Breaking Down Barriers
Moving Beyond Prescriptive Codes and Standards to Achieve Deep Energy Savings in the Laboratory Environment

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What Motivated UC Irvine to Challenge Status-Quo?

❑ A daunting goal

❑ Accumulated skepticism from value-engineering explanations

- o "Don't worry about reheat … it's unavoidable"
- o "Margin of safety"
- o "Standard practice"
- o "Best practice"
- o Heat dissipation program assumptions that went up 10X
- o Seemed that energy waste was tolerated and taken for granted

❑ Inspiration from several leading engineers and physicists.

Management Performance Improvement Tool Supported Innovation and Questioning Status-Quo
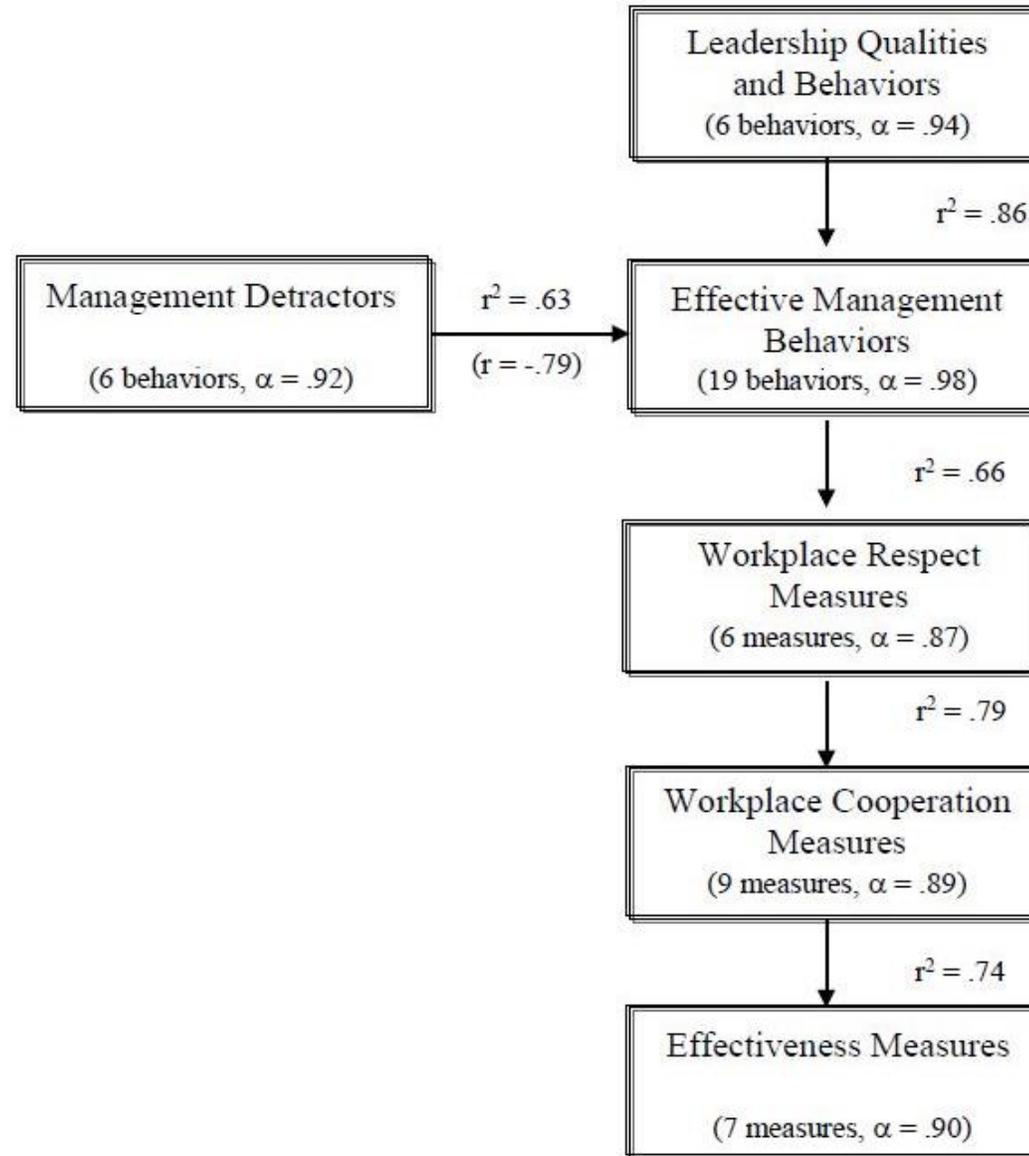
SUSTAINABLE PERFORMANCE IMPROVEMENT

Good managers want to improve their performance, as evidenced by their insatiable interest in new books about management excellence, and their willingness to carve time out of busy schedules for workshops that promise management strategies to revitalize organizations, foster teamwork, and improve the performance of enterprises. Many models of management performance improvement surfaced over the past decade, although most were not called "models," as such. But to the extent that these programs claim a causal relationship between normative management behaviors and desired enterprise performance, they constitute models that warrant rigorous evaluation, in terms of measured effectiveness, compared to both their claimed results and *competing* models of performance improvement.

Which Improvement Model Works Best?

The past decade saw a plethora of popular management books that advocated a variety of dogmas. Managers were urged to promote teamwork through reward systems and new organization forms, to pay for performance, to train managers and staff in "total quality" principles, to deploy cross-functional teams, to re-engineer core business processes, to return to value-based management fundamentals, to adopt the Baldridge criteria, to foster and use customer-driven improvement, to implement "balanced scorecards," to derive and use these strategies while downsizing, outsourcing, simplifying, and producing just-in-time results. No manager could afford to employ *all* these programs. Some management improvement protocols that extolled simplification, streamlining, clarity, and accountability became obese, rigid, and even bureaucratic, violating their own precepts. The streamlining agenda needed a dose of its own medicine.

Conscientious managers had little objective information to enable them to choose from an array of rapidly promulgated ideas. "New" management ideas were backed by little verifiable data demonstrating their efficacy. Many ideas were superbly presented not only in print but also by consultants who polished and added pricey legitimacy. Most new methods were promoted without attacking other strategies, but with a dogmatism that implied the superiority of new theories over their antecedents and competing models. Anecdotal evidence was used to extol new methods of organizing, managing, and rewarding people, buoyed by rising optimism about the productivity and competitiveness of American industries.

However, the thoughtful manager could find little evidence about the relative effectiveness of various improvement programs, to enable an informed decision about where best to invest limited time. Which tools would most efficiently and assuredly lead to improved management effectiveness and enterprise performance?

Performance Improvement Tool
Measured Organizational Behaviors

- Seeking better methods respected and rewarded
- Can discuss problems without fear of "looking stupid"
- Differences of opinion are discussed openly
- Differences of opinion are resolved using facts rather than power
- Work groups continually improve practices
- Group members share expertise

Performance Improvement Tool
Measured Management Behaviors

- Managers reward initiative
- Managers will try new, potentially better methods
- Managers treat new ideas with respect
- Managers do not make some people look good at others' expense
- Managers do not discourage bringing up problems
- Managers do not make employees "feel stupid" when they disagree

Example of Testing a Hypothesis

- Observed all bypass dampers open all the time
- This problem exacerbated by reduced air-changes
- Observed all new lab buildings exhaust stack airspeeds 3200-3500 FPM
- Marc Gomez proposed a wind study using tracer gases on completed buildings to measure effect of lower stack airspeeds

Wind Tunnel Study

Exhaust Stacks Extended

Values Embedded in Research University Culture

- Health or safety will not be compromised to save energy
- Evidence-based validation of practices
- Measurement is better than unchallenged "standard practices"
- Challenge "conventional wisdom"
- Form hypothesis, then test it, then stress-test it

Employees, Technical Staff, and Regulators Trusted UC Irvine

- UC Irvine had accident and injury rate ~ ½ UC average
- Risk assessments completed in every lab
- Lab workers regularly monitored
- Monitoring data shared 100 percent
- Continuous, ongoing monitoring
- When questioned UC Irvine had complete and credible data!

In Summary: Engineering with Attitude!
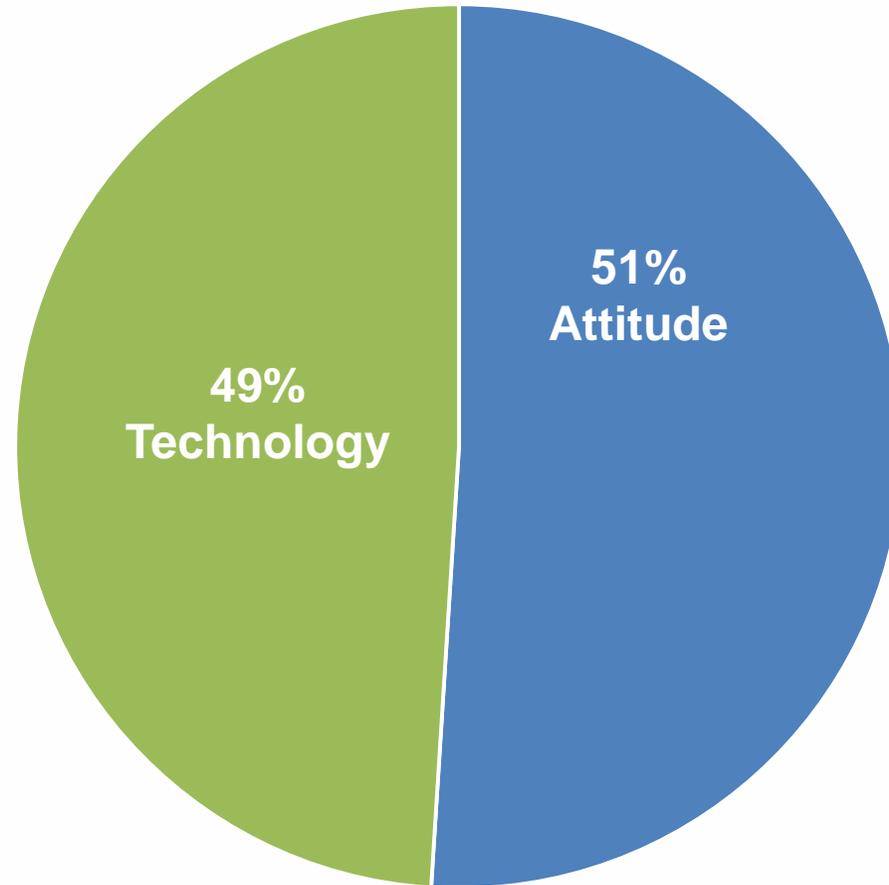
QUESTIONS?

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