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Toshiba's Approach to Customer Value Design

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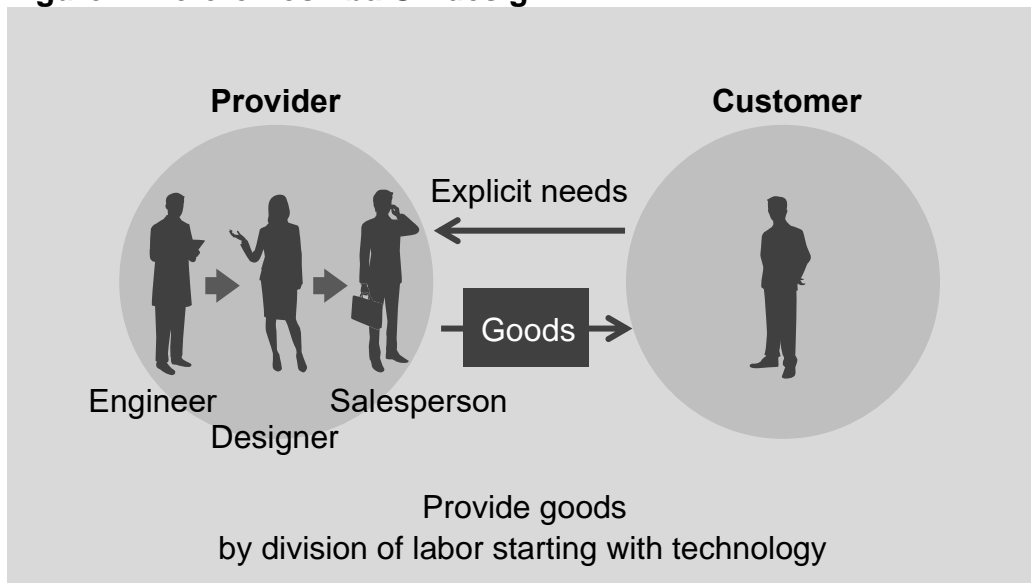


Toshiba's Approach to Customer Value Design

Introduction

For many years, manufacturing industries have been engaged in marketing and development based on a business model of producing valuable products that make use of their technology and delivering them to customers in order to achieve sales (See Figure 1).

Figure 1. Before Toshiba UX design



Source: Author's conceptualization

In this approach, the division of labor that depends on the expertise of each department has been carried out internally. Firstly, an engineer devises a plan for the product's structure based on the explicit requirements from the customer. Next, a designer makes the product aesthetically appealing. Then, a salesperson sells the finished product to the customer. In order to maximize efficiency, organizations have been siloed. Consequently, their viewpoints are inward-looking and focused on turning existing technology into benefits quickly.

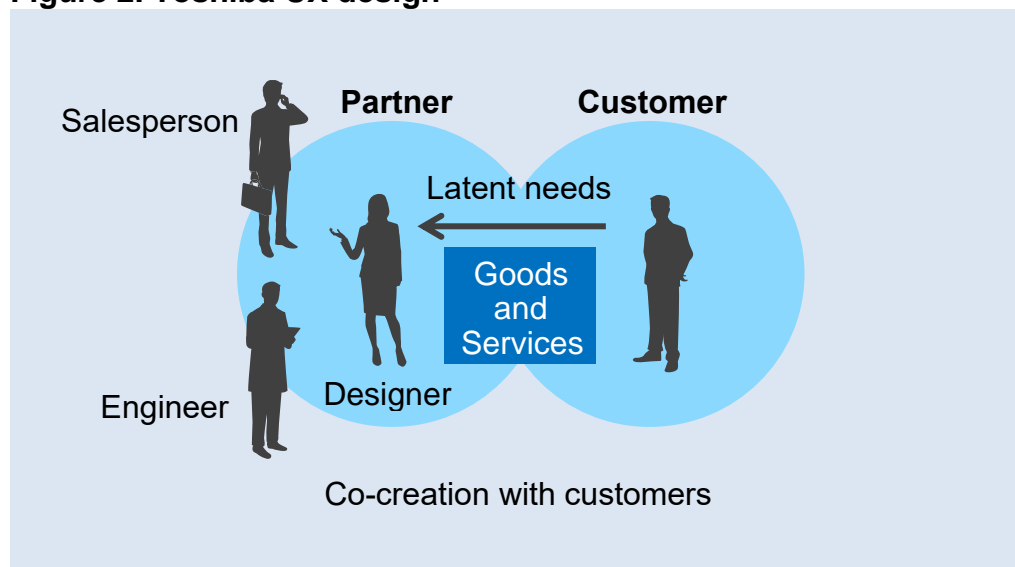
However, industries have recently been confronted by significant changes in the global business environment accompanying people's increasingly diversified and complicated values and the impact of the Fourth Industrial Revolution on business models. There has also been a shift in marketing logic from the idea that products have intrinsic value to the idea

that value is only created when products are put to use (Inoue and Muramatsu 2010). Furthermore, it has become difficult for customers themselves to clearly identify what they really want. These factors are making it difficult to continually generate profits only through conventional approaches in product marketing and development.

In response, manufacturing industries are now striving to support customers in using their products and to realize value created from the results of their use, instead of focusing solely on the provision of products. In these circumstances, the introduction of design thinking that extends the application of design for various business scenes has been attracting much attention in Japan.

Therefore, Toshiba sought to co-create the real value for the customer by elucidating the latent needs of the customer and providing not only goods but also services (See Figure 2).

Figure 2. Toshiba UX design



Source: Author's conceptualization

In order to realize this, Toshiba employed experience design that creates not only the product but also customer experience value, service design that comprehensively considers all economic activities as a service, and design thinking. In 2014, the company organized all these design methods into Toshiba UX Design and started to leverage it across the company. However, although Toshiba UX Design has achieved some

successes, it has not been possible to dramatically change company-wide business results.

Design thinking and these methodologies have been cultivated in the context of the frank, flexible, diverse culture prevalent in the United States and certain European countries as well as through specialties and design literacy at leading business schools. It is not an easy task to introduce such a concept to conventional Japanese industries that are highly optimized for the division of labor based on the technologies they possess. Therefore, Toshiba did not simply adopt the methods practiced in the West, but pursued customization so as to fit them to its own organization and launched a foundation to introduce them smoothly to tackle the issue of organizational change. The following sections of the paper describe the activities and discusses how Toshiba introduced design thinking to conventional Japanese organizations.

Installing Design Thinking with Toshiba UX Design

In order to respond to changes in the business environment, the company introduced Toshiba UX Design that includes design thinking. However, it transpired that the introduction of these new design methods to the entire organization did not proceed as expected. Here is a brief discussion of what happened and what went wrong.

The company introduced Toshiba UX Design, which is a collection of methods and tools, and aimed to create outputs that would lead to desirable business results. However, it had the unrealistic expectation that positive results could be obtained simply by introducing a new method. In addition, some engineers and salespersons took the view that design was not their job and that everything would proceed smoothly if all matters relating to design were entrusted solely to the designers. Consequently, the designer was forced to fight a lone battle, and the project members only understood the customer needs from the designer's perspective. As a result, the company was unable to devise solutions or monetize its co-creation efforts and failed to make a profit with Toshiba UX Design.

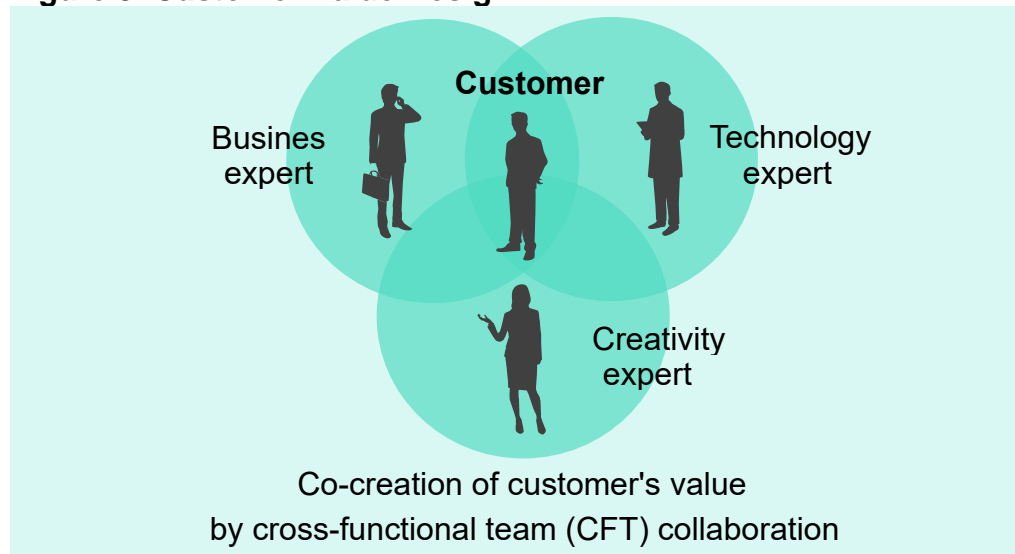
Because the organization was highly optimized for the technology-driven division of labor, there were various hurdles to the introduction of new design methods. Since product development had been based on technology, the concept of co-creating with customers had not penetrated. Also, in order to maximize efficiency as a manufacturing company, organizations were rigorously divided into business domains and functions, and the mindset and literacy of collaboration did not take root and flourish across organizations. In addition, although various customer-oriented efforts had been made, and the value for various stakeholders has been

considered, it was only from Toshiba's viewpoint, not from the customer's point of view. As mentioned above, the company had encountered various difficulties in terms of organizational culture, mindset and literacy in introducing Toshiba UX Design.

Customizing Design Thinking as Customer Value Design

The company launched a project to enhance Toshiba UX Design and reorganized it as methods, focusing on the co-creation of value for customers through the collaboration of a CFT composed of business, technology, and creativity experts (See Figure 3). It referred to these methods collectively as "Customer Value Design," highlighting the commitment to co-creation of customer value, in contrast to the traditional approach in which goods are manufactured from an inward-looking perspective.

Figure 3. Customer Value Design



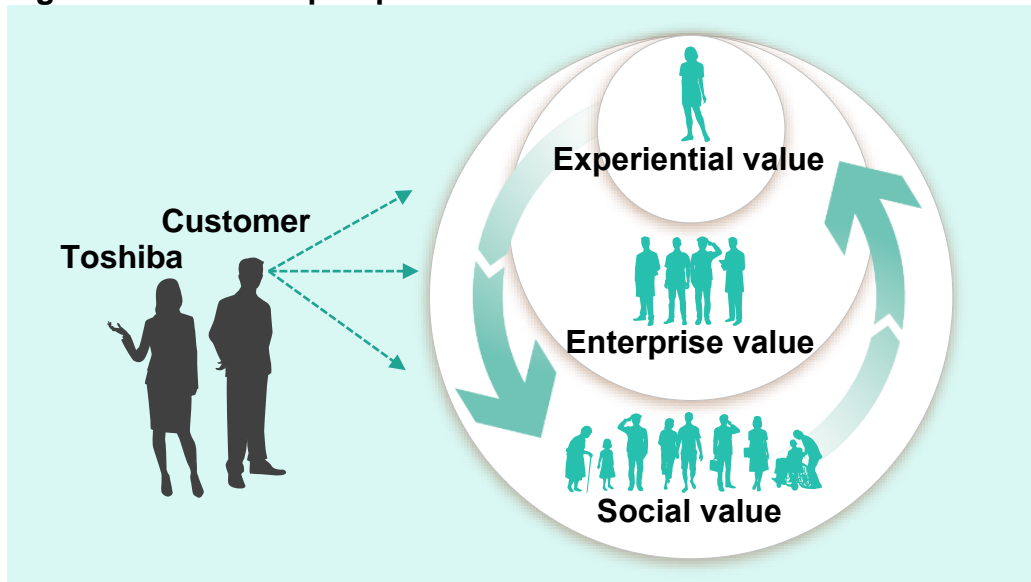
Source: Author's conceptualization

The first characteristic of Customer Value Design is that its purpose is co-creation. The word "co-creation" was used in various ways in the company, and so it was organized in four factors. The first factor is co-creation in production whereby customers are involved in the planning and design of products and services. Co-creation in production with customers was an approach commonly used in Toshiba UX Design. The second factor

is co-creation in use, meaning the company's participation in the customers' use of products and services. Toshiba is particularly focused on this because participation in customers' operation will become increasingly important in view of the progress of digital transformation. The third factor is in-house co-creation, which is sometimes referred to as collaboration in contrast to co-creation with customers. The fourth factor is co-creation with partners, i.e., co-creation among manufacturers, which may also be referred to as collaboration.

The second characteristic of Customer Value Design is collaboration. Experts in the business (e.g., sales and planning), technology (e.g., engineering and development), and creativity (e.g., design) fields share wisdom and collaborate on multifaceted activities transcending organizations and the conventional categories of expertise. Such CFT collaborative work makes it possible to achieve user's desirability, technical feasibility, and business viability for customers with greater accuracy than ever before.

The third characteristic of Customer Value Design is the customer perspective. Although Toshiba UX Design promoted the customer orientation, the project members still viewed customers from their own perspectives. With Customer Value Design, they work together with customers from their viewpoints, focusing on the co-creation of experiential, enterprise, and social values for customers from customers' perspectives. The company called it "a synergistic cycle of well-being," which not only advances the interests of users, but also involves a commitment towards caring about other people and society in general. It emphasizes the well-being of users circulating through their communities, enterprises, and society, and back to the users (See Figure 4). Specifically, various tools are incorporated into processes, including the sharing of context and vision with customers, taking the SDGs (Sustainable Development Goals) into consideration.

Figure 4. Customer perspective

Source: Author's conceptualization

In addition, Customer Value Design is also characterized by an aspiration for continuous progress. The company constantly develops new methods and tools, try them out, polish them, and improve versatility, to refine them. To solve issues encountered recently and the ones that will be encountered in near future, there is an urgent need to strengthen the efforts concerning new business models and business ecosystems using IoT (Internet of Things) and AI (Artificial Intelligence) technologies. For this purpose, Toshiba is now endeavoring to incorporate systems thinking, service engineering, and data science into Customer Value Design (Nishikawa et al. 2018).

Constructing a Foundation for Co-creation and Collaboration

In comparison with conventional design thinking, Customer Value Design is more focused on co-creation, collaboration, and the customer perspective. In addition, the company simultaneously launched a foundation to complement and facilitate adoption in traditional organizations. In order to overcome the problems of organizational culture, mindset, and literacy, it worked to build a foundation to integrate and promote cooperation

encompassing the three elements of "process" (methods), "people" (human capital) and "place" (space for opportunities).

Regarding "process," Customer Value Design incorporates a mechanism for continuous improvement of methods. Toshiba is constructing a platform that will work in an iterative cycle encompassing the processes of (1) converting tacit knowledge acquired through first-hand experience into sharable explicit knowledge; (2) systematizing explicit knowledge together with internal and external knowledge resources; (3) learning the explicit knowledge and assimilating it until it becomes applicable tacit knowledge for practitioners; (4) applying the knowledge to real work and finding something new; and (5) sharing and refining know-how continuously. Although such knowledge management concepts have been known for many years (Nonaka and Konno 2003), in actual operation they are dependent on the manager's skills, and there are problems in sharing the knowledge across organizations. Therefore, the company is promoting a tool that facilitates externalization of tacit knowledge and group communication, transmitting and sharing across organizations.

The company's respect for "people" is reflected in its commitment to human resources development and the building of personal connections. For human resources development, it is emphasizing progressive education and training programs to increase the number of competent people at each level of the organizational hierarchy. Although previously the content of education had mainly focused on understanding processes and how to use tools, the content has been reorganized so that greater emphasis is accorded to the mindset and the basic literacy of co-creation and collaboration, in order to further promote the penetration of Customer Value Design. Various events designed to promote the building of personal connections also help expand the network of innovation-ready talent so that people in various fields can collaborate in ways that transcend organizational barriers. Through such efforts in education and networking, versatile experts with the mindset and literacy of co-creation and collaboration can be referred to and assist one another, and the practices of the design thinking project are beginning to be activated.

Concerning "place," Toshiba is creating opportunities by implementing many types of virtual and real spaces, including readily available workshop studios, IT facilities including digital tool platforms, a community environment for online networking, and equipment necessary to conduct on-site workshops. Regarding IT facilities, the company developed a digital mapping system, which provides various original tools that are used in many processes, such as a tool to share context and vision with customers and one to generate and explore ideas. In addition, there is a

platform that allows to maintain and manage the records of workshops and other activities (Fukaya, Maruya and Kikuchi 2018).

Case study #1 on Customer Value Design

From here on, two typical examples of the application of Customer Value Design are discussed. The first example concerns a service design for an information-sharing system developed to improve the level of Japanese-style hospitality, referred to as *omotenashi* in Japanese, of a traditional inn. Through co-creation and collaboration, the project team was able to build a scheme to continuously improve the experience value of guests and employees, the business value of the inn, and the social value of the service industry.

In Japan, the service sector, which accounts for 70% of employment, has been facing critical issues including low productivity and labor shortages. In these circumstances, a certain inn, one of Toshiba's customers, introduced an ICT (Information and Communication Technology) system to improve its efficiency and service. This inn developed a dedicated system for the hotel business and made it available to other inns as a commercial system. The staff of the inn were using tablets to share various types of information, including work attendance and cleaning records, as well as wireless headsets to communicate with one another in real time. However, there were many problems because of the restrictions of wireless headsets. For example, wireless headsets have a limited communication distance, and since they provide only one-way communication, the staff often missed messages while they were serving guests. In addition, they frequently had to ask speakers to repeat what they had said because the headsets did not deliver clear sound.

To solve these problems, the inn introduced The Communication AI System of Toshiba incorporating speech recognition and speech synthesis technologies. AI system records conversations among the staff and converts them to text through speech recognition so that they can be easily viewed, listened to, or shared later. The company conducted a workshop in which it simulated staffs' work situations to demonstrate how they could use the records of their conversations to improve their work and enhance the level of *omotenashi*. Attendants, cooks, receptionists, and porters participated in this demonstration. Likening a large room to the entire inn, the workshop showed how each staff member was moving and what conversations were received and sent by the AI system while replaying the audio logs of all conversations recorded in one day.

Following the demonstration, all the participants had a discussion to review the problems to be solved. Through this discussion, the company

acquired valuable information from the inn staff, including their frank opinions, actual usage conditions, the viewpoint of management, and the staff's motivation. And then it embodied the to-be vision for the enhancement of *omotenashi* using insights inspired by this information. It held a series of discussions on the ideal system from the viewpoints of system user's desirability, technical feasibility, and business viability, gradually giving shape to ideas. By creating a minimum viable prototype of the system and iterating the verification, improvement, and adjustment process within the CFT, the company solved various problems one by one.

With a view to implementing the new communication AI system, going beyond the usual technical demonstration of the system, a service design method was employed for co-creation and collaboration involving the inn staff and the development team. In order to improve the system and the way of working in line with the on-site issues, enhance *omotenashi* services, and provide new findings to the system immediately, a continual refinement cycle is now in place. Through this activity, together with its customer the company has been fostering mutual trust and maintaining relationship for continuous co-creation. At present, CFT is striving to further enhance the quality of the inn's guest service by adding technology to scan the license numbers on guests' cars and connecting the system with a guest database.

This system to enhance the experience of both employees and guests and thereby improve business results is now available for sale to the hotel industry as an option to a core system. The company also released the communication AI system for various industries including maintenance, security, and logistics. Its aspiration is to contribute to the promotion of work style innovation and the improvement of *omotenashi* service quality in every area of society through the communication AI system. In this way, through CFT collaboration and co-creation with customers from their viewpoints, the company improves the employee's and guest's experience value, enhance the business results of the inn, and contribute to creating social value in various industries (Kuroda et al., 2018).

Case study #2 on Customer Value Design

The next example of the application of Customer Value Design concerns the development of a water leakage measuring instrument with high usability to address the issue of water leakage caused by old and eroded pipes. In this project, co-creation and collaboration improved the experience value of the operator, overcame the trade-off with the business outcome, and started efforts to contribute to the solution of social issues.

To maintain a stable supply of water, it is important to regularly assess the conditions of water pipes and perform effective preventive maintenance before water leakage expands. However, the frequency of water leakage inspections was as low as once a year partly because of the large water service area and partly because of a decrease in the number of inspection companies. Consequently, there was a lack of basic data for effective preventive maintenance of water pipes. To address this issue, the company focused on the work of meter readers who read all residential water meters every two months. It aimed to develop a new water pipe management system that can be incorporated into the work of meter readers so that they can perform water leakage inspections efficiently and frequently to increase basic data on water leakage.

First of all, members of a CFT experienced the meter readers' issues and burdens through on-site research and observation of their behavior. The experience of walking a long distance for meter reading made Toshiba realize how demanding their work is and provided information that would not have been acquired through interviews and questionnaires. Next, the company made a rough prototype using a 3D printer and gradually refined its specifications while acquiring feedback from meter readers and swiftly responding to unexpected findings.

A highly accurate usability evaluation using a test system that is internally similar to the final system revealed two design problems. The first problem was that when the test system was placed on a water meter, its center of gravity moved backward because of the weight of a battery. The second problem was the need to increase its size so as to add a waterproof structure around the battery compartment, which made it difficult to realize a palm-sized system. To solve these problems, the CFT decided to redesign the system and did so through an iterated cycle of mechanical design, exterior design, and prototyping. As a result, the team succeeded in completing an uncompromised final product that met the goal of reducing the burden of meter readers when reading meters or moving.

The key point of this example is the flexibility in decision making to redesign the system in the course of co-creation and collaboration efforts. With a conventional development process, the company would have been required to solve the center-of-gravity and waterproofness problems at the expense of usability, prioritizing the development cost and delivery time. However, because the CFT shared the requirement from the customer's perspective, it was able to make a multifaceted decision, including consideration of the likely business impact. Consequently, Toshiba succeeded in overcoming various trade-offs and realized a significant enhancement in user experience. In this way, the results of the co-creation

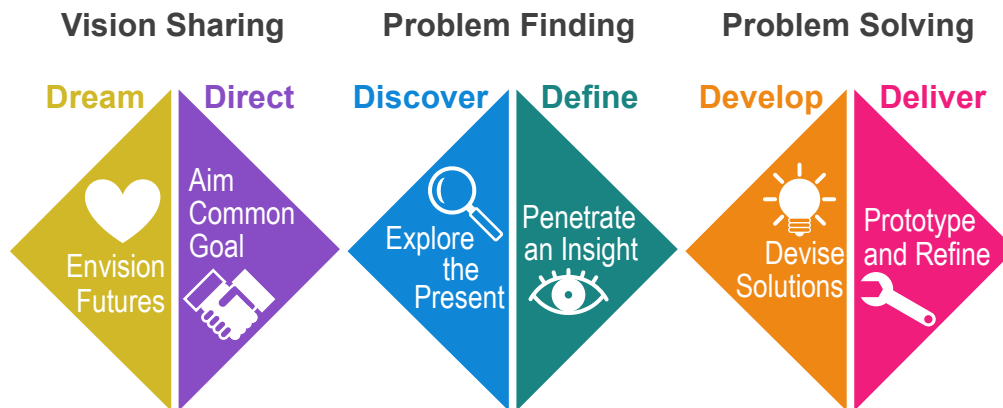
and collaboration activities of this project struck a balance between the user's value and the business's value while promoting the collection of preventive maintenance data that contributes to countermeasures for the deterioration of infrastructure, which is a social issue (Tsurumi, Sugino and Sato 2018).

Evaluating Projects and Improving Continuously

As mentioned above, customized design thinking has activated projects that realize experiential value, enterprise value, and social value through co-creation and collaboration from a customer perspective. So, how does the foundation that integrates and promotes cooperation encompassing "process," "people," and "place" work? To illustrate this, it is important to look at how a CFT evaluates a project and makes use of the experience in subsequent activities.

Inherently, the success or failure of a project appears in the sales, profits, corporate value, or other objective survey data of the customer or the company. However, it usually takes a long time for project outcomes to be implemented and for such quantitative results to become available. This tendency is particularly noticeable in the social infrastructure sector, which is the main field of Toshiba's business, where it often takes several years. Therefore, the subjective evaluation of customer and user satisfaction, the self-evaluation of the CFT, etc. are practical approaches.

In order to perform such evaluations, it is necessary to clarify the purpose, set evaluation items and metrics, assess the current level and the target, and share these with CFT and the customer. Therefore, as a "process" countermeasure, the procedure of goal setting and sharing is standardized and implemented before starting the design thinking process. Prior to entering the Discover, Define, Develop, Deliver design thinking process, the "Dream" and "Direct" "Vision Sharing" steps are added (See Figure 5).

Figure 5: Customer value design process

Source: Author's conceptualization

Then, for "place," the company formulated samples of target items and guidelines for setting goals, implemented them in the communication platform, and started recording, counting, and sharing. And, for "people," it is reflecting success and failure cases in education content and networking events. As these endeavors gain traction, a virtuous circle will arise whereby more case examples and data will be shared with more people through education and events, leading to further improvement of tools and processes. Thus, it is expected that the co-creation and collaboration projects will become more effective and investment planning will become more accurate.

As discussed above, Customer Value Design is an evolving system involving iterative improvement through trial and error.

Conclusion

This paper described Toshiba's efforts to introduce design thinking that evolved in the United States and Europe to conventional large Japanese organizations through the use of Toshiba's variant of design thinking, Customer Value Design.

Since the global business environment is changing in view of the progress of digital transformation and the increasing complexity of people's values, it is becoming more difficult for companies to achieve sustainable growth only with conventional marketing and development. Therefore, in response to the new market structure, the need to reform marketing and development processes is an issue common to industry as a whole. As one way of addressing that issue, it is considered effective to introduce the

"design thinking" methodology that utilizes design in various activities of the business. However, organizations that are highly optimized for the technology-driven division of labor encounter various obstacles in terms of organizational culture, mindset, and literacy. In order to overcome these obstacles, it is possible to introduce design thinking to conventional organizations by customizing the method to suit the organization and by simultaneously launching a foundation that integrates and promotes cooperation encompassing process, people, and place.

Through such an effort, an evolving system of co-creation and collaboration is achieving comprehensive open innovation inside and outside the company. Mutual understanding, empathy, and resonance among various stakeholders through design thinking will be the driving force of corporate transformation and growth, and expected to contribute to people's enhanced quality of life, business achievements of enterprises, and the realization of a sustainable society.

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