended output and the right quality depends on a stable and effective process operating correctly. This requires working to plan in the full knowledge of what is happening, throughout the process. Information systems enable us to keep a "finger on the pulse", tracking the health of each stage of the process.

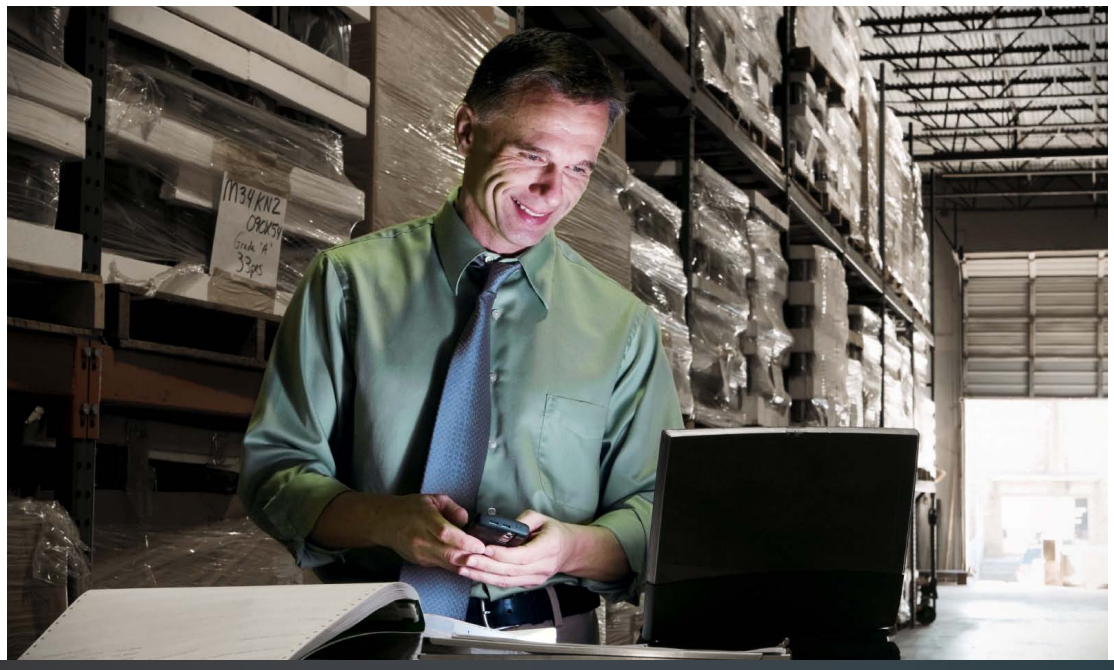
With valid analysis of the facts, timely and helpful presentation enables each of us, manager, supervisor and operator, engineer and technologist to exercise due control, not just by instinct but on the basis of "actionable evidence".

All's well that ends well!

The title of Shakespeare's play is regarded almost as a proverb. It is used to play down the difficulties in reaching a satisfactory conclusion. Shakespeare exposed the conflict, intrigue and turmoil involved in getting a favorable result when things had gone wrong. It makes for good theatre.

Now the expression, "All's well that end's well" is often used to excuse inadequacy and express relief after getting away with a failure. As such it ill-fits the management of manufacturing, where conflict, intrigue and turmoil are quite undesirable. In line with Dr Deming's assertion on process not product, the expression that better relates to manufacture is surely:

All's well, only if it starts well and continues well so that it is sure to end well!



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