

## Episode 15

### **Third Golden Age of Hitachi Semiconductor**

In Hitachi's business management, particularly striking points compared to other companies is the strict "budget system". It is a system that makes detailed budget for sales, profits, investment amount, and human resources etc. at each division and factory in the first half and second half of each fiscal year. The result of the budget is strictly followed. Historically, the company started up from the heavy electric field, and it seems that this system played a major role in Hitachi's business development early in its history. That is, if you set up a budget, it is almost all in the field of heavy electric business.

It is ideal to close the budget term with as close numbers as possible to 100% to the initial budget, and in the heavy electric field, it is most likely the result comes very close to such an ideal.

Meanwhile, in fields with rapidly changing industries such as semiconductors, there are cases of drastic deviation from the budget figures. For example, sales may be (+) 30%, or conversely (-) 30%. From the viewpoint of executives from the heavy electric field, it is no wonder that they have suspicions if "semiconductor people are seriously working to keep their budget."

Because of this background, every time the semiconductor market declines, penalty was imposed for the responsibility for "not achieving budget". I myself experienced them two times in the past. Some of our more senior executives have been removed from the semiconductor business.

That happened in 1992 as well. In June of this year, Takeshi Sasaki, who was a board director and in charge of semiconductor business division was suddenly moved to an affiliated company. Usually, Hitachi's executive personnel appointments were done in the odd number years, so the change in this year was undeniably unusual and was generally perceived as the result of not achieving the budget. And I was appointed to the Division General Manager in place of him. It was really unexpected development, considering the situation five years before when I was in a gloomy feel that it would be my last position at Hitachi when I was transferred to Takasaki Factory caused by non-achievement of budget.

It is the "factory operation ratio" that greatly influences the performance of semiconductor business. It is the greatest measure for improving performance to increase sales and to operate production lines in their full capacity. No matter what it takes, we had to increase sales by aggressive measures, and had to remove the allegation of "non-achievement of budget" from our name.

Our promotion activity to expand sales was strengthened. It was an extensive operation called, "SGO" and "MGO" which I had started previously as the GM of SDDC. SGO stands for "Submicron Grand Operation" and MGO stands for "Microprocessor Grand Operation".

Actually, the hint of these projects was derived from "Operation Crash", or "crushing strategy" conducted at Intel in the latter half of 1970's. Shortly after I arrived at Takasaki Factory as GM, a friend of mine in the US sent me a book, "High Technology Marketing" written by William Davidoff.

In this book there was a concrete description of the fierce marketing battle of 16-bit microprocessor between Intel and Motorola in the latter half of 1970's. Although Intel's 8086 was the market leader at the time as a 16-bit microprocessor, it was widely perceived that Motorola's 68000 was as good or better as an MPU architecture. Intel's marketing team, led by Davidoff, started a "crushing strategy" with a sense of crisis, and won the game literally pulverizing Motorola's microprocessor. The book emphasizes the importance of design-win activities in the high-tech field. It also emphasizes that, for design-win, it is insufficient simply to have superior performance of the product itself, and that customer support is very important so that customers can use them effectively.

SGO started in February 1990. The target products in this operation were 4 Mbit DRAM and 1 Mbit SRAM. Since both products were the products based on 0.8 micron technology for the first time, they were named "submicron" devices. Masahiro Yamamura was appointed as the leader, and young engineers of SDDC were assigned as dedicated members. They had detailed understanding of the products and also had solid ideas of the intent of development and application fields, and could respond to any questions from customers on the spot.

SGO was successfully proceeded from the start with accumulating momentum. Fortunately, the Hitachi 4Mbit DRAM was selected as the "Nikkei Excellent Product Award" in the month when the project just started. For members of SGO, it was like having an Imperial banner in their design-win activities. The sales department received big orders from customers with the kick of this great operation. The manufacturing department worked hard to increase production in their full power. In the summer of this year, the production volume of 4Mbit DRAM reached 1 million pieces per month for the first time in the world by the synchronized efforts of sales and manufacturing, and we recovered the world top position since 64K bit DRAM.

The microprocessor version of MGO (Microprocessor Grand Operation) started in February 1991 in a form prompted by the success of SGO. Compared to memory, there were many more varieties of products, customers were diverse, and application fields were also diverse. Excellent engineers, mainly in the design department, were mobilized for this great operation.

In the first stage (1991 to 1993), the members were a little over 10, and it was reinforced to about 30 members in the second stage (1993 to 1995), to about 80 in the third stage (1995 to 1997), and global design-win activities were carried out.

It was a group of senior engineers of the design department at the time including Masayoshi Abe, Norishige Kawashimo, Shinkichi Hotta, and Tsuneo Sato who played the leading roles as the dedicated members. They worked in the marketing activities with in-depth understanding of the technology.

Products to be promoted were mainly H8 microprocessors in the first phase. This is Hitachi's first original microprocessor, and we started its sales promotion as the result of the termination of the patent dispute with Motorola.

SH microprocessor was added after the second phase. In terms of performance, it was in the highest level in the world, and the members of MGO progressed with the greatest pride and affection.

Also, the F-ZTAT version of the H8 microprocessor (on-chip flash memory version) was developed in 1993, and the design-win was advanced widely as a new concept microprocessor.

Since I was the advocator of this “grand operation”, I went directly to the customers, and supported activities in the form of top sales, as long as time allowed.

Later on, I heard from Toshimasa Kihara that rival companies were stating their impressions about MGO as follows:

“The most formidable product from Hitachi is SH microprocessor, and MGO is further formidable. Even more scary is Makimoto-san’s top sales.” Although it might have been flattering to some extent, I think we may also say that my clear commitment to SH microprocessor provided our customers a sense of security.

SH microprocessor played a pioneering role to open up a market segment collectively referred to as “digital consumer” today.

Among them, most memorable for me is the adoption of SH-1 for the digital camera for consumer use “QV-10” which Casio commercialized first in the world. Although the number of pixels was 270 thousand and the definition was not good enough, it sold far more than expected as the input device for PC.

Also, SH-2 was adopted for Sega’s game machine “Sega Saturn”, and it became a driving force to greatly expand the sales of SH family. Incidentally, both “QV-10” and “Sega Saturn” received the “Nikkei Excellent Product Award” in 1995. Further, the design-wins of SH microprocessors expanded to many customer products such as Sharp's PDA “Zaurus”, Yamaha’s electronic musical instruments “Clavinova”, Roland's music workstation, Xanabie’s car navigation system, and others.

With the strong momentum of SH microprocessor as the background, joint development with Microsoft was started. In March 1993, the project was kicked off to install the Microsoft's new OS (Windows CE) which was oriented towards the consumer field into the SH microprocessor. The leaders were Toshimasa Kihara in Hitachi side and Harrell Kodesh in Microsoft. In addition, HMSI's Tony Moroyan worked on site on a full-time basis. This project continued until 1996, and I attended the meeting for each milestone and reviewed the progress situation with the executives of Microsoft.

The result appeared at the Windows CE presentation at the Comdex exhibition in November 1996. At this exhibition, 7 companies worldwide announced HPC (handheld PC) with the new OS, Windows CE. SH microprocessors were adopted by five of them (Casio, HP, LG, Compaq, and Hitachi), and at this point SH overtook MIPS and X86 which had been ahead.

Until then Microsoft had built an overwhelming share in PC OS, but Windows CE became a catalyst for the company to advance into the consumer field, based on which the application to mobile devices such as mobile phones, and automotive applications was expanded.

Photo 15.1 is the memento from Microsoft at this time. It is a model which evokes today's compact mobile PC. Photo 15.2 is a picture of the members at the end of the project.



Photo15.1 Model of HPC incorporating Windows CE presented from Microsoft (Nov., 1996)



Photo 15.2 Commemorative picture of the completion of Windows CE project:

From left, front row: Harrell Kodesh, Tony Moroyan, Craig Monday, The Author, Isao Ohnishi, Toshimasa Kihara (Nov., 1996)

Triggered by the remarkable activities of SGO and MGO, the sales of Hitachi semiconductor increased rapidly. In 1992, when I was appointed General Manager of Semiconductor Division, sales amount was 560 billion yen, and it increase by 400 billion yen up to 960 billion yen in 1995, very close to 1 trillion yen, in these 3 years.

We can call this time the third golden age of Hitachi semiconductor, and it was also the time when my semiconductor life was in the most fulfilling period. In June of this year, I handed over the post of the GM of Semiconductor Business Division to Kosei Nomiya (later Senior Managing Director of Hitachi Kokusai Electric), and I served as the Head of Electronics Group, managing the semiconductor and display businesses.

It might be a somewhat selfish expression, but my honest feel was that I was “relieved”. A friend of mine told and comforted me, “You have been hurt several times due to semiconductor P&L problems, but you will not be blamed for it any more from now on.”

However, shortly after that, I was made acutely aware that the world was not that sweet. Due to the intense nature of semiconductor dynamism, the deepest valley of my life was approaching.

-----  
Note: The original version of this article was first published, in Japanese, on the Semiconductor Industry News (Sangyo Times Co., Ltd.) from July 12, 2006 to January 9, 2008.