

**The time is long gone when companies could make products without a thought for the impact on the global environment. But does the energy-efficient, resource-saving approach to making products that most companies currently employ actually result in environmentally friendly product innovation? We invited University of Tokyo professor Ryoichi Yamamoto to help us examine this question as it relates to Casio's efforts to make ever-more compact, lightweight, slim, and energy efficient products.**

**The calculator as a path to environmental responsibilities, and future challenges**

**Kashio:** Dr. Yamamoto, ever since Casio was founded, the company has taken "Creativity and Contribution" as its corporate creed while seeking to make ever-more compact, lightweight, slim, and energy efficient products. In the spirit of going from "0" to "1," the company has engaged in product development of a sort not practiced anywhere else. When you think of Casio, what comes to mind?  
**Yamamoto:** Calculators. I did my early research on computer simulation, and I have a good appreciation of just how powerful they are. For example, I often wonder what might have been if Johannes Kepler, the 17th-century astronomer who showed that Mars orbits the Sun on an elliptical path, had had a calculator.  
**Kashio:** Oh? What do you mean?

**Yamamoto:** Kepler carried out a prodigious number of calculations. We still have the sheepskin he wrote them down on. Modern-day astronomers say he made two errors, but the two errors canceled each other out (laughs). It was an extremely laborious task. The word "if" is not allowed in the study of history, but I still wonder what incredible things Kepler might have been able to do if he had only had a calculator. It really makes you realize what an awesome invention the calculator truly is. And it fits in the palm of your hand!  
**Kashio:** The card-style calculator which I just handed you is just 0.8 mm thick. We have been the beneficiaries of progress in the electronics industry, especially in the integration of circuitry, and at the same time we're proud of the fact that we have played a role, along with the semiconductor industry, in spurring progress in circuit integration. The quest to make our products ever-more compact, lightweight, slim, and energy efficient resulted in the downsizing of the facilities used to produce them. Moreover, smaller products make for energy savings at the logistics stage, which is good for the environment. But will this actually lead to a product development process that stands at the leading edge of an environmentally conscious society? We have to focus on the creation of new value beyond what we have already accomplished.  
**Yamamoto:** I think Casio's product development process has moved in the direction of less reliance on materials and increased emphasis on service. You started incorporating environmental themes into business in about...  
**Takasu:** We started in 1993 with the adoption of the Casio Environmental Charter. At that time, developing high-quality products was the top priority, while the approach to environmental

concerns was something like, "while we're pursuing quality, don't forget to take the environment into account"—that sort of thing. Environmental concerns weren't really central to the product development process.  
**Yamamoto:** The first Earth Summit was held in 1992, and then ISO 14000 was introduced in 1996. It was around that time. But I think the quest to make things more compact, lightweight, slim, and energy efficient is different in principle from the thinking that underlies product development in the environmental age. The former was indeed an important aspect of environmental innovation, to be sure, but I think there came a time when the two parted ways. The decision not to use toxic substances, for example, or to find substitutes for rare substances like indium, was evidence that the environment, not downsizing, had become the driving principle. That's when protection of the global environment became the central concern of the product development process.

**Wisdom from the past on integrating technology and the environment**

**Kashio:** Just making compact, lightweight, slim, and energy efficient products is no longer enough to satisfy consumers. Casio's product development is not about responding to obvious social needs; what we do is provide society with new value and meet latent needs using our uniquely innovative product development process. To what extent this approach helps our products contribute to the global environment is a very important question. Dr. Yamamoto, what sort of products do you think will be emerging in the future?

**Yamamoto:** I think it will be products that impart a sense that you are creating sustainable value. How to conduct that sort of product development has become an important theme. I think the rise of the modern-day "less is more" idea is important in this respect.  
**Takasu:** How so?  
**Yamamoto:** I'm thinking of the fusion of high tech and Gogo-an, the mountaintop hermitage in Niigata Prefecture where the Zen monk Ryokan spent 20 years of his life two centuries ago. He spent his days enjoying his natural surroundings, but the weather could get quite cold, and I hear he didn't spend his winters up there (laughs). Using modern techniques, however, you could build a warm house that generates minimal greenhouse gases, and all the while live a very free lifestyle in a remote corner of the world, yet still have access to today's knowledge-based global society. High tech, in other words, is starting to support our lifestyles. The idea of a "high-tech Gogo-an hermitage" points the way to one type of environmentally aware society, I think.  
**Kashio:** The term "knowledge" means more in today's knowledge-based society than just something you learn; it also refers to entertainment, wouldn't you say?  
**Yamamoto:** Yes. For example, there are functions that enable people to communicate. If we follow this direction, I think it will eventually enable us to use a bilingual electronic dictionary to talk with people from other places, or to access the entire collections of the world's largest libraries. And the demand for environmentally friendly entertainment is limitless. We don't get "controlled" by science; rather, science helps us with our need for clothing, food, shelter, and communication. I think establishing that kind of relationship is important.



**Professor Ryoichi Yamamoto**  
 University of Tokyo Institute of Industrial Science

Born in 1946 in Japan, Dr. Yamamoto now specializes in materials science, the theory of sustainable product development, and eco-design. In addition to his academic activities, he has also chaired the executive committee of the annual Eco-Products exhibition and served in public, advisory positions for many other organizations. He is working hard to bring about a paradigm shift leading to responsible human co-existence with the global environment, and is highly regarded both in and outside Japan for his efforts.

**Yukio Kashio**  
 Executive Vice President & Representative Director

Born in 1930 in Japan, Mr. Kashio assumed his current position in May 1996. He has been a member of the Board of Directors since the founding of Casio Computer Co., Ltd., in 1957, and also worked with its predecessor, Kashio Seisakujo, starting in 1952.

**Tadashi Takasu**  
 Director and Senior General Manager, Research and Development Center, oversees all environmental issues for Casio

Born in 1950 in Japan, Mr. Takasu assumed his current post in April 2008. Since joining Casio Computer Co., Ltd., in 1973, he has headed up various business divisions and been involved in the development of many Casio products.

**Highlight 2**

**Defining Environmentally Innovative Craftsmanship**

**Takasu:** Casio's electronic dictionary includes the content of 100 dictionaries, which would weigh as much as nine-tenths of a full-grown cedar tree if you printed them all out. In that sense, we can speak of an environmental contribution, although we are aware that there is a need to look at environmental issues from a different viewpoint than that.

**Kashio:** As the capacity of memory cards expands, it becomes possible to put more and more content into our electronic dictionaries, but the real point is not the downsizing; what we need to be focusing on is developing products that enrich our lives and prompt changes for the better in the lives of consumers. In other words, the important thing is not the material aspect, but enrichment of our inner world.

### Top management must lead the way

**Yamamoto:** I think the world is in dire straits, indeed. It would be fair to say that time is running short. Battles are raging over climate, resources, water, energy, and food, to name a few examples, and I think the fighting will grow worse over the next 10 or 20 years. The polar ice caps are melting. The Arctic ice cap, in particular, has been reduced by 40% over the past 30 years, and some observers say that ice will disappear from the Arctic Ocean in a few more years, every summer.

**Kashio:** A sense of crisis and urgency are still rather lacking in most companies' product development.

**Yamamoto:** When former prime ministers of Japan Shinzo Abe and Yasuo Fukuda called for a reduction by half in greenhouse gases, it was a signal of a need for revolution. So who is going to step forward and exercise leadership? Enterprises are the only ones who can do it, because they're the ones with the capital and the know-how. And who within enterprises will do it? It will have to be top management.

**Kashio:** Due to the urgency of the situation, environmental initiatives at the enterprise level have to start at the top. Enterprises that don't address environmental concerns are not engaged in "Creativity and Contribution," as we would define it at Casio. From the standpoint of corporate social responsibility, which has been a hot topic in recent years, this is a very natural thing.

**Yamamoto:** The important thing is the message from the top, and not just within a company, but also speaking up to the outside world. Eco-products are still quite pricey, but it is the job of top



Yukio Kashio

management to persuade consumers and investors to buy what is expensive. If all they do is focus on short-term profits, it's not a crisis they have on their hands, it's a collapse. If more than 80% of what you sell is green products, consumers will come to have a high opinion of your company and buy more of your products. And investors will buy your stock. The publication of an outstanding environmental report can cause your stock price to go up significantly. Those in top management are the only ones who can lead the way to results like these.

**Takasu:** For enterprises, or perhaps for the societies in which they find themselves, the economy is still the main concern. But we must accord equal status to the environment, and move ahead with equal urgency on both fronts. That is my own thinking on the subject, but this approach is going to have to be promoted before it really becomes a company-wide consensus.

### "Less is more"—a key theme of environmental product development

**Takasu:** If I may return to the idea of the monk Ryokan and his Gogo-an hermitage, Japan is not without its traditional "less is more" way of thinking, but I think the "less is more" idea that you mentioned earlier is a bit different from the traditional concept. Nevertheless, when it comes time to address environmental concerns, I do think that this mindset can be the foundation.

**Yamamoto:** Ryokan was a Zen monk. His philosophy stemmed from Buddhism, but I would like to suggest a new "less is more" concept—one that stems from environmental philosophy and ethics, and from concerns about the finitude of the earth. In the United States and elsewhere, people use the term "voluntary simplicity." It describes a lifestyle where the governing idea is, "Sure, I could afford to drive a gas-guzzling car, but it emits greenhouse gases that stay around for the next thousand years, so why not drive something else?" Because the culture of Zen is part of everyday life in Japan, I think this way of looking at things ought not to be so hard for us to accept.

**Takasu:** True. But at the same time, I have the feeling that Japanese engineers aren't quite cut out for dramatic action on the new "less is more" way of thinking.

**Yamamoto:** Japanese industry is marvelously well suited to a case-by-case, one-off sort of approach, but is not at all adept at



Tadashi Takasu

addressing things from a system-wide perspective. In the United States and Europe, by contrast, they take a rational, systemic approach. Western countries have led the way in the formulation of ISO standards, for example, while Japan has been on the sidelines.

**Takasu:** From the standpoint of research, especially looking back over the history of Casio's product development, it is true that "innovative moments" were not usually systemic in nature. In the course of development, a lot of different people bat around a lot of different ideas, but at root it is a very personal thing, and not a matter of taking the results of marketing research and incorporating them into the process. The idea for a portable calculator, for example, first occurred at a bowling alley when someone wondered whether it wouldn't be possible to take a calculator to a place like that to calculate the scores. That's how it was with digital cameras, too—someone just got to wondering whether it would be possible to make a camera that doesn't require film, and we started looking into it.

**Yamamoto:** That's a very important point. No matter what approach you take to product development, individuals have to be free to express their creativity. And then there are cutting-edge technologies that enable us to reduce the time it takes to come up with ideas, especially computers. To develop new medicines, for example, in the past they had to carry out actual experiments over and over again in test tubes to synthesize certain chemicals, but they almost always use computer simulation nowadays to narrow things down to the most promising possibilities. So the question is, in a knowledge-based society, how do you integrate the creativity of researchers within the internal systems of an organization? That's where Japan needs to be stronger.

**Kashio:** One of our commitments is to "ensure that our products meet universal needs." We don't just respond to market demand, but use our own imagination in the process of product development. What we develop is entirely new value, not just material affluence. In that sense, our goals are very congruent with the "less is more" idea.

**Yamamoto:** How does one create an ecological lifestyle? Precisely because you are Casio, I really am looking to you to demonstrate what the new "less is more" means. With the global population set to rise from 6.5 billion to 9 billion, I would like to see you come up with unique products that those 9 billion people can all enjoy without destroying the environment.

### Waiting for a "magical" product to build an environmental civilization

**Kashio:** By the way, Dr. Yamamoto, you've been involved in planning and holding the Eco-Products exhibition. Are there any products that have really caught your attention?

**Yamamoto:** The Eco-Products exhibition has attracted 175,000 visitors in just three days, and the number of companies exhibiting there has reached about 800, so interest in the exhibition is very



World's first personal calculator, Casio Mini  
The launch of the Casio Mini enabled ordinary people to use calculators on their own desktops, and created a whole new culture and market.

strong. Over the past 10 years, a lot of progress has been achieved in developing ecologically friendly products and carrying out environmental management. However, I have yet to see a revolutionary product hit the market that would herald the arrival of an environmental civilization. Nothing out there has totally cast a spell over people, in other words. Energy-efficient and resource-saving products can only go so far towards ushering in an environmental civilization.

The Crystal Palace, which was built for the first World's Fair in London in 1851, electrified visitors with its displays showing the wonders of industrial civilization. And when the Au Bon Marché opened in Paris in 1871, it blazed a trail for department stores that would follow in later years, and drove home the wonders of consuming in an industrial civilization. It cast a spell on people. Today we are milling about at the doorway to the environmental civilization, but we haven't

seen the magical product that will make us believe it's really possible. That's why the intelligent device, which has so strikingly driven home the point that we are now living in a knowledge-based society, also harbors extremely high potential in terms of the environment.

**Takasu:** The "Green New Deal" represents a promise—to bring forth giant new industries—but at the same time it constitutes a threat, for it will bring new competition. Many companies are apprehensive.

**Yamamoto:** Former Prime Minister Shinzo Abe put forward a proposal to reduce worldwide greenhouse gas emissions by 50% by the year 2050. The International Energy Agency estimates that an expenditure of ¥4,800 trillion would be needed to achieve this goal. That does indeed imply the emergence of a huge industry. Some are even referring to environmental undertakings as "green to gold." I think companies should be thinking about how to get a piece of the action!

I would like to see Casio develop a product that, just by using it in the office, gives you an unmistakable feeling that it's ecological—a "model product," if you will, a manifestation of the new "less is more" mindset. I want to see your top management send a strong message about it, too, so that consumers will be willing to pay a bit more for it, and investors will find it compelling.

**Kashio:** Indeed, we've always been about creating new value and presenting it to society in the form of a product. It needs to be an expression of "enrichment" the likes of which we've never seen before. We want for this expression of "enrichment" to come to fruition in the form of a Casio product.

**Yamamoto:** The reason I mentioned the Gogo-an hermitage of the monk Ryokan is because we, as humans, must not allow ourselves to be dictated to by technology; it should merely be a tool that we use to enrich our lives. Products that manifest the new "less is more" mindset should do just that.



Professor Ryoichi Yamamoto

# Defining environmentally innovative craftsmanship



Digital camera with LCD screen, QV-10  
The release of the first filmless camera created a new market for digital cameras.