Application of N7 in TQM

Yoshinobu Nayatani
Professor and Dean
College of Engineering
Osaka Electro-Communication University

In this treatise I shall discuss total quality management (TQM) and the new seven tools for TQC (N7) under four headings:

(1) Matters requiring our attention when promoting TQM in the future
(2) Prerequisites for TQM success
(3) Priority issues in the future promotion of TQM
(4) Where N7 is useful in TQC

Matters requiring our attention when promoting TQM in the future

In 1979 and 1981 the author in this periodical discussed matters needing our attention when promoting TQM in the future. After reading an article treating a round-table discussion on the application of N7, published in its January 1996 issue, I realized that these matters have gained greater importance. Specifically, they are:

(1) The need for multi-dimensional evaluation

Business management demands paying close attention to trade friction, industrial pollution and exchange rates, in addition to the quality of products and services, pricing, speed in making decisions and giving high priority to services. Also important is the monitoring of international mega-competition.
(2) The importance of aiming at improvement while preventing problems from recurring

To shift from preventing problems from recurring to identifying and positioning them as matters for resolve is indispensable. Simply put, it is essential to effect a change from problem-solving to issue-resolving.
(3) The necessity of reform

In issue-resolving as an aid to management, including the development of new products with appeal, various administrative systems must be reformed. Breaking away from conventional practices and the application of business process reengineering (BPR) are required.
(4) The importance of forecasting and foresight

To reform business management systems and develop products with appeal demands foresight and accurate forecasts. Here, two elements are present: developing creative plans, and the prevention of mistakes and failures.

There are other points for consideration, but I shall omit them at this time. In 1977 I suggested that N7 would be an effective method for addressing them. For the past several years the importance of resolving problems by identifying and positioning them as issues for resolve as well at the need for creative ideas when promoting TQM has been widely discussed. At the 48th Quality Control Symposium in 1989, however, the participants opposed Mr. Kiyoshi Uchimaru's and my arguments that certain QC methods, including N7, currently used in TQM can benefit creative problem-solving. Their opposition disappointed us. The author's opinion regarding the relationship between methodology in developing creative ideas and N7 appears in the "Application of the New Seven QC Tools to Business Management"

The author is amazed that TQM circles have been so slow in appreciating the abovementioned four matters and putting them into practice.

Prerequisites for TQM success

TQM and N7 figure as the principal subject of this treatise, but TQM cannot succeed merely through the application of N7. For N7 to be effective in promoting TQM, four corporate practices must first exist:

(1) Top management assumes leadership.
(2) Engineering technology and the development of human resources are stressed.
(3) Education in, and application of, all kinds of management techniques, including QC methods, are effected. As Mr. Yoshiro Mitsufuji mentioned at the round-table discussion, Mr. Kaoru Ishikawa argued that applying all the tools indicated in (2) and (3) would aid business management, and that one should not insist on using only certain methods.
(4) TQM is actively and permanently promoted. It will take a long time to establish (2) and (3) as lasting corporate practices. But to do so requires the implementation of (1) and (4) too. Without this, efforts to introduce and promote TQM become futile, as the program will be stereotyped and ultimately disappear. TQM should continue even if the president is replaced.

Priority issues in the future promotion of TQM

To what, then, must priority be given when promoting TQM in the future? The following summarizes a special lecture by the author at the 25th Annual Meeting of the Japanese Society for Quality Control. He fears that it does not express his thoughts satisfactorily, but hopes the readers will understand the issues he deems important as presented below.

(1) Let TQM favorably affect management
• Promote the TQM of MMK (mokatte, mokatte komaru) or too much emphasis on profit causes trouble, as Mr. Kaoru Ishikawa suggested.
• Promote MMK on the assumption that supplier satisfaction (SS), employee satisfaction, and customer satisfaction (CS) are assured.
(2) Establish QC methods that enable the development of new products having appeal
• Study companies that are advanced in their development of products.
• Make sure that the Union of Japanese Scientists and Engineers supports such firms, and that university researchers have proper places for their studies.
• Based on such support and research, flexible systems that will increase the potential for new product success should be established.

(3) Integrate TQM into a new product development system with a view toward concurrent engineering
• Systematize concurrent engineering in QC circles.
• See to it that experts do not function by themselves but collaborate.
• Revise the "Guide to Quality Assurance" and issue it as a new edition.
• Make the development process more efficient, refined and information-oriented, including continuous acquisition lifecycle support (CALS) and other methods.
(4) Have top management promote TQM systematically
• Formulate management strategy.
• Revitalize top management group discussions and make them take root.
• Collect case examples of top management QC activities that merit praise.
(5) Promote TQM by including all departments so that all employees feel a sense of achievement
• This is mandatory for the successful development of new products.
• Include all departments in TQM promotion from the very outset.
• Promote QC in such a way that it helps resolve problems related to the basic function of each department.
(6) Work to establish methodology for promoting TQM in each department (e.g. sales and development)
• Establish QC methods at headquarters as well as in the sales, R&D, and technical departments.
• Set up ways to introduce and promote QC abroad.
• General remarks about TQM are not necessary.
(7) Be sure to pass the results of TQM to the next generation (on-the-job development : OJD)
• In addition to the results obtained in the manufacturing department, collect those produced by TQM in the sales and technical departments and at headquarters for transfer to the next generation.
• Recognize the difference between two types of standards: overall strategic instructions and routine logistic instructions.
• Implement OJD for managers and rank-and-filers.

Where N7 is useful in TQM

Here, I shall discuss the issues and departments in which N7 can help promote TQM. I shall also touch on the "improvement of intellectual productivity," which this series has addressed. The author defines the intellectual productivity of managers and personnel as the quantity of ideas that are developed and realized by a manager or employee over a given period of time, with respect to the duties for which he or she is responsible and that enable overcoming a current difficult situation. The

intellectual productivity of university researchers is measured without major error based on the number of scientific articles they have had published in the world's first-class journals and the total number of pages they contained.

In the following, I shall present cases in which N7 has proved its worth in promoting TQM with a view toward breaking through the current situation.

(1) N7 's effectiveness in introducing TQM

When introducing TQM, group discussions by top management are necessary to share perceptions of pending and future issues affecting the company. In these discussions, N7 works well since it enables top management to collect and collate linguistic information. Similar discussions should be held in each corporate department. If TQM is successfully introduced, an appreciably large amount of numerical data can be gathered at a later time. Oral data in itself will suffice, but should be based on facts.

The foregoing applies to the time when TQM is again introduced. Whether introduced or reintroduced. TQM should start with top management group discussions.

(2) N7 helps when forming management strategy

The author believes that if top executives clearly understand social, economic and industrial trends, and therefore can identify issues that their firm should address, the probability of success will run high. There is a great deal of evidence to support this.

For example, in August 1988, a time when Japan was halfway through its "bubble economy," top directors in various forms of industry made forecasts of industrial trends five years hence in an economic journal. Many of their predictions were convincing, even if evaluated from today's viewpoint. Let me cite a few examples: A top bank executive stated that drastic internationalization of the domestic financial system would be promoted, and that leaving the old system unchanged would be a problem. A chemical firm's top director said that, owing to the pursuits of developing countries, competition in terms of quality-not-quantity- would intensify. A head of a department store said that department stores would shift from ones having a homogenous nature to those with marked individuality, and that building information systems for customer management would become necessary. A top cement firm executive foresaw no possibility of mounting demand that would lead to expanded capital investment, that the key lay in operational integration and fluctuations in the exchange rate of yen against won. However, in the same issue, forecasts of journalists regarding who would be the next president of their own

company proved to be wrong. Another instance of forecasts was an affinity diagram made by a construction machinery firm director in 1982, which predicted the future environment of the construction machinery trade. When reviewed today, most of the forecasts proved to be correct, making them a valuable case example. In "A Report by a Study Group on Strategic Business Management and Case Examples of TQC," published by the Japanese Society for Quality Control, Mr. Kinji Sakakibara presents case examples of N7 application to various strategic management issues.

In forming and implementing strategic corporate plans, it is important to have an established system in which top management conducts group discussions and administrates with a future vision. It is just as important to effect specific measures at all levels of the organization through use of N7. The ongoing problem with management seems to be that, even if top brass has a future vision, specific measures to realize it are not taken and often are carried forward into the future.

(3) The worth of N7 in policy and daily management

If management strategy embraces medium- and long-term policies, N7 can be highly effective in annual policy. With focus on N7 and policy management, the author's "Policy Management for the Promotion of TQC" was published in 1982, marking the first book on the subject written for QC circles. The author strongly recommends reading it. By 1996 the discussion featured in the volume still wants for acceptance by those who call themselves experts on TQM. Happily, though, in recent years the book has been read again by top executives and senior managers of private enterprise.

Daily management and standardization are issues to be addressed in N7. In doing so, however, cooperation between the TQM promotion secretariat and the departments responsible for effecting TQM is vital. This is where Japanese firms make a poor showing. The future issue is how to integrate and advance efforts to meet ISO 9000 standards and to promote Japanese-style TQM. To turn the PDCA cycle in the process requires the use of linguistic data.

(4) The use of N7 in R&D of new products

To provide the market with a continuing assortment of appealing new products demands (a) a plan for making them, (b) technical breakthroughs, and (c) taking proper measures for serious complaints and product liability claims.

Studies of companies have revealed several patterns for successful planning of products with appeal, and the contributing factors can be summarized as: (a) leadership taken by top management, (b) a corporate climate which

supports a system that motivates employees to submit suggestions for the development of new products, and (c) flexibility that enables the suggestion system to continue. These are matters that corporate management should study. Regarding (b) and (c), N7, quality charts, and failure mode and effect analysis (FMEA) are well worthwhile. With respect to research and development, the reader is advised to refer to "Research & Development and TQC," compiled under the author's editorial guidance.

The book treats extensively case examples of N7 application. The "QNP" magazine is also effective and many companies make use of it.

(5) N7 as essential in sales department QC

The application of QC to sales departments is important, and N7 is indispensable when introducing it. It is difficult to imagine QC in sales without the use of N7. For more than ten years the author has had experience introducing and promoting QC in sales departments, and has seen the sales operations successfully increase their business with very few exceptions. The author often hears that progress has not been made with respect to sales department QC; he wonders why and feels sorry about it. In "Sales Efforts That Make the Most of Wisdom Obtained Through TQC" by the author and another book compiled under his supervision, the author's ideas on this subject are systematically elaborated. If QC is properly introduced, it follows that a surprisingly large amount of market data can be secured and analyzed.

(6) The application of N7 to headquarters

In only a few cases has the author experienced the introduction and promotion of TQM in the headquarters of enterprises under the leadership of department bosses. These cases concerned companies engaged in the spinning, brewing, machinery parts and other industries. There, TQM at least was brought in without objection, which was attributable to group discussions conducted mainly by department heads using N7 when TQM was introduced.

(7) Applying N7 to information systems

Aside from discussions about CALS, it is important to make effective use of information systems for business operations and thereby distinguish one's enterprise from competitors. But the unit value of information per byte is decreasing year by year. In business management it is necessary to determine the purpose for which department information systems must be developed. To that end, discussions among management and employees and the application of N7 are essential.

Conclusion

N7 constitutes the only system of QC methods in Japan's TQM circles established by the concerted efforts of a committee of experts and includes many case examples of implementation. Today, the need for such a system is obvious. The effectiveness of N7, and of other QC methods, has been proved. Now is not the time for criticism. Rather, to use N7 wherever possible is essential. The author hopes that, with the coming age in proper perspective, young TQM experts will work hard to study, propose and implement new methodologies for TQM and make them take root in corporate Japan. He also hopes that, based on Japan's TQM circles, they will disseminate more and more useful information on TQM. Studies of N7 got under way in 1969, and N7 was brought forward in 1977. Later, in 1985, it spread widely. And so, it took fully sixteen years for N7 to find its place firmly among Japan's private enterprise.

"Use and Know-how of QC Games" Series (1)

Management Game
KNOWLEDGE BECOMES WISDOM
ONLY THROUGH EXPERIENCE

Yoshiteru Myoga
President
Keiei Sogo Kenkyujo

Quality Control of the Mind

(1) Crisis of quality

I am but a layman with respect to quality control, but my association with Mr. Hiroshi Odajima, Associate Director of Ricoh Co., Ltd., who stands as an authority on total quality control, led me to write this article. During the 1970s I was engaged in accounting, costing and production management at a pharmaceutical firm, and for seventeen years since 1978 I have worked in the sphere of in-company education and training. Recently, when I look at business people in Japan, it seems that the prolonged recession brought about by the collapse of the bubble economy has caused them to lose their sense of direction.

Falling prices in a deflationary economy boastfully are called "destruction" but they are not an active phenomenon. "Collapse" would be a more realistic term. In particular, certain manufacturers have been heard to complain that "the Japanese awareness of quality has changed," "manufacturers pursue over-quality" and "customers do not conscientiously evaluate products even if their manufacturers painstakingly make parts that cannot be seen from outside." But are these complaints based on truth? I cannot help but think that such manufacturers are making these claims for their own reasons, even if unwittingly. Some are heard to mention things like "quality that suits the price." This translates into "cheap and disgusting," in other words, the first step toward degredation of quality. This "crisis of quality" has begun to affect Japan.

(2) Cost suits a manufacturer's circumstances

The view of "over-quality" has emerged recently because wages as converted to dollars have risen and relative prices against imports have climbed, but this is much like putting the cart before the horse. The Japanese have exerted single-minded efforts to produce "quality goods at low cost." If the will to build quality into goods becomes rough, the Japanese desire to make things would immediately collapse.

Nevertheless, "cost is a reward for efforts exerted by manufacturers." Today's customers are not so simple as to buy merchandise at the maker's suggested prices. Everything depends on consumer consent. What, then, should be done? The only solution to this giant bugaboo seems to be increased productivity, including the development of new goods. If the dilemma cannot be resolved by stepped-up productivity, all that will remain is the collapse of jobs and wages as caused by "hollowing out."

If this comes to pass, there would appear to be no other recourse than for manufacturers to have the audacity to cut wages at their own discretion. However, what is painful to do if forced by others need not be painful if done voluntarily.

(3) Winning over the consumer

It has been pointed out that the bubble economy and the mass confusion that arose when its problems were resolved stemmed from Japan's underdeveloped financial system. The bubble economy can be ascribed to the unrefined quality of products (services) shipped by the "factory called a financial system." And the government is imposing the consequences of the financial system's failure on the general consumers by feeding them deceptive explanations such as "public funds" and "low interest rates." Private enterprises, on the other hand, cannot sell defective merchandise to the consumers no matter how hard they try.

But if the financial mill collapses, so will the lives of the consumers. If the government is allowed to do whatever it chooses by making it a great cause to prevent the financial system from falling apart, the effort would be unbearable for the general public.

If the persons employed in the financial industry had a conscience and announced an intention to voluntarily accept wage reductions and thereby help write off bad debts, the wrath of general consumers, whose interest on deposits and taxes are being used to erase bad debts, would be appeased, and the empathy that consumers would have for the workers at the bank counters, who after all are consumers themselves, might lead to the recovery of depositor satisfaction.

For this reason I believe that the quality of products,

whether goods or services, starts with "mind." Evidently the Japanese need quality control of the mind.

(4) The need for "why"

The principle of the "five Ws and one H" is often cited as a management tool, but the Japanese got by with only four Ws from the latter half of the 1980s to the first half of the '90s. The Japanese used their four Ws (when, where, who, what) effectively and their methodology worked well, but there was something missing, like beer that has passed its warranty period. Old beer does not bubble as intended. The four Ws, with the "why" missing, triggered the bubble economy that was fated to shake the very foundation of Japan's economy.

The word "why" should be translated into Japanese as "for what." Everyone repeatedly asks "why" as a child, but as the person ages, he or she asks fewer and fewer questions. This also applies to business people. What they ask about when first joining a company is taken for granted before they even realize it, and if they continue to ask "why," their bosses dismiss their queries, saying that they're still not full-fledged or even remain as "green." Such remarks from superiors tend to make the employees work to mask their naivete, which, if not done, could lead to being passed over for promotion.

(5) Rebuilding the four Ks

Recently, in the midst of corporate calls for restructuring and reengineering efforts, middle-aged and elderly workers who first fell victim to personnel cuts mourned that they had sacrificed themselves for their family, and their family for the company, and that they were laid off after they devoted themselves to the company for so many years even at the sacrifice of customers. This lachrymose cry is also the result of mistaking "why" for "what" in life.

Reengineering for our post-bubble, information-oriented society is to ask "why" from the standpoint of a novice and to restructure Japan's four Ks — kojin (individual), katei (family), kaisha (company), kokyaku (customer) — so that their relationships will be for oneself, for the family, for the company and, above all, for the customer. Quality control of the mind starts with asking oneself "why."

Abandoning Knowledge Education

(1) Objectives of education

Because the Japanese got by with only four Ws, corporate educational programs have grown increasingly short-sighted and their evaluation criteria are based solely on whether or not they serve the needs of the concern. Corporate educators cram employee heads with apparently useful knowledge but pay little or no attention to whether or not their pupils have absorbed it. If they really believe this method of education is good enough, how degraded Japan's four Ws have become! This type of education eventually will prove to be worthless and their employers will gripe in wonder, "They were taught by our own instructors! Why can't they do their job right?"

Hopefully corporate educators will add to the objectives of their training programs such far-reaching benefits as being "useful in the future," "for the good of the employees" and, of course, "for the customers." Including such thoughts in the curricula definitely will help an enterprise in the long run.

(2) Fostering

However appropriate the objectives of education may be, training is meaningless if the workers fail to learn something. A dictionary called "Kojien" defines education as "providing instruction and fostering," but this definition falls far short of a proper answer. "Fostering'' means to "bring up" or "rear." In the dictionary, "fostering" is defined as "parent birds that cover fledglings with their wings." What a warm and loving sound the definition has! The term is also defined as "rearing in the hope of growth and development." Fostering is meant to benefit fledglings but not parent birds. In the future, it is hoped that corporate training programs will feature emphasis not only on book learning but also on fostering.

(3) Learning by experience is paramount

It is impossible to train and foster employees using only traditional knowledge-education methods in hopes that they will master what is taught. For the past ten years Keiei Sogo Kenkyujo has been using a combination of management games and personal computers to provide Business Sensibility Training and other programs designed for people to learn what management, in fact, is through experience.

It appears that in the realm of quality control, QC games intended to impart knowledge in the science by experience have become quite popular. This is gratifying indeed. To truly assimilate what is taught, it stands as paramount to learn via firsthand experience.

(4) War orphans and paper airplanes

The Asahi Shimbun (newspaper) of November 4, 1995 carried the headline, "This way of folding paper airplanes...it's my brother's." The article reported the identification of two World War II orphans who were abandoned in China by their Japanese parents. Because I was born in Manchuria (now the northeastern part of China) and very nearly ended up as a war orphan myself, the report of the two did not strike me as an incident which occurred to total strangers, and my body seemed to respond involuntarily.

The Asahi article stated that "as children the two war orphans learned to fold paper airplanes and they recalled the taste of sweet beans; the bond of blood relations that did not sever provided decisive evidence for their indentification." Knowledge eventually may be lost, but what a person learns through his or her body will never be forgotten.

In short, knowledge is the "experience" of others. But it can serve no purpose however hard one works to acquire it. Learning is to memorize through the left brain. Conversely,

"one's own experience" is highly useful since it is memorized through the right brain. The basis for determining what is and what is not useful lies in whether it leads to "action" and "problem-solving" and, furthermore, if it provides entree to "living," because life in itself is a problem-solving process.

"Practice" in Figure 1 is to repeat doing something through the body. Practicing through the body builds an image of action in the mind, and once such an image is there, human beings will act voluntarily. Even if one understands the workings of the brain, it will not lead to action unless an image of action already has been built.

(5) Experience changes knowledge to wisdom

Knowledge is gained from external sources while wisdom springs from within. Knowledge that leads to action is called wisdom, and the only way to convert knowledge into wisdom is through experience. Only when one tries to apply the knowledge gained can it transform into wisdom.

Mr. Wang Qiang, one of the war orphans mentioned in the Asahi newspaper article, undoubtedly was shown how to fold paper airplanes many times as a child. At the meeting when he was identified, he reportedly lost himself when trying to fold a paper airplane after his elder brother asked him if he remembered how to do it. He told the reporter that "even though he had not folded one in many years, his fingers still remembered how to do it." Evidently, in that case, wisdom lay within his fingers rather than in his brain.

Simulative Experience

(1) Fostering through games

It becomes a waste not to make use of the valuable experience of others. The principle is simple because all one needs to do is experience it personally. One has merely to form a habit of experiencing new knowledge every day of one's life, including in one's work.

In education, if emphasis is shifted from "teaching" to "fostering," the necessity of "learning through experience" becomes readily understood.

In QC games, such methods as flying paper airplanes and playing other games are applied. As in the old proverb, "Make haste slowly," fostering the mind for quality control through games may seem like a detour, but it presents the shortest way to achieve successful quality control. Were it possible to foster an awareness of quality control in daily life, how wonderful it would be! However, this already may be in actual practice at places with which I am not familiar.

(2) Mock battles

Armed forces everywhere conduct mock battles as a means to learn through experience. These battles take a form similar to that of a game of chess, but magnified to a gigantic scale. In them, models of troops and weapons are deployed on a mapped-out battlefield to simulate a war.

These sham battles call for the use of tables of random sampling numbers, and the rates of hitting targets and inflicting damage are calculated. Such battles are fought for days, weeks or even longer, as in real warfare. They are also called "maneuvers on a map," since they take place on a map. Following these mock battles, military personnel visit the actual battlefield to conduct research so that they can link images on the map with real terrain.

In military practice, places to gain experience can be provided during a real war. Times of peace do not furnish opportunities for practical experience. Knowledge education alone does not enable military personnel to learn tactics and strategy. This is why the armed forces emphasize learning through experience, including via mock warfare.

(3) Strategically important points of the Russo-Japanese War

Saneyuki Akiyama, a gifted staff officer of the Japanese Imperial Navy, was the man who brought the method of mock battles to Japan. From the end of the 19th century into the opening years of the 20th, he studied mock battles in the United States beneath the thickening clouds of impending war between Russia and Japan.

During the Russo-Japanese War, which was fought for hegemony in Manchuria, the most important point, strategically, was to retain command of the Sea of Japan. The Japanese had to transport weapons and ammunition by sea to the Asian continent. If the Japanese had lost control of the sea and their supply line had been cut, they would have been defeated before their troops could even make a stand in Manchuria.

Saneyuki Akiyama developed the T-shaped strategy, a famous one that has found a place in the world history of naval battles, by repeating mock battles using models of Russia's Baltic Fleet and those of Japan's Imperial Navy on a map of the Sea of Japan.

At the time, is said that admirals all over the world wanted to employ the T-shaped strategy. Later, in the Pacific theater during World War II, the Imperial Navy was whipped decisively by the American naval forces which employed this strategy. One can imagine Saneyuki Akiyama lamenting the fact in his grave.

Saneyuki Akiyama studied the archives (knowledge) of the fleets of the Murakami clan, which flourished in Japan's Inland Sea during the nation's era of feudalism. He fought mock battles envisioning how the Murakami fleets would have engaged in them. He learned from this experience. He also researched the war experiences of Horatio Nelson, the celebrated British admiral, who defeated the invincible Spanish armada. The Murakami ships were manned by pirates who dominated Japan's Inland Sea. Akiyama's strategy is said to have been based on a combination of his knowledge of Lord Nelson and of the Murakami pirates. Thus, Akiyama converted the experience of others into wisdom through his own experience, thereby making a valuable contribution to completing the task of building a modern Japan.

```
┌───────────┐              ┌───────────┐
│ Knowledge │              │ Experience│
└───────────┘              └───────────┘
                                 ⇩
┌───────────┐  ⇨        ⇨  ┌───────────┐
│   Learn   │             │  Practice │
└───────────┘             └───────────┘
                                 ⇩
┌───────────┐  ⇨  [Experience]  ⇨  ┌──────────────┐
│In the brain│            │With the body │
└───────────┘             └──────────────┘
                                 ⇩
┌───────────┐  ⇨        ⇨  ┌───────────┐
│ Left brain│             │ Right brain│
└───────────┘             └───────────┘
                                 ⇩
┌───────────┐             ┌───────────┐
│  Memorize │             │  Acquire  │
└───────────┘             └───────────┘
                                 ⇩
                          ┌───────────┐
                          │    Act    │
                          └───────────┘
                                 ⇩
                          ┌──────────────┐
                          │Solve problems│
                          └──────────────┘
                                 ⇩
                          ┌───────────┐
                          │    Live   │
                          └───────────┘
```
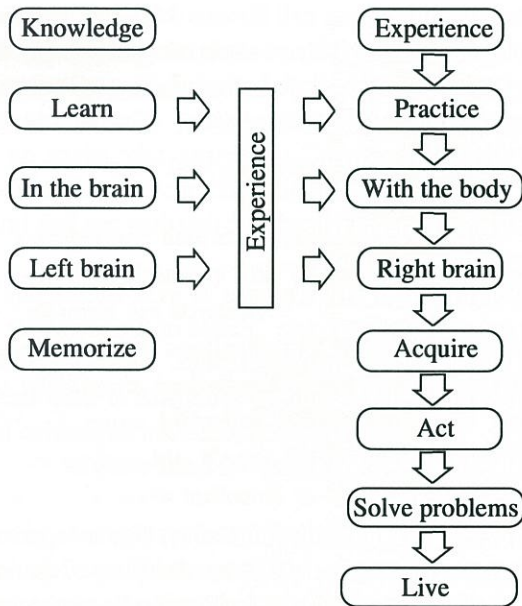
Figure 1

During the Pacific war, the Japanese Imperial Navy also engaged in mock warfare against the US fleet, but suffered defeat whenever the battles actually were fought. Mock battles for the air raids on Pearl Harbor were discovered halfway through, with the result that the Japan's military operations failed. During the war the Japanese already had lost in the mock battles, and as they predicted, the conflict ended in defeat without kamikaze (divine winds) blowing in favor of Japan.

Mock battles represent but one method of simulation. With the diffusion of personal computers, the same kind of simulation can be applied to all fields of endeavor. Business management plans, including those relating to profit and capital investment, are another form of applying simulation. Hopefully, business management strategy can be devised with minimal error by taking advantage of this simulation method. The realm of quality control offers many areas in which personal computers can be used effectively.

"If" Thinking

Human beings repeatedly use the word "if": "If only I had done it then" or, "If I hadn't done it then..." When "'if' is used in context with the past, it is called a "negative if," but when "if" is used with reference to the future, it is called a "positive if." When "if" refers to future events, it constitutes simulation thinking. Simulation thinking wherein a person envisions something that "would happen if" or what "would happen if (whatever) were not" represents projection. One tends to think of projection as extending the past into the future by using such mathematical tools of linear or quadratic equations as u=ax+b, but this is only one facet of projection. More important is projection wherein we think "if one freely does what one wants to do" or "if one does not do what one wants to do." In business management plans it is worthless to stretch past results into the

future and indicate them on a graph. Simulation based on scenarios like "if investments are made in plants and equipment" or "if this new product is developed" can be highly advantageous.

Simulation of changes that would take place, for example, "if the yen were to appreciate as much as fifty yen to the US dollar" is also important. Simulation thinking in which a person forecasts and ponders possible future changes represents vital wisdom in an age of discontinuity.

Business Sensibility Training

Ten years ago Keiei Sogo Kenkyujo developed an education and training program called Business Sensibility Training by merging Ricoh's "My Tool" software for personal computers (its Windows version was put on the market in May 1995) and management games. Since then it has worked to provide education and training for corporate personnel.

With its extensive curricula, the Business Sensibility Training program is arranged so that corporate leaders and ordinary employees can study management methods through experience and learn the need of the "why in management" and the "customer-first principle." The program also aims at giving hints for the use of personal computers and removing the aversion of middle-aged and elderly workers to using such state-of-the art equipment.

In this program corporate leaders and rank-and-filers experience enterprise management by playing the role of its president in two terms over a period of four years. They experience the dynamism of making decisions on the timing of capital investment, financing, research and development projects, and the like. Each trainee must experience all management issues as if in a one-man operated firm, and take sole responsibility for the causes and effects of issues. Even though the whole thing is simulated, the trainees still find themselves under a considerable amount of pressure. The program is highly meaningful provided they in fact experience the pressure, but mainly they tend to seek causes of bankruptcy in the structure of management games, and this includes risk cards.

Such poor attitudes render even this superb method of learning through experience worthless. The crux of this method lies in the process of experience. Even in simulated experience, however, the trainees tend to stick to whether they win or lose, since they concentrate almost entirely on "what," thereby losing sight of "why." In other words, they try to get by with only four Ws. For persons such as this, striking it rich or climbing in the corporate hierarchy is their goal (what) in life, but not "why." Merely sticking to goals will make one's life (process) meaningless. That being the case, how miserable a person's life can be! As for myself, I would like to see more people placing importance on gaining experience at every opportunity.

In the Business Sensibility Training program, I hope that the trainees can learn such basic tenets through experience.