A Note on Quality:  
The Views of Deming, Juran, and Crosby

Teaching Note

Synopsis

W. Edwards Deming, Joseph Juran, and Philip Crosby are three of America’s leading quality experts. Each has developed a distinctive approach to quality management. Deming emphasizes statistical quality control and shop-floor involvement; Juran focuses on breakthrough projects, measurement and control, and quality planning; and Crosby emphasizes zero defects, motivation and attitude change, and cost of quality reporting. This note describes the three approaches in detail. Comparative information is provided on their definitions of quality, underlying principles, analytical tools and techniques, quality measures, and recommended roles of management, labor, and quality professionals.

Purpose

This note describes the philosophies and approaches of America’s three leading quality experts. Although their views overlap in important respects—each emphasizes prevention over detection, believes top management must be intimately involved in quality improvement, and sees quality as a powerful competitive weapon—they differ on such fundamental issues as the definition of quality, approaches to measurement, targets for improvement, and the roles and responsibilities of managers, production workers, and quality professionals. Exploring their shared views and individual differences allows further insights into the nature of quality improvement. Knowing their work also allows students to develop a better understanding of more recent contributions to the literature on quality.

Suggested Assignment Questions

1. How do the views of Deming, Juran, and Crosby compare?

2. In what settings is each approach likely to be successful?
3. What problems is each approach likely to encounter?

Analysis

I. Deming, Juran, and Crosby: Comparisons and Contrasts

A. Definitions of Quality

1. Deming implicitly defines quality as “zero defects” or “reduced variation.”

2. Juran defines quality as “fitness for use.” Fitness for use can be thought of in terms of design, conformance, availability, safety, and field use. Of the three definitions, it most directly incorporates the customer’s point of view.

3. Crosby defines quality as “conformance to requirements.”

B. Cost, Productivity, and Competitive Success

1. For Deming, the pursuit of quality results in lower costs, improved productivity, and competitive success.

2. Juran has developed analytical tools which lead to improved productivity and competitive success. But his cost of quality accounting system suggests that the pursuit of quality pays for itself only up to a certain point, and beyond that point leads to rising costs.

3. Crosby believes that quality is free. This suggests that lower defect levels are always desirable, because the costs of prevention will always be lower than the costs of after-the-fact detection and correction. He also believes U.S. companies have to improve quality to compete. His idea that prevention means perfection implies improved productivity.

C. Three Major Contrasts

1. How does each regard quantitative measures and standards? Deming relies on statistical process control (SPC) as a problem-solving tool which separates systemic causes from special causes, but is unwilling to set quantitative goals for the work force. Juran is prepared to measure and quantify everything from conformance, to risk of injury due to product hazards, to the cost of quality. Crosby, on the other hand, is far more interested in motivation than measures, although he does suggest the need for a cost of quality measurement system.

2. How does each regard the relative responsibilities of upper management, quality professionals, and the work force? All three experts agree on major roles for upper management. But only Juran sees a central role for quality professionals who assist top management with planning, measurement, and problem solving. Deming stresses the value of the worker/management relationship and feels that workers themselves should be responsible for problem solving, once they are properly trained. Crosby is also a believer in training and motivating workers, but he counts on them to communicate problems to the next levels of management rather than to solve problems themselves.

3. How does each deal with targets for improvement? Deming and Crosby basically agree on the need for the ongoing pursuit of zero defects as a goal. But
Juran’s COQ concept suggests to companies that it is increasingly costly to take the final steps to perfection.

D. Underlying Management Philosophies

1. Although Deming stresses that quality initiatives must come from the top, he also believes it is the worker who will finally produce quality goods. His stress on worker pride and satisfaction suggests a “theory Y” approach to management, with participation and involvement the key elements. His overall approach focuses on process improvement.

2. Crosby believes in posting goals for workers. (Deming does not.) He also stresses the importance of training, motivation, and rewards. Crosby seems to see attitude change as the critical element in quality improvement, with management leading and the work force following somewhat passively. His overall approach focuses on people.

3. Juran relies on systems, problem-solving techniques, and measurements. There is virtually no mention of workers in his Breakthrough Sequence. His thinking focuses on managing from the top down, and the methods are largely technical. His overall approach focuses on individual improvement projects.

E. Key Tools: Their Value and Limitations

1. Deming’s SPC model is extremely valuable in certain contexts—for example, when technical data can be gathered on products produced in large volumes. It is less appropriate for low-volume products, or those which are customized (implying a lot size of one).

2. Calculating the cost of quality makes sense. But there are several missing elements in Juran’s list of measurements. The cost of quality ignores the value of foregone sales—either because of poor quality or because competitors offer superior quality. It seldom includes such hidden costs as excess inventory or extra capacity held in anticipation of defects. And, it fails to account for the organizational impact and reduced motivation due to setting an “acceptable level of defects” at the point where COQ is minimized.

3. Crosby’s management maturity grid is useful as a broad map to suggest direction at the start of a project. The stages also suggest a way to visualize progress over time. But its value as an evaluative instrument is limited by Crosby’s highly generalized terms and the subjective responses the grid invites.

F. Tools versus Philosophy

1. Crosby stresses motivation and planning. His guidelines do not include the nuts and bolts problem solving that is evident in Deming and Juran. Thus Crosby has little need for SPC and the kind of data it might generate, and seldom mentions it explicitly in his writings.

2. Because Deming envisions quality as an ongoing pursuit, with zero defects as the goal, he sees little need for COQ numbers that suggest a stopping point for quality initiatives.

G. Measures of Improvement
1. Deming measures improvement using the control charts generated by SPC. Fewer deviations over a given period of control would indicate improvement, as would a narrower range of variation. Thus, a new design that produces readings that fall within a tighter band of control would be considered an improvement.

2. Juran provides measures and data that allow a company to map improvements in all phases of its business, from design to vendor relations to manufacturing to customer relations and field service. These include defect rates, measures of field reliability, customer satisfaction ratings, and many others.

3. Crosby recommends that companies estimate the costs of quality, but he is not very much interested in measuring improvement. He seems to see it as a natural byproduct of attitude change and the practices charted in his management maturity grid.

H. Matching the Experts to Companies

1. Deming is extremely popular in Japan. There is a fit with his management philosophy and the Japanese respect for production workers. Much of his thinking seems to address issues relevant to high-volume manufacturing and assembly.

2. Juran’s intense, multifaceted approach, on the other hand, seems best suited to a highly technical or scientific company, although he too is popular in Japan because of his emphasis on quality planning and systematic tools.

3. Crosby’s motivational techniques (and lack of technical measures) seem best suited to a company that is people driven. Alternatively, Crosby can be used as a starting point—to change attitudes—and then one of the other programs may be meshed with it.

II. Common Themes/Issues

A. All Three Experts Propose Programs Which Are Difficult to Implement

1. The view of quality as a “policing function” persists at many companies. Yet all three experts propose prevention-oriented programs that come out squarely against policing.

2. Their programs require organization-wide efforts. Piecemeal programs, they believe, are likely to yield meager results, because most quality problems involve diverse functions and multiple levels of management.

3. Their programs demand long-term commitments, with major investments in training, expensive and time-consuming testing, plus the visible participation of top management. Yet many companies continue to put a premium on short-term financial results.

4. Their programs demand a fundamental shift in traditional organizational priorities. Companies which continue to focus on the goal of meeting their production schedules find it difficult to step back and think quality first, and schedule second.

5. New programs also mean new languages and new techniques.
B. The Leadership of Top Management Is Essential

1. A commitment to quality means a new corporate culture, and only top management can create and support the needed changes.

2. A commitment to quality means new goals, and only top management can communicate the new rewards and priorities.

C. Inspection Is Never the Answer to Superior Quality

1. The idea of quality as policeman is difficult to change because it is such a common practice, and on the surface an obvious answer to the quality question. It seems to make sense to inspect products just before they leave the plant.

2. What common sense fails to tell the policemen is that this approach is a license to accept poor quality, because all corrective action takes place after the fact. At that point the remaining options—the product can be shipped, discarded, rebuilt, or repaired—are expensive and time consuming.

3. Designing quality in makes more sense than the above options, and in the long run is much less costly. All three experts emphasize this approach.

D. Strengths and Weaknesses of Each Approach

1. One of the flaws in Deming’s overall program is that he does not include marketing issues and a concern for the customer. In his view, a reduction in defects means more satisfied customers. Little attention is paid to designing products that are appealing to customers.

2. Juran appears to have a comprehensive approach, but can a company with top of the line products, such as the Mercedes automobile or Rolex watch, afford to use the COQ model? Can a company faced with intense quality competition from a Japanese manufacturer?

3. Crosby can be criticized for relying too heavily on leadership and motivation, and not providing more exacting measures.

Discussion Questions

I. Deming, Juran, and Crosby: Comparisons and Contrasts

1. How does each define quality? Which view makes the most sense to you? Why?

2. Why does each think a company should pursue improved quality? What are the links each sees between quality and:
   
   • competitive success?
   • productivity?
   • cost?

3. What are their recommended approaches for improving quality? Why do they differ so strongly on such issues as:
   
   • the use of quantitative goals/standards?
• the relative responsibilities of upper management, quality professionals, and the work force?
• targets for improvement (zero defects vs. COQ minimization)?

4. What management philosophy is implied by each approach?

5. What are the key tools that each recommends? What is your evaluation of:
• statistical process control (SPC)?
• breakthrough projects, the control sequence, and annual quality planning?
• COQ?
• the management maturity grid?

Why do you think these techniques (especially SPC and COQ) are applied so seldom?

6. What are the links between these tools and each expert’s quality and management philosophies?
• e.g., why doesn’t Crosby push SPC as hard as Deming or Juran?
• e.g., why doesn’t Deming argue for COQ measures?

7. How is improvement measured in each approach?

8. What types of companies are likely to favor each approach?

II. Common Themes/Issues

1. What makes these programs so hard to implement? What are the barriers to successful implementation? Where in the implementation process is each approach likely to run into trouble? From what sources?

2. Why do all three experts regard top management leadership as so essential? Is this a crutch, or is quality improvement different in fundamental ways from other types of manufacturing improvement?

3. Why do all three experts reject inspection as a means of securing superior quality? Why is the idea of “quality as policeman” so hard to change?

4. What are the blindspots or weaknesses of each approach? The strengths?

Teaching Suggestions

After exploring the basic similarities and differences of the three quality experts, the fine points and implications of their thinking can be dramatized by focusing on the following issues:

Zero defects versus cost of quality The instructor can introduce this topic by asking: What are the bottom-line implications of the two approaches? Which makes the most sense from the standpoint of profitability?

Discussion of these two concepts will spark considerable debate. Students will see obvious value in Juran’s goal of making the costs of quality visible to top management. They will see that keeping a ledger also gives a company the leverage it might need to reduce rework and scrap and raise quality issues with suppliers and vendors. At the same time, they will sense the potential for subjectivity in calculating and assessing prevention costs, and the elements that are omitted in COQ
calculations. To get at this point, the instructor may have to ask: Exactly what do COQ measures leave out?

This discussion should also push on the larger issues of corporate culture and the pursuit of quality as a long-term goal. In the short term, COQ can be a device that enables a company to improve in areas where measurement exposes weaknesses. But in the long term, the signal implicit in COQ is that the company will only go so far with quality improvement. Early successes will suggest that it may soon be time to ease off on quality. For this reason, long-term quality commitments are difficult to obtain when COQ measures drive improvement.

Role of managers, quality control engineers, and workers  Juran’s quality control engineers invite several observations. Here, the instructor can ask: What happens when a company relies on special expertise? What message is sent to shop floor employees? The visibility of the quality control staff is important, but most students will sense the limitations and risks of this approach.

Eventually, this discussion should lead students to consider the differing management philosophies of the three experts. The instructor can raise the issue by saying: Does Deming’s emphasis on the work force, Juran’s emphasis on quality control engineers, and Crosby’s emphasis on top management suggest anything about their underlying management philosophies? Students should then sketch out the differences described in the teaching note.

How might the different approaches be suited to different products and industry environments? What makes them so hard to implement? Students who have read the Steinway case and the note by Stanley Marcus will realize that Deming’s statistical quality control methods would be difficult to apply in such settings. Crosby, too, is difficult to apply at a company like Steinway which has high rejection rates (i.e., low conformance) but strong management support for quality. An explicit question may be necessary to raise this point. Students can then be asked to match the approaches to generic industry environments, and then to consider what makes the approaches so difficult to implement. Class can conclude with an observation by the instructor that the issue for companies is not so much identifying the best quality program in the abstract, but finding the program that best fits their culture and industry environment, and then committing themselves to a long-term implementation plan.

See Exhibit TN-1 for a sample blackboard plan.
Exhibit TN-1  Sample Blackboard Plan

Similarities  Implementation Problems  COQ vs. Zero Defects

Deming/Juran/Crosby  Deming/Juran/Crosby