Chapter 7

Product Design

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This chapter traces the evolution of Japanese product design from the Meiji era through the postwar period and into the late twentieth century and beyond. It analyzes how industrialization, exposure to Western art and design movements, and shifting national priorities transformed both craft production and industrial design, while longstanding traditions continued to exert significant influence. The discussion begins with the gradual emergence of design as a distinct professional field, coinciding with the rise of mass production and urban consumer culture prior to the Second World War. The focus then shifts to the postwar era, when economic recovery, international exchange, and technological innovation enabled Japanese designers to redefine the relationships among industry, usability, and everyday life. Finally, the chapter examines how advancements in electronics, product platforms, robotics, interaction design, and materials science extended these concerns into new technological domains, highlighting persistent tensions between global influences and local values, as well as between innovation and tradition.

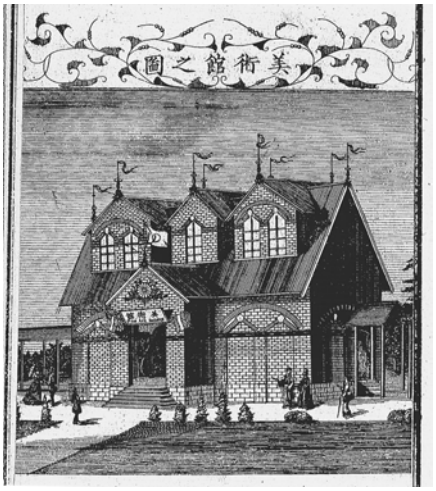

Figure 1: An engraving from an unknown artisan of a building from the First National Industrial Exhibition (*Naikoku Kangyō Hakurankai*), first held in 1877, Ueno, Tokyo.

1 Meiji era to World War Two

During the Meiji era, Japan underwent rapid modernization in politics, society, and technology, fundamentally altering domestic production methods. Industrial designers and craftspeople, like those in visual culture, adopted Western techniques and ideas, resulting in significant transformations in both industrial design and craft production. The government organized industrial exhibitions to showcase Japan's manufacturing sector to domestic and international audiences, which encouraged improvements in craft quality and supported the development of new decorative styles.[1]

Artisans in traditional disciplines such as ceramics, metalwork, and lacquerware faced the challenge of adapting their crafts to contemporary industrial mass-production techniques, paralleling developments during the Industrial Revolution in Britain and Europe. Some artists resisted mechanization, emphasizing handmade techniques, while others experimented with new methods and materials. The British Arts and Crafts movement, followed by Art Nouveau and Art Deco, exerted considerable influence in Japan around the turn of the twentieth century. During this period, Japanese artisans also gained international exposure through world fairs, including the *Naikoku Kangyō Hakurankai* (National Industrial Exhibitions), held in Tokyo, Kyoto, and Osaka (Figure 1).[2]

[1] Tōkyō Geijutsu Kurabu, ed. *Nihon no 20-seiki geijutsu [The 20th Century Art in Japan]*. Heibonsha, 2014.

[2] Tōkyō Geijutsu Kurabu, see n. 1.

Figure 2: The original Bauhaus building in Weimar, Germany, built 1904-1911. Bauhaus ideas had a strong influence on Japanese design and architecture. Photograph by Ralf Hermann.

2 A new discipline emerges

By the 1920s, industrial design in Japan was recognized as a distinct profession, paralleling developments in graphic design. This emergence coincided with the expansion of mass production and urban consumer culture. European movements such as the Bauhaus, which advocated for the integration of art and industry and a systematic approach to design, were particularly influential.

By the 1930s, Japanese craft and design – particularly metalwork and enamel – were facing significant industrial and artistic developments. They were influenced by two forces: on one hand, a growing market for Japanese exports, and on the other, the increasing use of industrial technology. Japanese enamel production featured new firing methods, enhancements to materials, and increasingly-complex decoration, leading to increased acclaim for Japanese enamelware internationally. It involved a mixture of both machine and handmade techniques, which created a new category of modern craft. Japanese enamelware in particular had strong recognition abroad, encouraging manufacturers to prioritize designs for Western tastes. At the same time, domestic craft associations were still attempting to preserve high artistic standards and maintain a uniquely Japanese identity within these modern crafts.

During the 1930s, functionalism gained prominence, emphasizing practical use, clarity, and efficiency in design. Bauhaus principles were widely adopted by industrial designers, graphic designers, and architects, although Michiko Yamawaki (1910-2000), a textile designer, was the only Japanese designer to have studied product design directly at the Bauhaus (Figure 2).[3] Urban modernity expanded, and mass-produced household objects and consumer products became increasingly popular.

With Japan's entry into the war, product design was subordinated to national mobilization

[3]Meg Miller. "From Weimar to Tokyo, We Trace the Origins and Influences of the "Japanese Bauhaus"." In: *AIGA Eye on Design* (Dec. 2019). URL: https://eyeondesign.aiga.org/from-weimar-to-tokyo-the-origins-and-influences-of-the-japanese-bauhaus/.

policies that prioritized efficiency and durability, requiring the use of scarce materials. Civilian products became more simple and standardized as factories shifted to military production. Designers and craftspeople operated under strict state controls, often experimenting with substitute materials such as wood and bamboo.[4] Opportunities for innovation were severely constrained, resulting in limited substantive progress in product design during the war years.

3 Early Postwar period

In the 1950s, industrial design in Japan gained momentum as the country rebuilt its manufacturing base following the Second World War. Initially, the emphasis was on producing inexpensive products, but attention soon shifted toward usability. Major companies increasingly focused on household items and electrical appliances.

The 1960s were a turning point for Japan, as the decade saw rapid economic growth that drove the expansion of the national economy, consumer culture, and social change. The 1960 World Design Conference in Tokyo was Japan's first major international design conference, where influential international designers – including Herbert Bayer (1900-1985) of the Bauhaus and Italian designer Bruno Munari (1907-1998) – gathered to discuss the social role of design beyond purely commercial concerns, alongside Japanese designers such as Yūsaku Kamekura (1915-1997), Kenji Ekuan (1929-2015), and Sōri Yanagi (1915-2011), the son of *Mingei* theorist Sōetsu Yanagi, as well as architects Kenzo Tange (1913-2005) and Kiyonori Kikutake (1928-2011).[5] The 1964 Tokyo Olympics further accelerated Japan's economic growth. Consumer society expanded rapidly, with cars, televisions, and other household appliances becoming widespread by the late 1960s. As Japan emerged as an economic superpower, companies faced increasing pressure to differentiate their products in order to compete within a growing mass-consumption market.[6]

Despite accelerating industrialization in the early postwar decades, the *Mingei* movement maintained significant influence. Sōetsu Yanagi's ideas remained influential after his death in 1961, offering an alternative to both the nationalism of the 1930s and the prevailing modernism of the mid-twentieth century.

Several designers attempted to reconcile mass production with principles from the *Mingei* movement. A notable example is Sōri Yanagi, who, like many prominent Japanese product designers, worked with various Japanese companies. Graphic designer Kenya Hara (born 1958) describes Sōri Yanagi's working process, which notably did not involve computing technology, even though such tools were widely available during Yanagi's later career:

[4] Tōkyō Geijutsu Kurabu, see n. 1.

[5] Tōkyō Geijutsu Kurabu, see n. 1.

[6] John Zukowsky et al., eds. *Japan 2000: Architecture and Design for the Japanese Public*. Munich; New York: Prestel Verlag, 1998.

Figure 3: Sōri Yanagi's butterfly stool, designed in 1954, is an iconic example of Postwar Japan's product design. The product is still sold today.

> I once visited Yanagi at his atelier, and found many plaster models of products on display. These full-scale plaster models, which he crafted without the use of computer simulation, carefully and repeatedly reshaping them by gently rubbing them by hand, reflected his determined pursuit of form adapted to utility; I felt great respect for that conscientious approach and unwavering conviction.[7]

This process demonstrates a clear influence from craft traditions and reflects the philosophy of Sōetsu Yanagi. Sōri Yanagi articulated ten principles of design:

- Creating a design is not about altering the surface appearance. It is about using originality and ingenuity to reform inner mechanisms.
- True beauty is born, not created.
- The concept of design is inspired by the action of designing.
- Design is not a solitary act.
- An entrepreneur more than anything else must possess a talent for products.
- Best sellers are not always the best in terms of design. The best designs do not always become best sellers.
- Talented designers are not solely responsible for good design.
- True design does battle with trends.
- Tradition inspires creation. Design is impossible without tradition and creativity.

[7]Kenya Hara. *Designing Japan: A Future Built on Aesthetics*. Trans. by M. K. Hohle and Y. Naito. Japan Publishing Industry Foundation for Culture, 2018, 36–7.

- Design is a social issue.[8]

It is difficult to imagine what this list from the younger Yanagi, whose *Butterfly stool* (Figure 3) is one of the most iconic works of modern Japanese product design, would look like without his father's philosophy and movement.

Following the oil shock of 1979, Japan shifted from resource-intensive industries toward lighter industries, distribution, and services. Technological advances enabled miniaturization and accommodated evolving consumer preferences. By the 1980s, these characteristics became hallmarks of Japanese design, alongside rapid developments in electronics, logistics, and information systems.[9]

Within this context, Japanese companies developed new approaches to product development. By the late 1970s, Japanese companies such as Sony and Kodak were at the forefront of creating product platforms. Design historian John Heskett explains:

> [Product] platforms group modules and components to serve a basic functional purpose, from which it becomes possible rapidly to develop and manufacture a variety of product configurations. This enables a basic idea to be modified rapidly in response to changing market or competitive conditions. A successful example was demonstrated by Sony after the initial favourable reception of its Walkman, launched in 1979, with the development of a basic functional module and an advanced features module. Each was the basis of warding off competition from followers, enabling a rapid succession of models to be launched to test a wide variety of applications and features at different levels of the market.[10]

The platform-based approach contributed to the emergence of several iconic Japanese products during this period. Sony's Walkman redefined music consumption by enabling private, portable listening, while companies such as Canon and Fujifilm developed compact and disposable cameras that emphasized portability and ease of use. In these examples, technological innovation was integrated with lifestyle appeal, positioning experiential qualities alongside functionality as central to the user experience. The widespread adoption of the product platform concept by major Japanese companies in the late 1970s and early 1980s has had a lasting impact on product development. As Heskett notes, these companies often

> have very large in-house groups, 400 designers being not unusual ... [many of whom are] designing minor variations of existing products in an effort to satisfy a broad range of tastes.[11]

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[8] Sōri Yanagi. *Design: Yanagi Sōri no sakuhin to kangae [Design: The Works and Philosophy of Yanagi Sōri]*. Yūhikaku, 1983.

[9] Zukowsky et al., see n. 6.

[10] John Heskett. *Design: A Very Short Introduction*. Oxford University Press, 2005, 109.

[11] Heskett, see n. 10, 47.

Figure 4: Naoto Fukasawa's CD player, designed in 1999 for MUJI.

Although Japan is no longer the economic powerhouse it was prior to the early 1990s, it continues to dominate specific fields, particularly camera development.

Alongside technological innovation and the expansion of consumer culture, designers also turned their attention to traditional craft. Designers such as Akioka Yoshio (1920-1997) integrated traditional materials and techniques into contemporary design contexts. Products such as tableware emphasized sustainability and the social conditions of their production, presenting craft not as a return to the past but as a viable alternative to mass-produced goods grounded in locality and promoting long-term use.[12]

During the 1980s, MUJI emerged as a counterpoint to the expanding consumer culture, while still operating within a retail capitalist framework. MUJI eschewed overt branding, and its products featured minimal ornamentation, emphasizing simplicity, restraint, and everyday usability (For example, see Figure 4). This approach resonated with consumers who were likely fatigued by the excesses of the bubble era.

The tensions between mass production and personal experience, global capitalism and regional identity, excess and restraint, and industrial efficiency and craft values were all brought into sharp relief during this period, and designers such as Akioka Yoshio and Sōri Yanagi demonstrated that at least some of these opposing forces could be productively balanced.

4 Robotics and Interaction Design

Though product design in Japan shifted direction in the 1980s in no small part due to technological advances, it is also worth considering Japan's sustained focus on robotics and related technologies – an area of technological development to which Japan has contributed for several decades.

[12]Zukowsky et al., see n. 6.

Figure 5: Softbank's Pepper robot, now manufactured by Aldebaran Robotics, is a service robot utilized in several customer-facing roles in Japan.

Since the 1960s, Japan has invested heavily in robotic design across a wide range of applications, including industrial robots, social robots, and more experimental humanoid robots. It is likely not a coincidence that the "uncanny valley" theory was proposed by a Japanese robotics researcher in the 1970s, Masahiro Mori (1927-2025), who perhaps foresaw that several researchers, both in Japan and internationally, would focus on attempting to make robots more human-like, an advancement that continues to evoke uncomfortable feelings in us human users.[13]

On the other hand, non-humanoid robots such as PARO, created at AIST (National Institute of Advanced Industrial Science and Technology) Japan, provided early examples of how social robots might have a significant role to play in healthcare – an area that Japan has a strong stake in, given both its rapidly ageing population and long-term labour shortages.[14] Non-humanoid robots are also being utilized in the services industry, such as in Figure 5.

Beyond robotics, Japan has made significant contributions to the field of interaction design. Naoto Fukasawa, who has worked with major companies such as MUJI, identifies as an interaction designer.[15] His approach challenges the assumption that interaction design must always incorporate the latest technologies, instead emphasizing human experience and every-

[13]Masahiro Mori. "The Uncanny Valley." In: *IEEE Robotics & Automation Magazine* 19.2 (2012). Trans. K. F. MacDorman and N. Kageki. Authorised English translation of the 1970 original, pp. 98–100.

[14]Takanori Shibata. "An Overview of Human Interactive Robots for Psychological Enrichment." In: *Proceedings of the IEEE* 92.11 (2004). National Institute of Advanced Industrial Science and Technology (AIST), pp. 1749–1758.

[15]Gary Hustwit. *Objectified*. Documentary film. 2009.

Figure 6: An early (2016) iteration of the IMSS project Interactive Modular Screen System by researchers at Tokyo Metropolitan University.

day behavior. Fukasawa's work seeks to provide what users require without their conscious awareness, an approach he describes as *muishiki*, or "without thought."[16] Numerous technologically advanced examples of innovative interaction design have emerged from Japan in recent decades. These include modular systems for built environments, such as the IMSS (*Interactive Modular Screen System*, Figures 6 and 7) project from Verl Adams and Tetsuaki Baba at Tokyo Metropolitan University, and Jun Rekimoto's Squama project from the University of Tokyo, both of which explore modular interactive systems as novel contributions to spatial design.[17]

Although these experimental prototypes have attracted attention within the design community, they have not yet been realized as commercially available products. Such approaches may be inspired by Japan's cultural tradition of *shōji* screens.

Another example of Japanese interaction design, and one more relevant to product design than spatial design, is Tetsuaki Baba's *Freqtric Drums* project.[18] This device, based on the human body's electrical conductivity, "turns audiences surrounding a performer into drums so

[16]Hustwit, see n. 15.

[17]Verl Adams et al. *IMSS Progress Exhibition*. Exhibition, System Design Gallery. 2019; Yuki Matsuoka et al. "Towards Combining the Beauty and Utility of Architectural Materials with Interactive Media Technologies: IMSS Project." In: *Proceedings of IPSJ Interaction 2016*. Mar. 2016, pp. 402–406. URL: https://www.interaction-ipsj.org/proceedings/2016/data/pdf/1C59.pdf; Jun Rekimoto. "Squama: Modular Visibility Control of Walls and Windows for Programmable Physical Architectures." In: *Proceedings of the International Working Conference on Advanced Visual Interfaces*. AVI '12. ACM, 2012. URL: https://lab.rekimoto.org/projects/squama/.

[18]Tetsuaki Baba, Taketoshi Ushiama, and Kiyoshi Tomimatsu. "Freqtric drums: a musical instrument that uses skin contact as an interface." In: (June 2007). DOI: 10.1145/1279740.1279827.

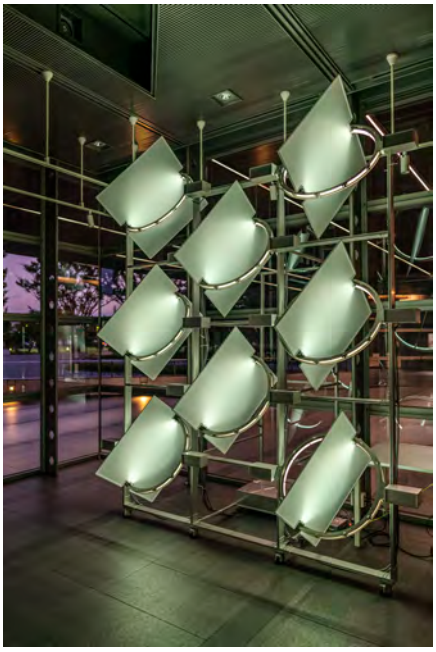

Figure 7: A later (2020) iteration of the IMSS project Interactive Modular Screen System by researchers at Tokyo Metropolitan University. Photograph by Verl Adams.

that the performer, as a drummer, can communicate with audience members as if they were a set of drums."[19] Unlike many interaction design prototypes, though, this one was made into a commercial product as a Doraemon toy, which was only available in Japan.[20] The prototype version is shown in Figure 8.

The art collective teamLab further advances interactive environments by employing techniques such as projection mapping, motion sensors, programmable LED (light-emitting diode) lights, and augmented reality to create immersive experiences that have expanded beyond Japan to other regions, including Asia, the Middle East, and Europe.[21] teamLab's exhibitions continue to draw on Japan's rich visual culture, referencing motifs such as the changing seasons, calligraphy, and traditional environmental design.

Beyond innovation in interactive technologies, advances in material sciences also suggest how products in the near future might develop. For example, although Japan's more traditional textile industry lost its dominance to Taiwan and Korea, and then they to India and China, Japan now leads the way in synthetic textile development. Kenya Hara explains:

> Synthetic fibres are more than a substitute for natural fibres. Maturing technology will reconcile the opposition between the artificial and the natural, and will move toward erasing the boundary between them. As technology continues to

[19]Baba, Ushiama, and Tomimatsu, see n. 18, 386.

[20]Tetsuaki Baba. Personal communication. 2014.

[21]teamLab. *teamLab*. `https://www.teamlab.art`. Accessed: 2024. 2024.

Figure 8: Tetsuaki Baba's *Freqtric Drums* project. The device creates music signals based on the human body's electrical conductivity.

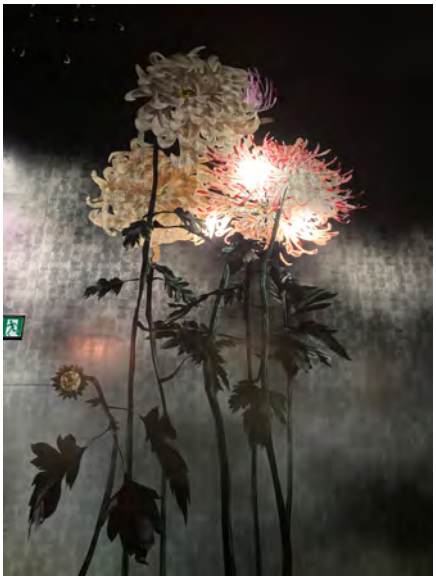

Figure 9: An interactive graphic from the permanent exhibition teamLab Biovortex in Kyoto. teamLab's work makes frequent references to traditional themes from Japanese arts and crafts.

> evolve, products with unique features that can't be evaluated on the same plane as natural fibres are being developed.[22]

Aside from more obvious applications such as the fashion industry, these fibres are used in a range of applications, from bulletproof and fireproof materials to fibre optics and electrical conduction. These developments point toward a future of Japanese product design in which advances in materials offer new creative and functional possibilities for everyday products, but also raise important questions about environmental impact and sustainability that designers will increasingly need to address.

5 Summary

This chapter has shown that the development of Japanese product design was, and continues to be, a continual negotiation between modernization and tradition. From the early challenges of adapting craft practices to industrial production, through postwar reconstruction and economic growth, designers consistently sought ways to balance functionality and cultural identity. The enduring influence of the *Mingei* movement, especially alongside the adoption of modernist and technological approaches, contributed to a design culture attentive not only to form and performance but also to social context and everyday experience. As later sections suggested, this sensitivity extended into emerging fields such as interaction design and robotics, where human behaviour, perception, and environment remain central concerns. Finally, advances in material sciences suggest new creative possibilities in product design, though not without ongoing concerns about environmental impact.

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[22] Hara, see n. 7, 135.

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