

Making of robust designs and processes



**RICK
BRIMEYER**
Brimeyer
LLC

He is president of
the Ames, Iowa,
consulting firm

When I left a great company after 25 years, I was prepared to miss three things:

- Daily interaction with a number of brilliant colleagues who also were friends.
- Health insurance (of course).
- The annual week of shutdown between Christmas and New Year's which represented the only time one could leave work for a week and intend to find their desk exactly as he or she left it upon return (the closest feeling to the last day of school in third grade).

Five years removed, I can now confirm that those three anticipated voids were certainly justified. And while I have no regrets, in honest retrospect I've noted a fourth unanticipated change that might be the most significant.

The majority of manufactured assemblies undergo a final production test to provide a stamp of approval prior to being packaged and shipped. As such, the percentage of units that pass the test on the first try, commonly referred to as first pass yield, is the ultimate gauge as to how well an organization's quality systems are working.

One might argue that fallout at the external customer is the ultimate quality measurement, but this has at least two severe limitations.

First, feedback occurs too late for any effective problem solving. Second, not all customers bother to complain; many just quietly take their business elsewhere. No news is not necessarily good news.

When a unit fails final test, it's generally due to one of four reasons:

- An error occurred during the assembly process.
- A gross defect in an individual component exists.
- A problem with the production test stand is causing

it to fail good units.

- A combination of "to-spec," but marginal components won't allow the assembly to meet its requirements.

Let's look at each of these in a bit more detail.

Honest human assembly errors happen. The potential for assembly errors, however, can be dramatically reduced by creative mistake proofing during the design process.

Some of the most positive feedback our design team received was when a colleague reported that a group of seventh grade girls that she was introducing to the engineering profession assembled our new hydraulic motor without instructions.

Relative to gross defects in components, again thoughtful planning during the design and process planning stage will identify the most likely mishaps and how they can be prevented, or at least detected, prior to reaching assembly.

Choosing production methods and suppliers based on proven quality, and not solely on cost, also goes a long way toward minimizing this issue.

A test stand is nothing more than a custom gauge. Skilled design is needed to ensure that gauge is accurate (it measures correctly), repeatable (it measures the same item consistently) and reproducible (it provides the same answer regardless of who operates it).

An ongoing verification program to ensure these qualities is paramount, not only for preventing false positives but also to ensure real defects are weeded out.

RICK THINKS ...

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((563)588-3980
mentordbq@gmail.com

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532673-01A(BIZ)13

Workouts don't have to be routine



**MICHELE
MALONE**

The Finley
Hospital

She is the director
of community
wellness at the
Dubuque hospital

Are you sick of the same old workout? Does the treadmill or exercise bike bore you? Do you worry that you don't exercise all muscle groups or that you should be increasing reps instead of increasing weights or vice versa?

Here's good news. There are ever-changing exercise opportunities available for keeping you fit and interested. Variation provides the greatest benefits.

ZUMBA

Zumba fitness is a dance exercise program that keeps everyone motivated by creating a party like atmosphere.

Zumba is mostly about "booty shaking" dance moves that make everyone laugh, smile and let loose. Zumba was developed during the 1990s by professional dancer Alberto Perez in Colombia.

PILATES

Pilates focuses on the core postural muscles that keep the body balanced and support for the spine. Pilates exercises teach awareness of breath and alignment of the spine, and they aim to strengthen the deep torso muscles.

Pilates was developed in the early 20th century by Joseph Pilates in Germany.

YOGA

Yoga is a form of exercise, meditation and various poses. Yoga is the sum of all disciplines — physical, mental and spiritual. Yoga originated in India with Patanjali regarded as the founder.

TAI CHI

Tai Chi focuses on aspects of health, meditation and martial art. It is a noncompetitive, self-paced system of gentle physical exercise and stretching.

Tai Chi was believed to be formulated by Taoist monk Zhang Sanfeng in the 12th century.

EXERGAMES

Exergames has grown in popularity. This integrates fitness-based video games into classes offering unique exercise sessions for game-lovers. A nice feature is you can easily do it at home as your routine

or make up if you miss an exercise class.

P90X

P90X or Power 90 Extreme was released in 2004 and is a commercial home 90-day (it takes you 90 days to complete) exercise program, known for its intensity.

P90X uses "muscle confusion" to prevent the body from adapting to exercise over time, resulting in continual improvement without plateau. The program consists of a nutrition guide, fitness plan, calendar and a series of DVDs.

CROSSFIT

CrossFit is a rising program. CrossFit Inc. is a fitness company founded by Greg (and Lauren) Glassman in 2000. CrossFit describes its strength and conditioning program as constantly varied, high intensity, functional movements. It is designed to forge elite

fitness.

Workouts are short, usually 20 minutes or less, but intense, demanding all-out physical exertion.

TRAINERS

Another way to get the "routine" out of your workout is to make an appointment with a certified personal trainer. A trainer provides individualized motivation and support in addition to proper technique instruction.

STRENGTH TRAINING

Strength training or resistance training uses fitness bands, dumbbells and/or kettlebells to improve muscular strength and endurance. Work your full body two times per week for best results.

All types of exercise improve your health. Don't let your workout get dull. Grab a friend to join you and you are more inclined to continue your workouts. You will offer encouragement and hold each other accountable.

Try new exercises and switch up what you are doing to keep it fun and interesting. Take your dog and improve its health. Dubuque has wonderful hills and trails for adventurous walks or runs. Determine the best fit for you.

MICHELE THINKS ...

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Finally, a production test is certainly not the place to sort out if a particular combination of "to-spec" components results in a winner. During design, specifications for individual components should be chosen that ensure "to-spec" components result in a good assembly — every time.

Manufacturing processes and vendors are then selected to ensure only "to-spec" components will be provided.

Our understanding and implementation of quality systems advanced eons over the course of my quarter century career. In the early years, pushing the start button on the production test stand was akin to spinning a roulette wheel. By the time I left, a failure was news.

I assumed the world of manufacturing was learning and applying at the same pace. That was a faulty assumption.

Built-in-quality, as opposed to inspected-in-quality, is a key ingredient to any Lean initiative. It's almost impos-

sible to make meaningful improvements in an assembly cell when efforts are constantly being diverted to reworking defects.

If your organization sounds more like the company I joined back in the early 1980s than the company I left five years ago, realize that you're leaving a lot of money on the table every single day. Find yourself an experienced quality professional who has already led an organization through this transformation.