Japanese Software Industry: Where's the Walkman?

Edward A. Feigenbaum
Professor of Computer Science

February 8, 1994
Japanese Software Industry: Where's the Walkman?

Edward A. Feigenbaum
Professor of Computer Science
Software Study Director, Stanford Computer Industry Project

Both economists and business persons are interested in the evolution of industries--the economists to understand the process and the business people to better understand markets, competition and other features of the business environment. For all of these reasons, faculty members and students at Stanford University, supported by the Sloan Foundation, are engaged in a study of the worldwide computer industry. One of the major foci of the study is the software sub-industry of the computer industry, a segment that is paradoxically booming yet troubled and difficult to understand.

Nowhere is this more true than in Japan, in many other areas a "heaven" for things technological. Stanford University has an ideal base for studying Japanese societal phenomena, the Stanford Japan Center. It was my good fortune to have a faculty assignment there that allowed me to conduct a study of the paradoxical Japanese software industry. I was doubly fortunate to have as research assistants fourteen very smart students from Stanford and Dartmouth who were "students abroad" in the Spring of 1993.¹ This paper will present, hopefully in not too "academic" a manner, some results from this fascinating study.

¹The contribution of these students was stimulating and substantial. The students were: S. Chang, M. Chen, A. Cho, N. Eustance, R. Gaines, E. Iwami, A. Goore, L. Jen, H.T. Liao, C. Meindl, M. Moore, N. Morgan, K. Pascual, R. Sandoval.
the Japanese. Having done this study, I now realize that the company knew little about the Japanese industry in which it was participating, and the markets it was selling into!

Size of the Industry

What is the total size of the Japanese software business? It's about $100 billion annually for all kinds of software—that is, programs which are packaged, programs which are custom prepared by a contractor, and software that is made in companies (doing their own programs). Of that $100 billion, one half is spent on in-house programming. Approximately $35 billion is spent on packaged software or custom programming services. Computer makers spend about $15 billion on system software for their equipment. In the Japanese way of doing things, customers like to have software customized for their own interfaces and their own ways of doing business; and they're willing to pay for it. Approximately 90% of the software sales are custom software sales whereas only 10% is packaged software sales.\(^2\)

Size of Firms

Nintendo is the largest packaged software company in the world at $5 billion annual revenues. In custom software the largest in Japan is NTT Data, a subsidiary of NTT (three and a half to four billion dollars a year annual revenues). There are two Hitachi software subsidiaries that are each over one billion dollars a year in sales. A subsidiary of Nomura Securities doing software in the financial area is about a billion and a half dollars a year in sales. The largest independent software house in Japan is CSK, the parent

---

\(^2\) For software use rather than revenues, the ratio may be less because so much use of packaged software is from illegal unpaid-for copies.
What is making MITI nervous is a perception that is quite correct—that hardware items are becoming commodity products whose profit margins are eroding; that the high value-added software part of the computer industry is the place to which the high profit margins are moving.

This is true not only of the sale of packaged software, but of the sale of software embedded in other products. Right now we are beginning to say that "hardware is the box that software comes in." Software is where the major value is being added. The Japanese are worried about that. They look to a future, say past the year 2000, when software is really the locus of the economic action in the computer field.

**Who We Interviewed**

Our study\(^4\) was largely an interview-based study. We interviewed the large computer makers, Fujitsu, Hitachi, NEC and Toshiba. Also interviewed were packaged software companies. One of these was JUST Systems, the largest packaged software company in Japan--$100 million revenues per year (compared with Microsoft's $4 billion per year).

Another was Japan Lotus, a subsidiary of Lotus Development Corporation. I wanted to see how an American company operating in the Japanese packaged software industry saw the situation. IBM has established a new subsidiary called Encyclosoft, as a combination of software publisher and distributor, to try to enter the packaged software market in Japan; we interviewed this new company.

We also interviewed two system integrators. System integration is playing an ever greater role in the software industry. As the industry moves away from mainframes toward the client-server architectures, the situation is

\(^4\) with students of the Stanford Japan Center
itself. The Japanese have matched their liking for hierarchies with the hierarchies of structured programming and mated the two together, saying "some people will do design and some people will do top-level coding and some people will do lower-level coding." This is dysfunctional in the sense that the people doing the lower level work don't learn about how to do tasks at the higher level because they're never given those tasks. And the feedback channels are very noisy. It can take a long time for information to get passed up from the coders (that some piece of the design won't work or some logical alternative wasn't explored).

Much of the "custom" software produced by the Japanese may in fact be built out of hidden packages. The big system integrator firms, including the big computer makers like Fujitsu, may have libraries of large packages that they use when producing custom software systems. Large custom software jobs may indeed have many "packages" inside. In this country we might sell them separately but in Japan they are sold as integrated custom systems.

Japanese software distribution networks are not mature by American standards. There are three distributors for all PC shrink-wrapped software. If you are not covered or handled by one of those distributors, you simply have no way of selling your software.

I went looking for Japanese database software. IBM sells a lot of DB-2 worldwide; Oracle sells about 1.8 billion dollars a year; other large American vendors are Informix, Sybase and so on. What are the Japanese equivalents? The answer is--there is not a single Japanese equivalent. A buyer can get database systems built by the system integrators or the large computer makers but there is no separate market for Japanese database software. How about CAD software? With minor exceptions, the same is true of
IBM to sign a consent decree that said that it would not include software in its hardware prices; software would be priced separately. The reason for that was obvious: you couldn't have a software industry when IBM was producing all the software and giving it away. A competitive software industry could not come into existence. Since 1968 the USA has had 25 years to build up a highly competitive software industry. It is almost impossible to survive in the American software industry, it's so competitive. Microsoft and a few others are anomalies. Most companies have a very difficult time because the industry is so competitive. The Japanese have no such situation. Until a few years ago bundling was the norm. The large companies would bundle their software in with their computers and it was very difficult for anyone else to survive, to compete in that industry. Then the government issued an "advisory", which normally is the equivalent of the government telling firms what to do. In this case it didn't work. The advisory was "Don't bundle your software. Japan is supposed to go to unbundling." In 1993 the government issued another directive putting teeth into that first directive: "if you don't unbundle, we're going to take you before the Japanese Fair Trade Commission." Until the Japanese unbundle software, there won't be any room for competition to arise to help invigorate the Japanese software industry.

**The Demand Side**

The independent software "body shops" supply workers for large software projects. The need for the large number of programmers from the body shops has decreased significantly because (1) there's a recession; if a firm is going to save money, it's going to save money by not redoing a system that it might otherwise have redone and (2) firms know now that they really
One government official told me, "Japan is a copier's paradise." A contra view came from Japan Lotus. Their view was: "We just lowered the price of Lotus 1,2,3. We had a price which was about $1000 taking into account the fact that so many illegal copies were made. We just decided to cut the price in half. We figured that at a lower price the Japanese will want the manual and they'll want our service, so they'll stop copying our software."

I interviewed another CEO who told a story that I found very poignant. The man was the president of a small software boutique. He was the first person in Japan to produce a good word processor. He expanded that into a desktop publishing operation; now his firm does software for text-to-typesetting. When he introduced his word processing software many years ago, it became quite well known. Everyone wanted it because it was the only good one. He heard from a friend that a retailer in the electronics district of Akihabara in Tokyo was giving away his company's software on the street as a gift if one bought an NEC computer. So he went to court to sue the people to stop that. As soon as he did so, the word got out and his sales dried up. The potential customers knew that they too make illegal copies; and thought action might be taken against them. Furthermore, using lawyers is not the Japanese way of doing things. He then backed off of legal action, and his sales picked up again. The man was deeply angry. He told me that Microsoft has now sent out 5,000 letters to the 5,000 largest purchasers of Microsoft software in Japan informing them, rather bluntly, that Microsoft will prosecute to the fullest extent of the law anyone caught copying. My CEO friend said, "That's great--only the Americans can tell them that and we're very happy that Microsoft has done that."

The laws regulating copying are satisfactory. The government enforcement of the law is essentially nil; and anyway people don't enforce it
The Japanese system graduates many programmers from trade schools and high schools; these are the people who are becoming increasingly redundant. The real need now is for highly trained University graduates.

Cultural Factors

Underlying all of the malaise in the software industry there is a problem that became evident after many interviews. The issue is deeply cultural--does the culture respect software? Is software "real"? Years ago, software writers were called programmers; programmers were paid less, and were treated at a lower level, than "real" engineers. The "real" engineers were electrical and electronics engineers, the hardware engineers, etc. As software writers came to be in great demand, the Japanese firms changed the name "programmer" to "software engineer" and changed the salary levels. But, alas, the status level did not change. In the Japanese mind, software is not something real. Software is considered something like a service--something that comes along with the hardware. You expect it; it's supposed to be there; it makes the hardware run; but it's not distinct. It is not a product in its own right.

It is a kind of "vapor". You can't feel it. You can't lift it. Can you really sell it? Is one comfortable with selling something that is not tangible, is not hard?

Is software worthy of respect as a field? If it's not worthy of respect, is it worthy of investing your money in? If it's vapor, it's nothing. Would you invest your money in nothing? Would you invest your career in nothing?

Today it is hard to motivate young people to go into the software business. The Japanese do not have a highly visible and respected folk hero who made six billion dollars in the software industry.
the doctor is hearing and will be able to give intelligent readouts. That's an example of the way that an intellectually and economically valuable product idea gets embodied in something that is actually hardware. What the customer buys is an intelligent stethoscope, not a piece of software that is read into a stethoscope. The Japanese plan to make a major business out of this paradigm.

The Japanese see multimedia as a major future trend. There is great uncertainty about "when" and "how much" but not about "if". In an interview I asked one of the Executive Vice Presidents of Fujitsu: "Given that IBM's mainframe business is declining and Fujitsu's business is modeled after IBM's, what is Fujitsu's future? The answer was "multimedia."

The traditional large Japanese computer makers are worried about the upcoming confluence of consumer electronics, communications and computing. They worry that the firms that will master this new world will be the firms who have mastered the consumer electronics industry in the past--Sony and Matsushita, specifically. Sony, indeed, is a company considerably skilled in computer science and technology. Nintendo is also a potential winner. A Nintendo game computer is the computer that's present in more Japanese and American homes than any other computer. If Nintendo's alliances with Silicon Graphics and other firms bear fruit, Nintendo might become a major player in the new era of computing.

**Conclusion**

I wish to conclude with a hypothesis about how the Japanese software industry is going to evolve. This is an hypothesis of several faculty members of the Stanford Computer Industry Project.
US currently has a dominant position on the world scene. The US packaged software industry has a 75% market share worldwide. But American firms should not set their expectations too high for penetrating the Japanese market for big business software. The alliances and relationships which the Japanese have developed over a long period of time are very durable, and Americans are very much "outsiders."

References
