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## The Age of Knowledge Design: A View from Japan

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*For the global corporation, the role of the designer is increasingly significant, giving form to the organization and decision-making, as well as shaping the development of products and services.*

# The Age of Knowledge Design: A View from Japan

by Noboru Konno

The corporate environment today is more the source of uncertainty than it is the foundation for business. We have seen the drastic changes caused by the globalization of the economy and of information. A new consumer awareness has emerged from the abundance of products and information, blurring and distorting market boundaries. Firms are often forced to compete with unpredictable rivals in a vast and volatile arena in which the conventional frameworks for markets and business do not exist. Products and services are easily commoditized; thus, we can no longer achieve growth or profit by simply pursuing good quality.

Today's firms are asked to make an especially big shift. In the midst of the transformation from the twentieth-century "information society" to the "knowledge society" of the early

twenty-first century, their biggest challenge is to address creativity. The age of "quality management" is nearing an end. Now, firms must practice "creativity management," in which the value of a product or service lies in the experience, meaning, or discovery the consumer extracts from it.

This paper is based on my book, *The Knowledge Design Company* (Nikkei Publishing, 2008). It centers on the challenges Japanese firms currently face amid such changes, and discusses a new perspective that seems to be useful for them. I believe this perspective will offer insights for companies in other parts of the world, as well.

## **Toward a creative paradigm**

In the knowledge society and economy, a difference in value cannot be achieved simply by a difference in

information. We may be able to figure out a certain gap, namely a trend, by analyzing the past. However, the value in the future does not lie in an extension of the past.

The source of value lies in differences produced by knowledge creation or by innovation. A firm can survive only when it has the sensitivity to detect changes in an uncertain business environment, and to create and offer knowledge that achieves customer value based on an in-depth understanding (not an analysis) of the human and society. These days, everyone talks about innovation. But the concept of innovation has also changed. Fundamentally, companies need to make a shift from the analytical to the creative model (see Figure 1 on next page).

In creative management, innovation is neither something that

takes place only occasionally, nor a process involving only engineers and researchers. It is the day-to-day practice of all members of the organization. Even large global firms strive to expend the energy and resources necessary to assimilate innovation into their corporate culture. In order to make innovation continual, disciplines, processes, and ba<sup>1</sup> (a Japanese

1. Kitaro Nishida explained ba as a “context that harbors meaning.” It can be physical (for instance, an office or a workplace), virtual (emails, teleconferences), mental (shared experiences, common ideas), or any combination of these—that is, as a place in which relationships can emerge and knowledge can be created and shared. Cf. Ikujiro Nonaka, Noboru Konno, “The Concept of ‘Ba’: Building a Foundation for Knowledge Creation,” *California Management Review*, vol. 40, no.3 (Spring 1998).

word for shared places, networks, or contexts among people) for knowledge creation have to be embedded in the organization as part of its culture. And this is true for all firms, regardless of the countries in which they operate and the industries to which they belong.

For example, Google is well-known for its unique approach to innovation management. Hundreds of projects are carried out concurrently; technical people from a wide range of fields generate new ideas every day. Researchers and engineers are encouraged to spend 20 percent of their work hours on projects outside

their regular jobs, chosen solely for their personal interest. Most ideas are turned into new software or services immediately and tested and evaluated in the company and with beta users.

Google’s idea management focuses on creating ba in which people can evaluate and develop knowledge (knowledge assets) as tangible resources. The conditions necessary for creating such ba include: 1) intellectual curiosity in all Google employees; 2) employees who try to be sincere in a very spontaneous way; 3) employees who believe they should use their capability and expertise to

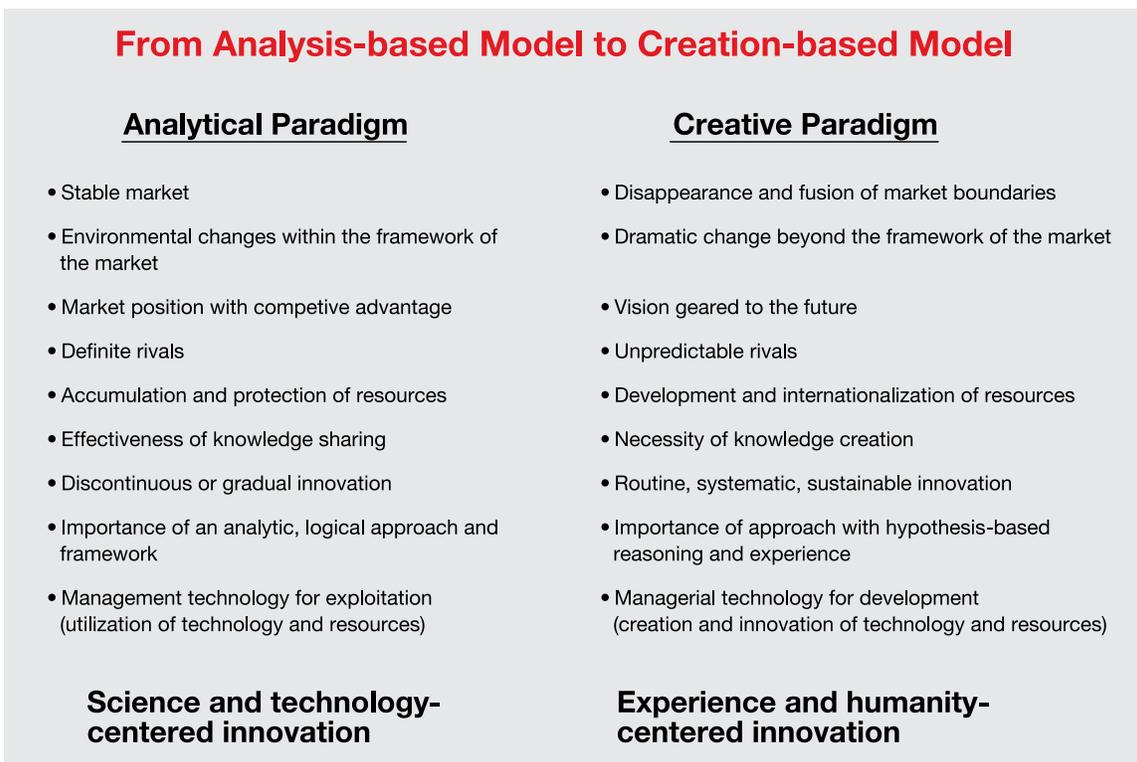


Figure 1. From the analytical model to the creative model of management.

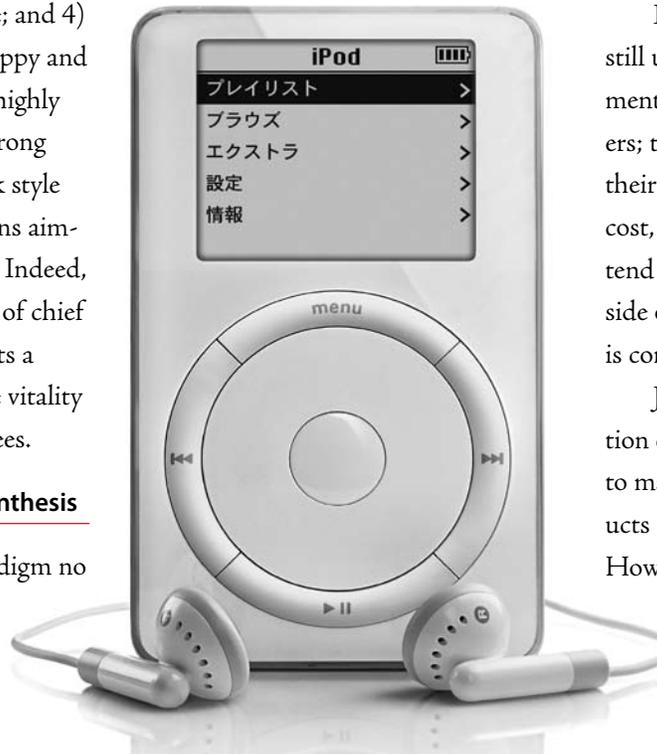
make the world a better place; and 4) employees who want to be happy and work hard to stay so. Such a highly developed sensibility and a strong preference for an artisan work style are important for organizations aiming at creativity management. Indeed, Google has set created a post of chief cultural officer, and it conducts a happiness survey to boost the vitality and motivation of its employees.

### The shift from analysis to synthesis

Why does the analytical paradigm no longer work?

First, the idea behind this paradigm—a deterministic way of thinking that we can always reach the right answer by narrowing down the question through analysis—has come to the end of its tether. In fact, it has become quite difficult for us to reach the right answer in today's business environment. This is not surprising, because we are unable to predict unexpected circumstances from the past data on which the analysis is based. Another problem is that we cannot develop an effective strategy against volatile and unexpected rivals through the use of one fixed answer.

Then what should replace analysis as a new methodology? Perhaps a methodology of dynamically connecting a variety of things—such



as hardware, software, a business model, and so on—to create a world. Connection here does not mean the simple act of combining various elements; it covers both combination and creation. More specifically, it entails the connection of different business units and outside partners through knowledge sharing—the creation of something new through interactions among them—and brings about co-evolution.

In this respect, Japanese firms have a serious problem in that they have always thrived on departmentalism—a tacit but strong corporate culture of silos, which is neither cross-functional nor open.

Improvement and cost reduction still underlie the product development of most Japanese manufacturers; the main focus of discussion at their planning meetings is quality, cost, and delivery (QCD). Since they tend to focus only on the hardware side of manufacturing, cost reduction is considered to be the top priority.

Japanese firms excel at production engineering. They do their best to make quality hardware products as cost-efficiently as possible.

However, the great success of the

Apple iPod, for instance, was achieved by bucking this rule.

Where Japanese firms pursue the best possible quality with the best cost efficiency, the iPod exemplifies pursuing the best possible user experience, and can be understood as a phenomenon epitomizing the creative paradigm.

There are many MP3 music players manufactured by Japanese firms. However, they don't come with software like iTunes and services like the iTunes Store. For iPod users, the digital music player does not exist as a simple product, but instead represents an integral experience. It is a part of a trinity of hardware (iPod), software (iTunes), and service (iTunes Music Store). In this trinity, iTunes functions as a catalyst for integration. The significance of the iPod as a platform

for the trinity is much greater than that of a standalone product. This is why Steve Jobs was committed to integrated product design and the finest quality in every detail for the iPod.

This also answers the question I had when I saw the iPod for the first time: “Why is the back of the iPod polished to a mirror finish?” Did you know that craftsmen in Niigata, the region facing the Sea of Japan, care-

*This also answers the question I had when I saw the iPod for the first time: “Why is the back of the iPod polished to a mirror finish?”*

fully polish the back of each iPod? The hardware part of this trinity, iPod, works as the gateway to or the platform for the integral experience. Actually Apple has now held on to the iPod, as a design icon, for almost seven generations.

For Japanese manufacturers, it is almost impossible, in terms of cost and customer needs, to adopt something like the mirror finish on the back of the iPod. If it were proposed at a product-planning meeting, it would likely be rejected. Japanese firms would rather choose to bring out new models frequently. Apple, however, found value in such costliness. The iPod was designed to have a high-quality, finished form requiring

craftsmanship, and Apple believed this would add an unequaled quality to the comprehensive value of the iPod experience. In other words, the costly mirror finish constitutes a high barrier for competitors.

Let us admit that such an approach to manufacturing would not come from the belief in “good quality at reasonable prices” or the “customer-first” policy of Japanese firms. This

policy often makes firms nearsighted and encourages them to concentrate on satisfying short-term customer needs. The tendency has been criticized, as it sometimes prevents firms from viewing business from a comprehensive perspective.

The development of the iPod was thus a process of gathering, networking, and synthesizing various elements, problems, and pieces of knowledge—hugely different from traditional product development and engineering. But it does have something in common with a capability that Japanese firms have long held—the ability of adjusting and synthesizing different elements in an integral manner at production sites. The story

of the Apple iPod might offer Japanese firms some insight into how such new capability could be re-utilized.

### **The power of knowledge design**

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I advocate the concept of knowledge design, the central topic of this paper, as a new managerial capacity for the age of creativity management. Design, as a cognitive and empirical methodology, has been understood only in a narrow sense thus far. But now, in the face of this great shift, it is very likely that design offers us a new perspective (or philosophy) to take the place of the analytical paradigm.

Design is basically an activity in which we actualize knowledge and create images or forms (models) for artifacts. In such a process, we use our hands and are physically involved. It is very different from logical analysis. When we design something, we commit to the environment or dwell in the customers’ situation and use all our experience and knowledge to embody our ideal or truth. P.G. Rowe, a researcher in design methodology, argues that a designer organizes many different pieces of knowledge in line with aesthetic, traditional, cultural, and social systems in a tacit way, and repeats this process.

Organizations need to assimilate the power of design to organize knowledge and fully utilize it as

one of their strengths. Just as the industrial society needed industrial design, the knowledge society requires knowledge design for product systems, platforms, coordinating and visualizing knowledge assets, and creating experiences.

### **Abductive reasoning and the power of knowledge design**

Although the term *design* can evoke various images in our minds, the roles of design, when used in the context of knowledge design, are as follows:

- To give a social perspective to management or technology, and to help such a perspective take shape (mediation or insight)
- To synthesize differing elements (for instance, hardware, software, services, and business) into an integrated whole (combination or connection)
- To intuitively visualize and give form to businesses, management, and market—and even long-term strategy (formation or narration)

Knowledge design is not about things or materials or hardware products, but rather about events, phenomena, and experiences. As Alfred North Whitehead, a British mathematician and philosopher, explained in his book *Process and Reality*, our actual world comprises events, not things. Or consider that

in quantum physics, a thing is both a particle and a wave; nothing is allowed to stand still. Similarly, in this knowledge era, our design focus has shifted from materials to events. Knowledge design is a way of embedding knowledge of things (and technology) into events (process).

How do individuals and organizations develop this capability? First, we have to see the big picture, be sensitive to signs of changes to come, and have a future-oriented perspective. Furthermore, we must have an ability to figure out a way to make people happier, wealthier, and better educated in the face of what has become a vast amount of information and knowledge. We have to be both idealistic and pragmatic.

*The process of abduction begins with applying prototypes of ideas (memories) from experiences, mental images, and beliefs, and forms a picture of the future.*

Because knowledge design is an act of organizing knowledge, it requires the integration of a huge number of multidimensional factors. What is important here is that we become acquainted with the process of abduction rather than cling to analytical approaches.

Abduction is a hypothetical

inference involving a creative leap.

It was Charles S. Peirce, an American philosopher and the founder of pragmatism, who pointed out the importance of abduction. It had been believed that deduction and induction were the two fundamentals of scientific reasoning. Peirce argued that deduction and induction were not enough to discover creative hypotheses, and advocated the abductive approach as a way of reasoning that involved a combination of intuition and logic.

Peirce believed that a hypothesis was not something you could form from past data. The process of abduction begins with applying prototypes of ideas (memories) from experiences, mental images, and beliefs, and forms

a picture of the future. It entails building a set of hypotheses by asking constructive questions such as, “If this happens, how will it change things?” or thinking, “If I were the customer, I would want so-and-so.”

Since, after all, these are hypotheses, nobody can tell whether they will come true. This, in fact, is a matter

of no importance. The point is that abduction helps us to break out of the conventional ways of thinking that are focused on data analysis, build a set of scenarios of the future based on our intuition and insight, and view things from multiple perspectives, then practice—and repeat. This process should be followed by deduction (applying the hypothesis) and induction (observing and verifying it). This is the process by which knowledge design is activated (Figure 2).

Apple isn't the only company that has substantially practiced knowledge design. Oticon (hearing aids) in Denmark, Samsung (electronics) in

Korea, Camper (shoes) in Spain, and Nintendo (games) and Disco (precision manufacturing) in Japan have also learned to focus on design as a process to create value.

**The power of individuals and the firm's sincerity**

Knowledge design is about people and their contributions to the firms they work for.

When knowledge design becomes management's core, the focus turns to the individuals who generate knowledge assets as the source of value. As knowledge workers come to play a leading role, the scale of

corporate value will also come to depend on them. During the era of blue- and white-collar workers, the wealthy capitalists possessed all the means of production. But now the individuals, as knowledge workers, are the key to production—with their intellect, experience, and skills to create, apply, and synthesize knowledge. Shareholders own the firm's hard assets, according to the balance sheet. But they will have no power over the knowledge workers, the intangible assets, and so in future their influence will be limited. Now that the corporate emphasis on shareholder returns has become the subject of some re-

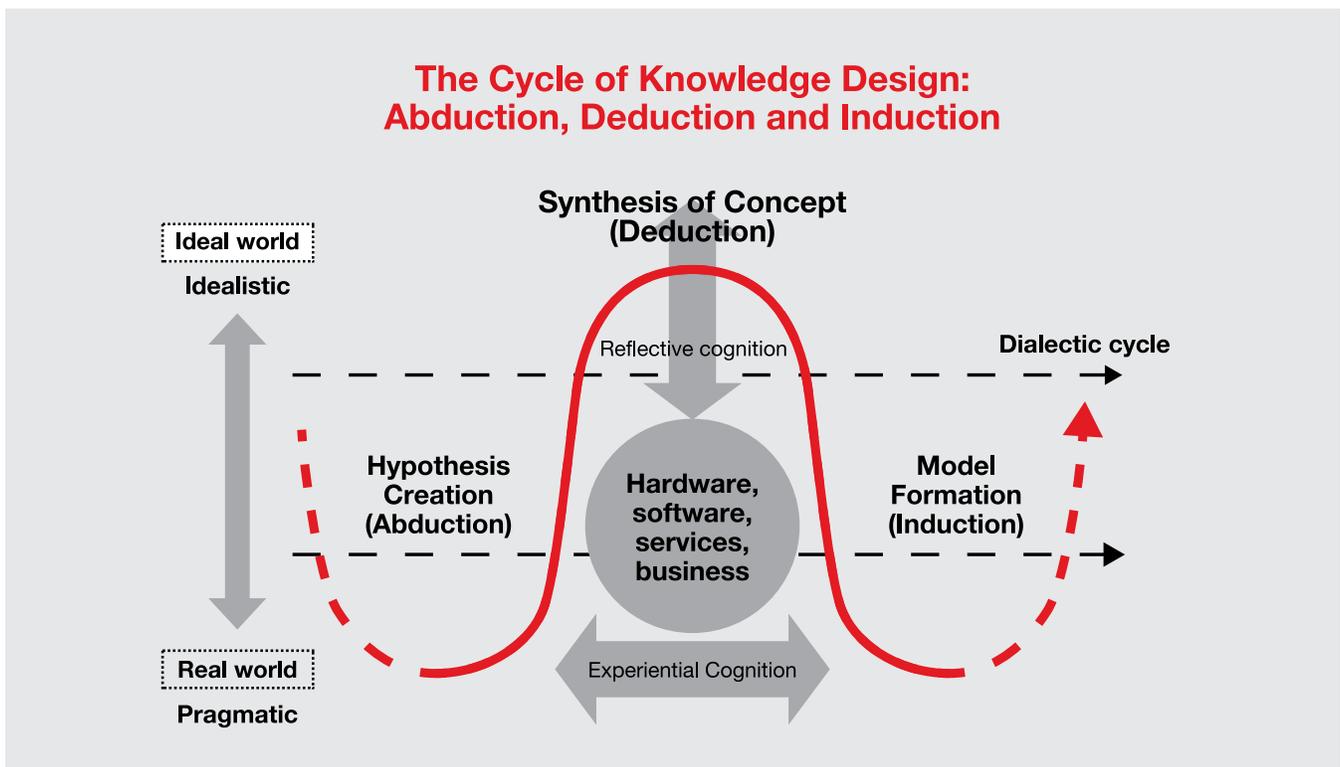


Figure 2. The cycle of knowledge design.

morse, it will be easier to rethink the conventional style of governance in which shareholders are considered to be the ultimate owners and recipients of benefits.

In this context, one of the mottos of Japanese-style management, “The company belongs to its employees,” seems to have some point. However, what Japanese firms truly used to care about was collective employees, not individuals. Also if a firm continues to reconcile the interests of various groups and people, as Japanese firms tend to do,<sup>2</sup> it will not be able to help individuals demonstrate their capability. And here will be the challenge for Japanese firms: to inspire people’s desire to do interesting work—to, as Steve Jobs would say, “build products that really turn us on.”

What matters to the firms who seek knowledge design is their attitude toward business. The most important factor here is sincerity. In order to create something new, we have to devote ourselves to our mission with sincerity. Concentration, stamina, and serendipity—the ability to make something new by chance—is necessary for creativity. These factors cannot be ensured without sincere devotion.

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2. In Japan, this is called *nemawashi* (consensus building).

If companies wish to focus on knowledge design, they will have to learn to offer products and services in mutual relationships with customers. Customers will become their knowledge partners. It will be increasingly important for companies to have people who know how to draw out the value of the people networks inside and outside their organizations. Indeed, firms that put no importance on people will not be able to create value and evolve with customers.

The most important ingredient for the practice of knowledge design is passion shared across teams and organizations. Because it helps us to envision the future, synthesize complex business factors, and present products or services to the market effectively, we cannot benefit from design without a serious commitment to it.

I believe that companies should reconsider where their virtues lie and become aware of sincerity. Sincerity is an attitude in pursuit of truth, goodness, and beauty. It is also a quality that allows individual executives and employees to become fully convinced of the significance of their mission. Such a virtue helps people maximize their potential abilities and add vitality and the power of execution to the organization. In this respect, finally,

Japanese corporate tradition and its culture of commitment to the art of manufacturing should take on new meaning and significance, so to speak, as knowledge design companies.

### Knowledge design methods

If we are to fully pursue knowledge design, we must also employ something more than the conventional strategies, which focus only on differentiation and efficiency. In essence, knowledge design runs on two planes of cognition. One is experiential cognition, involving perception and behavior; the other is reflective cognition, which involves conceptualization and contemplation.<sup>3</sup> Both are necessary in order to create something new, because what we learn, create, or master depends on the cognition with which we make judgments.

People tend to be inclined toward experiential cognition in today’s society. Japanese firms are also good at prototyping, in terms of observing and identifying what fits customers based on their direct front-line experiences. In order to leverage knowledge design for business,

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3. Cf. Don Norman and Tamara Dunaeff, *Things that Make Us Smart: Defending Human Attributes in the Age of the Machine* (New York: Basic Books, 1994).

speedy, experience-based prototyping is crucial.

However, it is still not enough. Because the experience-based approach tends to engross us in addressing particular problems in particular situations, we also need to pull back and see the whole picture in order to bring it into harmony. The sincere pursuit of creating a quintessential concept based on reflective cognition is equally important.

In order to synthesize both experiential and reflective cognition, it is worth considering the concept of pattern language as an effective *lingua franca* for knowledge design. The English architect and builder Christopher Alexander proposed this idea to refer to common problems of civil and architectural design, from the way cities should be laid out to where windows should be placed in a room. The pattern language is a system of generative elements that repeatedly appear in our life and society, such as patterns of places, as well as patterns of how people meet and move. The system enables people to create a wholesome, quality environment.

Pattern languages can be considered as a methodology of co-evolution for synthesizing a variety of elements into something new. In other words, they combine our experiences and thoughts, and integrate different

realms such as hardware, software, services, and business models into the realm of society and daily living.

### Looking ahead

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In this creative economy, firms and customers, as well as designers, architects, and public-sector organizations, will become co-creators and knowledge partners. Needless to say, flexible knowledge and a nondeterministic way of thinking is required for this new world. In the past, firms have shown a strong inclination toward analysis-based, deterministic decision-making. They have tried to get the best possible view of important issues, such as market research, strategic planning, and core competence, but they have done it based on analysis. Decisions about all these issues need to be made in a more flexible and humanistic way.

However, this does not mean that we should deny the past. Knowledge design has great potential to make the knowledge and ethics we have already developed better and more humanistic. We also need to have an esthetic or artistic perspective when adopting design as a methodology, because art and beauty work as a catalyst for shifts and sublimation.

As philosopher Peirce said: "Esthetics is a science of ideals.... Ethics, or the science of right and wrong,

must appeal to Esthetics for aid in determining *summum bonum* (the highest good)." Knowledge design has the potential to reform traditional management through esthetics or art into a new form of knowledge.

### Suggested Reading

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