

Societās Quālitātis

Vol 9 No 2 May / Jun 1995

SHIFT TO A GOAL—ACHIEVING APPROACH



from "Total Quality Management," Vol. 46, No. 3 (March 1995) JUSE

Takashi Shimizu
President
Aisin Keikinzoku Co., Ltd.

Formerly our company's total quality control (TQC) activities were based mainly on a "problem-solving approach" wherein the PDCA cycle was firmly turned by indentifying and correcting unsatisfactory matters found during the preceding year. In this manner improvements were made. I believe this approach was instrumental to improving and strengthening our corporate structure during our nation's period of rapid economic growth when sales continually increased.

With the collapse of the bubble economy, however, the basics of traditional Japanese management methods came under fire, and many companies began to change their business strategy through various approaches called restructuring, reengineering, etc. Our company was no exception; we were obliged to part with our former "growth-first" policy. At that time I keenly felt that we would not be able to survive unless we reformed our management techniques based on TQC. Thus because determined to promote company-wide management reform.

AIMING FOR A GOAL-ACHIEVING APPROACH

Based on the traditional problem-solving approach, we developed a goal-achieving approach, whereby management forms a vision of what the company should be in the future, sets goals, identifies issues to be addressed in achieving the goals, and resolves them. Basically, in the traditional problem-solving approach, accumulation of improvements eventually resulted in the achievement of goals. But with the new approach, we also aimed to expedite solutions to problems and change our way of thinking.

In order to realize the vision of what our firm ought to be in the future, all divisions and functions were required to picture what they and their activities should be come. In this manner we intended to make individual activities within functions and divisions consistent with

management goals. Through this new approach, we also intended to make jobsite employees aware that their improvement and reform activities were directly linked with management, thereby peaking personal motivation.

DEFINING THE MEANING OF REFORM

In order to reform management methods on the basis of TQC, we decided to reform manufacturer, technology and products via the goal-achieving approach. Management clearly stated that reform will be accomplished if more than half the effects are realized and we urged our functions and divisions to set goals of achieving more than half the effects of reform when they making future plans. Furthermore, we decided that management methods would be regarded as reformed when our goal-achieving approach had spread throughout the entire company; when reform is accomplished in manufacturing, technology and products; when management methods have changed in line with realization of the corporate vision and the attainment of managerial goals.

Since 1992, based on this new approach, we have been pursuing management method reform. As a result we saw several case examples of reform in manufacture, technology and resultant products that helped realize our management goals. In addition, corporate structure was transformed into one whereby profits are secured even though sales are sluggish.

Looking back, I can say that the entire workforce made united to achieve management goals and that these efforts constituted management itself. Thus, on February 1, 1995, we decided to revise the name of our "TQC" activities to "total quality management (TQM)."

I firmly believe that we will be able to make progress toward the 21st century by upholding our motto of "Reforming management methods through TQM." ★

CONCEPT ENGINEERING POINTS IN DEVELOPING HIT PRODUCTS

from "Total Quality Management," Vol. 46, No. 4 (April 1995) JUSE

Hajime Karatsu
Professor
Tokai University



TECHNOLOGICAL PROGRESS LOWERS PRICES

The term "destruction of price structure" has been highly popular since last year. Economists seem to think that the phenomenon may have negative effects on business. Naturally, profits decline when prices are reduced. The view these experts hold is that prices forcibly lowered owing to yen appreciation will not last long. These experts also have a fixed notion that commodity prices must continue to rise; they never go down.

It is natural, though, that technological progress leads to price reduction. Recently, when attending the meeting of a committee organized by a government agency, I heard one of the members expressed agreement with positive technological development, but only if it does not cause price increases. I told the committee that new forms of technology need not be applied if they are more costly, that old forms are good enough, and that engineers work to find new technologies in the hope that lower prices will result.

Not long ago, I went to Akihabara and found radio cassette recorders selling at less than 20,000 yen each. This is a remarkable price. These recorders include a radio, a cassette tape recorder, and a compact disk (CD) player. CD players went for more than 100,000 yen per unit when introduced to the market, and because of it very few were sold. Some time later, CD players priced at 49,800 yen were put on the market and they sold admirably. A mere one year after they appeared on the market, LP records fell into eclipse. Today, radio cassette recorders with built-in tape recorder and a CD player are tagged at less than 20,000 yen each.

One of the results brought about by technological progress is the destruction of price structures. Daily newspapers run reports of new manufacturing methods that have lowered costs by thirty percent or have doubled production capacity. Improvements involving but minor percentages never make news. No one doubts that new technology is opening markets one after another, and in recent years Japanese engineers have worked overtime to develop new forms of technology. A few days ago I learned that, according to statistics released by the Organization for Economic Cooperation and Development

(OECD), Japan has finally registered a surplus in balance of international trade in technologies.

So far, a stereotyped image of technological development in Japan has prevailed: Japanese are good at making things, but not at creating something completely new. This view further has it that the basic concept of products Japanese use to gain profit can be traced to the inventions of Western countries, which is proved by the fact that Japan has recorded a remarkable international trade surplus with respect to tangible goods but has consistently registered a substantial deficit in its balance of international technological trade—things like patents and knowhow. In 1993, however, Japan emerged as a country with a favorable balance of international technological trade. Among all other countries, only the United States shows an overwhelming surplus in balance of international technological trade. European countries suffer a huge loss in this regard. Therefore, we must now discard the notion that Japanese technologies are a product of imitation.

At present, research and development investments in Japan total 1.1 trillion yen, reaching the three percent level of gross domestic product (GDP). These huge investments have sharply increased the number of patents obtained. Five Japanese companies are on the list of the top ten firms that hold the largest number of patents secured in the United States.

DEVELOPING NEW PRODUCTS THROUGH THE USE OF TECHNOLOGY

A few years ago, twenty Russians called on me to ask me how military technology could be converted to nonmilitary use. I told them it was impossible. First of all, in nonmilitary industries, manufacturing volume per product differs vastly from that of the military industry. While military manufacturers at most produce several hundred aircrafts similar in type per year, nonmilitary builders usually produce more than a million units of each product per month. In the majority of cases civilian production requires the use of automatic machinery, such as industrial robots. Moreover, for example, in the automotive industry, models are changed every four

years, and in the home electrical appliance industry design revisions are made on an annual basis. In addition, quality requirements are so strict that products are not accepted by the market unless the rate of defectives to the total output is below one percent.

The Russians found it hard to believe my explanation. Rather it was natural for them to assume they can easily manufacture video tape recorders because they have the world's most advanced aircraft and have long competed with the United States in space development. In spite of their high hopes, though, they are not equipped to produce internationally marketable products. Its as though a champion sumo wrestler could not swim well enough to win a race: Every professional athlete has his or her own competitive field. Added to it, civilian manufacturers are vying to acquire new technologies on a global scale. Even if the Russians claim their products to be excellent, an obvious difference in quality between their products and ours will appear when both are compared in the marketplace. Inferior products simply will not sell.

Japanese readers probably can understand these explanations well. Nevertheless a misunderstanding with respect to the development of new products or new technologies still prevails among them: a belief that one must start by inventing a fresh principle when developing new products or technologies. This false belief comes from mistaking technology for science. A number of innovative products will result if new uses for principles or technologies discovered as far as ten years ago are applied.

Recently, the production of lithium ion batteries has rapidly grown in keeping with the cellular telephone boom. These electric cell containers are made by cold-forging stainless steel. In order to further miniaturize them and at the same time boost their capacity, a squarish container would be better. In spite of it, many manufacturers supply cylindrical batteries owing to the difficulty of producing square ones. Still, some companies make square batteries, one of which is a small firm in Tokyo's Mukojima district. This company invariably turns a profit because it produces square batteries on an exclusive basis. The technology for this was developed for use with metal cigarette lighters more than twenty years ago. Later, when the introduction of plastic lighters priced at only 100 yen made the manufacture of metal lighters, impractical this small organization carefully preserved this small organization carefully preserve its technology. And now it has been revived.

The principle on which today's popular quartz chronometers are based is an application of piezoelectricity

as discovered by Pierre Curie about a hundred years ago. Corporate leaders should know that new products can be successfully developed by finding fresh uses for principles and knowhow discovered or invented by one's predecessors. Take for instance some of the products already available. A close look at materials, processing methods, and principles used in their manufacture will show the products as having been developed by combining materials, processing methods, and principles discovered or invented fifty, sixty even a hundred years ago. These contemporary forms of merchandise embody new combinations of earlier materials, processing methods, and principles. People with technological knowledge will understand this.

THREE STEPS IN DEVELOPING NEW PRODUCTS

In recent years, corporations commonly expect a great deal from innovative products and new technologies, but new forms of merchandise do not necessarily require the advanced technology so often discussed.

The foregoing shows that three steps should be taken in developing new products:

- (1) What to make (development)
- (2) How to make (production)
- (3) How to sell (marketing)

Product development succeeds when all three are properly taken. For example, the rotary engine was invented in Germany but only Mazda Motors, based in Hiroshima, eventually succeeded in using it for automobiles on a commercial basis. The Germans fell short of what was required to succeed in the second step of production.

Knowhow is the ultimate key to making things. An understanding of principles or a clear knowledge of the materials used will not always lead to manufacturing success.

Japanese firms have moved to the fore in developing and manufacturing liquid crystal displays (LCDs). Last year the U.S. Department of Defense initiated a project to make LCDs on their own because, from the viewpoint of national security, they had misgivings about the ability of Americans to produce LCDs unassisted. The project has not worked, however. Americans know well what facilities, materials and principles are needed to manufacture LCDs, and in fact it was America's RCA that invented the liquid crystal display. Nonetheless, Americans cannot produce LCDs. U.S. company experienced many difficulties in trying to make LCDs and found it cost a hundred times more than when buying them from Japan. Eventually, the firm dropped the idea of producing LCDs. This clearly shows the status of whether or not

the Japanese or Americans have proper knowhow.

Regardless of their technological prowess, however, the fate of manufacturers will be imperiled if the products they worked so hard to produce fail to record the anticipated sales. There is fierce competition in nonmilitary merchandise markets. Most of today's bankruptcies are imputed to excessive inventories resulting from product unsalability. Even in the former Soviet Union, where the economy was controlled, innumerable cases appeared in which state-run enterprises suffered immense losses owing to mistaken sales projections, which resulted in the axing of top executives. Currently, most of the government-managed enterprises in China are also in the red; simply because market saturation with goods made consumers more discriminating, causing a drop-off in sales.

Naturally implementation of the three steps takes a long time. A distinctive feature of today's society is its tendency to change rapidly. Consequently, products once regarded as definitely salable may not move well now unless they have been revamped to suit social transition. So the development of new products will not necessarily rack up a success unless the factor of contemporary needs is included in the three steps. Then, too, there is another factor that manufacturers must never overlook: competition. Even a company that has succeeded in developing a new product according to plan might go bankrupt if a competitor scoops it by marketing a comparable or superior product sooner.

There is no major difference in technological capability among Japanese enterprises nor is there a conspicuous dissimilarity among their engineers as they all stand fairly equal with respect to ability and they think of almost the same thing at the same time. Moreover, Japan can point to having the world's finest production facilities and materials. Against this background the success of new-product development heavily depends on when a manufacturer undertakes to develop whatever and on how fast it can carry through and get the results on the market. Even though certain products are technologically quite similar, their timing ultimately will lead to a mighty gap between a successful product and the might-have-beens. This is what happens in Japan, a nation with a highly advanced information network.

Until about a decade ago manufacturers believed that if they made sure of how their competitors would respond and could foresee success, they could finally manage to win by muscling into the market even as a latecomer. And to a certain extent they actually succeeded.

But times have changed. Delays in developing new products can so seriously affect enterprise that they have no chance for recovery. In this context the key to success in product development is how timely it is carried out and of course the nature of what is developed.

DECISIONS ON PRODUCT AND TIMING ARE ESSENTIAL

Let us now proceed to the knowhow in resolving what product should be developed and the proper timing for this. First of all, as a matter of course, it is essential to have a thorough knowledge of one's targeted customers. In this, basically it is important to simply let customer facts speak for themselves. This means that conventional theories and commonly held beliefs should be disregarded in favor of data analysis. Originally, theories and beliefs of this sort related to what happened in the past, and did not take the future into consideration. They merely explained past events on the basis of theories and knowledge, hence amounted to nothing more than hindsight. Essentially, the future is not an extension of the past. The future remains to be explored.

A good example of this lies in the belief widely held among home electrical and electronic appliances manufacturers that consumer demands have been fully met. They entertain notions that households are packed with electrical and electronic devices, thus there is no room for additional appliances. Some in the industry contend that new products will not sell. We can find houses equipped with two or even three TV sets as well as tape recorders and other devices. No law has it that a person is forbidden to buy more than two TV sets.

Superior television sets, or those featuring a wider screen, are moving well on the screen market. In fact they already account for more than half of TV sets produced in Japan. These sets originally were designed for high-definition television and failed to sell according to expectations owing to their high cost. Manufacturers had already forged metallic molds for cathode-ray tubes. And they would have been in serious financial straights unless they could earn as much as the capital invested. Then, they made wider cathode-ray tubes for existing TV sets and soon found that those with a wider screen sold exceptionally well. In tempo with the popularity of these new sets, television stations began to air pictures which have greater width, leaving a blank space at the upper and lower margins of the tube. Cinerama movies are perfectly suited to these widescreen TV units. These television sets then started to record good sales in Southeast Asian countries. To own them is a status

symbol there. Video software producers in Hong Kong promptly climbed on the bandwagon by marketing video presentations intended for widescreen reproduction, and these tapes are selling remarkably well.

Recently one of our greatest hit electronic products is the silent piano. I had always regarded the piano as an instrument whose melodious sounds permeated the room in which it was played. But surprisingly, pianos with muted sounds began to sell well. I now understand that playing the piano is a form of physical exercise in which one moves his or her hands and feet. Pianos do not annoy the neighbors. So I told a Yamaha representative that the upcoming bestseller instrument would be silent violins, since they would help people lead a quieter life.

As seen from the above, the future is really not an extension of the past. Rather, new products may be developed by breaking conventional theories and commonly held beliefs.

Customers buy products because they want them, not because they have money. If they want them, they will buy even if it requires borrowing, or taking a part-time job. One of the dreams that Japanese salaried workers have is to own their own house. But houses are expensive. To overcome this they buy on time. No one can say that borrowing to buy a house is not wholesome. This kind of moralism should be jettisoned when one talks about buying. To be sure, moralism of the ilk still prevails in our society, thus one should not allow oneself to be deceived by it.

Japan's economy is showing signs of recovery. Still, some insist that our economy has yet to bottom out. Last year Japan's GDP amounted to 460 trillion yen and accounted for fifteen percent of the aggregated GDPs worldwide. This stands as a remarkable figure. Reportedly China has been growing lately. Nevertheless, China's economy, whose GDP totaled 57 trillion yen last year, remains for smaller than Japan's.

As the above figures show, the citizens of Japan now have money. The balance of individual savings amounts to one quadrillion yen. This works out to an average 7.44 million yen per household. Why, then, did our moneyed Japanese curtail their spending money, causing the nation's economy to slide into a recession? The reason is simple. Newspapers and TV preached about recession daily morning till night. Because the Japanese have money, they buy products they want whenever they appear on the market. Television sets with a wider screen and silent pianos are good examples of Japanese purchasing behavior. Accordingly, I am not at all concerned about the nation's economy. What we must consider is

how to develop products that consumer wants to buy.

After the Japanese grew affluent, their pattern of spending changed. I want those concerned with new product development to know how the Japanese now apply their money. The transition appears in the findings of household spending surveys conducted by the Prime Minister's Office Statistics Bureau every month. For example, one result of the survey shows the monthly total of Japanese sake consumed per household. Akita ranks first as the prefecture with the largest rate of consumption. Niigata and Hiroshima prefectures occupy the next two places. All three are well known for their excellent sake. Okinawa Prefecture, on the other hand, shines as number one in the realm of soft drink consumption, probably because it is hot the year round. As seen by the foregoing, the survey findings reveal even the different lifestyles of prefectural citizens.

Table 1. Household Spending Survey (1993)

- How Japanese families spend their money -

Food	20.4%
Dining out	3.9
Housing, utilities and furnishings	14.2
Clothing and footwear	6.7
Transportation and communication	9.9
Education	4.5
Culture and entertainment	10.0
Other spending	15.9
Socializing	9.8
Extra	2.9

Data analysis constitutes the business of quality control experts. Table 1 presents the findings of a typical household spending survey.

A quick look at the table will show that, with the rise in income, miscellaneous expenditures grew rapidly, finally accounting for more than half of the total household spending. It is amazing that money spent for culture and entertainment, and socializing, both of which belong to the miscellaneous expenditure group, account for as much as ten percent and 9.8 percent, respectively. The spread of automobiles represents one of the phenomena that attests to Japanese affluence, but expenses related to automobiles account for only seven percent of the household spending. Recently, multimedia has come to be regarded as one of the promising future industries, but the percentage of information-related expenses, such as telephone, TV and newspapers, combined has not shown signs of growth for more than two decades, remaining at the five percent level. Almost every household

has at least one telephone, but they experience use for an average of only ten minutes a day at most.

As indicated above, development of new products would fizzle as a fruitless unless analyses of markets for the future are based on solid data.

WHAT THE FUTURE HOLDS

What will happen to household spending in the future? For the past ten years, Japanese household spending has risen one and half times. In their reports, however, various research institutes predict that this spending growth rate will decline in the future, increasing by only about 1.3 times over the coming decade. The question, therefore, is what the Japanese will spend their money for as their spending ratio slows.

First, it is unreasonable to assume that spending on such basics of life, as food, clothing, housing, and energy, will grow by 1.3 times. One will not be able to eat 1.3 times as much, or require more clothing. This means that the outlay for housing still has the potential to grow, and right now forms part of the reason why the housing industry is booming. The spending category expected to grow more than any other is miscellany. Experiencing amazing growth is the outlay for personal enjoyment, such as culture and entertainment, socializing

and the like. Travel abroad has become highly popular; last year, all of twelve million Japanese went overseas, averaging one in every ten persons. Moreover, a marked increase among married couples in their forties, fifties and even older who vacation in other countries has been observed. This means that Japanese representing virtually all age brackets have come to travel abroad. And spending on education is now even larger than that for overseas travel.

Consumer spending accounts for 57 percent of the gross national expenditure in Japan's economy. Government and business activities support consumer spending. Therefore, in determining what products should be developed, it is essential to know the future direction of consumer spending.

Let me repeat. The average Japanese consumer has plenty of money. The question that remains is how much effort your company can put into marketing products that are attractive to customers. If you market desirable products, they will sell. Absolutely unwelcome products will never sell. Some complain that their products do not sell well because of the recession. Trying to pass the responsibility for failure to someone else or some condition can accomplish nothing. The recession is not to blame. To survive, you must stand on your own two feet. There is no other way. ★



INTERNATIONAL CONFERENCE ON QUALITY 1996 YOKOHAMA

— Quality - Key for the 21st Century —

— CALL FOR PAPERS —

A 250 words paper abstract in English should be submitted to the Conference Secretariat not later than **December 25, 1995**. A short biographical sketch should be attached or sent. Also the authors are requested to complete and send the Application Form (in the conference circular).

All the authors will be advised by **March 15, 1996** if their papers have been accepted or not. The final papers, written in English in the typing format paper provided by the secretariat, should be submitted by **June 30, 1996**.

SUBMIT TO :

ICQ '96-Yokohama Programme Committee
Union of Japanese Scientists and Engineers (JUSE)
5-10-11 Sendagaya, Shibuya-ku, Tokyo 151, Japan
Phone:+81 3 5379-1227 Facsimile:+81 3 3225-1813

SUBMISSION DEADLINE : **DECEMBER 25, 1995**

Visitors from Abroad



TQC Seminar for Brazil
Top Management Course
April 3-13, 1995
Number of Participants:33

TQC Seminar for India
Top Management Course
May 15-25, 1995
Number of Participants:31



International Seminar on TQC
for Top Management Course
June 12-22, 1995
Number of Participants:25



Welcome

INTERNATIONAL CONVENTION ON QC CIRCLE 1995 YOKOHAMA

“QC Circles toward the 21st Century”
at Pacifico Yokohama Conference Center

Date	Morning	Afternoon	Evening
Oct. 17 (Tue.)	Pre-Convention Seminar on QC Circles (<i>Optional</i>) (Convention Registration)		Welcome Cocktail
Oct. 18 (Wed.)	Opening Plenary Session	QCC Forum: Panel Discussion	Technical Parallel Session (4 Streams)
Oct. 19 (Thu.)	Technical Parallel Session (4 Streams)		Closing Plenary Session & Farewell Dinner
Oct. 20 (Fri.)	Industrial Visit in Yokohama / Tokyo Area (<i>Optional</i>)		
Oct. 21 (Sat.) Oct. 26 (Thu.)	Post-Convention Industrial Tour (<i>Optional</i>)		

OPTIONAL

<Pre-Convention Seminar on QC Circles>

Oct. 17, Tuesday 9:00~16:30

This seminar provides an opportunity for the effective sharing of QC games new to you, which are developed for purpose of brainstorming, communication and cooperation using QC 7 tools. There are the following three types of game in the seminar.

Paper Airplane Game

Aiming at understanding the essential factors and improvement techniques of QC Circle activities while designing and making paper airplanes.

Postman Game

Deriving from its communication method of delivering letters within the group and enabling participants to understand team-building, two-way communication-top-down and bottom-up etc.

Paper Helicopter Game

Being ideal for improving problem-solving abilities in line with procedures used in the QC stories. Basic knowledge of histograms and control charts are required for the participants.

<Industrial Visit in Yokohama Tokyo Area>

Oct. 20, Friday, full day

The participants wishing to visit the following Japanese companies to see how the QC Circle activities actually work.

- Group A: East Japan Railway Company
(Transportation Service)
- Group B: Fuji Xerox Co., Ltd.
(Copying Machine)
- Group C: KIRIN BREWERY Co., Ltd.
(Beer)
- Group D: Nissan Motor Co., Ltd.
(Passenger Car, Forklift)
- Group E: Ricoh Co., Ltd.
(OA Equipment)
- Group F: Shiseido Co., Ltd.
(Cosmetics)
- Group G: Toshiba Corporation
(Copying Machines, Social Automation Systems)
- Group H: TOTO Ltd.
(Sanitary Ware)

<Post-Convention Industrial Tour>

Oct. 21, Saturday - Oct. 26, Thursday

- Oct. 21 (Sat) Sightseeing Hakone area
- Oct. 22 (Sun) Sightseeing Kyoto area
- Oct. 23 (Mon) Plan Visit in Osaka area
- Oct. 24 (Tue) Plan Visit in Nagoya area
- Oct. 25 (Wed) Plan visit in Nagoya area, and back to Tokyo
- Oct. 26 (Thu) Check-out

Apply to : ICQCC '95-Yokohama SECRETARIAT
c/o Union of Japanese Scientists and Engineers
5-10-11, Sendagaya, Shibuya-ku, Tokyo 151 Japan
Phone: +81-3-5379-1227 Fax: +81-3-225-1813

CONTENTS

“Shift to a Goal-Achieving Approach” by Takashi SHIMIZU	1
“Concept Engineering - Points in Developing Hit Products” by Hajime KARATSU	2
ICQ'96 Yokohama - Call for Paper	6
Visitors from Abroad	7
ICQCC '95 Yokohama, Optional Events	8