Figure 11.16a. PROCESS IMPROVEMENT STRATEGIES: Total Quality Management 1

EM9211: The Globe and Mail, April 25, 1992, page B4

The concept has mostly failed because companies didn't target their customers

Total quality management, half baked

The Economist

FOUR decades after Tanabe Seiyaku, a Japanese drug company, won one of the country's first Deming prizes – an annual award named after W. Edwards Deming, an American consultant who set off Japan's post-1945 quality revolution – "total quality management" is still the Japanese trick Western firms are keenest to copy.

But despite some headline success stories – Motorola Inc. of Schaumburg, Ill., for instance, says total quality techniques have cut about $700-million (U.S.) from its manufacturing costs during the last five years – there is mounting evidence that the quality programs of many Western companies are failing dismally.

Some of the most damning testimony comes from the very consultants that helped managers to implement those programs.

A new survey by Arthur D. Little of 500 U.S. manufacturing and service companies found that only a third felt their quality programs were having a "significant impact" on their competitiveness. And in a recent study by A.T. Kearney of more than 100 British firms, a mere fifth of those surveyed believed their quality programs had achieved "tangible results."

Graham Sharman, an expert on quality with McKinsey & Co. Inc. in Amsterdam, believes two-thirds of the programs that have been in place for more than two years grind to a halt because of their failure to produce the hoped-for results.

If he is right, a staggering number of companies are discovering that quality street is a dead end. About three-quarters of U.S. and British firms claim to have some form of total quality program. If so many Western companies believe they are at the mercy of quality, why are they finding it such a strain to get it right?

One problem is inexperience. Even the most quality-conscious Western firms have had little more than a decade's experience with total quality management.

Contrast that with early Japanese converts like Nippondenso Co. Ltd., Honda Motor Co. Ltd. and Nissan Motor Co. Ltd. that helped in the 1950s to build quality into a cornerstone of Japan's industrial success. They were inspired by Dr. Deming and Joseph Juran, the Romanian-born, American-raised co-founder of the quality movement.

But Japan's head-start is only a part of the story. The crux of Western firms' quality crisis is their apparent inability to aim their efforts at the right target – the customer.

TOTAL quality management focusses on processes, rather than results and products. Get the details of your manufacturing or service process right, goes the theory, and the result will be a high-quality product.

The Baldrige award, the U.S. answer to the Deming prize, allots only 250 of a possible 1,000 points to the actual results of a firm's quality efforts; the remaining 750 focus solely on processes.

Taking that to heart, many Western firms have concentrated all their efforts on improving their quality processes, and lost sight of the customer on the way.

Take **Florida Power & Light** (FP&L). In its bid to become the first non-Japanese winner of the Deming prize, the utility acquired all the trappings of an extensive quality program – an 85-strong quality department, 1,900 quality teams involving three-quarters of its employees and a rigorous, highly statistical "quality review" system.

FP&L won its Deming prize in 1989. But while customers saw some improvements in the quality of its services, these were insignificant when set against the sheer scale of the firm's quality effort.

To a large extent, FP&L was simply going through the motions. One utilities regulator, visiting an FP&L nuclear power station, noted many employees seemed as interested in the appearance of quality as in quality itself.

Michael Fraga, FP&L's head of quality, is clearing up the mess. The quality department now has only six employees and most of the quality teams have been disbanded; the whole process, say Mr. Fraga, is "a lot less rigid." Customers now count for everything, Mr. Fraga says. "You have to keep going back to the customer to check what they want from you."

British Telecommunications PLC's quality program, launched in the late 1980s, has never really recovered from getting bogged down, early on, in its quality processes and bureaucracy. It failed to focus its initiative on customers – with the notable exception of those products and services that Oftel, Britain's telecommunications regulator, was investigating.

British Telecom has dismantled most of its quality bureaucracy, partly on the argument that quality is now in its bloodstream. Few are convinced.

Allen-Bradley Co. Inc., a Milwaukee-based manufacturer of industrial-automation equipment with sales of $1.4-billion in 1991, nearly fell into a similar trap. In the 1980s, the success of its quality program was routinely measured against short-term financial results (has quality improved profits this quarter?), rather than against customer expectations, says Jim Weber, a manager on Allen-Bradley's quality council.

With its effort yielding meagre results, the company finally realized that, in the words of Glenn Eggert, a vice-president of operations at Allen-Bradley, "quality needed to be in the eye of the customer."

The group now uses its salesmen as a quality task force, continuously surveying customers to pit their expectations against Allen-Bradley's results. But for customers really to see a difference, muses Mr. Eggert, "quality must run through the company's blood."

Steve Young, one of the authors of A.T. Kearney's study, stresses that, hard though it is to do, "empowering" all of a firm's employees, making each responsible for quality, can pay dividends.

Of the firms the consultancy surveyed, those whose quality programs had succeeded were twice as likely to have pushed responsibility for quality down to the shop floor, flattened their organizational structures and broken down functional barriers. Only by going that far, says Mr. Young, can the quality gospel be spread throughout the firm.

WRESTING control of the quality program from the quality department may be the only way to do that.

Richard Palermo, vice-president of quality at **Xerox Corp.** of Stamford, Conn., is at pains to stress that he is not a quality professional. A Baldrige winner in 1989, Xerox has no quality department.

Mr. Palermo thinks most programs fail because firms construct isolated quality departments. At Xerox, cross-functional teams attack quality problems, most of which, says Mr. Palermo, result from "functional foxholes" – misunderstandings between departments. Every employee is responsible for quality.

"We did encounter resistance," says Mr. Palermo. "Empowering workers means taking power from somewhere else." At Xerox, the

(*continued overleaf*)

sticking point was middle management.

At **Modicon,** a Massachussets-based maker of industrial automation systems, resistance came from higher up. Senior managers, says Dick Eppig, Modicon's vice-president of quality and one of this year's Baldrige examiners, still measure the firm's quality program against its short-term financial performance.

When Modicon threw itself into total quality in the late 1980s, senior managers expected near-instant results – which, unsurprisingly, failed to materialize. Such impatience, laments Mr. Eppig, makes it "incredibly difficult to get positive results."

Why do so many Western firms seem to find it hard to take the long view of quality?

Ron Hutchinson, head of customer service at **Harley-Davidson Inc.** of Milwaukee, says the "continuous, creeping shakeup" needed to make improvements "is a curious kind of goal." This can be expressed more simply. Human nature demands clearly defined targets, not the constant shifting sort needed to achieve ever-higher quality.

"Workers didn't like the thought of continuous, long-term change," says Mr. Hutchinson. What this means is that maintaining the momentum of a quality program can be a Sisyphean task. Yet a long, slow effort is vital.

The other obstacle, thinks McKinsey's Mr. Sharman, is many firms still believe that putting a quality program in place is a swift and sure way to reverse their fortunes.

He reckons quality programs work best if they are put in place after an ailing company has turned itself around: "Total quality is much easier to implement during a period of company prosperity," he asserts.

Xerox's Mr. Palermo disagrees. He believes that because Xerox faced possible extinction at the time it launched its quality initiative, managers and workers were more inclined to accept radical changes.

But he admits Xerox did not expect rapid, dramatic results. The firm did not, he says, intend to "fold its tents after two or three years."

After almost a decade of keeping its tents up, Xerox is one of the rare Western winners in the quality game. Like Honda and Nippondenso, it sees quality simply as "a way of doing business," one that is focused wholly on the customer.

Nonetheless, it still fails the test set by A. T. Kearney's Mr. Young. "Do you have a director of 'the way we do business?'", he asks firms when advising them on their quality programs. "If not," he goes on, "you don't need a director of quality." Mr. Palermo should watch out.

The article EM9211, reprinted above and overleaf on page 11.93, is continued on the facing page 11.95 with a box containing a wry description of TQM training provided by Philip Crosby Associates (recall Figure 11.9a) to *The Globe and Mail* management.

This Figure 11.16 is the fifth of eight overviews of process improvement strategies for quality improvement, listed at the right; the main points of agreement, and some of *dis*agreement, are summarized below, with illustrative quotations from the overviews.

Crosby	Figure 11.9	TQM	Figure 11.16
Deming	Figure 11.10	Box	Figure 11.17
Joiner	Figure 11.12	Taguchi	Figure 11.18
Six Sigma	Figure 11.15	Ishikawa	Figure 11.19

- Quality improvement in a company is a slow, arduous process that does not quickly produce tangible results; the on-going discipline required for success makes it unattractive to both management and workers.
  - Crosby and Deming emphasize that quality is *primarily* a management responsibility, whereas management finds it easier to blame quality problems on careless workers.
  - Management may try to retain their prerogative of making decisions, rather than empower workers.
  - Workers may see quality improvement strategies as a way to eliminate jobs.
    - *... despite some headline success stories ... there is mounting evidence that the quality programs of many Western companies are failing dismally.* [Figure 11.16a, page 11.93, left-hand column]
    - *Graham Sharman ... believes two-thirds of the programs that have been in place for more than two years grind to a halt because of their failure to produce the hoped-for results.* [Figure 11.16a, page 11.93, left-hand column]
    - *After almost a decade ... Xerox is one of the rare Western winners in the quality game. Like Honda and Nippondenso, it sees quality simply as "a way of doing business," one that is focused wholly on the customer.* [Figure 11.16a, page 11.94, right-hand column]
    - [Mr. Sharman] *reckons quality programs work best if they are put in place after an ailing company has turned itself around ... Xerox's Mr. Palermo disagrees. He believes that because Xerox faced possible extinction at the time it launched its quality initiative, managers and workers were more inclined to accept radical changes.* [Figure 11.16a, page 11.94, middle column and right-hand column]
    - *"Empowering workers means taking power from somewhere else." At Xerox, the sticking point was middle management.* [Figure 11.16a, pages 11.93 and 11.94, right-hand column and left-hand column]
    - *"For all the talk about jointness and worker control, employers are certainly not putting true equality between themselves and their employees on the agenda...."* [Figure 11.11b, page 11.69, right-hand column]
    - *But many employees remained suspicious that the process was really a way of eliminating more jobs.* [Figure 11.15, page 11.91, lower box, middle column]
- Process improvement strategies that are the basis for improving quality must not distract a company from its focus on customer feedback to prioritize process improvement activities (as emphasized in Six Sigma).
  - A defect-free product is no help if it does not meet customer needs.
  - Company structure must facilitate rapid flow of information on quality problems from shop floor to management, who must show eagerness to correct the problem efficiently.
  - Box suggests that many quality problems are simple enough that most people have the skills needed to correct them; within the priorities set by customer feedback, there must be an effective company system to assign the (minumum) necessary resources to problem resolution.

(*continued*)

Figure 11.16a. PROCESS IMPROVEMENT STRATEGIES: Total Quality Management (continued 1)

EM9211: (cont.)

A TQM crash course – where zero defects meet morality

The Globe and Mail has been exploring total quality management for its own operations. Editor-in-chief Willian Thorsell recently spent four days in a suburban Toronto hotel learning the values.

BY WILLIAN THORSELL (Master of TQM)

We were enrolled by our persistently helpful Human Resources department in the Quality College, a four-day program starting with a free coffee coaster and leading to a graduate plaque and a conductor's baton. We were to be at our desks at 8 a.m. sharp at an office building in central Mississauga. (There is no downtown Mississauga because there are no downtown streets in Mississauga.) There would be a brutally early drive out west on the freeway past the Humber. There would be lectures. There would be working groups. There would be homework. There would be four days.

Total Quality Management (TQM) is a movement promoted throughout corporate North America and Europe by consulting firms that specialize in selling the secrets of higher productivity and customer loyalty. In this case, it was Philip Crosby Associates, a leading force in the field that is now also populated by some of Crosby's earlier customers, such as IBM and 3M. These firms first sell the need for a TQM program, then the training and consulting to implement it.

Our first instructor was from Chicago, a perky guy who obviously spends a lot of time travelling. His real-world examples were replete with references to airlines and how they could benefit from TQM in customer service. (Did you here the one about how carpets at the front and back of the passenger cabin got soaked because the cabin crew left the doors open all night in a rain storm? What else did they forget?)

A deft combination of workbooks, blackboards, overhead slides and a promotional video whose instructive episodes at "Magna Bank" spread out over four days constitute the course of study.

The definition of quality in this context is precise. Quality means meeting all the requirements all the time. It is based on the principle that all work is a process. It focuses on improving business processes to eliminate errors, thereby cutting costs and increasing customer loyalty and market share. The concept is perfectly logical and essentially simple. Most smart things are.

Example: you are a parts manufacturer that supplies inside door panels for General Motors. One out of every 1,000 of these panels, say, has a faulty set of attachment devices. In sum, you typically get it right 999 times out of 1,000, which sounds pretty good. But consider the outcome: GM produces 3,000 cars a day using your panels; soon, three door panels a day come off when a passenger pulls a door closed from the inside. By the time you add up the costs to GM, which must take the car back for repairs under warranty, the costs to the panel maker, which must pay GM a penalty and offer a replacement, and the disgust of the customer, the cost of the error becomes very steep indeed. In almost all cases, the cost of preventing the error would be much lower than the cost of making it. That is the insight driving TQM.

(Now we understand the DIRTFT inscribed on the Post-It note pad beside the homework assignments: Do It Right The First Time.)

The message is driven home via repetition, example, group projects, reading and writing under the fervent direction of an instructor with evangelical tendencies and total control of the exits. He is also the salesperson and consultant who would like to sign you and your corporation up for the whole TQM shebang. What is the whole shebang?

It is a complex, detailed, exhaustive, instructive training program for the rest of your management, a detailed implementation program for your workplace (including posters, T-shirts and festive quality days), measurement, review, evaluation, expansion and reflection leading to Starting All Over Again (And when do we find time to write and edit?). A new way of life. Continuous improvement. Zero defects. Market share. Profit. Goodness. Morality.

Yes, morality. TQM finally assumes the mantel of a mantra. Perfection in work equals happiness equals perfection in work – an HR department's dream. The pop song comes to mind: Turning Japanese. In Mississauga.

- Crosby's TQM ideas noted by Willian Thorsell are (of course) discussed in more detail in Figure 11.9a.
- For these Materials, the three-fold use of 'error' in the discussion above would be better as 'mistake' or 'defect.'

p. 11.94: (cont.)

– More complex quality problems requiring more technical knowledge (like statistical methods, as discussed by Joiner) to resolve them must quicky be assigned to the appropriate company employees (Six Sigma's idea of Black Belts).

- Statistical methods useful for achieving process improvement are handicapped by their often-arcane terminology and by their difficulty of non-technical description (see the Six Sigma Speak box on page 11.90). The table at the right lists eight such methods, the first seven being Ishikawa's tools. Six Sigma employs Minitab to assist with using the tools, including producing suitable graphical displays, an introduction to the large topic of Data Visualization. As indicated on the right of the table, six of these tools are discussed elsewhere in these Materials. The Chi^2 method in Six Sigma, mentioned on page 11.90, sounds from its description like a contingency table test for probabilistic independence, which is discussed in Figure 12.26a in the STAT 221 Course Materials.

Check sheets	
Pareto diagrams	Figure 11.20
Cause and effect diagrams	Figure 11.21
Histograms	Stat. Highlight #26
Stratification charts	
Scatter diagrams	Stat. Highlight #29
Control charts	Figure 11.22
Design of experiments	Stat. Highlight #68

  ∗ *A Pareto Chart ... is the most widely used data display tool in Six Sigma because it identifies which problems occur with the greatest frequency or incur the highest cost and therefore should be attacked first.* [Figure 11.15, page 11.90, upper box, left-hand column]

(*continued overleaf*)

It may be that the history of industrial development over the last century or two, including the introduction of the assembly line, has conveyed a subliminal message that the worker is merely a "cog in the machine" and, as such, has little responsibility for the viability or the quality of what is produced. *If* this is the case, it may be a slow process to make empowered workers a reality.

* *"The question is, how do you bring people alive to their full potential? ..... How do you stop them from parking their brains in the lot every morning at nine and picking them up after five?"* [Figure 11.16b, page 11.102, EM9350, left-hand column]
* *Human nature demands clearly defined targets, not the constant shifting sort needed to achieve ever-higher quality.* [Figure 11.16a, page 11.94, middle column]
* *"Workers didn't like the thought of continuous, long-term change, ..."* [Figure 11.16a, page 11.94, middle column]

Discussion at the bottom of the left-hand column on page 11.93 in the article EM9211 cites the shorter time (about a decade by 1992) that American companies had had to master the intricacies of quality improvement, compared with the Japanese starting in the 1950s (some three decades earlier). It is possible that the superior Japanese manufacturing operations also involved good fortune – the Jananese happened to concentrate their initial quality efforts in *automotive* manufacturing (Nippondenso is an *auto parts* maker), where previous American dominance may have bred carelessness and complacency in both design and manufacturing – recall the comments on pages 11.73 and 11.74 in Figure 11.11d. Without detracting from the Japanese accomplishment, automotive manufacturing may have been an area where quality improvement was needed, was easier to achieve, and was obvious to customers.

1 In the paragraph starting at the bottom of the middle column in the box on page 11.95, describing the costs of a 0.1% defect rate of the fastners of a car-door inside panel, Willian Thorsell concludes by saying; *This is the insight driving TQM.* From Figure 11.15, describe succinctly one (or more if appropriate) corresponding 'insight(s)' that drive Six Sigma.
   - Compare and contrast these TQM and Six Sigma insights.
   - Identify where Figure 11.15 makes the same point about a 0.1% defect rate.

2 A common feature of approaches to quality improvement is *process* improvement. Make a list of key statement(s) from each overview that illustrate its recognition of the importance of *process* (or even *statistical*) *thinking* [as defined on pages HL91.18 and HL91.21 in Statistical Highlight #91 – also recall Point 6 on the overleaf side (page 11.4) of Figure 11.1].
   - What danger of *undue* attention to process improvement is identified in the article EM9211 reprinted in this Figure 11.16a?

3 Nine statistical tools (useful well beyond just quality improvement) are named in the discussion overleaf near the bottom of page 11.95. Describe briefly how, in Figure 11.12, Joiner sees the key role of statisticians in the transformation of North American industry as involving *more* than simply their knowledge of such tools.

4 Summarize the main points Philip Crosby makes about the Quality Manager of an organization, in the left-hand column of Figure 11.9a on page 11.50.
   - Compare and contrast the points in your summary with the discussion in the article EM9211 reprinted in this Figure 11.16a of the need for an organization to have a Quality Department as part of implementing a quality improvement initiative.