

## Chapter 14

### Memories of Customers

No matter how good a microprocessor product is developed, it is meaningless unless the customer uses it and succeeds in the market. High throughput, low power consumption, features with many good functions ... they are only the part of necessary conditions, but not all. Whether the excellent performance as a device is fully utilized or not depends on whether we have good customers who use it.

We can say that our microprocessor has succeeded only when our customers' product has succeeded in the market. Fortunately, while promoting the microprocessor business, we had many those good customers in and out of Japan.

However, since the number of companies I visited and the number of people I met were so numerous, it is impossible to keep all the details in my memory. I would like to touch on the customers who gave us helps and supports, although it will be more like "so far as I remember".

Regardless of domestic and overseas, I will mention the following customers in alphabetical order; Acer (Taiwan), Canon, Casio, Delco(US), Nokia (Finland), Omron, Ricoh, Sega Enterprises, Seiko Epson, Sharp, Sony, and Yamaha.

Well, while listing up the company names, I noticed that the names of all the domestic companies are in "katakana" which is a set of Japanese characters created as phonetic alphabets and are usually used to express the words of foreign origin. Of course, there may be accidental factors, but it is probably that many of the advanced high-tech companies have chosen katakana names.

#### Acer (Taiwan)

The company is a model case example of a successful venture company in Taiwan. They achieved a dramatic breakthrough in a short period of time that can be said as "Taiwanese Dream".

In 1976, Stan Shih who had been a computer engineer started, together with his wife, the company with 11 members, with microcomputers as their core business. In 1981, they released a computer learning machine named Micro Professor as their own brand, which was the first computer product of Acer.

From around November 1996 when Windows CE was installed in the SH-3, we began to have frequent contact with Chairman and CEO Stan Shih, and the design-in activities were promoted. When I visited him in April 1997, I was informed that they decided to adopt SH-3 for the company's HPC (handheld PC). He liked the SH microprocessor very much and expressed that they would use the SH microprocessors also for their future home electronics products in addition to the HPC. With the company's growth, sales of SH microprocessor also increased, and Acer became a major customer for us in Taiwan.

He was strongly aware of the impact of semiconductor technology innovation in the high-tech field, and we very naturally hit it well together. I got his request to hold a seminar on semiconductors in general for their engineers.

We made a sufficient preparation in three months in Hitachi, and held “Hitachi Seminar for Acer” on July 2, 1997. I made the keynote speech, and talked about the global trend of semiconductors, paying attention not to stay in Hitachi product commercials.

Photo 14.1 is a picture of Stan Shih who hosted on Acer-side, and Photo 14.2 is the picture of all the attendees. On the next day, a socialization golf competition was held by the seminar participants from the both companies.



Photo 14.1 Stan Shih, Chairman of Acer (July, 1997)



Photo 14.2 Hitachi Seminar at Acer (Chairman Stan Shih at the center, and the author to the right) (July 2, 1997)

### Canon (Japan)

The company's predecessor was Precision Engineering Laboratory which had been founded in 1933. Wishing to share benefaction of KWANNON Bodhisattva, they named the high-precision small sized camera developed in the same year as KWANNON, and in 1935 they changed it to Canon as the brand which could be accepted by global markets.

They became Canon Camera Co. Ltd. in 1947, and it became Canon Co. Ltd. in 1969, which is the name today.

It started as a camera company, but the business has been gradually expanded to cover business machine sector such as printers, copiers, fax, and industry sector such as semiconductor exposure equipment, and further to medical sector. The company had always been a large customer of Hitachi semiconductor, and H8 microprocessor was adopted to their cameras immediately after its market introduction. This was the first case of big design-in of H8, but since this field was also a stronghold of Motorola, we came to a head to head competition. And this became a trigger for the MCU legal battle as described in Chapter 9. Motorola sued Hitachi that H8 infringed their patents, and it developed into a large trial case.

After the trial was settled, the interactions with Canon became even deeper, and it became a big user not only of H8, F-ZTAT, and SH microprocessors, but also of the whole semiconductors of Hitachi.

The relationships with the executives were deepened, such as President Hajime Mitarai (5th President), Hiroshi Tanaka (later Vice Chairman), Takashi Saito (Executive Director), Hisashi Sakamaki (Executive Director then and President of Canon Electronics now), through the regular and irregular meetings and golf games.

Particularly in February 1997, we were invited to Hawaiian Open of US PGA Tour which was sponsored by Canon, and we were able to deepen our friendship with executives of other companies. President Nobuyuki Idei of Sony, President Naoki Kaneko of NEC, Vice President Hirabayashi of Mitsubishi, and Vice President Higashi of Oki were also present, and Vice President Matuoka and I joined from Hitachi.

This was also a major event for Canon, in which Hiroshi Tanaka, the vice president of the company, was fully in charge, and it got a great deal of excitement. Photo 14. 3 is a picture taken in the friendly golf game at this time.



Photo 14.3 Members of golf games invited by Canon

From left in the front row, Hiroshi Tanaka (in a white shirt, Canon), Yu Hosaka (Asahi Kasei), the author, and Nobuyuki Idei (Sony)

### Casio Computer (Japan)

The founding of Casio dates back to 1946, soon after the end of World War II, when it started as Kashio Manufacturing Co. in Mitaka City in Tokyo. They developed a small computer in 1957, and on this occasion, Casio Computer was founded by the four brothers of Kashio family; Tadao, Toshio, Kazuo and Yukio.

The four brothers were firmly tied together in developing the business, leading to the great success of today, by appropriately incorporating semiconductor innovation to their business.

The company's technology center was located in Hamura City. Partly due to its close location to the Musashi factory of Hitachi in Kodaira City, a deep association started from the days of calculator LSI. We did numerous joint developments of LSIs for calculators, watches, musical instruments and so on. Among them, the 6-digit calculator, Casio Mini, which was released in 1971 had the biggest impact. It was a novel design that used one-chip LSI manufactured by Hitachi, and it became a big hit commodity with the famous TV commercial of "Answer in one shot! Casio Mini". With the success of this product, the market share of Hitachi's LSI greatly expanded, reaching a peak of 65% in Japan.

We had opportunities of official and unofficial meetings and golf plays with the executives like President Kazuo Kashio, Vice President Yukio Kashio, Senior Executive Directors Kosai, Maeno and Shimura, Executive Director Hakata. The relationship became even stronger in the era of microprocessors.

It is noteworthy that SH-1 was designed-in to the world's first digital camera (QV-10) for consumer use, and it became the pioneer product of the new digital camera era. Product release was in 1995, which was also the year when Windows 95 was released and personal computers expanded rapidly. QV-10 became an unexpectedly big hit product as a handy input device to personal computers.

In addition, Casio played a major role in installing Windows CE on SH microprocessor. In the development of the consumer OS by Microsoft, Casio had a good connection with them from the early days, and recommended SH microprocessor as the one to install the new OS. As a result of this process, SH-3 was adopted in the Handheld PC, Cassiopeia, announced by Casio at COMDEX exhibition in November 1996.



Photo 14.4 HPC Cassiopeia released on 1996 (with Windows CE and SH-3 as the CPU)

Because the Kashio brothers were all golf enthusiasts and were good at it, golf games were very popular inside the company. Regular and irregular golf games were held with Hitachi semiconductor group. Photo 14.5 is a picture of a gathering after the golf game in May, 1997.



Photo 14.5 Golf competition with Casio (May, 1997)

The third person from the right in the front row is President Kazuo Kashio, and to the left, Yukio Kashio, Masaaki Takashima, Kosei Nomiya, Tokumasa Yasu.

To the right of President Kashio, the author and Maeno, Casio's Senior Executive Director.

### Delco Electronics (US)

The company was founded in Dayton, Ohio as a manufacturing and sales company of electronic equipment in 1909. Originally it was a subsidiary of NCR, and in 1920 it became a subsidiary of General Motors (GM), and became a manufacturing company focusing on automotive electrical equipment.

In the 1970's it was a major supplier of automotive electrical equipment with 30,000 employees based in Kokomo, Indiana.

The first visit to this company was on April 13, 1978. The reason that this visit stays as a particularly clear memory in me is because it was my first overseas customer presentation. Perhaps, as far as I know, this kind of formal customer presentation was the first case for Hitachi semiconductor.

In February of this year, the Third Design Dept. of Musashi Works was newly established, and I was appointed the first Dept. Mngr. It was a department dedicated for memory and microprocessor design and business operations which was separated from the First Design Dept.

Soon after this, I got a request from Hideaki Ito in the Chicago Office (Sales Office of Hitachi semiconductor) to visit Delco and to make a presentation on our semiconductor activities centering on microprocessors.

According to him, there were various themes in which Delco was interested, covering 14 items on

the list, including overall semiconductor operations, microprocessor products, process technology, packaging, TAT of mask rewriting, characteristics and reliability data of 6800. I took it as a unique opportunity for the development of our microprocessor business, and I decided to take all possible measures to make it successful. Since I could not cover all the items by myself, I had to organize a team with proper selection of members so that we would be able to answer to any of the questions on the spot.

I thought that the way of “take back home and answer later” would not be accepted by Delco. At that time, there were not many persons yet with deep technical knowledge and also with good capability of making presentation in English. We could not deal with it by the members in my department only, and I asked the support from other departments to attend the meeting.

The following is the members at this time:

Shigeru Suzuki: Dept. Mngr. of Quality Assurance, in charge of quality related matters

Satoru Ito: Engineer of Process Technology Development, in charge of process and passivation technologies

Joe Nakajima: Engineer in the Third Design Dept., in charge of microprocessor design

Noboru Horie: Engineer in the Second Design Dept., in charge of bipolar design

Except for Suzuki who was in a department manager position, all others were younger engineers.

On April 11th, all of us flew to Chicago together and had a preparatory meeting for the presentation by the arrangement of Hideaki Ito. We decided that each one would complete the final presentation material by the next morning, and that we would rehearse then. In those days, presentations were ordinarily done using OHP (overhead projection), not in Power Point presentations like today. The initial plan was that only the three young Engineer members would rehearse, but Suzuki, Dept. Mngr. also joined by his own will, and the rehearsal became like an actual presentation. The materials to be distributed were put together by stapling at the upper left corner, and all the preparation was completed.

However, an unexpected incident happened in the next morning. We found that a confidential material was included in the material to be distributed, but we did not have time to remake the correct materials by removing the staples and removing the confidential portion. With some feel of hesitation, we removed the page by tearing off, but we were not attentive enough to the obvious thing that small triangular piece would remain unremoved.

On the customer side, more than 10 people welcomed us with Dr. Costello, the top of purchasing department, as the head, including procurement personnel, device engineers, and QC engineers.

First of all, Costello gave us an introductory explanation about the situation of Delco, which was generally as follows. Demands for semiconductors such as microprocessors for engine control were rapidly increasing, and 30 to 35 million ICs per year were necessary. Currently, Motorola was the main supplier, but they definitely needed a second source particularly for microprocessors, and they were seeking overseas sources, too.

Now, it was our turn. The stapled materials as described above were distributed to all the members in the meeting. In the moment, when I was starting to talk as the first speaker, a triangular piece of paper which remained unremoved in the material fell on the desktop.

Costello found it in a quick eye. He must have found that we had removed a particular page. I

wished he would pass over it by "mercy of the brave", but he gave a direct question on the spot, "Dr. Makimoto, what is this?"

I could not mess around by making a strange excuse here. Quickly, I thought about evading the question.

"Thank you for asking. This page is specially reserved for the next meeting".

"Oh, I see. I am looking forward to the next meeting".

"Yes, please".

Everything was settled by this exchange. It was a start with tension, but after that the meeting went smoothly with an extremely friendly atmosphere. Hitachi's presenters all performed their missions brilliantly. They gave clear answers to the questions, and it ended with a perfect job done. For this day, everyone made thorough preparation for the successful meeting.

Costello invited us for the lunch to a country club restaurant to which he belonged. It was a hospitality with wine, and we had lively talks.

The first customer presentation ended successfully in this way. Gottlieb, a local sales rep (Hitachi distributor) who also attended the meeting was greatly pleased, with a comment that, "It was his great satisfying expression that Mr. Costello invited us to a country club restaurant where he belongs."

As a result of this visit, the relationship with Delco became closer rapidly, and the business proceeded quickly from sample evaluation to order receipt. Shipment of mass-produced products began in the following year (1979). Two years after the first mass-production delivery, in May 1981, Costello visited Musashi Works with Gottlieb, and gave us the following message.

Collaboration with Hitachi progressed very smoothly and Hitachi entered among five semiconductor vendors, but you were still far behind Motorola. You should be able to attain 20% share with your further efforts. For that, I would like you to make proposals of new technology. In the automotive field, the application of electronics, not limited to ECUs, would spread wider, and you have a big opportunity.

We were encouraged by this message, and introduced new technologies of device, process and packaging. In particular, we promoted high speed CMOS microprocessor (63-series microprocessors).

In February of the following year, Czaper, the vice president of GM in charge of procurement, visited Musashi Works. At that time, Hitachi's share was close to that of Motorola, and he had a strong interest in Hitachi CMOS microprocessors, and we shared the concept that CMOS would be the future direction. It was not a mere lip service, and would become a reality, soon.

A big achievement came in in December of that year. The design-in of CMOS microprocessor 6301V was decided for the ECU of Cadillac and Buick.

The plan for the first year was 660,000 units, and there was a further possibility that it might be expanded to other models. Hitachi was the only company which could manufacture CMOS microprocessor on mass production basis, and Hitachi established the first vendor position at GM. Four years had passed since the first customer presentation, and we now had a large flower blooming by the integrated efforts of factory and sales operations. Delco/GM microprocessor business became a strong basis of Hitachi semiconductor.

Nokia (Finland)

The company's history dates back to a paper manufacturing company established in 1865, and it has reached today's Nokia after numerous transitions.

Their business in the diversification strategy got stuck in the 1990's, and they decided to focus their resources to mobile phones and related fields, while undertaking a massive restructuring. They succeeded in this strategy, and Nokia is keeping the world top position today as the mobile phone maker.

Nokia was one of the most important customers for Hitachi, and I attended the executive meetings every year; in 1994, 1995 and 1996. On the customer side, President Ara Pietira attended every time, and it was a friendly and intensive meeting.

At the time in 1995, they produced 15 million mobile phones a year, and H8 microprocessors were designed in almost all models. We were aiming at the design in of SH microprocessor, and in particular, we promoted the design in of SH-DSP, the SH microprocessor with an integrated DSP function.

We progressed to the point of, "Let's work in the practical level" in the meeting in 1995. And at the meeting in 1996, there was a report that "SH-DSP demonstration succeeded last month". We were very much encouraged by this, but unfortunately, this design-in was not fulfilled.

Photo 14.6 is a picture with President Pietira at the 1995 visit.



Photo 14.6 President of Nokia, Ara Pietira (March, 1995)

Omron (Japan)

Omron has been a key customer for Hitachi, since we did joint development of calculator LSIs in the 70's when Omron was still called Tateishi Electric Company.

We participated in development projects for several kinds of products during the time of fierce calculator war, and among them the development of LSI using silicon gate process stays as a clear memory with me. They were aiming at "high-speed and low-power" calculators in order to



differentiate them from the competitors.

The mainstream process technology at that time was aluminum-gate process using aluminum for the gate electrode. Meanwhile, since Hitachi was developing silicon gate process, I explained the outline of the technology. They liked it very much and said that, "We would like to use that process technology by all means."

Even though it was still technically immature and we had some concerns about its mass production launch, we took it up with the thought, "Why not take the plunge?"

However, as we were worried, even though we managed to make samples, the mass production launch was difficult, and we made piles of defective products. A special team was laid down to solve the problem. The countermeasure lots were processed at a speed close to bare physical turn-around-time, and feedback was made one after another. Although we did our best, it was delayed several months to the original promised schedule, resulting in a great inconvenience for the customer.

However, it is certain that this experience greatly contributed to the start-up of mass production of next generation memory and microprocessors (both silicon gate products). Although I felt regretful for the customer, I also felt very appreciative about it.

Later, in March 1998, I visited President Tateishi and explained him the general trend of microprocessors. He realized that the microprocessor would play an important role in the company's business in the future and gave me a request of a microprocessor seminar for the executives of the company. I promised "I will gladly make that opportunity", but that promise was never fulfilled. It was because I got a two-stage demotion soon after that due to the bad performance of semiconductors. In retrospect, the meeting with President Tateishi was my last customer visit as the top of Hitachi semiconductor, and I never had a chance after that.

### Ricoh (Japan)

The relationship with the company dates back to the days of calculators. A calculator with a printer that was released in 1972 was promoted extensively with the nickname of "Ten-ten P" as a strategic model. In the development of the custom LSI used here, Hitachi received orders by competing with AMI in US, which was regarded to be the strongest custom LSI company at that time.

As development schedule was too tight, AMI was hesitant. Also, it was with a success bonus present of "Joni-kuro" to motivate Hitachi engineers. Joni-kuro was "Johnny Walker Black Label" as it was called in Japan as a synonym of luxury whiskey at that time. Within Hitachi semiconductor group, it was called "Joni-kuro project" as someone named it. All the manufacturing steps were treated as priority processing, and we got our credit by finishing the LSI on the promised schedule. However, it was more significant that the engineers of Hitachi semiconductor got confidence that "We won AMI!"

Mr. Baba was in charge of the project in Ricoh at this time, and he was promoted to a director in charge of fax, copiers and printers and so on 20 years later. The experience at the above LSI project helped us to get design wins of various products including H8 microprocessors, ASICs and memories.



Photo 14.7 Executive social gathering with Ricoh (December, 1997)

The fifth person from the left in the front row is Ricoh's Vice President, Kamimoto, and the author to the right.

### Sega Enterprises (Japan)

Sega was working on the business of home game machines since the 1980's, and in the 1990's they started the study of next generation game machine (later named Sega Saturn).

We started to contact President Hayao Nakayama from January 1992 regarding the selection of microprocessor as the engine of this machine. In other words, it was a relationship from the time before the SH microprocessor product announcement.

We continuously updated him on the development situation of SH microprocessor, and he had a good understanding of its outline. And we were told by him that they would most probably adopt SH series product about one month before the product announcement (that is, around October of the same year).

After that, with Shoichiro Irimajiri (who joined Sega as Vice President from Honda in June 1993, and became the president in 1998), we proceeded with the development of SH-2 microprocessor as the main engine of the machine, also in close contacts with Hideki Sato (then Director and President of Sega in 2001).

It's just an aside, but we were asked at one time on a dinner table with Sega, "What is the origin of the name SH?", and we answered, "Originally it came from SuperH, but SH also stands for Shobai Hanjo, meaning Prosperity (Hanjo) of business (Shobai). But from now on we want to make SH for "Sega and Hitachi". And the dinner became very lively.

Sega Saturn with the SH-2 as the engine was released in November, 1994, and it sold 170,000 units on the first day, becoming a big hit product. Delivery of the SH-2 microprocessor was started from several months prior to this, and it led to a large increase of Hitachi 's semiconductor sales in 1994.

At the beginning of the next year, the ranking of "number of shipments of RISC type microprocessor

in 1994” was announced from US market research agencies. Surprisingly, SH microprocessor was in the second place, which had not been even on the list in the previous year! The top was Intel’s i960, but the SH microprocessor was ranked second, surpassing the other RISC processors including Power PC. Needless to say, Sega Saturn made a big contribution to pushing up SH to this position, and SH had truly a good opportunity right after the market introduction.

With this background, in order to express our appreciation to the people of Sega who supported the momentum of the SH microprocessor’s success in the market, we held “Appreciation Party of SH microprocessor” in a big hall of a hotel. President Nakayama and other executives of Sega attended the party, and we exchanged various episodes from the decision making to adopt SH to the product release of Sega Saturn.



Photo 14.8 “Appreciation Party of SH Microprocessor” for Sega

The third person from the right is President Nakayama. To the left, Director Sato of Sega, and the author. Mastuoka and Nomiya of Hitachi to the right of Nakayama.

In April 1995, soon after the announcement of Sega Saturn, we started the discussion on the microprocessor for the next generation game machine. Initially it was to be a combination of “SH-3 and Nvidia’s image processor chip”, but eventually it was settled in “SH-4 microprocessor together with NEC’s image chip and Yamaha’s sound chip”. A new model “Dreamcast” was announced in May 1998, and it was released on 20th November of the same year. At this time I had already been retired from the front line and I could only observe the situation from afar.

### Seiko Epson (Japan)

The history of Seiko Epson is old and dates back to Yamato Industry Co., Ltd., established in 1942 as an affiliate of Dai-Ni-Seikosha. It became independent and became Suwa-Seikosha in 1959. It then established an affiliate company, Shinshu Seiki in 1961, which changed the name to Epson in 1982. Further in 1985, Suwa-Seikosha was merged with Epson and became present Seiko Epson Co. Ltd.

The company manufactures a wide range of precision electronic devices such as printers, personal

computers, watches, camera equipment, liquid crystal projectors, etc. and it has long been a customer of Hitachi semiconductor products. In the era of microprocessors, the relationship became more deepened along with the commercialization of 68-series/63-series microprocessors, H8 and SH microprocessors.

As already mentioned, the first connection with the company was established when their HC-20, the handheld computer, made a big hit. Hitachi's first high speed CMOS microprocessor 6301V was adopted in the product.

The leader of this project was Koichi Nakamura, Director, who was a junior alumnus of mine in our high school. He had sympathized with Hitachi's CMOS strategy early on. He succeeded in the commercialization of a portable computer ahead of the world, as an all CMOS system, including SRAM and mask ROM, as well as microprocessors.

And the big hit of HC-20 also became a trigger for Hitachi's CMOS microprocessor to achieve its dramatic growth. Since that time, the company has become an important customer for Hitachi microprocessors. They became a big customer of SH microprocessor, too, and we owe a lot to the decision of President Hideaki Yasukawa in its adoption.

In the meeting with us in November 1995, he clearly stated that, since the microprocessor selection is an extremely important management decision, he would decide it by firmly confirming the vendor's policy. After a while, he told us that they wanted to adopt SH microprocessor under license, and it was finally settled in the meeting with him in September 1997 after several advanced negotiations. We had regular and irregular meetings and golf events, and we have had good relationships as an important customer of Hitachi semiconductor.

Photo 14.9 is a picture of a golf game held in September, 1997.



Photo 14.9 Seiko Epson and Hitachi's Party Golf (September, 1997)  
(President Hideaki Yasukawa, the fourth person from left, and the author to his right)

Sharp (Japan)

The relationship with Sharp is also very long and it dates back to the time of calculator LSIs in the 1970's. Sharp introduced the world first electronic calculator using transistors in 1964, and it commercialized a new model almost every year since then, utilizing new semiconductor devices. It was in 1969 when the world's first LSI calculator was commercialized, but at this time, LSI was supplied by Rockwell in US. In 1970, Hitachi established a CAD system to undertake LSI custom design, and we could get orders from Sharp, too.

At that time, young persons in Sharp like Washizuka, Kunikane, Hashimoto and others led by Atsushi Asada (Vice President later) were playing big roles, and Sharp was a big customer of Hitachi LSI. With the development of SH microprocessor in the 1990's, we could have a strong connection with Asada once again. We recommended him to use SH-3 for their PDA (Personal Digital Assistant), Zaurus, and we succeeded in the design-in.

Moreover, when the new OS, Windows CE, was announced from Microsoft in 1996, their interest in SH microprocessors increased more and more. Sharp also had a plan to develop HPC. We explained the details of SH-3 and SH-4 to Asada in April 1997, which led us to the design-win.

Sony (Japan)

Masaru Ibuka, the founder of Sony, focused on applying the strong power of semiconductors to consumer products, and he sent out many products into the market ahead of the world, starting from a transistor radio in 1955, followed by TV, VCR and Walkman, and so on.

Initially, they proceeded with "vertical integration method" to manufacture semiconductors internally to supply for their end products. But because of the large increase of their consumer product sales, they started to buy semiconductors from outside companies, too, and various semiconductor devices of Hitachi had also been adopted.

In the age of microprocessor, Minoru Morio, then Vice President of Sony, actively recommended internally the adoption of Hitachi products. I had known him from some time before, and he kindly arranged opportunities of detailed presentation of Hitachi microprocessors like F-ZTAT, SH and so on to Sony's engineering teams.

He had a great track record in the development of passport size 8-mm video cameras, etc. There was a kind of atmosphere about him, inside the company, like "commanding general of technology", and his opinion had great influence like "a word from the throne."

As of 1995, the numbers of SH microprocessor design-ins already exceeded 20, and Morio wanted to introduce SH microprocessor under license, and the license agreement was concluded in March, 1997. In this situation, we held a special seminar of SH microprocessor to the key members of Sony in June, 1998 with 41 participants. After that, microprocessors for the new products gradually became narrowed down to SH.

This was in the background of my move to Sony later on, and I heard later that Morio made a strong recommendation internally on this matter.

As the relationships with Sony grew stronger through the SH and other business cases, we started to have golf competition events among the executives of the both companies. Morio was also a good golf player, and all other executives were good, too. After the golfs, we would enjoy dinners with a lot of lively talks. Photo 14.10 is a picture of the golf competition in May, 1997.



Photo 14.10 Sony and Hitachi's Golf Competition (May, 1997)

The third from the left in the front row is Morio in a red shirt, and to the right, the author, Watanabe, Takashino, Kihara.

Around that time, I had the opportunity to get familiar with President Idei and Chairman Ohga, who were the bosses of Morio. I got to know President Idei on the occasion of Hawaiian Open PGA Tour in 1997, which was sponsored by Canon. Idei was also invited and I had a chance to have friendly talk with him.

By this relationship, I was directly inquired first by Idei on my transfer to Sony in 2000. And I also had an opportunity to work with Chairman Ohga in the negotiation of Japan-US semiconductor Agreement in 1996.

He was the chairman of the Electronic Industry Association of Japan (EIAJ) and I was the head of its device committee. We were engaged together in the intense negotiations with the SIA on how to terminate this agreement. When I moved from Hitachi to Sony at a later time and visited him for greeting, he welcomed me on my entering to his room, saying "Oh, my comrade!" It was the most concise and wonderful welcome I ever had.

### Yamaha (Japan)

We have had a long relationship with Yamaha which is a long-established electronic musical instrument company. Especially after the introduction of H8 and SH microprocessors, design-ins were actively advanced, and Yamaha became a large user of Hitachi microprocessors.

In May, 1996, the cumulative number of microprocessors delivered from Hitachi reached 20 million units, and a party was hosted by President Ueshima to which we were invited.

In addition, in April 1997, the successor president Ishimura consulted with us on the second source agreement for SH microprocessors, but this was not realized due to the subsequent deterioration of the semiconductor market situation.

The above are the episodes of our experiences with twelve key customers of Hitachi's microprocessors, tracing my memory at the time. I had a lot of opportunities to meet and to get acquainted with so many people in and out of Japan through the microprocessor business.

Every time we had various twists and turns, we learned many things from our customers. It was definitely by the support of our customers that our microprocessor business was brought up to the strong pillar of Hitachi semiconductors.

I would like to express my deepest appreciation for the associations with the customers which made my life so rich.

But, of course, I could touch on just a few among all the important customers. The numbers of customers must be as many as several thousands, because of the nature of the microprocessor products. There are overwhelmingly more customers who I could not mention.

To any one of you who may think "There is no mention at all about us", I can only humbly beg your pardon.

The End

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