Lean Thoughts
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Building Effective Measurement Systems

Work measurement and methods engineering are terms that have traditionally described actions taken to quantify the performance of a worker or a work unit and to improve the performance of the individual and the unit. The relevant body of knowledge has been developed and preserved through the entire history of Manufacturing. Throughout that history, one principle has served as its unifying force: an appreciation for and the applied knowledge of systems. Soon after methods engineering began to be practiced, the need for measurement technology became clear. This was inevitable. Once analysts proposed improvements to the way a job was done, natural curiosity led to the question ‘‘How much better is it?

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More recently, the importance of methods engineering and work measurement was underscored by the late W. Edwards Deming in his legendary seminars. Dr. Deming, when questioned about a system performance deficit, would confront his audience with the challenge ‘‘By what method?’’ He virtually browbeat thousands of paying customers into the realization that insufficient thought and planning went into the design of work systems. Dr. Deming believed that workers, by and large, strive to meet our expectations of them. The lack of sufficient high-quality output, he taught, stemmed not from poor worker attitude, but from poor management and poor design of the methods, tools, and systems we provide to the otherwise willing worker.

Dr. Deming also promoted the engineer’s contribution through work measurement with an additional challenge. Once a solution to the ‘‘By what method’’ question was offered, Deming would ask, ‘‘How would you know?’’ This query highlighted his insistence that decisions regarding process improvements be data driven. In practice, this means that effective systems improvement activities require evidence as to whether the changes make any difference. The requirement is that we use our measurement expertise to quantify the results of our efforts to design and implement better systems.

Deming questions—‘‘By what method?’’ and ‘‘How would you know?’’—articulate the defining concerns of the early engineers, concerns that continue to this very day.

The ability to measure individual and group performance allowed organizations to anticipate work cycle times, which led to more control over costs and ultimately more profitability and better positioning in the marketplace. Understanding how long it actually takes to do a task led to inquiry about how long it should take to do work through the application of scientific methods. Standard times became prescriptive rather than descriptive. The next step in the evolution was the integration of production standards into incentive pay systems that encouraged workers to exceed prescribed levels of output. Application of extrinsic rewards became an additional instrument in the Operation’s toolbox, vestiges of which linger on.

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So much for the evolution of the work measurement and methods aspects of traditional Operation’s Management practice. The following are some evolutionary enhancements that have become part of the Operation’s measurement value proposition:

• Statistical thinking plays a more critical role in understanding work performance. Variation is inherent in all processes and systems. Discovering the underlying nature of variation and managing the key variables has become more critical than just establishing a standard.

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Where Lean Thoughts can become Reality

"Unless you try to do something beyond what you have already mastered, you will never grow.“

Ronald. E. Osborn

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• The role of production quotas is being reexamined. Should we throw out all standards, quotas, and targets, as Dr. Deming suggested? We think not. We contend that the effective approach is to establish a system within which teams of employees hold themselves and each other accountable for system performance and are encouraged to reduce variation and improve performance on their own. Standards that control and limit employee creativity should be eliminated. The key is understanding performance variation and what causes it and creating a partnership with employees so that they are integral members of the team working to improve it.

• Work measurement and methods improvement became detached, to some extent, from the larger system of improvement efforts. Today, efforts to improve what workers do and how they do it is being tied to overall business strategy and actions. This means that measures of performance at the work unit level will have to be tied to and integrated with measures of performance for larger units of analysis. Linkages between individual worker and team performance and system level measures of performance are becoming better understood and managed. Here again, our message is ‘‘transcend and include.’’ Efforts to understand how long something does or should take at the employee or work center level will expand to include understanding of how the unit level systems need to perform in order to fill the treasure chest of the organization.

• Time and quality are no longer the only indicators of organizational performance for which ISEs are being held responsible. This is manifest in a vector of performance indicators, including efficiency, effectiveness, productivity, financial performance, quality of work life, customer satisfaction, and innovation, which are being made elements in a rich and balanced scorecard on which the organization is being graded (Kaplan and Norton 1996).

• Visibility of measurement systems and portrayal of performance data are being recognized as critical elements in the deployment of enhanced measurement systems. Traditionally, a worker knew the standard and that was it. In the future, employees at every level of the organization will have continual access to their scorecard indicators. Furthermore, they will be aware of how these measures are linked to the performance of more inclusive systems. For example, employees at the checkout counter will understand that their behaviors and attitudes influence whether the store is a compelling place to shop and will have data to tell them how this helps to fill the treasure chest and how that affects them. Store managers will understand that a five-point increase in employee attitudes translates into a 1.3% increase in customer satisfaction, which translates into a 0.5% increase in gross store revenues, and their chart book will portray the data that portray how their unit is performing. As a result, daily, hourly, moment-to-moment decisions will be made on the basis of visible data and facts.

The Engineering and Operation Team will be integral to the design, implementation, and maintenance of these comprehensive and very visible measurement systems.
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