Recall the past to understand the future: The Spirit of "Platform" Business Seen in the Nintendo Famicom and the Sony PlayStation

From Famicom to Super Famicom

The Conversion from a One-Hit Idea to the Creation of a Sustainable System

Masayuki Uemura

(Ritsumeikan Center for Game Studies, Ritsumeikan University Kinugasa Research Organization, Professor)

Nintendo was founded in 1889, two years after the Meiji government lifted the Edo-period ban on the production of *hanafuda*, Japanese playing cards.

In 1902, it started doing business as Japan's first manufacturer of playing cards, and this is the point when Nintendo, which had continuously been in business as a card maker since the Meiji period, could be defined as "a company that has thoroughly researched play."

However, after the Second World War and the arrival of the 1960s, hanafuda sales dropped with the changes of the times. Hiroshi Yamauchi, the president of Nintendo at the time, was compelled to pioneer new products. With the assumption that it would be able to use the hanafuda and playing card distribution routes, it embarked on the development and production of toys. The impetus for this was Gunpei Yokoi's joining the company, who later did great work as Nintendo's First Development Division chief (I was chief of the Second Development Division).

At the same time that Nintendo was making progress in the digitization of toys with products like the Love Tester, I was associated with Nintendo as a customer, as an employee of Sharp. The most important thing that made me want to work for Nintendo was that at Nintendo, I could freely conceive of artistry, and that it had everything at hand to create an environment that would make that possible.

In 1973, Nintendo developed the *Laser Clay Shooting System* for business use, as a way to reuse bowling alleys that were left vacant after the end of the bowling fad. This is what earned Nintendo a reputation as a maker of arcade game machines. I, too, was involved in the development of this *Laser Clay* system and the video game *EVR Race*, which was released as Nintendo's first video game in 1975. By developing and manufacturing gaming equipment for arcades, we were able to conduct market surveys to directly learn about customers' gaming preferences, and we also had relatively few cost restrictions, and thus we were able to incorporate many different kinds of technology. Because Nintendo gained a variety of expertise by entering the arcade market, it was able to make use of that experience in the later development of home game consoles.

Nintendo had consistently been a "developer and maker of toys" since the Meiji period, but the most important thing about toys is that they are "not daily necessities." For that reason, it had to "become more appealing to people than everyday goods" in order to satisfy customers' curiosity.

Nevertheless, it was always doomed by the fact that "sooner or later, people will lose interest." If we did not keep these three things in mind while we continued to develop products, it would have been difficult for the company to do business.

Because toys have these three characteristics, as a company, we have to continually develop new products. To really understand peoples' curiosity and produce unique products one after another, the "personality of individual developers" comes into play. Back when I used to hire new employees, I had a policy of not hiring the kind of high achievers hired by ordinary companies. The first target market for toys is, of course, children. But children use things in outrageous ways that cannot be foreseen by the

people who develop these devices.

Because that itself is play as far as children are concerned, we as developers have to achieve a product quality that can withstand that kind of play. It is easy enough to say this, but it is extremely difficult to balance costs from a planning standpoint.

Aside from development and manufacturing, another characteristic of toy business is the excessive expectation of distribution. I think you will also hear this from Mr. Kutaragi, but in the end, it is important to have a discerning eye for figuring out the products that consumers want. What this means is that in the wholesale system, because products leave the manufacturer and the bill is settled right then and there, even though there are no products left with the manufacturer, there is still stock left with the wholesaler. If a wholesaler takes a bet on the wrong product, they will have too much leftover stock and will not be able to purchase the next product, and this is an extremely difficult problem. This also has repercussions for manufacturers, as they are told to make newer and newer products.

Therefore, as the deceased President Yamauchi often said, "it's fine if they don't buy anything and everything, they should only buy the things that will really sell," and this really was his demand for the company's products. I do not know why, but I was called over on the spot and had to listen to this kind of thing as a bystander, and I was always surprised to see him able to utter something so easily that it sounded like he was telling people not to buy his company's products. From a different standpoint, as a company responsible for distribution, I think that those remarks called for discernment that would allow for a perfect flow of products; in other words, they demanded that people have the insight to "know a good thing when they see it."

In reality, this is extremely difficult. It is difficult even now. Say what you will about internet societies, the human mind changes rapidly and in all kinds of ways, and we are all becoming more globalized, and thus this is not exactly a simple topic. At the time, both before starting the Famicom and after its launch, Nintendo took this stance. For that reason, Nintendo did not become a member of the Japan Toy Association. In other words, what we were dealing with was not a toy. It was not a daily necessity, but it was also not a toy.

So, after the Famicom came out, Nintendo held its own exhibitions. The toy exhibition is held in May or June every year, but the separate Famicom and Super Famicom exhibition was started up by people who sympathized with President Yamauchi's thinking on this. In that sense, I think

that even while it was extremely strict with distribution, it was, in a sense, a kind and thoughtful company.

This is us coming into contact with video games for the very first time, in the form of "television games." This is the game "Pong" which was made by the American company Atari. Imitations of this were also being made in Japan. I was in charge of three games we made around this time: *Nintendo Color TV-Game 15, Nintendo Color TV-Game 6*, and *Nintendo Block Breaker*. Block Breaker was also the Japanese version of a toy made by Atari. This was a bit too fanatic, and because of my bad habits, we did everything up to the IC design as one company. We were actually unsuccessful because we spent too much time on it, but this design was done by our fellow Shigeru Miyamoto. He entered Nintendo straight out of college, and because this was the first design he completed, it deserves to be remembered.

As for Color TV-Game 15 and Color-TV-Game 6, when we were producing specialized calculator LSI chips for a Japanese calculator manufacturer to be used in calculators sold in the US by Mitsubishi Electric, there was a plan to use the same manufacturing technology as the calculator chips in America to develop and sell video games. The calculator market gradually reached saturation, and then we tried to make so-called imitation goods. Exact copies were, of course, not allowed, but there are no copyrights for methods of playing, and thus there did not seem to be any issue whatsoever with just changing things slightly. Then, the Tokyo calculator manufacturer Systec commissioned Mitsubishi Electric to make chips, but Systec went bankrupt, leaving the chip issue up in the air. As a result, these were products that they had Nintendo launch as video games.

That is the story of the inside of these products, but what we experienced at the time was the difficulty of selling products that hooked up to a television for the first time. We were confronted with the somewhat unimagined issues of not knowing what would happen when you connected a toy to a domestic product. In a sense, our experiences from that time later proved to be extremely useful, although television sets then did not have video terminals or HDMI terminals, but rather had an antenna terminal called an RF terminal where the signal entered the television. Thus, the console had to send in video game signals that had the same standards as direct television signals.

Televisions were supposed to be standardized, but we discovered that there were slight differences between

manufacturers. Local repairmen seemed to have been aware of this. When we examined products that had been returned, they were in a condition that should by all accounts have been able to display properly. In fact, they displayed when connected to our televisions, but they did not display on the customer's television. This issue was extremely difficult for video games, which was the result of connecting them to domestic products. There are standards, but in reality, there are not. Figuring out how to respond to this issue was one of the things we studied when video games were getting their start as toys.

On the other hand, there was also a saving grace in the fact that it was perceived as a toy. If it did not display, some customers resigned themselves to the fact that it was a toy after all, although we did not really grasp the degree of the issue that was actually occurring. Because all returned products came right back to development, we examined them and figured out the problem.

After that, the thing that was established as interesting here was that color television at the time was broadcast on electromagnetic waves through the somewhat tricky method of color signals. The signal had to be sent on electromagnetic waves using the same frequency of 3.58 MHz. The measuring instruments for that were pretty expensive, and thus, we did our measurements with instruments that we made ourselves. It is absurd, but here we were, toymakers attempting to do the job not of TV manufacturers, but rather the job of TV stations. About 1.5 million of these consoles were sold in total, and a considerable amount of data was accumulated as a result.

Meanwhile, the issue of *Space Invaders* came up. I think this could be considered the first arcade game to become a worldwide hit. Actually, when we released the previously mentioned *Block Breaker*, it ran into this, and long ago, there had been a *Block Breaker* arcade game craze before *Invaders*. Customers were not at all satisfied with the home version, and turned to the other game, something that everyone could play with a 100-yen coin, which was a really frustrating moment for us.

What happened next, and this is a famous story already, but microprocessors first began to be used as microprocessors. That is, the method was established for making games as software rather than hardware. This was a huge shock for us. Of course, we opened up the games and tried to decipher them, and discovered how the microprocessors are used. The fact that they were made by a Japanese person was a big shock for us as a company.

On the other hand, our development department at that time had bought an Intel CPU from Mitsubishi. Since we had received pretty thorough support from them, we had quite a bit of knowledge about it, so we were able to make an imitation product right away. This was called *Space Fever*. With that as the start, we embarked on making arcade games. We had made the arcade version of *Block Breaker* before that, but that was really just putting something made outside the company into a box and selling it. In a sense, after *Space Invaders*, the company began to appreciate the development of video games and arcade games. This was 1978.

At Nintendo at that time, there were two department chiefs. I was one, and Gunpei Yokoi was the other one. Yokoi was anti-computer, saying things like, "There's no way I'm gonna lose to a computer," even while he was using one. Yokoi made this *Game & Watch* here. This was a renowned market development strategy of using seasoned technology for developing new products. The multiscreen underlying *Game & Watch* also went on to become the prototype for the Nintendo DS.

Around this time, and this was around 1980, various game consoles in the private sphere had games that were made using unchanged LSI that had been used in calculators, with graphics that had been rewritten. Their strategy was all about making copies of arcade games.

The interesting thing about Nintendo was its anti-arcade work. I do not know if it is because he hated the idea of making copies of what I had made in the second development division, but he designed types of play that were not for arcades and would not be possible at arcades. Another step was the fantastic idea to give a character to the calculator segment displays. The clock function was a part of the digital clocks and combination calculator-clocks, a market that had been created by Casio. Sharp also built this function in competition with Casio, and Nintendo used its product. We did not have much confidence in this at the time, as we were late to the game. We thought it would be considered old hat. Plus, in the company, we all assumed that, of course, copies of arcade games would be the mainstream, in the sense that kids who were used to playing arcade games would want to play the same games without having to put in money every time.

That is an interesting thing about entertainment: the results are always absolutely different from the in-house assessment. We had experienced popular products in the company not selling as well as expected, and this was a similar experience. The original design idea was a game

console for adults, and it was made at just the right size to fit into a shirt pocket, similar to card games or today's smartphone games. The game content was simple, but it included the critical consideration of "timing" that has allowed it to be played even now. I think that, instead of emphasizing characters, we pioneered the important sense of vying for the perfect timing of pressing a button.

This *Game & Watch* was Nintendo's savior, and even though it did not use the latest hardware, the fact that it satisfied people as an original item was confirmed in the domestic market. However, it did not sell so easily overseas. It sold slowly but surely, and eventually it reached a considerable number of units sold. There were also several instances of imitations coming out and having the market pulled out from under us.

In this way, it eventually stopped selling, and by 1983, the Atari video game console also stopped selling in both America and Japan, and we made the Famicom because we had no other choice. The main impetus was really that there was nothing else to do. Some people said, "surely you're just being modest," but that is not true. All of the hardware other companies were putting out around that time had keyboards, and Sony's MSX had one too. However, when we put out the press release for the Famicom, someone asked, "There's no keyboard with this, is that okay?" Our makeshift reply was, "Oh don't worry, we'll put out a keyboard later." The thinking was that we would have to make one eventually. The software at this time was all brought in from arcade games that we had been making around then. *Donkey Kong* is one example.

What we used in this process was actually the exact opposite of Yokoi's message; we used the latest technology, and faced extremely embarrassing problems like defective graphic chips, which required us to make revisions over and over again. On top of that, and this was really unexpected, the button-pushing method was completely different from our experiments. In other words, we had not done simulations during actual game play. We did over 1 million trials and the specifications passed, but in the end, it was no good to have a perfectly square thing that prioritized design, and ultimately, we decided on a rounded shape. I think the square ones are rare items and sell for a good price even today.

One more thing, and this was something we did together with Ricoh, and we had them make it in a rush. I think it is best not to go into too much detail, but to get to the point, because this product processes at a pretty high speed, there was the issue of failing in the thermal processing design, which often caused the console to stop running after some time. Because of this, we ended up having to do a number of revisions. With home game consoles, we cannot buy back and do repairs on items once they have sold. You can do this all you want with arcade games, but the fate of the home console is that you cannot repair it. In that case, the only thing that can deal with the problem is software. You end up having to do 100% inspections of the software. Some people said after the fact that 100% inspections was Nintendo's strategy, but that is nonsense. It is just that nobody wants to openly talk about the mistakes we made.

At first, we made them little by little in-house, intending to use our own software, and that first year particularly, all of the software was made in-house. And then we sold 1 million units, and after that, talks started to change around the time that Hudson, Namco, Konami, and Enix came along.

Because Hudson had made the Hu-BASIC it was very familiar with the issue of overheating. However, Namco had no clue, and it thought that it would be fine to operate with products bought from somewhere else, which was not going to work. This was a problem not only for the manufacturer, but also for the customer. Products would come back to Nintendo, with people saying that Namco's software did not seem to work. We were puzzled about what to do with this issue of products not being returned to Namco, and there were talks between the two companies. The conclusion was, of course, that they had no choice but to ask Nintendo to do 100% inspections.

The next interesting thing was that when all kinds of manufacturers were putting out all kinds of software, the hardware sales went up and up. It was utterly impossible for one company to manage. We had assumed, just like conventional toys, that sales would start to drop after 3 million units. Now, I think of this as a general concept of a system, being created out of the blue.

As this was a totally new thing, we were skeptical about whether it would really continue. We kept saying that this was a lucky fluke. Our first countermeasure was the NES for the American market. People were saying that video games were done in America, but we decided to try launching them there anyway, and they ended up selling even better than the domestic Japanese version. These results probably also greatly influenced Sony and others, who learned that it was possible to launch entertainment systems worldwide.

The next problem was that after they started selling, the software prices were quickly marked up. Because we would lose customers that way, we developed a disk writer to lower costs. Ironically, instead of discs for disc systems within the course of semiconductors at the time, more and more high-capacity ROMs were put out, which were not necessarily cheap but were similarly priced. When this happened, there was no way to make money and no way to do business using a disc system. Then, attaching a high-capacity ROM led to a tendency to want to enhance the graphics and sound even more, at which point rival PC engine and mega-drive manufacturers also began to add CD-ROMs and enhance graphics and sound.

Because that was the way things were going, it would be misleading to say we had no choice, but the result was the Super Famicom, which is today's topic. I am already running out of time, and I will also be speaking at the round-table discussion later, so I will make this brief. The Super Famicom has enhanced video expression and also handles high-capacity memory. However, the internal design concept is unchanged from the Famicom, even though we had to give up on making it compatible with the Famicom. We simply improved the Famicom functionality. It even looks just like the Famicom, and its name is the Super Famicom. This was a strategy of using the advantages of the previous generation, but at that time, we were actually talking about what to do after the Super Famicom. The sound for the Super Famicom was done along with Sony, and the originator of that, Mr. Kutaragi, and what they came up with was the PlayStation. I think the reason behind PlayStation being named PlayStation will be covered later.

To us, we had thought it would have been great if we could have worked in this field together with Sony, but that idea broke down for one reason or another. Then, what happened next was that the memory capacity used in games increased on the whole, and CPU operation speeds also rapidly increased.

Finally, I want to share an interesting thing that Pokemon's developer, Mr. Tajiri, once said:

"In game creation, close examination of the hardware characteristics is the start of everything. It clarifies what can and cannot be done, and the sense of it fundamentally binding the maker's hands is concealed. At that point, those characteristics act as brakes on my own imagination because of all the things I can't do, but even though these brakes look like drawbacks at first, what I really want to say is that they also give me a chance to calmly make decisions. To create the image of the way to send out a message, we could say that powerful constraints are the best thing for the job." He then said, *"If some magnificent hardware came out that could do anything at all, I think maybe that would be exhausting for game creators."*

This was said in 1996, after we had already entered the era of PlayStation, and it was something only Mr. Tajiri could have said.

I will now make way for Mr. Kutaragi. As for what comes next, I think that will come out at the round-table discussion after this, including my reasons for bringing up this message and my own feelings. I do not know whether I could represent Nintendo, but that sums up my thoughts.

That is all from me. Thank you for listening.