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INNOVATIONS IMPROVING EFFICIENCY

Statistical method helps boost bottom lines, batting averages

By Jon Van
Tribune staff reporter

Whether it's helping a kid hit a baseball farther or trimming the repair backlog for a phone company, Charles Holland has the answer.

Using statistical techniques embraced by quality guru W. Edwards Deming, Holland has worked for a generation guiding enterprises large and small to boost efficiency. His chief insight is that the best suggestions to improve efficiency are as likely to come from a janitor as from a foreman.

Dozens of executives attest to Holland's success and, he said, hundreds more keep quiet because they don't want the competition to know about his small Knoxville, Tenn., firm, QualPro.

"I've used QualPro several times, and they haven't failed yet," said Ed Mueller, chief executive of Williams-Sonoma, the California-based purveyor of household goods.

Bill McBee, who has used Holland's techniques in several companies he has led, is similarly impressed. McBee is general manager for Hexacomb, the Lake Forest-based protective-packaging division of Pactiv Corp.

McBee's most recent project saw a 25 percent improvement last year in waste reduction at the firm's plant in Trenton, Ill. This year, improvement has already increased an additional 12 percent.

"We're quite happy with the results," said McBee. "Our Trenton plant had been running a lot of overtime, but last year it ran almost no overtime."

When Mueller was a top executive with SBC Communications Inc. he challenged QualPro to help reduce the phone company's backlog of trouble tickets.

Shortly after SBC took control of Ameritech in late 1999 its service operation fell apart, with some customers waiting weeks or months to get phone service restored or new lines installed.

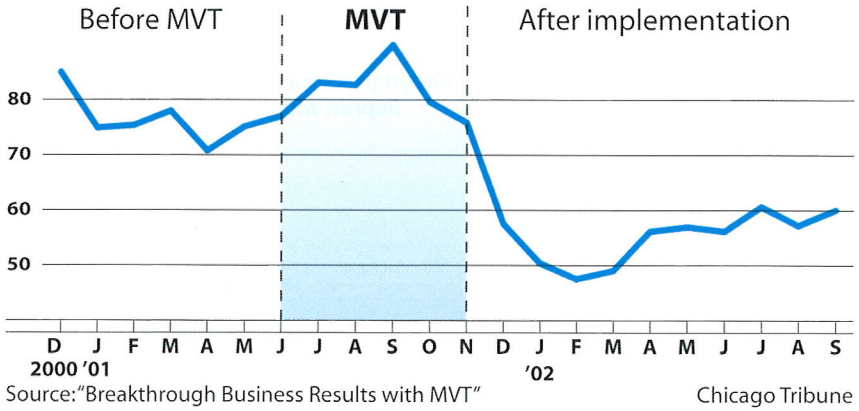
Photo for the Tribune by Michael Mercier/AP

Shortcuts to better processes

Charles Holland (above) used a statistics-based technique to improve the batting average of his son's baseball team. The mastermind behind QualPro helps businesses improve efficiency using a technique known as multivariable testing (MVT). The method cuts down the number of experiments that need to be tested to identify the best processes for a company.

IMPACT OF MVT PROCESS ON AMERITECH

Work load (installation and repair backlog) in thousands



Source: "Breakthrough Business Results with MVT"

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STATICS:

Lower-level workers give suggestions

In 2000 SBC brought hundreds of technicians from Missouri, Texas and elsewhere to the Midwest to regain control.

SBC considered the situation normal once it reduced the backlog to about 80,000 Midwest customers awaiting service.

When Mueller asked his managers to trim the backlog further they said it could only be done at great expense.

"I brought in QualPro almost as a lark," he said. "I wanted to see if our managers' assessment was correct."

Following its usual format for problem solving, QualPro's consultants held brainstorming sessions with people who did the repair and installation work for SBC–technicians and customer reps who answer complaint calls as well as managers and department chiefs. Everyone was asked to propose ideas for improving the process.

The only suggestions considered were those that cost little or nothing and were easy and practical to implement, said Kieron Dey, QualPro technical director.

SBC tested dozens of suggestions in a large controlled experiment that follows a statistical method Holland calls multivariable testing, or MVT.

The experiment identified about eight changes that improved efficiency. Most were fairly simple things such as giving employees written instructions rather than relying upon them to remember what they were told.

The firm acted on the suggestions. Over several months SBC's backlog in the Midwest was cut in half, dropping to about 40,000, Mueller said.

"It's unbelievable you could get it there and sustain it in a cost-effective way," said Mueller, who was so impressed with MVT that he traveled to Knoxville to study Holland's methods.

Holland, a statistician, got involved in quality improvement efforts when he worked for Union Carbide's nuclear weapons division in the 1960s. His ideas are based on work by R.L. Plackett and J.P. Burman, British statisticians who described in 1946 how to do multifactorial experiments.

He started QualPro at the urging of Deming, whose theories helped Japan shed its image as a source of cheap, shoddy products and become a world leader in quality manufacturing.

'Our Trenton plant had been running a lot of overtime, but last year [after using QualPro techniques] it ran almost no overtime.'

—Bill McBee, general manager, Hexacomb division of Pativ Corp.

"Anything that can be measured can be improved," Holland said. He has even applied his methods to his teenage son's baseball team.

Using a radar gun Holland measures how fast a baseball leaves the bat once it is hit. As each batter changes various factors, such as his stance, bat length and weight, Holland records the performance.

By finding an optimal batting strategy for each player, Holland said, batters have raised by 10 miles an hour the average speed of a batted ball. The extra speed translates into more runners reaching base, he said, and has helped the team achieve a batting average above .400.

"You can use MVT to improve almost anything," said Holland, whose new book, "Breakthrough Business Results with MVT" (John Wiley & Sons, $29.95), was released in March.

While Holland claims MVT as his own, others say it is really just a variation of strategies widely used in business.

"Multifactor experiments have been around for a long time," said Ajit Tamhane, Northwestern University professor of statistics and industrial engineering and management sciences. "The idea is simple. To test many factors simultaneously in one experiment could require 1,024 runs. Plackett and Burman devised a method whereby you could make some assumptions and run a much smaller experiment."

David Coit, a Rutgers University professor of industrial systems engineering, said that Holland's MVT is very much like a quality-enhancing scheme called design of experiments.

"Holland brings some new ideas," said Coit, "but it's rooted in the fundamentals of traditional approaches."

The real key, said Joel Goldhar, professor of technology and operations management at the Illinois Institute of Technology, is taking advice from line workers.

"It's using ideas that come up from the bottom," he said. "The executive suites don't like that."

Yet getting management support for an MVT project is vital, Holland said, because experience shows that only 25 percent of ideas intended to improve a process will have a positive effect. The others will either have no effect or will hurt. Managers hate to see experimental results shoot down ideas they were certain would help, he said.

Holland said that given his experience with his son's ball team, the Chicago Cubs ought to take a look.

"There's no doubt it would boost the performance of major-leaguers," he said. "There's no such thing as an optimized process, no matter what it is. You just don't get there with trial and error."