

— Aiming to Achieve One-Trillion-Yen Mark Before Fuji Electric Centennial in 2023 —

Technology Marketing: Role and Significance in Pursuing Customer-Value-Centered Product Planning and R&D

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The time when high performance was the strongest selling point of products is in the past. Today, businesses cannot forgo having a customer-value-centered perspective in product planning and R&D. They can succeed only if they continue offering new concepts. What does Fuji Electric need, with its stronghold in core components and the system business built around them, to delve into this uncertain environment through structural reform? Professor Hiroshi Miyanaga, a leading specialist in management of technology from the Tokyo University of Science's Graduate School of Innovation Studies, talks with Shiro Kondo, Fuji Electric's Corporate General Manager from the Corporate R&D Headquarters, about the future of research and development.

Gathering information is the key to successful marketing

Kondo: I would like to take this opportunity to thank you for your ongoing support with training our young engineers through the management of technology (MOT) workshops at Fuji Electric. The company will celebrate its centennial anniversary in 2023. Keeping this in mind, we are currently pursuing a reform program "Renovation 2018," aiming to achieve sales of one trillion yen by this milestone. As part of the program, we reviewed our business and R&D structures completely, and the resultant reform of April 1 this

year is designed to maximize Fuji Electric's strengths.

As you know, Japanese products are often criticized in the international market because they veer away from the value that customers really desire while being obsessed with offering excessively high quality.

The performance indices that have long been one of the competitive axes are no longer the key players. This fact has given us a big sense of crisis. We have come to understand that having a customer-centered approach is indispensable in product planning and R&D to overcome this difficult time of change. This understanding has led us to the structural reform of this time. Fuji Electric is literally at "square one" as it starts operating with a new structure. It is a privilege to have a specialist like yourself share your insightful opinions with us on this subject.

Miyanaga: This comes across to me as a very interesting endeavor, and I am keen to learn more about it.

Kondo: We can start with the business structure. Fuji Electric has two major lines of business. One is the component business, offering power converters, controllers, sensors and other components as individual products. The other is the plant business, in which we deliver plants consisting of component systems that we manufacture or purchase from external suppliers. These two have been operated by different divisions, but we integrated them into one business entity through the structural reform this time. What we aim to achieve through this is, while further strengthening the components business, to create systems that really represent the value our customers are looking for based on this strength. We can then consolidate the know-how as a package and leverage it to boost overseas sales.

Fuji Electric is also renovating the R&D structure



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in tandem with the business reform. Through this, we aim to establish a system that allows us to pursue customer value validation at the earliest possible stage. Prototyping in product development has been focusing on technology-oriented validation, but this is also going to focus on ascertaining customer value. In addition, we have created a new team dedicated to technology marketing, to support the creation of value. This team is a pivot in driving our future growth by developing innovative projects.

Miyanaga: Technology marketing is vital to succeed in a business that is based on technology and engineering. Here is an example: a company that developed an integrated circuit (IC) for plasma TVs had only one client, Manufacturer X. The engineer responsible for developing the IC had no interest in purchasing X's plasma TVs (the products did not appeal to him). Ultimately, these TVs did not sell, and therefore the company's IC did not sell either. Eventually, plasma TVs lost their market share to LCD TVs, and became obsolete. Today, LCD TVs are also struggling.

Future is always uncertain and resources are limited. It is thus crucial that companies identify the best way to distribute their limited resources by using information and analysis.

Japanese manufacturers tend to focus on perfection, so they develop a customized product to meet requirements by company A, and then they develop another customized product for company B according to their preferences. They tend to start all over again for different customers.

What a company adept at technology marketing would do is to develop a product by generalizing the differences in opinions of companies A and B so that the product appeals to both of them. In order to achieve this, this company needs to stay in contact with all potential clients to obtain the necessary information. While many Japanese manufacturers have excellent technological capabilities, I think it is technology marketing that decides their destiny.

Kondo: I agree. For Fuji Electric, it is mostly the case that our clients have their own customers. It is therefore necessary for us to think what we can do through our products, to help our clients perform well in their competitive environment and sell more of their products to their customers. Japanese customers, for a long time, have been keen to propose their requirements. Today, however, we feel that customers are also in search of new styles of operating for the future, including the use of the IoT. In this sense, co-creation will be an important option to consider.

As you have just mentioned, the standardization of product development is one of the urgent challenges which Fuji Electric is faced with. We employ prototyping in order to validate customer value in advance, but this may lead to over-customization if we try to meet too many customer requests. What can we do to tackle this problem?

Miyanaga: That reminds me of an overseas automotive component manufacturer that well relates to this point. This company never turns down even far-fetched requests made by automotive manufacturers all over the world, so it has become somewhat a dependable organization for automobile manufacturers. This is why it can get information without making much effort. The company has built a system in which it reaches out to gather information, and also information comes to it.

One day, an automotive manufacturer in India commissioned this company to develop an electronic control unit (ECU) for an extremely low-priced vehicle. To meet this requirement, it was necessary to cut the manufacturing cost of this highly technological device. The Indian automotive manufacturer had approached many parts suppliers across the world, but no one thought it was possible to produce a high-performance ECU at lower cost. While they all refused the request, this component manufacturer that never said no to any request accepted the assignment by the Indian automotive manufacturer.

The component manufacturer managed to combine logic, analog, power supply control and other IC components into a single-chip unit, and succeeded in reducing the cost at the same time. More importantly, it did not pursue customization for this ECU, but applied standardized interfaces so that the product would be compatible with other car models. This was possible because the manufacturer had information from car makers across the world. Ultimately, this Indian automobile was not hugely successful, but the ECU was in great demand by Japanese, American and European automotive manufacturers. This is precisely how technology marketing can make a differ-

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Kondo: I agree that gathering information is a determinant factor for certain aspects of technology marketing. It is important to gather information from various sources, such as by communicating with a variety of people whether internal or external, reading newspapers, journals, reports and other public sources, and observing people's behavior. Real customer value must be discoverable by organizing information.

Miyanaga: For example, if you hear something from a customer, and mention it to another customer, you will get a new response. You can then present it to a third customer, and so on. By repeating exercises such as this, you will develop a reservoir of information and become adept at discerning valuable pieces of information.

Three hits in a row make a brand

Kondo: As mentioned earlier, we are considering an introduction of prototyping for evaluating customer value in advance. However, the prototyping at Fuji Electric has been focusing more on technology-oriented evaluation. Improvements must be made so that it can be leveraged in evaluating customer value.

Miyanaga: As you say, there are two types of prototyping. The technology-oriented one is called forward prototyping, and the other is known as backward prototyping. The latter aims to verify that certain concepts really offer value to customers.

For example, a component manufacturer always makes a full-scale model in styrene of the equipment under development, instead of drawings, and brings it over to the client's site. An actual operator of the

equipment can try this model. When they try the model, they find that this part clashes, that part is difficult to operate, and so on, giving their raw feedback in real time. Based on this feedback, they modify the drawings. If backward prototyping is executed appropriately, it lowers the chance of needing to alter specifications in the later stages of the development, which would necessitate reworking.

Kondo: I can see that, if product planning is thoroughly discussed with the client already at this stage, the remaining process can be carried out with confidence, and we do not keep modifying the product plan in response to what our competitors may be doing.

Miyanaga: When developing key concepts for a product, it is always a good exercise to have three versions from the start, and develop them concurrently. That is, the first concept is for a product to be released initially, the second is for the product to be launched in a few years' time, and the third is for the product released another few years later. All three are prepared from the very beginning of the product development.

The product to be launched first must be realizable quickly by combining existing technology. Meanwhile, the concept for the third product can be complex and time-consuming to be realized, sometimes requiring basic research to start with. However, starting early, you will be ready to launch the second product by the time your competitors succeed in copying your first concept. When they catch up with your second concept, you are ready to launch the third one.

It is generally accepted that it takes three successful products made consecutively to establish a brand in its product category. Without producing three successes, the efforts in pioneering a new product cate-

gory may well be wasted if competitors overtake you.

Kondo: A "one-hit wonder," you might say.

Miyanaga: That's right. The effort in prototyping to achieve one success would be wasted if your competitors could easily build their successes on that.

Apple, for instance, launched the iPod first, closely followed by the mini, shuffle, nano and touch. By so doing, Apple has established itself as a brand in the digital-audio player field, and its competitors gradually gave up trying to keep up.

In this sense, creating three concepts at the beginning has a great advantage in terms of product development. If we have only one concept, we tend to try to pack everything in the first product. The more features there are to be created, the longer it takes to develop the product. Having three concepts means that those features may be distributed. It is possible to launch the first product as planned, and then observe customer reactions and the sales performance.

Kondo: I see. There is an option of throwing in the first product sooner as a pilot case while accepting certain imperfections.

Miyanaga: This is in fact a form of prototyping. Prototyping in the general sense is about making a product model, but in this case, it is prototyping of a business. By launching the first product, there are many insights to be gained, such as profitability and future prospects. They are valuable resources that can be leveraged in the next projects.

Kondo: While preparing the second and third concepts, the findings from the first launch can be added to improve them.

Miyanaga: Usually, Japanese companies are technically adept, so they only have to work on the development of product concepts. Once they master it, they have a

good chance of performing well in the world market. During the era of high economic growth in Japan, products with a high performance were the winner, but the times have changed.

Technology marketing boosts sales

Kondo: What originally led you to study marketing?

Miyanaga: I originally worked at NTT's laboratory, specializing in semiconductors. As a researcher, the paramount objective was to achieve the highest performance. However, when I moved to a foreign-owned semiconductor firm, where I learned the importance of technology marketing through practice. I witnessed that technology marketing was the determinant factor in bringing the company's technical capabilities to light and allowing the business to grow.

Later on, I was made responsible for technology marketing. However, I had almost no resources to educate myself, as most marketing courses in an MBA program were based on a business-to-customer context. A business-to-business model was almost nonexistent. Technology marketing deals with engineers, which is fundamentally different from business to consumer marketing. This is the background of my coming to study business-to-business technology marketing at a graduate school for working people.

Kondo: We were faced with the same difficulty as we embarked on studying marketing, as most case studies were in the business-to-customer context. Your business-to-business model is incredibly valuable to Japanese manufacturers.

Miyanaga: In fact, I began teaching at the Tokyo University of Science's graduate school for working people as a result of trying prototyping for myself



based on my own past experiences. When I was working for a consulting firm, I hardly had enough time to train junior staff. My thoughts were that there might be many corporate executives who felt frustrated about not having enough time to educate their managerial personnel despite the fact that they knew it was important. If so, I thought there may be demand for services aimed at working people that I could offer based on my experience with some new case studies. Eventually, this brought me to the current position.

Kondo: Today, technology marketing has entered the mainstream of business-to-business marketing, but you found the subject a long time ago.

Miyanaga: I think that partly is due to the fact that I have experienced different companies and specialties, having seen the fields of R&D, a foreign-owned company, technology marketing and consulting.

Know customer value through communication

Kondo: In both cases of technology marketing and product planning using prototyping, it seems to me that success depends on communicating with many people and digesting what is learned from them as effectively as possible. The ability to do this is crucial. I think it is the determinant factor.

Miyanaga: Absolutely. Another advantage in the Tokyo University of Science is that, because students there have diverse backgrounds in terms of their business fields, the environment helps to improve communication skills. Others may not understand you if you rely on the terms used only in your company. You gradually learn to listen to and understand others while changing your ways of communicating with them so that you are better understood. This is perhaps an important point in pursuing technology marketing.

Kondo: It is in fact difficult to explain what we do. It is particularly difficult to communicate technical subjects without having a shared background.

Miyanaga: Even if your main business is component development, you need to be able to talk about automobiles if your end client is an automobile manufacturer. With clients in medicine and healthcare, you need to be able to communicate in their subjects. Without having field-specific knowledge and abilities in communication, it is impossible, in my opinion, to understand the clients' requirements. Needless to say, you must be familiar in the area of your specialty. It is important not to be complacent, and to continue striving to obtain further knowledge.

Kondo: I see. We sometimes encounter a situation where a product based on new concepts does not sell well despite the fact that customer advantages must have been carefully integrated in it. The reason for this misfortune is the lack of sufficient personnel who can communicate the new concepts to customers who



use the product. This is a serious problem.

Earlier, we were talking about prototyping methodology to start developing three product concepts simultaneously. I think it is also important to start developing the human resources in tandem with the development of the concepts.

Miyanaga: Fuji Electric operates in a variety of business fields, such as power electronics systems, power generation, electronic devices, and food and beverage distribution. There are engineers with specialist knowledge in their respective fields, and this point is the company's strength. This strength can be further enhanced by integrating these individual talents.

Kondo: I could not agree more, but we have a weakness in horizontal communication, so we want to change it. For example, our vending machine development team came up with an interesting application for consumer service using smartphones. However, the idea could not be transplanted, for example, to the industrial business field as they could only understand technical matters. The creativeness in developing innovative services is not easy to be conceived of. I realize the importance of encouraging communication across business divisions so that they can convey and share value and ingenuity. As you have pointed out, Fuji Electric has potential for synergy, and our imperative task is to actualize the synergy.

It has been a great opportunity to hear your invaluable opinions on technology marketing and prototyping. I am reassured that Fuji Electric is on the right track toward the customer-value-centered endeavor in its new business organization that started on April 1. Thank you for your time today, and we look forward to continuing our collaboration.



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