W. Edwards Deming

The *Deming* Videotapes

PROGRAM GUIDE

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

CENTER FOR ADVANCED EDUCATIONAL SERVICES

HOW TO USE THE DEMING VIDEOTAPES

In selecting this video course, you have chosen a unique method of learning, one that is ideally suited to the workplace. Video instruction allows you to:

- Control when and where the learning takes place
- Gain knowledge and know-how in a setting that may include your business associates
- Apply what you learn, as you learn it, to the issues and problems affecting your organization.

Form Study Groups To take full advantage of this video course, we recommend that you form Deming workshops within your organization. When used in groups, video instruction promotes **interactive learning.** It stimulates discussion and problem-solving among learners while imparting new information. You are provided with the opportunity to learn not only from the presentations of W. Edwards Deming, the voice of quality worldwide, but also from the participatory exchanges with colleagues that are a key part of the process.

Use Discussion Topics Your Program Guide is an integral part of this video course. In addition to providing a thorough outline and summary of each module, the Guide includes discussion topics to facilitate further interactive exchanges during workshop sessions. We recommend that you develop additional discussion topics that relate the information to your organization.

Read the Textbook with the Videotapes Whether the videotapes are viewed in groups or individually, we strongly recommend one copy of Dr. Deming's landmark textbook, *Out of the Crisis,* per participant. Each module listing in the Program Guide contains an appropriate chapter reference for reading in conjunction with the videotape. Additional references are provided in the back of this Guide.

Take Advantage of Video Instruction A built-in advantage of VCR-based instruction is that you are able to start and stop the tape at appropriate intervals, and to rewind and replay sections as needed. **You** control the learning pace, determine suitable stopping points to review and discuss the material, raise questions, pose challenges, and explore with coworkers how the information applies to your organization.

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(Studio footage of Dr. Deming recorded in 1981 and 1984)

PROGRAM GUIDE

W. Edwards Deming

Massachusetts Institute of Technology
Center for Advanced Educational Services

Reorder Number 683-5100

ORGANIZATION OF THE VIDEOTAPES

TAPE ONE	46 min
Module One: **Introduction**	8 min
Module Two: **Chain Reaction of Quality**	12 min
Module Three: **The System—Common and Special Causes of Trouble**	26 min

TAPE TWO	47 min
Module Four: **The 14 Points for Management**	47 min

TAPE THREE	61 min
Module Five: **Uses of Control Charts**	21 min
Module Six: **New Principles of Training and Supervision**	12 min
Module Seven: **Diseases and Obstacles**	28 min

TAPE FOUR	25 min
Module Eight: **Quality and Productivity in Service Organizations**	15 min
Module Nine: **Quality and the Consumer**	10 min

INTRODUCTION

> *"We have learned to live in a world of mistakes and defective products as if they were necessary to life. It is time to adopt a new religion in America."*

THESE PROPHETIC WORDS by W. Edwards Deming have come home to American business as we have felt the chill winds of economic change. The invasion of markets and capture of products by Pacific-rim and European companies continues apace, undermining our once unassailable economic and competitive position. Despite the alarm, the quality of many American goods and services still does not measure up to the test.

As Dr. Deming has demonstrated, 94% of all defects and waste are caused by system failures — cheap materials, poorly maintained equipment, outdated procedures. Only management can improve the system. Only top management can commit an organization to improvement of quality.

The MIT Center for Advanced Educational Services has produced a concise and readily accessible précis of Deming's legendary message for management and workers in manufacturing and service organizations. By learning and applying his easily understood definitions and tools, you will pinpoint the sources of trouble and discover opportunities to improve your processes. With Deming's principles of quality management, you will work smarter, redesign systems, streamline processes, reduce costs, and deliver quality products and services.

Deming's Way is both challenging and rewarding. It takes commitment. But it will lead to a quality-conscious, customer-driven business able to survive in today's global market.

Video Course Syllabus

TAPE ONE

Module 1: Introduction

Outline

History of W. Edwards Deming: The early years; Japan; U.S. and international consulting.

Module 2: Chain Reaction of Quality

Outline

Why productivity increases as quality improves (the chain reaction) — Production viewed as a system — Example: Improved operational definitions.

Chapter Reference from Out of the Crisis*:*

Chapter 1, "Chain Reaction: Quality, Productivity, Lower Costs, Capture the Market"

Summary

Improving quality leads to lower costs, increased productivity, and a better competitive position. To start this chain reaction, management must first map out and understand each step in the production system, from incoming materials or information through production and delivery to the consumer, then look for opportunities to make improvements. Management must understand its responsibilities for learning about and solving problems at every stage. Engineers must learn the simple, but powerful

statistical methods used to detect causes of trouble. Everyone in the organization must understand the need for never-ending improvement of the production system.

Discussion Topics

2.1. Produce a flow diagram of one process in your system. Discuss areas that are in the greatest need of improvement. Consider how attention to quality might improve productivity and lower costs.

2.2. Pinpoint specific procedures within your organization that need to be better defined. How will you communicate operational definitions, procedures, and specifications to everyone involved?

Module 3: The System: Common and Special Causes of Trouble

Outline

Lesson of the Red Beads — Definitions of Common and Special Causes — Example: Bad thread in shoe factory (Common Cause) — Example: Performance of salespeople (Special & Common Causes) — Example: Two bad machines out of nine (isolating the sources of defects) — Summary: Most faults are due to the system (94% to Common Causes; 6% to Special Causes) — A list of possible common causes.

Chapter Reference from Out of the Crisis:

Chapter 11, "Common Causes and Special Causes of Improvement. Stable System."

Summary

When problems exist within a system, defective output is inevitable. Faults of the system are referred to as common causes of trouble. Problems related to specific events or people are referred to as special causes of trouble. Special causes contribute

about 6% of all production problems. The remaining 94% are the result of common causes, and affect everyone in the system. Management is responsible for the system, including finding and correcting sources of defects. Statistical tools, like the control chart, are the only reliable methods for objectively solving problems in the system.

Discussion Topics

3.1. Look at one process in your operation and list the problems that you have experienced. Try to classify those problems into those produced by the system (Common Causes) and those produced by specific events or people (Special Causes).

3.2. Out of the problems analyzed in 3.1, select one that is particularly vexing. Discuss the solutions considered to date. Do these solutions focus on who's wrong or on what's wrong? List some new solutions to be considered.

3.3. Specify how faults (defects and mistakes) are currently traced back to their origin. Has this method been effective in preventing faults? If not, how can you improve the system?

TAPE TWO

Module 4: The 14 Points for Management

Outline

Introduction to the 14 points — Point 1: Create constancy of purpose for improvement of product and service — Point 2: Adopt the new philosophy, top management and everybody. Do not accept mistakes and defects as a way of life — Point 3: Cease dependence on mass inspection. The purpose of inspection: improvement of process, reduction of cost — Point 4: End the practice of awarding business on the basis of price tag alone — Point 5: Improve constantly and forever the system of pro-

duction and service — Point 6: Institute training on the job — Point 7: Improve supervision. Teach and institute leadership — Point 8: Drive out fear. Create trust. Create a climate for innovation — Point 9: Break down barriers between departments — Point 10: Eliminate slogans and exhortations for the work force — Point 11: Eliminate work standards (numerical quotas) for production. Instead, learn and institute methods for improvement — Point 12: Remove barriers that rob people of pride of workmanship — Point 13: Encourage education and self-improvement for everyone — Point 14: Take action to accomplish the transformation.

Chapter Reference from Out of the Crisis:

Chapter 2, "Principles for Transformation of Western Management"

Summary

Dr. Deming's "14 Points for Management" provide a road map for transforming any organization, manufacturing or service, into a quality-conscious, customer-driven business able to compete in domestic and world markets. This practical strategy for quality improvement blends fundamental leadership principles with modern statistical methods. Regularly review management's progress on the 14 Points. Don't be fooled by quick successes; allow a minimum of five years for substantial evidence of transformation.

Discussion Topics

4.1. Write a statement that describes your understanding of your organization's goals. Compare and discuss the results with your colleagues.

4.2. Examine how resources are currently allocated to provide for long-term goals. Make a list of long-term objectives that require more attention.

4.3. Estimate the percentage of your final product or service cost that is attributable to waste or defects.

4.4. Identify one operation where high quality is sacrificed to keep costs down. Estimate the percentage of that operation's output that is defective. Calculate the savings that operation would realize if none of its output were defective.

4.5. For one operation, quantify all of the costs of inspection and correction of defects (rework). Consider problem-prevention procedures that might be a better investment of this money.

4.6. Discuss the criteria used by your purchasing department when selecting vendors. Are quality and total cost taken into account, or only lowest initial purchase price?

4.7. Evaluate how your suppliers affect the quality of your products. Discuss how you currently respond to receipt of defective incoming materials. How do you know they are defective? Do you ever rework and/or use defective materials out of desperation?

4.8. Identify existing methods designed to help workers report problems and make suggestions. How frequently are the suggestions used? What kind of follow-up action is taken on problems? In both cases, are workers aware of follow-up efforts?

4.9. Determine if programs for retraining are adequate to keep up with new products, processes, and services.

4.10. Decide if supervisors are given sufficient training in distinguishing system defects (Common Causes) from those produced by workers or specific events (Special Causes).

4.11. Consider how supervisors currently help people to improve their performance. How much of your supervision focuses only on "catching people making mistakes"?

4.12. Consider some of the fears that exist among your workers. Specify ways to remove these fears.

4.13. Determine barriers that exist between departments or groups within your organization. Examine the ways these barriers are currently reinforced. List steps that could be taken to unify departments and to improve communication.

4.14. Decide if the slogans, exhortations, and directives issued by management to workers provide sufficient guidance and direction.

4.15. Identify areas in your organization where numerical goals are used. Are any methods provided by top management for meeting these goals? Do they focus on quality, or only on quantity?

4.16. List factors that inhibit pride of workmanship in your organization. Compare and discuss the results with your colleagues.

4.17. List ways in which top management encourages education and self-improvement for every employee. Are there any influences that discourage these efforts?

4.18. Consider the kind of organizational changes you will need to make in order to make progress on the 14 Points.

TAPE THREE

Module 5: Uses of Control Charts

Outline

Introduction, history, and purpose of control charts — Two uses of control charts — Principles for control chart development — Learning to use control charts — A proliferation of charts is not necessary — Control charts minimize over- and under-adjustment to correct the process — Example: Filling orders in a mail order house — Summary: Advantages of a process in statistical control.

Chapter Reference from Out of the Crisis:

See index under "Control chart"

Summary

The control chart is a key element for successful implementation of Dr. Deming's methods for quality improvement. It is the one simple but powerful technique that most clearly directs attention toward special causes of variation and reflects the extent of common causes. The only way to determine if a process is in statistical control is by using a control chart. Control charts are used in production to establish and maintain statistical process control. It is simple to use control charts, and few are usually needed to be effective.

Discussion Topic

5.1. Pick one area of your operation in need of statistical process control. Discuss the parameters you would measure and the criteria you would use to determine the quality of output.

Module 6: New Principles of Training and Supervision

Outline

A new definition of supervision: Help people to do a better job with less effort — Why not tell a worker about his mistakes? — Example: A manufacturing company in trouble (blaming workers for defects) — Train employees until their work is in statistical control. Once statistical control is reached, further training is useless — Ranking people is ineffective and often has destructive side-effects — Supervisors need to give guidance and help.

Chapter Reference from Out of the Crisis:

Chapter 8, "Some New Principles of Training and Leadership"

Summary

Some supervisory and training practices must be changed in order to improve quality and reduce costs. The supervisor's role should be to help people to do a better job with less effort. Blaming workers for defects produced by the system does not correct the problem or help workers to do a better job. Proper training is critical to producing high quality. If training is not carried out correctly, workers learn the wrong procedures, and stick with them. Statistical methods determine when training is needed and when it is finished.

Discussion Topics

6.1. Identify ways in which control charts could aid in training and supervision in one of your operations.

6.2. Determine if system variation and external influences are considered in performance evaluations. Does an organization-wide system for raises and promotions exist, or do the rules and opportunities vary from department to department?

6.3. List some recent incidents of poor quality output. Decide whether any can be traced back to improper or insufficient training. Consider what you should do to prevent further occurrences.

Module 7: Diseases and Obstacles

Outline

Introduction to the Obstacles to Success (Diseases of Management) — Lack of constancy of purpose — Emphasis on short-term profits fed by fear of unfriendly takeover — Evaluation of performance, annual review, merit rating, annual appraisal, management by objective — The mobility of management. The mobility of labor — Running an organization on visible figures alone (considering only the bottom line) —

Insulation surrounding top management — Search for examples — The supposition that quality control methods will not work for small companies — Obsolescence in teaching in schools of business — Use of acceptance tables for testing of incoming product — Delegation of quality problems to "quality control department" — The supposition that "our troubles lie entirely in the work force" — Trying to inspect quality into the product — "False starts": Depending wholly on statistical methods in production — "False starts": Quality Control Circles — Trying to "install quality control" — The unmanned computer — The supposition that it is only necessary to meet specifications — The supposition that help can only come from someone who understands the business.

Chapter Reference from Out of the Crisis:

Chapter 3, "Diseases and Obstacles"

Summary

There are many obstacles, or diseases of management as Dr. Deming calls them, that prevent successful implementation of the 14 Points. Removal of some of the obstacles will require a shift in thinking, while others call for more dramatic changes.

Discussion Topics

7.1. Describe top management's involvement in the problems of design, production, and marketing. List areas in which top management is currently insulated from day-to-day operations.

7.2. Consider your turnover rate in management. List the most common reasons managers leave the organization. Discuss steps that could be taken to prevent good managers from leaving. Do the same for non-management personnel.

7.3. Review the list of Diseases and Obstacles (in the "Outline" section above). Determine which ones pose the greatest challenge to your organization. Discuss how you might overcome them.

TAPE FOUR

Module 8: Quality and Productivity in Service Organizations

Outline

Examples of service organizations — Three times more people work in service than in manufacturing in the U.S. today — Certain departments within any company are actually service organizations — Example: Problems in the payroll department — Example: Problems in the purchasing department — Quality of service is measured by the customer's opinion — Example: Reduction of mistakes in a bank — Suggestions for reducing paperwork mistakes — Summary: The 14 Points apply to service as well as manufacturing.

Chapter Reference from Out of the Crisis:

Chapter 7, "Quality and Productivity in Service Organizations"

Summary

Inefficiency in a service operation raises costs, lowers productivity, and loses customers to competitors. Three times as many people in the U. S. work in service organizations as in the manufacture of goods. Many service workers are employees of manufacturing organizations; they work in payroll, purchasing, clerical, and other areas of the business. Quality of service should always be measured by the customer's opinion. Just as in manufacturing, high quality is built into services through functional design and total quality management. The principles and methods for improvement are the same for service as for manufacturing. Service organizations must implement the 14 Points to improve quality, keep existing customers, and gain new ones.

Discussion Topics

8.1. List problems in your service operation. What needs the most urgent attention? Consider steps that can be taken to understand the source of the problem and ways to correct it.

8.2. Examine one service process. List possible ways to simplify it. How will the changes you suggest affect the customer? the costs? the quality?

Module 9: Quality and the Consumer

Outline

The consumer is the judge of quality — The Triangle of Interaction (a definition of quality that includes the consumer) — No one can predict the future loss of business from a dissatisfied customer — Consumer research — The new methods of total quality management: The Deming Cycle of continuous improvement.

Chapter Reference from Out of the Crisis:

Chapter 6, "Quality and the Consumer"

Summary

The only important judge of quality is the consumer. No one can predict the future loss of business from an unhappy customer. Dr. Deming's "Triangle of Interaction" provides a view of quality that includes the customer. To improve products and services requires feedback from the customer. Also, the "Deming Cycle" is a model for the new methods of consumer research that give customers a voice in the design of products and services better suited to their needs.

Discussion Topics

9.1. Examine the ways in which your organization currently learns about the customer's evaluation of your product or service. Do you actively or passively find out about problems?

9.2. Do you depend on complaints from customers to learn what is wrong with your product or service? If so, discuss the disadvantages of this passive approach. List better ways to understand the customer's opinion of your product or service.

9.3. What problems do customers have with your product or service. How do you know? What steps are you taking or could you take to address these issues?

9.4. Select one product, process, or service. List, in order of priority, the factors that are most critical to its quality. List the quality characteristics that distinguish it from your competition. Consider other quality characteristics that you might incorporate.

RECOMMENDED RESOURCES

Books

Deming, W. Edwards. *The New Economics*. Cambridge, MA: Massachusetts Institute of Technology Center for Advanced Educational Services, 1994 (second edition).

Deming, W. Edwards. *Out of the Crisis*. Cambridge, MA: Massachusetts Institute of Technology Center for Advanced Educational Services, 1986.

Gabor, Andrea. *The Man Who Discovered Quality: How W. Edwards Deming Brought the Quality Revolution to America*. New York: Random House, Times Books, 1990.

Gitlow, Howard S. and Shelly J. *The Deming Guide to Quality and Competitive Position*. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1987.

Grant, Eugene L., and Leavenworth, Richard S. *Statistical Quality Control*, 4th ed. New York: McGraw-Hill Book Co., 1980.

Ishikawa, Kaoru. *Guide to Quality Control*, 2nd rev. ed. Tokyo: Asian Productivity Organization, 1982.

Ishikawa, Kaoru. *What Is Total Quality Control?* The Japanese Way. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1985.

Kilian, Cecelia S. *The World of W. Edwards Deming*. Knoxville, TN: SPC Press, 1992.

Latzko, William J. *Quality and Productivity for Bankers and Financial Managers*. Milwaukee, WI: ASQC Quality Press, 1987.

Mann, Nancy R. *The Keys to Excellence: The Story of the Deming Philosophy*. Los Angeles: Prestwick Books, 1985.

Sherkenbach, William W. *The Deming Route to Quality and Productivity: Road Maps and Roadblocks*. Washington, DC: Continuing Engineering Education Program, George Washington University, 1986.

Shewhart, Walter A. *Economic Control of Quality of Manufactured Product*. New York: Van Nostrand, 1931; Milwaukee, WI: American Society for Quality Control, 1980.

Shewhart, Walter A. *Statistical Method from the Viewpoint of Quality Control*. Washington: Graduate School, Department of Agriculture, 1939; New York: Dover Publications, Inc., 1986.

Walton, Mary. *The Deming Management Method*. New York: Dodd, Mead, 1986; reprint ed. New York: Putnam, Perigee Books, 1986.

Walton, Mary. *Deming Management at Work*. New York: G.P. Putnam's Sons, 1990.

Videotapes

Of special interest are tapes 81-0111 and 81-0112, recorded by MIT/CAES in 1981. These two videotapes contain detailed discussions of Dr. Deming's rules for inspection. Cambridge, MA: Massachusetts Institute of Technology Center for Advanced Educational Services.

The Deming Library. Silver Spring, MD: CC-M Productions.

Roadmap for Change — The Deming Approach. Chicago, IL: Encyclopedia Britannica Educational Corporation.

Statistics in Quality, Productivity, and Problem Solving. Cambridge, MA: Massachusetts Institute of Technology Center for Advanced Educational Services.

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TAPE ONE

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