Lecture

Message from the President :

－ To Not Change is to Continue to Change －

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1. To Not Change is to Continue to Change

Executives and managers often use this phrase. This is also used in lyrics. This phrase is difficult to understand, like a Zen question and answer. However, if you know that the first half, "things that do not change," is the company's purpose (reason for being), and the second half, "things that continue to change," are the measures to make the business successful, you can somehow understand this phrase.

One of the reasons why "things that do not change" have come to be valued is that we have entered an era of "Volatility," "Uncertainty," "Complexity," and "Ambiguity," known as VUCA. In today's world, there is much uncertainty, and it is tough to predict the future.

Today, we cannot draw out a roadmap and have no choice but to move forward through trial and error. Companies need shared leadership in which each employee demonstrates leadership. For this reason, many companies have formulated their purpose as "things that do not change." This purpose is the answer to the question, "Why does our company exist?"

The aim of formulating a purpose is to respond to changes in the environment and changes in expectations for companies. Purpose management is management that is constantly changing. Properly grasping changes in the world and making bold decisions to respond to those changes will lead to major changes.

Even if the environment changes, companies must maintain their corporate stance, work together with their employees to respond flexibly to changes, and smoothly adjust the direction of their business.

In addition, companies must get out of trivial differentiation competition and technological development that does not consider customer value, return to their original business purpose, and create value.

The Seven Bank website states, "Our customers' wishes are seeds that grow and become the future… (omission)…that is our origin. Times change, and so do people's needs and wants. They also become diverse. While holding true to our core philosophy, we keep evolving to meet our customers' wishes." [1]

" Why do people live?" is another eternal question. However, I believe that, like companies, institutes must also continue to ask why we must exist and how we must continue to change.

Information and communication play a central role in building the infrastructure supporting social and economic activities and creating quality living spaces.

In the agricultural sector, the roles that agriculture should play are broadly defined. Article 3 [2] of the Food, Agriculture and Rural Areas Basic Act states as follows: "In consideration of the importance of maintaining the stable life of the citizens and the national economy, multiple roles that agriculture plays through stable production in rural areas including conservation of national land, water resources, natural environment, formation of good landscape and respect for the cultural tradition in addition to its conventional role as a primary food supplier (hereinafter referred to as 'multifunctional role'), shall be fully fulfilled for the future."

Information and communication also have multifaceted functions that are not inferior to agriculture, such as: enriching lives, building a sustainable society, building infrastructure to support the maintenance and improvement of Japan's international competitiveness, solving various social problems, including disasters, and inheriting culture.

In addition, the Japan Society of Civil Engineers (JSCE), in its "Declaration: Transitioning to a Public Interest Incorporated Association," defines civil engineering: "Civil engineering is a comprehensive activity that aims to promote regional vitality and national strength, ensure people's safety, and develop culture and the arts through the preparation, construction, maintenance, management, and operation of the various elements that shape the conditions and environment in which we live." [3]

In order to support such a wide range of fields,

the JSCE Research Division has fields such as "planning," "construction technology management," "environment and energy," and "interdisciplinary research." In addition, the Social Support Division has been established to flexibly provide professional and direct support for solving society's critical problems, and includes the "Special Committee on Judicial Support," "Committee on Disaster Mitigation and Disaster Prevention," "General Committee on Infrastructure Maintenance," "General Study Group on Measures against Heavy Rain Disasters," and "Study Group on Geotechnical Engineering."

Information and communication infrastructure is also a social infrastructure and system that supports people's lives today and will bring tremendous benefits to people in the future. It is

the mission of the Institute of Electronics, Information and Communication Engineers (IEICE) to comprehensively manage these facilities (design, construction, operation, and maintenance). We must also consider contributing to the development of society by equipping ourselves with functions that promote the sound development of the field of information and communication engineering.

In addition, the impact of communication failures on society has increased dramatically. As IEICE, we must also think about disseminating accurate information to society.

There is no correct answer. We would like to continue thinking about what the IEICE should do together with our members and various people in society.

2. Products Are Not Selling (around 2000)

When I was a graduate student, I was very much

indebted to the IEICE. I was allowed to talk frankly with many senior researchers and learned about the world behind the research scene.

The environment has changed dramatically between then and now, but IEICE may remain an extension of those days. Of course, it is essential to keep the core of the Institute unchanged and maintain it properly. On the other hand, it is also important to keep thinking about changing parts of the Institute in response to environmental changes and venturing into new worlds.

When I was a student around 1990, Japan's electronics industry dominated the world. It was a time when investment in R&D and developing superior technologies led to business.

It was a time of intense research and development focused on quantitative performance indicators, such as developing video coding methods with as little information as possible, faster communication technologies, and semiconductor devices with higher speeds and lower power consumption. Since customers themselves demanded performance, better performance led to new user experiences and business creation.

However, this trend gradually began to change, and around the year 2000 I had a discussion with some business people about "why products are not selling well." Rapid technological innovations were outpacing customer demand, product life cycles were becoming shorter, and R&D costs were being reduced. In addition, the horizontal division of labor had progressed due to digitalization, and the individuality of "products" had become increasingly diluted. Products were no longer selling well.

ICT had become a "commodity" [4]. Of course, it was still necessary to develop technologies that dramatically improved current performance and to research and develop innovative new technologies.

However, it had become much more difficult to "sell" achievements based solely on performance as an extension of the conventional.

Attractive qualities such as being exciting, bringing wonder and being surprising to customers are now required.

The field of architecture may be instructive. In architecture, structural design is a fundamental field. Structural mechanics is a fundamental technology in the design of buildings to provide the necessary structural strength.

However, since buildings are closely related to various human activities, emphasis has also been placed on creating spaces and environments that are easy to use, safe, comfortable, and inspiring. This is a field called architectural design.

Buildings are required to comprehensively consider how they are used by humans (functions), technology, and beauty. They have come to emphasize not only engineering aspects, such as structure and materials, but also artistic, cultural, and social aspects, such as design and architectural history. In the words of the famous French architect Corbusier, they are not only "machines for living" but also "places of beauty that bring to mind the tranquility that is indispensable for human beings." This is truly an attractive quality.

ChatGPT, a hot topic recently, may also be a good example. ChatGPT has surpassed 100 million users just two months after its release, which is astounding, but the developer says that the underlying technology is not completely new [5]. ChatGPT was an unexpected hit for the developers since it is a fine-tuned version of the same language model as InstructGPT using conventional methods. The key points are the addition of conversational data and adjustments to the training process. What

surprised and impressed customers may not be the amazing technology but the ability to adjust. This example makes us think about the pursuit of attractive quality.

Also, as a major change, the shift from an industrial economy to an information economy has drastically reduced communication costs, has allowed knowledge to be transmitted instantly, and has made it possible to develop technology without spending capital. This phenomenon can be called the democratization of technology. It is now possible for anyone to develop technology that could only be implemented by large companies with capital. As a result, the speed of technological innovation has increased, the life cycle has shortened, knowledge has become more sophisticated and specialized, and the initiative has shifted from the supply side to the demand side.

We are in the midst of these major environmental changes. We have to face these changes head-on and sincerely.

3. Value Creation in the Era of Intangible Assets

One of the most significant environmental changes is the growing influence of intangible assets in the economy. A factor analysis of the market value of companies in the S&P 500 in the U.S. also shows that 84% are intangible assets.

Intangible assets are assets that do not have a physical existence, such as research and development, human resources, designs, organizational culture, and brands. Investment in tangible assets such as factories and equipment is decreasing, while investment in intangible assets such as software and R&D continues to expand.

The characteristic of intangible assets is that they "cannot be monopolized." [6] If it is a machine in a factory, you can restrict others from entering the factory and using the machine, but everyone can use intangible assets. With the spread of the Internet, the dissemination of knowledge has accelerated, and we have entered an era in which everyone can instantly share knowledge worldwide. The relatively lower hurdles for invention (technology) and higher hurdles for innovation (customers and society) are also attributed to the fact that value is shifting to intangible assets.

As the source of corporate value is shifting to intangible assets, it is essential for a company to recognize ubiquitous intangible assets in the world and combine them well to obtain benefits to gain a competitive advantage. This could be called a "new combination," as the economist Schumpeter calls it. If each intangible asset is viewed as a piece of Tetris, the source of value is the ability to find the parts, incorporate them well, rotate them appropriately, and fit them together perfectly (Figure 1)[7].

Technology is one part. Companies and people are also parts. Each part is valuable, but combining them well increases their value. Both Google's Android OS and DeepMind's AI are a combination of parts that have already existed outside. Microsoft has applied the Open AI part successfully. We live in an era in which the ability to sympathize with, connect, and involve each part of the Tetris leads to the creation of value.

Imitation may sound negative, but winners are skillful imitators. Intangible assets can be imitated. Google's pay-per-click service is said to be an imitation of the GoTo search engine. Uber's first

service was a premium service for drivers with a commercial driver's license, and Lyft's first service was a carpool matching service, both of which imitated Sidecar's service to become what they are today.

Apple may be the master of imitation. The revolutionary PC, the Macintosh, was inspired by the work of the legendary Xerox Pal Alto Research Center. It is not too much to say that Apple has yet to develop many of its own technologies. Apple is a technological "orchestrator," a master at rotating and combining Tetris parts.

Much of R&D can be positioned as the creation of single parts. In contrast, to contribute to value creation, we must not only create a single part but also consider the creation of value by identifying and combining the various ubiquitous parts in the world. As intangible assets are becoming the mainstay of the economy, it is important for the IEICE to contribute to society by incorporating initiatives that contribute to value creation.
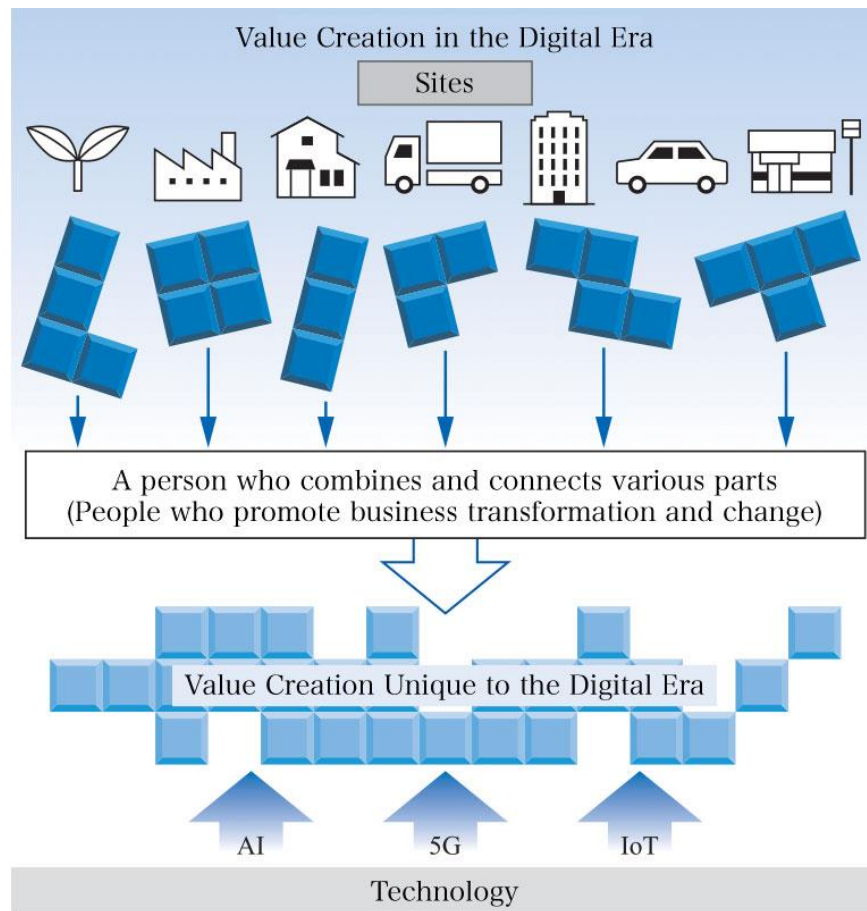

Fig. 1 Ability to Fit Parts Together Perfectly

Value is created by combining various parts. Technology, companies, and people are all one part. [7]

4. Stereotypes and Myopia

There is an interesting video created by a British FinTech (business that combines finance and information technology) venture called Tandem "to think about bank teller services."

The video shows what would happen if a pub served like a bank teller. The video begins with a customer trying to order a beer and being told to "please take a number tag." When his number came and he went to the counter, he was told, "I'll call the person in charge," and he was asked to fill out a questionnaire while he was waiting. Finally, when paying, he is charged a fee in addition to the price of the beer.

Both pubs and bank tellers serve customers, but the way they serve them is completely different. It is obvious, but we never notice this difference in our daily lives.

Kaggle runs a portal site for machine learning prize competitions. The portal site, which lists information on competitions in which data scientists from all over the world compete against each other to solve problems set by companies and governments, was acquired by Google in 2017. Google saw the value in the natural gathering of information on the world's best data scientists through the operation of the portal site. The database of qualified talent became one of Kaggle's strengths, but I didn't realize it until I was told about it.

In the words of management scholar Peter Drucker, "The highest compliment to innovation is 'Why didn't I think of that?'" People don't realize obvious things. We have a stereotyped way of thinking without even realizing it.

In the first place, Schumpeter expressed innovation as "shifting the center of gravity by changing the customary trajectory." Innovation exists where the "normal" way of doing things and thinking has been changed.

There is a term in the marketing field called myopia. Theodore Levitt proposed this concept in 1960, citing railroad companies and the Hollywood movie industry as examples of failures due to myopia.

Railroad companies considered their business within the narrow scope of the "railroad business" and did not position themselves within the larger framework of the "transportation business." Despite being the largest companies with vast amounts of capital and customers, they could not incorporate car and air transportation, and thus they declined

When television came along, the Hollywood movie industry confined itself to the narrow field of the "movie business" and ended up competing with television for customers. If it had defined itself as the "entertainment industry," it might have been able to capture new markets.

Engineering is "the activity of designing, developing, innovating or solving for the benefit of

humanity, protecting health and safety, taking into account cultural, social and environmental considerations, using knowledge from mathematics and the natural sciences."[8] We may consider incorporating into the IEICE any activity for humanity's benefit.

Incorporating the information and communication engineering fields mentioned earlier is also possible. It may also be essential to accumulate knowledge contributing to policy and institutional design. It may be necessary to answer the question of which area should the data center be located in terms of power and communication efficiency. It may also be required to continue compiling and disseminating recommendations to society on dealing with communication failures. It may be a good idea to submit to the government industrial policy proposals that contribute to developing the information and communications industry.

It may also be of great significance to study the background of the actual situation where many R&D projects have only conducted a Proof of Concept (PoC). As a matter of course, a PoC is a passing point for overcoming hurdles faced by customers and society. The steps leading to the PoC are important for social implementation, but many R&D projects remain at the PoC stage.

There is a book titled "The Smart Enough City."[9] The author gleefully states that many smart city projects are being implemented worldwide, but they are not all going well. He says optimizing cities using the latest technology is possible, but it is not being deployed in society. The book's band says, "Don't be seduced by the dream technology of technology companies' rash promises!?"

We must not forget that it is up to people to use technology best or kill it. It would be interesting to explore the relationship between technology and the people using it and identify commonalities in efforts that can lead to value creation. It would be wonderful if we could reduce the probability of future failures and contribute to strengthening industrial competitiveness by collecting and analyzing examples of failures.

The environment surrounding us continues to change relentlessly. The origin of IEICE is as the Institute of Telegraph and Telephone Engineers of Japan, founded in 1917. Only 100 years have passed since then. One hundred years from now, in the year 2123, the IEICE may look completely different from what it does today. The IEICE should continue to change. In the process of each of us dreaming up what the future of the institute will look like, hints may emerge.

The Institute is essentially a decentralized organization, not a centralized one. In a decentralized environment, people are more likely to exercise their creativity, which values flexibility over order. A decentralized organization disrupts the conventional order, has an economic impact, and survives in a changing environment.[10] The following questions for each of you will lead to a strong IEICE; "What is the purpose of the Institute?" "What will the Institute be like 100 years from now?"

5. Into the Digital Ocean

Although society has changed dramatically with the advent of the Internet and smartphones, we are still only in the initial stages. The permeation of

digital technology to every corner of society will spur innovation in all business domains and lead to major changes in industrial, economic, and social structures. The current state of the world is transitional, and we must aim to establish new industries and social systems with the mindset that new business opportunities will surely emerge through digitalization.

The tough problem is that we cannot predict how things will change.

It was obvious that the introduction of the washing machine would greatly reduce the burden of domestic labor, but it is said that the impact of the washing machine on society did not stop there. The clothing market increased as people began to wash their clothes every day due to dramatic changes in hygiene, which also significantly impacted society. In retrospect, it may seem obvious, but no one would have recognized that washing machines would change the concept of hygiene and increase the demand for clothing before they were introduced.

It is said that the steam engine gave birth to Wall Street and business schools. The context is that Wall Street and business schools were born because the huge railroad companies created by the steam engine required huge amounts of money and many middle managers. However, no one could have made the connection between the steam engine and Wall Street or business schools when the steam engine was introduced.

It is not certain how things will change in the future. However, digital technologies will undoubtedly transform all industries. This is because information and communication technologies are general-purpose technologies. Suppose digital technology could improve the productivity of local small and medium-sized businesses. In that case, it would not only revitalize the local economy but also contribute to the growth and development of the Japanese economy, and we should be able to see a completely different picture. The IEICE hopes to help drive the movement toward building a new society and to be a driver in passing on a prosperous Japan and the world to the next generation.

In 2018, Kyoto University hosted an all-disciplinarity symposium, "Ask Academic Societies: Aren't Academic Societies Meaningless?" [11] At the symposium, the following opinions were exchanged: "The participants have become so fixed that they all know each other." "The purpose of the symposium is to protect society." "There is an increasing separation between senior and junior and between disciplines." "It has become a place to create an alibi." "It's just a debut for graduate students." "It has not become a place for discussion about the purpose of research."

Many of the same points may apply to the IEICE. It is time to reevaluate the nature of academic societies, not only in our field but in any field.

Digital technology is drastically changing the economy's structure, and with COVID-19, the foundations we have taken for granted are crumbling, and a grand experiment in a digital society that anticipates the future has begun, accelerating the digital shift.

Without turning back, we must accelerate the digital shift and redefine the structure of society, industry, and the economy. IEICE will continue to contribute to transforming society, industry, lifestyles, and local communities by gaining deep insight into the future while valuing the awareness gained from COVID-19.

Many IEICE Board of Directors members are "senior," but the Board members do not play a leading role. Each one of you plays a leading role. You are irreplaceable and important. Board members work for each one of you. We would be happy if you could help us. Thank you very much.

References

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