

Contribution to Corporate Management

Mr. Takeo Yamaoka

My name is Yamaoka from JUKI Corporation.

In June this year, Dr. Kano called me to talk about this symposium and he invited me to talk about the contribution of Dr. Ishikawa to business management by TQC. There are so many companies that Prof. Ishikawa has instructed on TQC but Dr. Kano selected me. I said it would be presumptuous of me to accept, but he said that Dr. Ishikawa had talked about TQC since the 1950s, and since it's more than 50 years since then all the other people have already retired. So that's why he wanted to ask me.

Hundreds of companies in Japan and abroad have received Prof. Ishikawa's lectures on TQC. He visited each Japanese company 10 to 20 times directly to give lectures. I don't remember all their names, but around 30 to 35 companies received his direct lectures.

You're looking at this picture. These are ducks and you can see the parent. This parent is Prof. Ishikawa and at the end of the line there is one very small duckling. I think that is me, JUKI Corporation, so it's presumptuous of me to talk about Prof. Ishikawa, but please allow me to make this presentation.

These are some of the companies that received instruction from Prof. Ishikawa in the 1950s: Showa Denko, Toyo Boseki, Kawasaki Steel, Shin-Etsu, Asahi Glass, Nippon Steel, and Nissan; in the 1960s: Nippon Kayaku, Komatsu, National Matsushita, and Bridgestone; and in the 1970s: Pentel, IHI, Shiseido, Kashima Construction, Japan Zeon, Suntory, and JUKI.

Prof. Ishikawa lived in Chofu and our company was also located in Chofu about 10 minutes drive away, so it was easy for Prof. Ishikawa to come to our company.

I would like to introduce a little bit about our company. It was founded in 1938, and the next year, in 1939, the Japanese army for the first time introduced rifles for its soldiers. A total of 20,000 rifles were manufactured by our company for the Japanese army. That was the objective of its foundation.

During this preparation, our company's name was based on the name of the rifles; however, we decided on the name "JUKI." JUKI in Japanese means rifles or arms. The length of our yard for practicing shooting the guns was over 300 m.

We changed the name to "JUKI" later on and this was the logo for our products as well. The corporate philosophy was established and also basic management policy was established as well. The management policy was to promote total quality management.

This is about the history of our company. In 1947, we launched household sewing machines, and then card punchers and chip mounters in 1987. In 1950, there was a national council for sewing machine performance in Japan and we were awarded number one. We won the prize and for 45 years since then we were selected as the number one prize in the New Year Card Lottery. In those days, the number one prize was textiles, number two was baseball gloves for children, and number three was also to meet baseball players. Then they selected our sewing machine for the New Year Card Lottery.

Our fiscal year is from January to December. This is the performance of our company. About 68% of our sales come from industrial sewing machines and 84% comes from overseas sales.

As for industrial sewing machines, these are our main products. These are industrial sewing machines. There are different products like this, especially for industrial use. The most expensive one costs about 10 million yen and the sewing speed is about 10 times faster than that of household sewing machines. This is a jacket for men, and about 39 different types of industrial sewing machines are used to make only one jacket like this. There are different specialty machines.

Our products are used in global sewing factories so our export is 95%. We export our products to 180 different countries and there are about 2,000 different types of sewing machines manufactured by our company. Our production volume is about 520,000 a year. Globally, we have 45% of the market share.

This is an example of one of our uses. In China, there is a company called Yangha. They have over 20,000 employees so it is a very big company. This is their headquarters. It is very big so you can imagine how big the factory is.

This is our global operator sales operation. We have 16 sales offices globally. We also have 14 production sites: nine overseas and five in Japan. Only 15% of the production is in Japan; however, that accounts for 43% of our sales. For higher specification machines, we manufacture in Japan.

I would like to talk about JUKI Corporation before introducing TQC. Well, we have different products and we have had such progress. In one word, we are serious about manufacturing and we manufacture from the bottom of our hearts. This is our stance and our spirit.

As for the introduction of TQC in the postwar period, in April 1968 a new labor union was formed so we used to have two labor unions, and in 1968 QC circles were started. In March 1976, there was a proposal about a new joint declaration by labor and management to promote TQC.

Prof. Ishikawa, Prof. Ikezawa, Dr. Kano, and Dr. Kume were there and a lot of different instructors instructed us. This was a great opportunity for us to learn. The atmosphere should have been the same for every company so you can see the atmosphere of our office.

Prof. Ishikawa came to the industrial sewing machine production line and he offered instruction. He said that adjustment of the sewing machine as a regular process was rather strange and that the first time okay rate must be managed. That is what he said. He said that right after assembly the sewing machine should be able to sew right away and if adjustment is required either the design or the parts must be wrong.

He looked at the tools and said that the hammers and files were there is rather strange and he asked whether those tools were used for reworking. And he said that if the designs were wrong and parts or materials were bad, no amount of *genba* effort would make them right. He also said that the most noticeable people are the people on the frontline.

In the 1950s, the large camera manufacturers were doing adjustments, but he said that mass production would not be efficient if adjustments had to be made.

Also, companies should accumulate technology and he noticed that 70% to 90% of the parts were subcontracted to outside vendors and he wondered what the quality level of those part supplies was. He instructed us to build quality into each process.

The histogram and control charts and other things were taught to the front-line workers and also he held some collective school-type lectures. Back in those days, only 25% of people went to University but Dr. Ishikawa was a professor at the University of Tokyo so his instruction was really effective.

And in connection with new product development, he offered instruction in the R&D department. He said that you can only say that your QC is okay if your new product development can be carried out on time and if right after the development the first time okay rate is 95% and there are not so many complaints.

Also he said that we should be able to evaluate ideas and that designers should be able to imagine all kinds of possible uses for a product because without knowing the uses it is rather strange for a designer to create any design at all. Other companies may be doing that but at JUKI the designers should be able to understand all kinds of potential uses, and if there are complaints those must be incorporated as part of the items.

The production of a ballpoint pen may have 600 complaints as part of the test items but because we were making sewing machines we should have more items. Also the QCD evaluation criteria should be clarified.

And in any new product, completely new components and parts should account for only 10%. There may be some problems, but 90% of the parts are conventional parts and he said that there should not be any trouble at all for those existing parts. And if files are used for adjustment and no adjustment is done to the drawing, then the design is not good enough. Also, potential complaints should be identified so that the capability of the product is enhanced.

These are some of the things that he taught us. He was really frank in giving these comments. He said that we needed to capture complaints right away. His diction was really frank. Also, he said that people should be able to make presentations in front of people.

We were really serious in listening to these comments by D. Ishikawa. I gave instruction to Komatsu and Komatsu was really good in new product development. JUKI was emphasizing B2B business in industrial sewing machines and he said that JUKI should meet people from Komatsu because Komatsu's business was also B2B.

At the bottom-left are the steps for new product development. This is just a copy of the practice of Komatsu. Bulldozers and sewing machines may be different but these must be common. He gave us very detailed instructions as to how we should identify check items, so we learned how important it was for us to select evaluation items.

Also he said that quality assurance is the essence and also the goal of QC. If new product development is successful, we have established effective QC activities. Also he talked about PDCA. What it emphasizes is the importance of the quality assurance of new products.

In 1981, the industrial sewing machine division received the Deming Prize. Singer in the United States and Pfaff in Germany were really advanced in the sewing machine industry, but at international trade fairs JUKI was amongst the top when it came to industrial sewing machines.

Since then we have been continuing our journey for quality. In 1995, when the yen was strong, we had to reduce costs so we changed the paint but a paint defect occurred in Bangladesh. I visited a customer in Bangladesh and I saw a JUKI sewing machine where the paint had come off and I was shocked. I got in touch with the relevant person in Japan and since then there has not been any major problem regarding quality.

When it comes to new product development, we have a series of completely dry sewing machines. A new product is defined as a product that has been launched in the past three years. The proportion of new product sales is 33%.

We have also introduced a new color. In the past, sewing machines were almost all silver gray but we introduced urban white as a colorful sewing machine. Also, the logo

is attached on this side of the sewing machine. After this, most of the industrial sewing machines in the world started to have this whitish color.

We have a mother plant and technology is developed in the mother plant and that technology is transferred to other plants in the world.

This is PDCA management. We have a steering committee and the steering committee is just like steering a ship. We are implementing QC circles. There are actually 194 QC circles. November is defined as our quality month. In the mother plant, the Otawara plant, we have our National QC Convention.

Let me talk about the change of the business environment. In the 1990s, the Japanese yen strengthened, changing the business environment quite significantly. This is what we did. Around that time, we had difficulties because of the strong Japanese yen. Back in this year, one dollar was 150 yen, but at this point in 1995 one dollar was 79 yen. So the strong yen made a big dent in our sales.

In Ningbo, in Langfang, we have three plants in China and if the yen strengthened by 1 yen our sales was reduced by 300 million yen, so the financial result was really bad. Control charts and other standards were introduced as part of the education of the line operators in China.

This is about the QC symposium in Hakone. It is organized by JUSE twice a year in June and December. This year, the June symposium marked the 100th symposium. People from academia and industry participated in the symposium and over dinner we had group discussions. Then until 9 pm or 9.30 pm we had more discussions over drinks.

Each year, between 150 and 200 people participate in this QC symposium. From the 1970s, someone from JUKI has participated in this QC symposium where we have had great opportunities to meet with prominent people, including Mr. Sekiya from Toyota. This was really significant because we have had opportunities to have discussions with various people from different countries.

These are the themes from the symposium on QC. There are different themes for each year. In 1994, the theme was TQC for Effective Management and this theme stayed the same for the entire year in 1994. The changes were significant and we were discussing how TQC should change in the changing environment.

These here are the survey results from the JMA, the Japan Management Association, and this is a questionnaire about managerial issues. Top is always the need for strengthening of technical and product development capabilities. In the manufacturing industry, quality assurance and new product development are the most important topics. So once again, JUKI redoubled its efforts to maintain and enhance its

capability for product and technical development.

There has been big trouble in Volkswagen recently and that company is really renowned all over the world. We really feel that when trouble comes to quality assurance it is really very serious.

Let me talk a little bit about what we have learned from Dr. Ishikawa. He said that we need to practice TQC steadily. In June 1983, Dr. Ishikawa delivered a lecture in a cafeteria to all the employees in JUKI and we printed 3,000 copies of this and gave one copy to each employee at JUKI.

This is part of the quotations of Dr. Ishikawa. This is “nomunication” or communication over drinks. In a symposium in Hakone, Prof. Ishikawa wore a cotton kimono, a yukata, and he gathered young people and started discussions with those young people. Dr. Ishikawa asked to which company they belonged and they had a very frank discussion. It was like a very informal school for QC. When I go to JUKI’s plants in provincial areas, just like Dr. Ishikawa, I have discussions over drinks.

He delivered a lecture for two hours and he said that if 5% of the new product development is successful, that is good. And Soichiro Honda of Honda Motors said that 1% successful new product development is quite okay. People and animals are different because people have intention and people have the ability to think, and JUKI is doing its best in TQC.

Last, these are what he said from the minutes of his lecture. This is not written language but it is more like spoken language because this is actually what he said in his lecture.

In 1980, Kayaba received the Deming Prize and this is a photo of the commemoration or celebration of Kayaba winning the Deming Prize. Dr. Deming was here on that occasion. He did not come to Japan every year. After that, nobody was around Dr. Deming so I went to see him and I said that we are challenging for the Deming Prize and he encouraged us to do our best. I then asked him to allow me to take a photo with him, so here is Dr. Ishikawa, and this is the president of JUKI, and this is Mr. Ueda the promoter of QC, and we had this commemorative photo taken.

We put this photo the newsletter and some people in the QC community said that we did not receive the Deming Prize so it is very strange for us to carry this photo in the newsletter.

Then when I became the president, there is an economic magazine called Diamond, and that magazine wanted me to provide a copy of a photo that was significant for me so I provided this photo to the magazine and it proved quite popular.

Kaoru Ishikawa: The Man and Quality Control has been published and his

comments are listed for 24 pages. He said that in order to do effective QC you should be able to drink alcohol and this is something that I have come across. He said that the spread of QC will promote the international division of labor, which will deepen mutual cooperation and dependence between countries. Then they won't fight each other and world peace will prevail. This was the first time for me to come across this comment. I believe that this was his worldview and there was an event that proved his comment to be correct.

There is a social group of QC people and management people and this social meeting was held starting in 1985. Around 180 meetings had been held. This was started from 15th June 1985 at Gotemba Country Club in Tomei, 14th hole, par 3, 131 m.

Mr. Sekiya of Toyota, Mr. Irino of Kajima, and Ms. Mitsuaki of JUSE were there together with him, and this was a hole-in-one in golf. Dr. Ishikawa was really glad. Mr. Sekiya and Ms. Mitsuaki have passed away but he had a hole in one.

Last month, in 2015, Konotori was launched successfully from Tanegashima Space Center in Kagoshima. That launch is providing supplies like food and water and experimental tools for the International Space Station. In April this year, the launch of Russia's Progress failed and the launch of Cygnus in June also failed, but our launch was successful.

JAXA did this launch. JAXA tried to prevent the recurrence of the launch failure so they set up the Office of Reliability Promotion and Evaluation, which is headed by Mr. Sekiya. The former QA manager of JAL, former QA manager of Hitachi, former QA manager of MHI, and the current QA manager of Denso are also members of JAXA's Office of Reliability Promotion and Evaluation.

Mr. Sekiya said that this was his last service in the area of quality control and when I went onto JAXA's homepage I found a message from Mr. Sekiya as head of this office. He said that JAXA have excellent human resources and very motivated young workers, and that they want to ensure that we can draw out all of the potential capabilities of the personnel at JAXA.

So it is not only the followers of Dr. Ishikawa but also everybody Dr. Ishikawa provided the same instruction and same guidance to. I felt that Mr. Sekiya, as one of the followers of Dr. Ishikawa, was emulating what Dr. Ishikawa was doing and I believe that the success of the launch of Konotori indicates that the worldview of Dr. Ishikawa in the area of quality control is now being realized. I believe that the promotion of TQM in Japan can contribute to world peace.

Thank you very much for your kind attention.